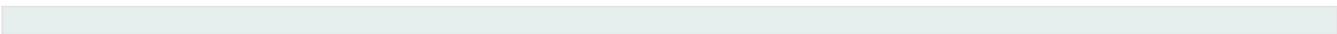




Parking Alternatives: Making Way for Urban Infill and Brownfields Redevelopment





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**Urban and Economic Development Division
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Washington, DC 20460**

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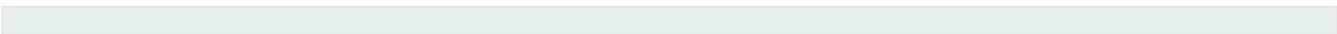
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Introduction

Throughout the country, sprawl development is consuming open space in outlying metropolitan areas and increasing automobile dependency. This trend is resulting in destruction of natural habitat, air and water pollution, excessive public and private expenditures on infrastructure expansion, increased transportation and travel costs, and shifts in jobs out of cities. Simultaneously, abandoned properties in once thriving urban areas are left behind with an underutilized public infrastructure, thus feeding the cycle of disinvestment in urban areas. There are many interrelated factors influencing this trend, not the least of which are the cost and ease of development. As the populace becomes increasingly dependent on automobiles, providing parking in urban areas has become a significant expense and deterrent to infill and brownfield redevelopment—development intended to reduce suburban sprawl and protect the environment by encouraging developers to invest within existing urban infrastructures. Providing parking in outlying greenfield areas is less burdensome because of the availability of land for low cost parking facilities.

In many instances, efforts to accommodate parking for motor vehicles have overextended actual need. An important case in point, and a focus of this guide, is the approach used by many cities to establish vehicular parking requirements—typically a generic formula based on satisfying maximum demand for free parking. Although this practice may allow city planners to err on the side of caution, it has some serious drawbacks.

In practical terms, this practice increases the cost of development and creates disincentives with respect to infill and brownfields redevelopment. In addition, generic parking requirements create excess parking spaces that consume land and resources, encourage automobile use and associated pollution, and degrade water quality. The oversupply of parking is of particular concern for infill and brownfields redevelopment because these sites are often located in urban areas where the existing parking infrastructure can be better utilized and parking alternatives, such as increased use of transit and pedestrian modes, can be more readily implemented.

With urban revitalization efforts underway in many cities, the timing is opportune for instituting changes in parking requirements and transportation behavior. An important way to reduce the demand for parking and the need to supply parking to meet maximum demand is to shift transportation behaviors in the direction of nonauto modes. This can be achieved by reducing the availability of parking in areas where alternative modes of transportation exist and by providing incentives for using alternative modes. Such changes will encourage infill redevelopment and reduce vehicle miles traveled, mobile source emissions and congestion.

They will also increase ridership for public transit and, in turn, provide the additional revenues needed to support public transit improvements.

There are, of course, potential drawbacks to reducing the supply of parking. Lenders, for example, may be unwilling to approve loans because plans do not meet their minimum parking requirements; developers may be concerned about the long-term marketability of their property; and residents may fear that parking will spill over into surrounding residential neighborhoods. Such concerns can be more readily addressed if: the factors that affect parking demand are understood; walkable, pedestrian-oriented development design is implemented; and viable nonauto transit alternatives exist where needed. Concerns are also alleviated when developers, employers, and employees are aware of public programs that promote the use of nonauto transit through financial incentives. The Transportation Equity Act for the 21st Century (TEA-21), for example, allows businesses to give their employees up to \$100 per month in tax free transit subsidies. TEA-21 also allows employees who commute by public transit or vanpool to deduct the cost of commuting from their taxable income if they do not receive a subsidy.

This guide is intended to further the readers knowledge and understanding of these issues. It was developed to accomplish the following objectives:

- Alert readers to the significance of the urban parking issue, addressing the perspectives of both city planners and developers;
- Illustrate the environmental, financial, and social implications of providing an over-supply of parking; and
- Describe cost-effective, environmentally-sensitive alternatives to generic parking requirements, providing case study examples of successful commercial real estate development in areas that have implemented parking alternatives.

The focus of this guide is on commercial parking, and the audience is primarily local government officials and city planners, as well as developers, any of whom can initiate changes to generic parking requirements. It

What is urban infill?

Urban infill is the practice of developing vacant or underutilized properties within an urban area rather than undeveloped land in more rural areas (greenfields). Infill helps to prevent sprawl and can aid in economic revitalization.

What is a brownfield?

A brownfield is an abandoned, idled, or underused industrial or commercial site where redevelopment or expansion is complicated by real or perceived environmental contamination.

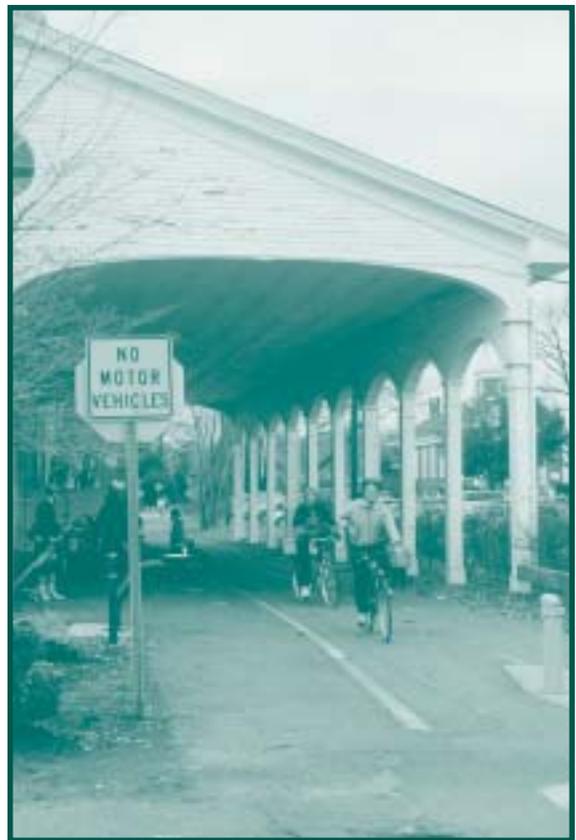
is essential, however, that these groups work together to implement such changes.

Intrinsic to this guide is the concern that generic parking requirements can be a disincentive to infill and brownfields redevelopment and associated urban economic development. With this issue as its focus, the guide is intended to stimulate consideration of parking alternatives, and provide the information needed to explore the viability and effectiveness of alternatives.

The guide is organized into five main sections:

- **Establishing parking requirements.** Explains how generic parking requirements are typically established and highlights the key issues city planners face in tailoring parking requirements.
- **Cost of providing parking.** Explores the factors that influence the cost of constructing, operating, and maintaining parking facilities of all types, from surface lots to structured garages.
- **Parking requirements and development decisions.** Describes the relationship between parking requirements and development decisions, focusing on the development costs and returns.
- **Innovative parking alternatives.** Describes alternatives to generic parking requirements, including:
 - alternatives that enable redevelopment projects to better utilize existing parking (e.g., in-lieu parking fees to cover costs of city garages, shared parking arrangements when users park at different times of the day, shuttle buses from centralized parking facilities); and
 - alternatives designed to reduce the demand for parking by providing incentives for nonauto modes of transportation (e.g., public transit subsidies, “cash-out” programs, trip reduction programs, bicycle amenities).
- **Case studies of innovative parking requirements.** Presents three case studies of development projects located in metropolitan areas that have benefited from innovative parking alternatives. These case studies present the cost savings associated with parking alternatives, as well as the broader economic, environmental, and social effects of these changes.

In addition, an appendix provides examples of innovative parking ordinances and programs.



Beyond Generic Parking Requirements

In setting parking requirements, planners typically use generic standards that apply to general land use categories (e.g., residential, office, retail). Such standards are provided in publications of the Institute of Transportation Engineers (ITE), or they are based on other cities' ordinances (Shoup 1998). One of the shortcomings of generic parking requirements is that they often do not take into account the mix of community-specific variables—density, demographics, availability of nonauto transit, or the surrounding land-use mix—all of which influence demand for parking and *should* be reflected in parking requirements. Instead, requirements are based on maximum demand for parking, when parking is provided at no charge to users. This formula yields a surplus of parking area that is costly for developers to provide, and it subsidizes personal automobile use and encourages auto use even in areas where convenient alternative modes of transportation exist.

Because of the way in which they are typically established, parking requirements are remarkably consistent across different cities, despite varying levels of economic vitality, population size, and development density. The sampling of data in the table on page 5 also shows that the requirements assume that every household has two cars, every employee drives to work, and every party visiting a restaurant travels by car.

Alternatively, parking requirements can be established using methods that are better tailored to specific development projects. This approach entails careful consideration of the following land use characteristics that relate to parking demand:

- **Building/development type and size.** Takes into account the specific characteristics of the project. Parking demand is influenced by the size of the development (typically measured by total building square footage), as well as the type of land use (e.g., retail, industrial). Generic parking formulas address these factors to some extent.
- **Population and development density.** Considers the density and demographic characteristics of the people using the building, including employees, customers, residents, and visitors. Information on income, car ownership, and age distribution also helps in projecting total parking demand.
- **Availability of nonauto modes of transportation.** Takes into account the modes of transportation available to employees, visitors, and residents. Proximity of public transportation to a particular development, for example, will reduce parking demand. Walkable neighborhoods and bicycle amenities will also reduce parking demand.

“Most planners surveyed relied on neighboring cities and national handbooks to determine parking requirements. This practice may result in inappropriate requirements if local conditions or policy approaches differ.”

—Michael Kodama,
Michael R. Kodama Planning
Associates

Examples of Minimum Parking Requirements¹

Location	Residential	Office		Retail	Restaurant
	Single family	Spaces per 1,000 sq. ft. ²	Number of Spaces per Employee ³	Spaces per 1,000 sq. ft. ⁴	With tables, no drive-thru
Bellevue, Washington Population (2000): 117,000 Area: 31 square miles (Off-Street Parking Requirements)	2 spaces per residential unit	4 spaces (net)	1.33	1 space (net) (for retail space < 15,000 sq. ft.)	14 spaces / 1,000 sq. ft. (net)
Saint Louis County, Missouri Population (2000): 1,016,315 Area: 506 square miles (Off-Street Parking Requirements)	1 space per residential unit - urban district 2 spaces per residential unit - non-urban districts	3.3 spaces (gross)	1.1	5.5 spaces (gross)	1 space / 3 seats + 2 spaces / 3 employees
Bozeman, Montana Population (2000): 27,509 Area: Approximately 11.5 square miles (Bozeman Planning Office)	2 spaces per residential unit (if on-street parking available) 3 spaces per residential unit (if no on-street parking available)	4 spaces (gross)	1.33	4 spaces	20 spaces / 1,000 sq. ft. (net)
Fairfax County, Virginia Population (2000): 969,749 Area: 399 square miles (Fairfax County Department of Planning and Zoning)	2 spaces per residential unit	3.6 spaces (gross)	1.2	5 spaces (net) (for retail space < 1,000 sq. ft) 6 spaces (net) (for retail between 1,000 and 5,000 sq. ft)	1 space / 4 seats + 1 space / 2 employees
Houston, Texas Population (2000): 1,916,647 Area: 556 square miles (Houston City Planning Department)	2 spaces per residential unit	2.5 spaces (gross)	0.83	4 spaces (gross)	8 spaces / 1,000 sq. ft. (gross)

¹ "Gross" values represent number of spaces per total area, whereas "net" excludes "unusable" space such as elevators, exterior walls and corridors. Where gross values are not available, we have presented net values.

² Parking requirements for office space less than 50,000 sq. ft.

³ The number of spaces per 1,000 square feet was converted into spaces per employee using an average number of 3 employees per 1,000 square feet of office space (Burchell *et al.* 1994).

⁴ Parking requirements for retail space less than 5,000 sq. ft.

“In the process of establishing parking requirements, local communities are sometimes engaged in a balancing act. They must consider access, mobility, and traffic safety, but they also must encourage appropriate land use and traffic management, environmental protection, and energy and resource conservation.”

— Thomas P. Smith

- **Surrounding land use mix.** Considers the surrounding land uses and density to better understand parking needs, and evaluates whether overall peak demand is lower than the sum of peak demands for different uses. This concept takes the timing of parking demand into account in determining the aggregate demand of multiple uses. The type of community in which a development is located will also affect parking demand. For example, if a development project is located in a city’s central business district, the availability of general use parking will reduce on-site parking demand. On the other hand, if the development is located in a residential area, on-street parking may be unacceptable to local residents, increasing the need for off-street parking at the development.

Land use and demographic information are important tools for establishing project-specific parking requirements that create a better match of supply and demand for parking than do many generic requirements. Moreover, adjusting parking requirements downward to reflect realistic demand helps reduce the total cost of development, particularly in urban areas. By reducing cost, a potential deterrent to urban infill and brownfields redevelopment can be removed.



The Costs of Parking

The cost of providing parking is driven by three key factors: the number of parking spaces required, the opportunity cost of the land used for parking, and the cost per parking space. The more parking spaces required, the higher the cost of parking. Generic parking standards tend to require a greater number of spaces and, thereby, increase total development costs. The opportunity cost of land used for parking is also linked directly to the number of required spaces—land that might otherwise be used to generate revenue is consigned to parking use.

The cost per space, on the other hand, depends on engineering and design considerations. Although cost per space is not directly influenced by local government policies and practices, it will vary for urban, suburban, and rural areas based on factors such as design constraints and land costs. Cost per parking space includes land, construction, maintenance, utilities, insurance, administrative, and operation costs (Siegman 1993).

Land and construction costs, which account for most of the costs of parking, vary considerably across cities and parking designs. For example, the reported average land and construction cost for ten parking facilities in northeastern Illinois (three garages and seven surface lots) is \$4,450 per space (Fish & Associates, Inc., 1998); the cost reported for surface parking in Lake Forest, Illinois is \$18,000 per space (Shoup 1998). Construction costs are typically higher for parking structures than for surface parking lots. For example, Shoup (1998) reports construction costs of \$21,831 per space for a structured garage in Walnut Creek, California.

Willson (1995) expresses parking costs in terms of a monthly amount that would pay for the land, construction, and operating costs of providing a parking space.¹ The reported average monthly cost calculated for six surface parking sites in Southern California was \$48 per space; among the six sites, the monthly cost ranged from \$28 to \$61. The average cost for two sites in Southern California with aboveground structured parking was \$97 per space per month.

In general, the following factors affect the cost of parking:

- **Structured versus surface parking.** Structured parking is more costly to construct, operate, and maintain than surface parking. Underground parking structures are more costly to construct than aboveground structures because of the added expense of exca-

“Ignoring both the cost of providing parking spaces and the price charged for parking in them, urban planners thus set minimum parking requirements to satisfy maximum parking demand.”

— Donald Shoup,
Institute of Transportation Studies,
University of California, Los Angeles

¹ The fee includes land and construction costs, amortized using a 7.5% interest rate over a 30-year period, and annual operating costs. Costs are in 1992 dollars.



vation, fireproofing, ventilation, and dewatering (Shoup 1997b). In a study of UCLA's parking facilities, the cost per space in an aboveground structure was approximately \$10,000 and for a comparable space in an underground structure, \$25,000 (Shoup 1998). Because of the relative scarcity of land in urban areas, parking requirements that assume maximum demand may necessitate structured parking facilities for urban infill and brownfields redevelopment, increasing the cost of brownfields redevelopment in comparison to greenfields development.

■ **Land cost.** Land costs vary widely across settings (urban/suburban), geographic areas, and location within a particular city. Land costs in urban centers are generally much higher than in suburban areas. For example, the cost per square foot of land in downtown Charlotte, North Carolina is \$121, while in the suburbs, the cost per square foot is \$21 (ULI 1997). Since most brownfields are located in urban areas, with higher land costs, the cost per parking space in brownfield areas is generally higher than in greenfield areas.

■ **Configuration and size of parking facility.**

Parking structures and lots are more expensive to build and operate on smaller lots and complex land configurations, due in part to economies of scale. For example, smaller garages have higher costs per parking space because of the fixed capital costs (e.g., stairwells, ramps, and elevators) and fixed operating costs. These characteristics—smaller lots and more complex land configurations—are typical of urban infill and brownfield areas, making parking more expensive at these locations than at greenfield sites.

■ **Geologic conditions.** Parking structures on land with more sensitive seismic conditions or land with difficult terrain also cost more per parking space because they require more complex engineering and construction design. While geologic conditions vary across the country, developers have a greater choice of land options when considering development in suburban and rural areas. On the other hand, land options in urban areas are more limited, and terrain with geologic constraints may be more difficult to avoid.

All of the cost factors discussed above will have an important bearing on the financial feasibility of development options and, as such, will influence development decisions. In addition to these tangible, financial costs, there are significant environmental costs associated with parking that typically are not factored into development decisions. Construction of parking facilities (surface and structured) increases stormwater management costs and loss of greenspace. Greenspace allows stormwater to percolate into the soil, provides wildlife habitat, provides air quality and noise reduction benefits, and is aesthetically-desirable. When greenspace is replaced with impervious surfaces, water pollution and stormwater flooding can result and adjacent property values can decline. Paved surfaces also increase local temperatures which can result in increased energy use, smog, and human discomfort in summer months. In addition, providing abundant free (or low cost) parking subsidizes automobile use, increasing auto dependency and associated air pollution, accidents, and congestion.

All of these environmental costs tend to be greater for parking built in greenfield areas where there is more, less expensive and ecologically-sensitive open space available and where development densities are lower thus requiring more and longer automobile trips. Because these environmental costs are not realized by developers, they do not influence development decisions which are driven primarily by the direct financial costs that are typically lower in greenfield areas.



Parking Requirements and Development Decisions

The connections between parking requirements and development decisions are somewhat complex, but can be boiled down to two basic components:

- **Costs of providing parking, and**
- **Expected financial returns associated with availability of parking or other uses of the land.**

Both of these components influence the financial feasibility of development options and, therefore, development decisions.

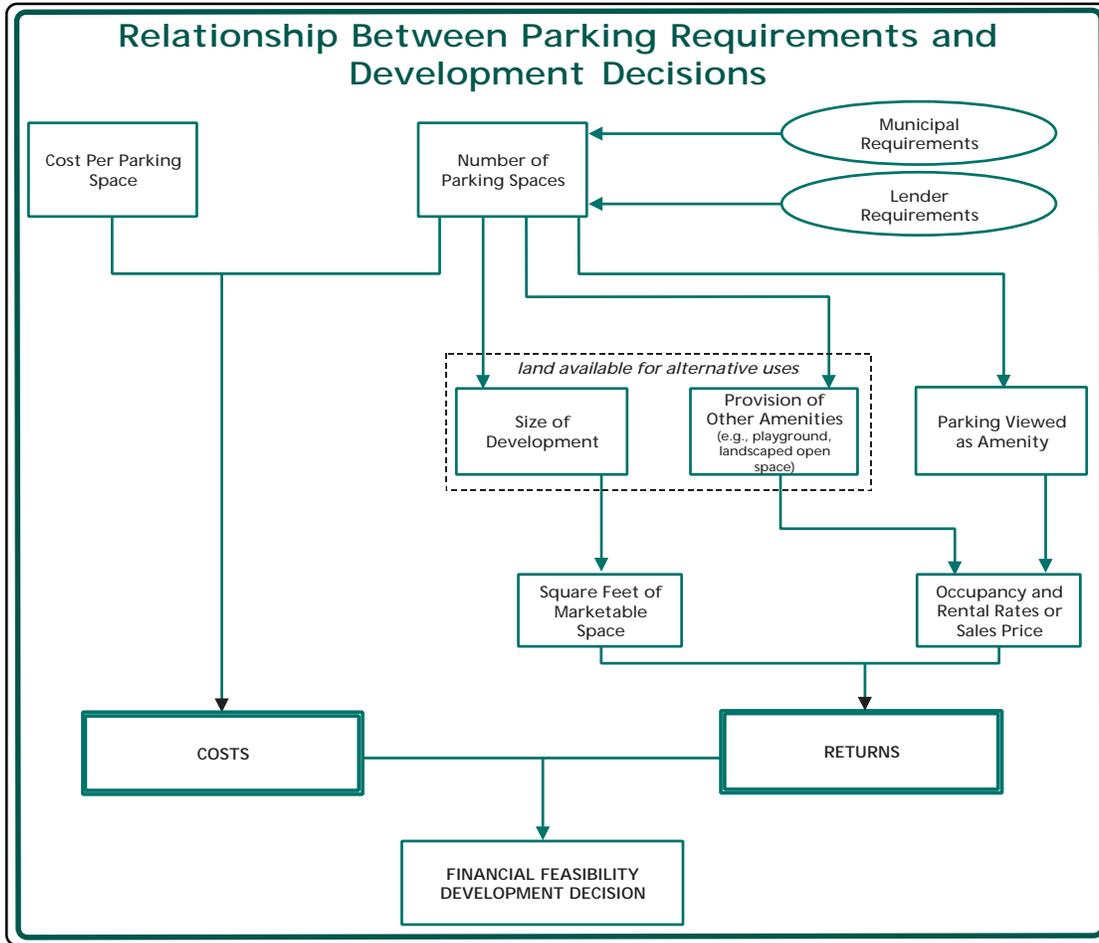
The cost component relates directly to the total cost of development—the lower the number of required parking spaces and the cost of those spaces, the lower the project development costs. The cost elements listed in the previous section suggest that the cost per parking space is more expensive at small sites with complex land configurations (which may necessitate building expensive structured garages) and at sites with high land costs. Another condition that may influence the cost of redevelopment is the need to demolish existing buildings to free up land to accommodate parking. Since many urban infill and brownfield sites have these characteristics, parking costs can influence development decisions associated with these sites.

The financial returns related to parking are more complex than the cost component. As shown in the flow chart on the next page, financial returns are a product of the amount of marketable space, the occupancy rate, and the selling price/rental rate for that space. Because parking consumes land, if less parking is required, more land is available for alternative uses. If that available land is used to expand the marketable space and the market for the space is strong, then revenues generated by the sales of the property and/or tenant rent will increase. If the land is used to provide other amenities, such as landscaped open space, its value will increase (i.e., the development will be more desirable and command higher sales or rental rates). On the other hand, to the extent that extra parking is viewed as an amenity that will influence occupancy rates and sales or rental income, reduced parking may negatively affect project returns. The availability of reliable and convenient nonauto modes of transport reduces, and may eliminate, this potential negative effect.

As shown in the flowchart, municipal and lender requirements are key determinants of the number of parking spaces provided at a given location; however, the number of spaces provided also depends on developer preferences, land costs, tenant preferences, and the practices of com-

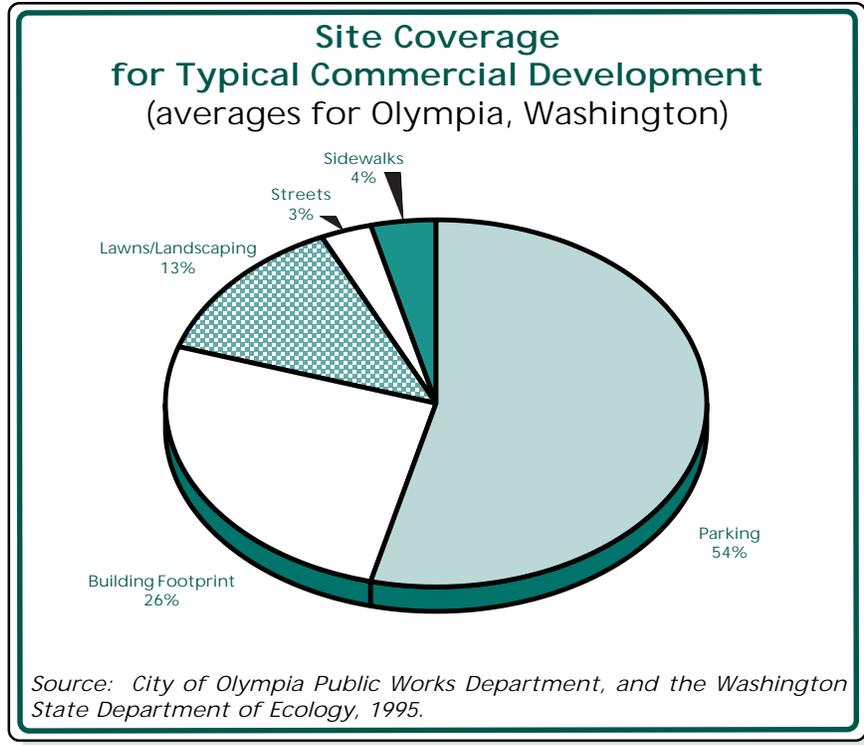
“Parking requirements hide the cost of parking by bundling it into higher housing prices, higher consumer prices, lower urban density, and lower land values. Everyone but the motorist pays for parking.”

—Donald Shoup,
Institute of Transportation Studies,
University of California, Los
Angeles



peting development. Strong municipal leadership is especially important with regard to promoting parking alternatives at the local level; high marketability and financial returns are more likely when municipal leaders demonstrate a serious commitment to enabling worthwhile infill and brownfield projects. From the lender perspective, parking requirements can improve lenders' ability to sell the mortgage in the secondary market should the project fail, as secondary mortgage buyers can fear unfamiliar property management requirements associated with "atypical" development.

Fearing that properties will not be marketable without ample parking, lenders often establish their own minimum parking requirements as part of their loan approval processes. Developers and planners need to work with lending institutions to demonstrate that innovative parking alternatives can be employed to reduce the need for parking while maintaining high marketability and projected revenues. Also, developers should search out local banks that have a good understanding of the city and its alternative transportation modes. Such lending establishments are more receptive to financing projects that employ creative alternatives to stringent parking requirements.



Reductions in parking requirements can decrease development costs and potentially increase returns, particularly for infill and brownfields redevelopment. Innovative alternatives that allow for reductions in parking requirements can improve the financial feasibility of development and may also provide incentives for alternative, less polluting, modes of transportation and nonauto-dependent development designs. Many cost-effective, environmentally-sensitive alternatives to generic parking requirements have been successfully implemented at cities in various parts of the country.



Innovative Parking Alternatives

Some local governments have implemented alternatives to generic parking requirements that increase utilization of existing parking facilities, reduce the demand for parking, and/or create more cost-effective and environmentally-sensitive parking structures that preserve pervious surfaces. By lowering total development costs, some of these parking alternatives have consequently encouraged urban infill and brownfields redevelopment.

This section presents some of these alternatives and includes a discussion of how and why planners establish these alternatives, the advantages of the innovations, potential concerns of developers and planners, and examples of how the various alternatives have been implemented.

The alternatives are organized according to their influence on parking supply, parking demand and pricing.

Supply Reduction

Municipal policies that result in limiting the supply of parking are an effective way to reduce the costs of providing parking. Limiting supply can also reduce the environmental impacts associated with increased impervious surface of parking facilities, and can influence automobile use and reduce associated air pollution impacts. The alternatives discussed below can reduce the supply of parking while effectively meeting demand.

Location- and Use-specific Standards

Parking requirements tend to be set on a one-size-fits-all basis. The same standards are often applied for each land use city-wide, without taking into account how parking demand varies with factors such as transit accessibility and density. The standards are often based on data from the Institute of Transportation Engineers' "Parking Generation" handbook, which are gener-

Implemented Alternatives	
Parking Alternative	Location
Location and Use-Specific Standards	Montgomery County, Maryland Milwaukee, Wisconsin Los Angeles, California Eugene, Oregon Seattle, Washington Boston, Massachusetts
Maximum Limits and Transferable Parking Entitlements	Portland, Oregon Redmond, Washington San Francisco, California
Shared Parking	Indianapolis, Indiana Montgomery County, Maryland
In Lieu Parking Fees and Centralized Parking	Miami, Florida Chattanooga, Tennessee West Palm Beach, Florida
Land Banking and Landscape Reserves	Portland, Oregon Palo Alto, California Carmel, California Cleveland, Ohio Iowa City, Iowa
Car-Sharing	Boston, Massachusetts Washington, DC San Francisco, California Seattle, Washington Boulder, Colorado
Subsidies for Transit	Boulder, Colorado Santa Clara County, California San Bernardino County, California Montgomery County, Maryland
Transit Improvements	Portland, Oregon Chattanooga, Tennessee
Pedestrian and Bicycle Amenities	Schaumburg, Illinois Kendall, Florida
Vehicle Trip Reduction Programs	Cambridge, Massachusetts Seattle, Washington Montgomery County, Maryland
Pricing Strategies	Los Angeles, California Santa Monica, California San Diego, California Pasadena, California

ally collected at suburban sites with free parking and little or no public transit (Shoup, 1999).

Parking demand is determined by a range of factors which lead to significant geographical variations across most jurisdictions, meaning that a single standard for each land use may not be appropriate. For residential developments, the most important factor is density. Each time residential density doubles, auto ownership falls by 32 to 40 percent (Holtzclaw et. al., 2002). Higher densities mean that destinations are closer together, and more places can be reached on foot and by bicycle—reducing the need to own a car.

Other factors that are strongly correlated with lower vehicle ownership in urban areas are frequent transit service, small household sizes, low incomes, a high proportion of seniors, and rental housing (Transportation and Land Use Coalition, 2002). Obviously, many of these factors tend to go together; frequent transit and lower-income households tend to be typically found in the most dense parts of a city.

Similarly, at commercial developments, transit access, mix of uses, and density are good predictors of parking demand. Often developers are interested in finding ways to reduce the vehicle trip generation calculations for their expected development, so that they can demonstrate fewer impacts on the surrounding roadway network, while they may not always be so eager to reduce the amount of parking to supply. Linking these two

and offering trip reduction credits to developments that lower their parking ratios is a strategy that could encourage commercial developments, especially those on the urban edge, to take a more innovative approach to parking supply.

A major challenge for cities is how to convert this research and data, together with experience from other settings, into local parking requirements or planning approvals for specific developments. Some of the mechanisms being used are:

■ **Transit zoning overlays.**

Many cities reduce minimum parking requirements citywide for certain types of uses that are within a specified distance of a rail station or frequent bus route. Montgomery County, Maryland,

Location- and Use-Specific Standards

Milwaukee, Wisconsin

Milwaukee has some of the lowest city-wide parking ratios anywhere in the country. Parking ratios for retail uses are 2 spaces per 1,000 square feet, compared to the Institute of Transportation Engineers' standard of 1 to 300 square feet. For commercial uses, Milwaukee requires 8 spaces for the first 2000 square feet, and one for each subsequent 1000 square feet. In the downtown zone there are no minimum parking requirements for any land use except high-density housing, where the ratio is a very low 2 spaces per 3 units. The city generally discourages surface lots within the downtown, and dictates that at least 50% of the ground floor of parking structures be used for retail.

These policies, which were enacted in 1986, were strengthened in October 2002 by new credits for transit-oriented development, on-street parking, and shared parking. Developments within a defined geographical area near transit (which encompasses over ½ the city area) are granted reductions of up to 15% in the minimum requirements. Further reductions are allowed for on-street spaces adjacent to the property (up to a 1:1 space credit), and for shared parking (up to 0.75 spaces credit for each shared space). One to one credits are also allowed for leased parking spaces in existing lots within 750 feet of the site.

Source: Milwaukee Department of City Development, 2002.

for example, grants reductions of up to 20 percent, depending on distance from a Metrorail station. Transit zoning overlays often go beyond parking to address issues such as density, design, and allowable uses.

■ **New zoning districts or specific plans.** Parking requirements can be lowered in specified neighborhoods, through the use of designated zoning districts or neighborhood specific plans. Most commonly, this applies to the downtown, where cities such as Milwaukee, Wisconsin, lower parking requirements or waive the minimums altogether. However, the same technique can be applied to other high-density, mixed-use neighborhoods that offer frequent transit, such as Seattle's Pike/Pine district. Specific Plans are particularly useful to encourage infill development in older neighborhoods or on brownfield sites.

■ **Parking Freezes.** The amount of parking required can be directly reduced through parking freezes that cap the total number of parking spaces in a particular metropolitan district. Such freezes have been implemented in various areas of the country in response to nonattainment of environmental standards, traffic congestion, or other urban planning considerations. Parking freezes need to be implemented in conjunction with viable public transportation options. Cities with successful parking freezes generally have strong economies and are attractive to tenants, customers, and visitors. Such cities can attract businesses because the benefits of the urban location outweigh the potential drawback of limited parking, and because public transit offers a viable alternative to auto use.

■ **Reductions for affordable and senior housing.** Citywide reductions in parking requirements can be granted for below-market-rate units and senior housing, recognizing that residents are less likely to own vehicles. Los Angeles, California, grants a reduc-

Location- and Use-Specific Standards

Seattle, Washington

Seattle's zoning code grants reductions in minimum parking requirements based on several factors, including:

- Affordable housing. Minimum parking requirements are reduced to between 0.5 and 1.0 space per unit, depending on income, location, and size of unit.
- Senior housing and housing for people with disabilities.
- Car-sharing, for multi-family developments that allow dedicated on-site parking for the city's recognized car-sharing operator.
- Location. No parking minimums are set in the downtown, and they are reduced in mixed-use, dense neighborhoods such as the Pike/Pine District.

The Press Apartments development – built prior to the introduction of many of these policies – is a good example of the need for reduced parking minimums. Despite lobbying by both the community and the developer for lower parking, the city required 88 spaces for the 75-unit project. Located in the mixed-use, transit-rich Pike/Pine neighborhood, the development used demand reduction strategies such as a \$95 monthly parking charge, and the provision of one car-sharing space. As of October 2002, the development is currently 50% leased, but only 9% of parking is being used—only 8 cars for the 41 apartments leased. The surplus of parking is not only a financial liability for the project developers, but a drawback for a community that is trying to create a dense, transit-rich, walkable neighborhood.

Source: Seattle Department of Transportation, 2002.

tion of 0.5 spaces per unit for deed-restricted affordable housing units, with further reductions if they are within 1,500 feet of mass transit or a major bus line.

- **Case-by-case evaluation.** Codifying reductions in parking requirements provides the greatest certainty for developers, and enables them to plan for less parking from the outset. It also reduces the risk of developments being held up in the permitting process, or being challenged by local residents who may be reluctant to see the project built at all. Where this is not possible, however, reductions in parking requirements can be granted on a case-by-case basis, often on the condition that mitigation measures such as car-sharing are provided. Cities such as Eugene, Oregon, specify in their zoning codes that such reductions will be granted subject to a parking study showing that the proposed provision will be adequate to meet demand.

The U.S. Census is often the most readily available source of data on geographic variations in vehicle ownership, and can be used to set baseline parking requirements for residential uses. For affordable housing, surveys of parking occupancy at existing below-market-rate developments often provide the most accurate assessment of demand. Alternatively, mathematical models can quantify the expected reduction in parking demand by lower-income households (for example Holtzclaw et. al, 2002).

For commercial developments, parking demand will depend on the number of employees, customers, and visitors at a site; how long they park; and the proportion of people who drive. For individual developments, this information is often derived from trip generation models. Aerial photographs, field observations of parking occupancy at existing developments, and surveys of staff and customers can also provide data. Furthermore, parking requirements can be linked to the provisions of a Transportation Demand Management (TDM) Plan. For example, if a site's TDM plan calls for a 20 percent reduction in employee commute trips, then the developer should be permitted to build less parking than would otherwise be required.

However, the exact parking demand will still depend on many factors, including the specific design and location of pedestrian and vehicle entrances, the price of parking, and any TDM programs. Supply and demand are also intertwined due to self-selection—developments with less parking will tend to attract tenants or purchasers who need fewer spaces. Parking demand is not a fixed number, and should not be treated as a physical law (Shoup, 2002).

One approach is for cities to simply acknowledge these uncertainties, and abolish all parking requirements in neighborhoods that are served by a range of travel options and where surrounding residential areas are

protected from overspill (Millard-Ball, 2002). This leaves it up to developers—who have a financial interest in meeting tenants’ needs while not oversupplying parking—to determine how many spaces are needed.

Maximum Limits and Transferable Parking Entitlements

In contrast to generic minimum parking requirements, maximum limits restrict the total number of spaces that can be constructed rather than establish a minimum number that must be provided. Planners set maximum limits much like they set minimum requirements. Typically, a maximum number of spaces is based on square footage of a specific land use. For example, the City of Portland, Oregon restricts offices in the central business district to 0.7 parking spaces per 1,000 square feet, and retail to 1.0 space per 1,000 square feet of net building area. Contrary to what might be expected, the maximum limits in Portland have not led to a parking shortage because of the abundance of transit alternatives in the area.

One option to make maximum parking requirements more flexible is to introduce transferable parking entitlements, as in Portland, Oregon. The allowed number of parking spaces for a particular development are an “entitlement” that can be transferred or sold to another development if they are unused. This policy enables cities to control the parking supply, without restricting developments that would not be feasible without additional parking. From a financial standpoint, both developers benefit. Projects that require more parking can proceed, while those that need less parking can benefit by selling their rights, or negotiating shared parking agreements for their employees or customers.

Planners establish maximum limits instead of minimum requirements for various reasons. By managing the supply of off-street parking and reducing automobile use, Portland’s planners hope to “...improve mobility, promote the use of alternative modes, support existing and new economic development, maintain air quality, and enhance the urban form of the Central City” (Title 33: Planning and Zoning Code for the City of Portland, 1999). Both planners and developers benefit from restricting the number of parking spaces allowed.

Link Between Maximum Limits and Transit Improvements *Portland, Oregon*

In Portland, Oregon, maximum parking limits vary according to distance from light rail stations. For example, new office space on the light rail transit mall is allowed 0.8 spaces per 1,000 square feet, while office space located in Goose Hollow, located several blocks from the transit mall, is allowed 2.0 spaces per 1,000 square feet.

These maximum limits have not been problematic to developers. In fact, property values and customer volume in the parking restricted areas near transit stations are higher than in other areas. In a 1987 survey of 54 businesses located near light rail transit, 66 percent of business owners said that their businesses had been helped because they were located near public transit; 54 percent reported increased sales volumes as a result of being located near transit.

Source: Tri-County Metropolitan Transportation District of Oregon, 1999.

From the city planner's perspective, maximum limits accomplish the following:

- Improve the urban environment by preserving open space and limiting impervious surfaces;
- Reduce congestion;
- Encourage attractive, pedestrian-friendly urban design; and
- Promote nonautomobile modes of transportation.

From the developer's perspective, maximum limits accomplish the following:

- Minimize costs for parking construction, operations, and maintenance;
- Reduce traffic and traffic related costs; and
- Operate with a greater floor-to-area ratio, increasing leasable space.

There are, however, challenges to setting and maintaining maximum limits. When limiting the supply of parking, planners must consider possible spillover parking in surrounding residential neighborhoods. To avoid such spillover, developers must understand the factors that affect parking demand and ensure that viable nonauto transit alternatives exist where needed. Changes in frequency or routing of transit, increases or decreases in development densities, or changes in land use can all influence the demand for parking. By understanding the various factors that affect the demand for parking, however, planners can build flexibility into zoning codes and be receptive to modifying requirements to fit the needs of the changing environment. Another useful policy for preventing parking spillover into residential areas is to implement residential parking permit programs.

“The generous parking capacity required by planners often goes unused. Studying office buildings in ten California cities, Richard Willson (1995) found that the peak parking demand averaged only 56 percent of capacity.”

— Donald Shoup,
Institute of Transportation Studies,
University of California, Los Angeles

With restrictive maximum limits on the number of parking spaces, developers may worry about the long-term marketability of a property. Marketability should not be a concern for competing developments in the same locale since all developments must adhere to the maximum limits. With regard to competing developments outside the region with maximum limits, amenities other than parking such as convenient access to services and places of employment, attractive streetscapes, or pedestrian-friendly neighborhoods, can have a strong influence on tenant preferences. City governments and developers should incorporate these elements to attract businesses and residents.

Maximum requirements are not ideal for all locations. It is crucial for municipalities that employ maximum requirements to have accompanying accessible and frequent public transportation. It is also important for the area to be sufficiently stable economically to attract tenants without

needing to provide a surplus of parking. A number of cities have implemented maximum parking requirements, including San Francisco, California; Portland, Oregon; and Seattle, Washington. The appendix provides an example of maximum limits as written in Portland's Title 33 Planning and Zoning Code.

Shared Parking

Different types of land uses attract customers, workers, and visitors during different times of the day. Shared parking is another alternative that city planners can employ when setting parking requirements in mixed-use areas. An office that has peak parking demand during the daytime hours, for example, can share the same pool of parking spaces with a restaurant whose demand peaks in the evening. This alternative also reduces overall development costs.

By allowing for and encouraging shared parking, planners can decrease the total number of spaces required for mixed-use developments or single-use developments in mixed-use areas. Developers benefit, not only from the decreased cost of development, but also from the "captive markets" stemming from mixed-use development. For example, office employees are a captive market for business lunches at restaurants in mixed-use developments.

Shared parking encourages use of large centralized parking facilities and discourages the development of many small facilities. This results in more efficient traffic flow because there are fewer curb cuts, and turning opportunities on main thoroughfares. This has the added benefits of reducing accidents and reducing emissions from idling vehicles stuck in traffic.

Establishing shared parking requirements involves site-specific assessment or use of time-of-day parking utilization curves.² Planners need to consider the following factors when developing shared parking requirements:

Shared Parking: Planner and Developer Concerns

Planner Concerns

Q: What if the land uses change within the mixed-use development?

A: Any change in land uses within a mixed-use development requires a revised assessment of parking demand. It is possible for peak demand to increase with a change in land use. Thus, planners need to be receptive to improving transit or providing other incentives to encourage nonauto transport modes. Responding in this way avoids the need for developers to provide additional parking in the event of more intense land use changes. Of course, transit solutions are not always available and creating incentives for other alternatives will only capture a limited number of commuters. In such cases, contingencies for additional parking may be necessary to accommodate development mix changes. One alternative is to "land bank" a percentage of land for parking use, if needed at a later time. (Schaumburg, Illinois incorporates a land banking provision in its 1998 Parking Ordinance; see the Appendix to this guide for relevant excerpts from its ordinance.)

Developer Concerns

Q: Will a development with fewer parking spaces be less attractive to tenants or patrons?

A: If parking requirements based on sharing have been established correctly, available supply should accommodate parking demands, and marketability will not be affected.

Q: How can unauthorized use of spaces be prevented?

A: Shared parking facilities are more susceptible to encroachment of unauthorized vehicles than single-use parking facilities. To inhibit such encroachment, owners or operators of the parking facility may want to restrict access and/or use by charging fees, gating the parking area, or using vehicle stickers/permits or electronic access cards.

Q: How are maintenance costs shared?

A: There are various options for sharing maintenance costs, and they will depend on the particular development project. One approach might be to share maintenance costs by prorating the costs depending on parking use. For example, in the Montgomery County, Maryland example (see table on page 21), using peak parking demands for different uses, we calculate maintenance costs for each use: the office user would pay 44 percent; the retail user would pay 41 percent; and the entertainment user would pay 15 percent of the maintenance costs. If there is single ownership of mixed-use development, this issue is avoided entirely.

Shared Parking

Circle Centre — Indianapolis, Indiana

Opened in September of 1995, Circle Centre is Indianapolis' newest example of an Urban Retail/Entertainment (URE) development. Located in the central business district, this mixed-use development contains 630,600 square feet gross lease area (GLA) of retail space, 78,000 square feet GLA of restaurant space, a 2,700-seat cinema complex, and another 28,000 square feet GLA of specialty and entertainment space. The total cost of the development was \$300 million, funded by the city, a consortium of 19 local corporations, and two international banks. One of the factors that led to a financially successful project was the conceptualization and implementation of a shared parking scheme that allowed for significant cost savings and a pedestrian-friendly urban design.

With generic minimum parking requirements, Circle Centre would have needed about 6,000 parking spaces. With shared parking taken into account, the project was built with only 2,815 spaces. Shared parking for Circle Centre includes two components. First, the mixed-use nature of the development project allows for customers to use a single parking space for multiple destinations. Second, because the project is located in the downtown area, employees can use nearby off-site parking, particularly in evenings and on weekends when more than 12,000 nearby off-site spaces become available to Circle Centre parkers. Taking these two shared parking components into account decreases the estimated demand for on-site parking by more than 50 percent.

This parking demand reduction translates into considerable cost savings. At parking costs of about \$10,000 per space for aboveground structured parking, development costs were reduced by about \$30 million. In addition, operating costs were reduced by approximately \$1 million per year.

Source: Smith, 1996.

- Physical layout of the development;
- Number of spaces for each of the individual land uses;
- Types of parking users (e.g., employees, residents, or hotel guests who park all day, or customers and visitors who park for short periods of time); and
- Hourly accumulation of parking for each land use.

Montgomery County, Maryland allows for shared parking to meet minimum parking requirements when any land or building under the same ownership or under a joint use agreement is used for two or more purposes. The county uses the following method to determine shared requirements for mixed-use developments:

- Determine the minimum amount of parking required for each land use as though it were a separate use, by time period, considering proximity to transit.³
- Calculate the total parking required across uses for each time period.
- Set the requirement at the maximum total across time periods.

The table below illustrates how peak demand occurs at different times of the day and week for different land uses when the shared parking method is applied to a mixed-use development. While maximum parking demand for the office component of the project

² Time-of-day parking utilization curves developed for weekdays and weekends are provided in the 1983 ULI publication *Shared Parking* for office, regional retail, restaurant/lounge, cinema, hotel, and residential uses. Calthorpe Associates, an urban design, planning and architecture firm, reports that when sizing parking areas for mixed-use developments, they use these ULI figures and their developer clients accept the analyses (Rood, 1999).

³ The minimum parking requirements in Montgomery County can be reduced for buildings located in close proximity to transit or within a central business district. Parking reductions are also possible at developments with owners who participate in transportation demand management programs. More information on Montgomery County's parking ordinance is provided in the Appendix.

occurs during the daytime on weekdays, maximum demand for retail occurs during the daytime on weekends, and for entertainment during the evening.

For this example, setting parking requirements using maximum demand would have resulted in requiring 680 spaces (300 spaces for office, 280 spaces for retail, and 100 spaces for entertainment). By recognizing the shared parking potential, a reduction of almost 200 parking spaces (about 25 percent) was achieved—representing a considerable cost savings for the developer. In addition, shared parking also allows for more efficient use of land and better urban design.

	Weekday		Weekend		Nighttime (12 a.m. - 6 a.m.)
	Daytime (9 a.m. - 4 p.m.)	Evening (6 p.m. - 12 a.m.)	Daytime (9 a.m. - 4 p.m.)	Evening (6 p.m. - 12 a.m.)	
Office	300*	30	30	15	15
Retail	168	252	280*	196	14
Entertainment	40	100*	80	100*	10
TOTAL	508	382	390	311	39

* Peak demand by use.
Source: Smith 1983, page 7.

An American Planning Association report, *Flexible Parking Requirements*, highlights factors that facilitate shared parking (Smith, 1983). The report suggests that for shared parking to function effectively, parking requirements for individual land uses must reflect peak demand land use and common parking facilities must be in close proximity to one another. Parking spaces should not be reserved for individuals or groups.

In-Lieu Parking Fees and Centralized Parking

In-lieu parking fees are established by municipalities as an alternative to requiring on-site parking spaces. With in-lieu fees, developers are able to circumvent constructing parking on-site by paying the city a fee. The city, in return, provides centralized, off-site parking that is available for use by the development’s tenants and visitors. The fees are determined by the city and are generally based on the cost of providing parking.

Cities set fees in one of two ways, either by calculating a flat fee for parking spaces not provided by a developer on-site or by establishing development-specific fees on a case-by-case basis. Shoup (1998) reports that in-lieu fees in the United States range from \$5,850 to \$20,180 per parking space. These fees can be imposed as a property tax surcharge.

In-Lieu Parking Fees
Coconut Grove — Miami, Florida

Coconut Grove is a pedestrian-oriented, entertainment, dining, and shopping village in southern Miami. In an effort to maintain Coconut Grove’s continuous street frontage, city planners established flexible parking requirements. Developers or property owners have three choices for satisfying minimum parking requirements: they can provide off street parking, contract spaces elsewhere, or pay in-lieu fees. With little space left to develop and high land costs, most property owners choose to pay the \$50 per space per month fee to the city and use the land for more productive, revenue-generating purposes. This in-lieu alternative allows the city to preserve a continuous storefront that maintains the aesthetic character of the area and improves walkability.

Source: Coconut Grove Chamber of Commerce.

In-lieu parking fees provide advantages to both planners and developers. Allowing developers to pay fees in-lieu of constructing parking has the following benefits:

- Overall construction costs may be reduced;
- Construction of awkward, unattractive on-site parking is avoided;
- Redevelopment projects involving historic buildings can avoid constructing parking that would compromise the character of the buildings;
- Planners can ensure that existing parking facilities will be more fully utilized; and
- Planners can encourage better urban design with continuous storefronts that are uninterrupted by parking lots.

In establishing in-lieu parking fees, planners must be cognizant of potential developers' concerns about the impact of a lack of on-site parking on the attractiveness of developments to tenants and visitors. This can be an issue if available public parking is insufficient, inconveniently located, or inefficiently operated. Planners must carefully consider the parking demand for each participating property and provide enough parking to meet this demand in order to avoid creating a perceived or real parking shortage. Planners must also work to ensure that public parking facilities are centrally located and operated efficiently.

Centralized parking facilities can reduce the costs of parking because large facilities are less expensive on a per space basis to build and maintain than small facilities. Centralized parking, as an alternative to on-site parking, also improves urban design and preserves the historic nature of communities. Some cities mandate centralized parking facilities and finance them through development impact fees in lieu parking fees or negotiated contributions established during the environmental review process.

While the concept of centralized parking facilities makes sense from economic, environmental, and urban design perspectives, developers' concerns relate to inconveniences to building occupants, such as lack of parking proximity. These concerns can be addressed in part by providing reliable and frequent shuttle services to and from the centralized parking

Centralized, Peripheral Parking

Chattanooga, Tennessee

The downsizing of the American steel industry took its toll on Chattanooga, Tennessee, and by the 1960s Chattanooga was an economically depressed and polluted city. In the 1980s, the Chattanooga Area Regional Transit Authority (CARTA) board of directors began looking for ways to revitalize the downtown. To encourage urban development while limiting congestion and air pollution, CARTA developed a strategy that included periphery parking and a free shuttle service. The strategy maintained that with a linear shaped central business district, workers and visitors could drive to the city, park in one of the two periphery garages, and use the shuttles to travel up and down the 15 block business corridor. By constructing parking at either end of the city, CARTA hoped to intercept commuters and visitors before they drove into the city center.

The two structures, Shuttle Park South and Shuttle Park North are owned by CARTA and operated privately. The CARTA's shuttle service commenced in 1992. The Shuttle Park South garage opened in August 1994 with 550 parking spaces, while the Shuttle Park North garage opened two years later, with parking for 650 cars. The free shuttle buses, financed through the garages' parking revenues, depart from both garages every five minutes all day every day and pass within walking distance of most downtown destinations.

The peripheral parking garages and the shuttle service offer a popular alternative to downtown parking. The electric-powered shuttles transport approximately one million riders each year, making shuttle-proximate property attractive to businesses. Since 1992, over \$400 million has been spent on development in Chattanooga. This includes a \$45 million aquarium, a \$28 million park, over 100 retail shops, and over 60 restaurants. CARTA's initiatives won commendation from EPA, receiving a "Way to Go" award in 1996 for innovative transportation solutions that support urban development. The parking-shuttle strategy has encouraged urban development while limiting the city's traffic and congestion.

Sources: EPA, 1998; Chattanooga News Bureau, 1999.

facilities. Successful centralized parking has been accomplished in Chattanooga, Tennessee. In this case, centralized facilities are located at the periphery of the city, reducing traffic and mobile source emissions in the downtown area and freeing up land in the center city for redevelopment.

Land Banking and Landscape Reserves

Estimating parking demand is not an exact science. Land banking and landscape reserves acknowledge these uncertainties, by setting aside land that can be converted to parking if demand is higher than expected, or to cope with future expansions. In many cases, landscaping can be used to turn this set-aside land into an attractive amenity for the development or wider community.

Land banking and landscape reserves are particularly useful policies when the expected need for off-street parking for a particular use is uncertain, due to unknown or unusual operating characteristics, or unavailability of comparable data to establish need. Rather than constructing additional parking to acknowledge this margin of error, they allow supply to be determined by the best estimates, with the security that more parking can be constructed if needed. In some cases, it may be appropriate to establish a landscape reserve in conjunction with parking reductions granted in return for a Transportation Demand Management or vehicle trip reduction plan. The possibility of having to construct additional parking can then serve as a compliance mechanism for the TDM plan.

Land banking and landscape reserve policies have been implemented in cities throughout Oregon (including Portland), and others such as Palo Alto, California; Carmel, California; Cleveland, Ohio; and Iowa City, Iowa. Palo Alto, for example, allows reductions of up to 50 percent in minimum parking requirements provided that the difference is made up through a landscape reserve. None of the city's landscaped reserves have subsequently been required for parking.

To avoid confusion with terminology, it should be noted that land banking can also refer to the purchase of land by a local government or developer for use or resale at a later date. Banked land can be used as interim parking for the purposes of revenue generation—parking fees generated from temporary lots are put towards construction of later phases of the development, and at some point built over into buildings or structured parking.

Land Banking

Iowa City, Iowa and Palo Alto, California

Both Iowa City and Palo Alto have enacted land banking policies in their parking codes. In some neighborhood commercial zones in Iowa City, minimum parking requirements may be waived or relaxed, and land banking used in place of up to 30% of the otherwise required parking. If an enforcement official determines in the future that the additional parking spaces are needed, the property owner can be required to construct parking on the land banked area.

Palo Alto's code allows the city to authorize the deferral of up to 50% of the required spaces as a landscape reserve where the expected need for off-street parking for a particular development is uncertain, for example due to unknown or unusual operating characteristics. The California Park Apartments development, for example, was granted a request to defer 22 of the 95 parking spaces required by city code, using the land instead for a family play lot, a barbeque area, and picnic benches. Nearly 15 years after construction, the landscape reserve has not been needed for parking, and the open space constitutes an important environmental and social benefit for the community.

Transportation Demand Mangement

Many of the alternatives to minimum parking requirements discussed above, provide ways to reduce excess parking supply. It is also possible to reduce the need for parking and the associated costs by influencing the demand for parking.

Demand reduction can be achieved through a variety of programs and policies that attempt to reduce the automobile transportation demand, and thus reduce the needed supply of parking. While these programs are typically developed by local governments, their success often depends on the commitment of businesses to implement them effectively. Demand reduction programs include: car sharing, subsidies for transit, transit improvements, pedestrian and bicycle amenities, and vehicle trip reduction programs. When employers allow telecommuting and/or flexible work schedules that reduce commuting, demand is also reduced.

TDM Parking Reductions: Lindbergh City Center

Atlanta, Georgia

The Lindbergh City Center is a mixed-use high-density development under construction in Atlanta, GA. It centers on a new MARTA light rail station that connects the development to downtown Atlanta, the airport, and other areas. As a result of the Transportation Demand Management programs, parking requirements for the development were reduced by 20% below the city's standard requirements. Parking reductions include:

- Commercial Space: 20% to 70% reduction (from 3.3 to 1.0-2.67 parking spaces per 1,000 square feet)
- Retail Space: 26% reduction (from 5 to 3.7 spaces per 1,000 square feet)
- Restaurant Space: 63% reduction (from 10 to 3.7 spaces per 1,000 square feet)
- Hotel: 62% reduction (from 1 space per room plus 0.5 spaces per employee to 0.5 spaces per room)
- Residential: 8% reduction (from 2 to 1.85 spaces per condominium unit)

Reductions were allowed because of shared parking between office and retail uses, as well as for the ample transit access, with MARTA running every four minutes at peak and every eight minutes during off-peak times. The goal is for transit to achieve a 30% share of trips.

The phasing of the development allows for fine-tuning of parking policies based on experience. Phase I is currently under construction. The amount parking in Phase II will be re-evaluated, depending on demand in Phase II.

Source: Paul Vespermann, Lindbergh City Center, 2002.

Car-Sharing

Car-sharing is a neighborhood-based, short-term vehicle rental service that makes cars available to people on a pay-per-use basis. Members have access to a common fleet of vehicles on an as-needed basis, gaining most of the benefits of a private car without the costs and responsibilities of ownership. In programs with the most advanced technology, members simply reserve a car

via telephone or the Internet, walk to the nearest lot, access the car using an electronic card, and drive off. They are billed at the end of the month.

Car-sharing dramatically reduces the need to own a vehicle, particularly a second or third car that is driven less than 10,000 miles per year. In San Francisco, nearly 60 percent of those who owned a vehicle before joining the car-sharing program have given up at least one of them within a year, and another 13 percent are considering it (Nelson\Nygaard, 2002). Zipcar, which operates in Boston, New York and Washington, DC, reports that 15 percent of members sell their private car. In Europe, which

has a far longer experience with car-sharing, each shared vehicle takes between four and ten private cars off the road (City of Bremen, 2002).

This means that parking provision can be significantly reduced at residential developments that incorporate car-sharing, although developers may need to contribute towards set-up costs and/or provide parking spaces to secure car-sharing as part of a project. Car-sharing can be provided as part of a mitigation agreement with the local jurisdiction on a case-by-case basis, in return for a reduction in minimum parking requirements. Alternatively, the parking reduction can be codified through zoning ordinances, as is being considered in Portland, Oregon; San Francisco, California; and Seattle, Washington.

In commercial developments, car-sharing can also be a useful tool to reduce parking demand. Employees can use a shared vehicle for errands and meetings during the day, allowing them to take transit, carpool, walk or bicycle to work. Car-sharing works best in compact, mixed-use neighborhoods, where firms with corporate memberships tend to use the vehicles during the day and residents use them in the evenings and on weekends.

As well as reduced parking demand, car-sharing brings a broad range of other benefits, including fewer vehicle trips, and improved mobility for low-income households



Courtesy of City Car Share

Car-Sharing, Pricing Strategies: Van Ness and Turk Development San Francisco, California

Slated to begin construction in early 2003, this development will include 141 residential units in a dense area of San Francisco, with only 51 parking spaces. The development was granted a substantial reduction in parking requirements—nearly two-thirds—from the city's minimum of 1 space per unit to 1 space per 2.8 units. Reduction was granted in large part because of the developers' agreement to provide two parking spaces for car-sharing operator City CarShare, accessible to both residents as well as all CarShare members. Strong community and organizational support, as well as proximity to major transit corridors were also factors.

If the developers had been required to build the additional 90 spaces required by code, they would have been forced to add either subterranean levels or parking lifts, which save space by stacking vehicles on top of each other. These costs amount to \$1.35 million for lift technology (estimated at \$15,000 per space) and \$8.1 million for below-grade structured parking (estimated at \$60,000 to \$90,000 per space).

Parking costs will be "unbundled," i.e. residents will be charged for parking separately from rent, and no resident will be forced to pay for a space that they do not want. The current market rate for parking is \$280 to \$300 per space, per month. By charging separately for parking and incurring lower construction costs due to needing less parking, apartment rents will be kept lower.

Source: Part and Tony Thieophilos, *Developers*, 2002.

**Car-Sharing, Parking Maximums:
Rich Sorro Commons**
San Francisco, California

Plans for Mission Bay, a 303-acre brownfield site and redevelopment area in San Francisco, include 6,000 units of housing, office space, university facilities, a hotel, community services, and retail. The city introduced parking maximums in this area to maximize the amount of new housing, make the most of the new Third Street Light Rail line through the neighborhood, and minimize traffic impacts on congested streets and the nearby freeway. Residential parking maximums were set at one space per unit.

Completed in summer 2002, Rich Sorro Commons was one of the first projects to be completed in the redevelopment area. The mixed-use project includes 100 affordable units and approximately 10,000 square feet of ground floor retail. It was constructed with only 85 parking spaces, due to:

- Excellent proximity to light rail, commuter rail and frequent bus service,
- Provision of two parking spaces for City CarShare; and
- All units are below market rate, meaning tenants are less likely to own a car.

With fewer parking spaces, Rich Sorro Commons was able to make space available for a childcare center and retail stores at ground level. Furthermore, the reduction of 17 spaces is expected to generate revenues of \$132,000 annually for the project (300 square feet per space at \$25.80 per square foot in rent), reducing the cost of housing and increasing its affordability. The two parking spaces for City CarShare vehicles will be available to residents, giving them access to a car without the costs of ownership – a particularly important benefit for low-income households.

Source: Kenneth Jones, Developer, 2002.

who may not be able to afford to own a car. Formal car-sharing programs have been established in many cities including Boston, Massachusetts; Washington, DC; San Francisco, California; Oakland, California; Portland, Oregon; Seattle, Washington; and Boulder, Colorado. Many others are in the process of establishing operations. Alternatively, developers can provide shared vehicles themselves, or facilitate informal car-sharing among residents.

Subsidies for Transit

Transit subsidies can be provided by employers, by cities, or by residential property managers. In the case of employer-paid transit pass schemes, the employer pays the cost of employees' transit, converting the fixed cost for parking spaces into a variable cost for the public transportation subsidy. This fringe benefit for employees reduces the demand for parking at the workplace, which in turn reduces traffic, air pollution, and energy consumption. It also reduces the cost associated with providing parking, as transit subsidies are generally less expensive than providing parking. A transit pass in Los Angeles, California, for example, costs \$42 per month, whereas the average cost for a parking space is \$91 per month (Shoup 1997b). To promote transit subsidies, the 1998 Transportation Equity Act for the 21st



century eliminates the tax burden for both employers and employees; these subsidies are not taxed as payroll or as income.

In some cases, city planners respond to employer paid transit subsidies by lowering minimum parking requirements. For example, included in Montgomery County, Maryland, office zoning requirements is a 15 percent reduction in minimum parking requirements if businesses offer reimbursed transit passes (Smith 1983). By offering subsidies for public transportation use, employers enable the reduction of parking space requirements, thus decreasing total development costs and making urban development opportunities more inviting.

Transit subsidies can also be useful for residential developments. Property managers in Boulder, Colorado and Santa Clara County, California, for example, can bulk-purchase transit passes for all their residents at deeply discounted rates. The principle is similar to that of insurance—transit agencies can offer lower rates on passes on the basis that not all residents will actually use them regularly. Residents can in effect take transit for free, meaning they are less likely to own a vehicle. Another benefit of pre-paid transit programs is that they encourage residents to take transit spontaneously. A person does not have to commit to transit full-time in order to be able to reduce their demand for vehicle travel and parking. Developers who agree to fund transit passes can thus be rewarded with lower parking requirements.

Subsidies for Transit

Boulder, Colorado

Boulder's downtown district comprises some 700 businesses and over 7,500 employees. Faced with a shortage of parking for customers, Boulder developed a program to encourage nonautomobile commuting for its downtown employees. In 1993, Boulder's City Council mandated restricted downtown parking and appealed for parking demand management for the city's commuters.

The Central Area General Improvement District (CAGID), made up of downtown businesses, responded to the Boulder City Council's demands by providing free bus passes for all of the district's employees. The pass program, which costs \$500,000 annually and is funded through downtown meter revenues, has successfully altered transportation modes, freeing up valuable customer parking spaces, in the following ways:

- Multiple occupancy vehicle commuting increased from 35 percent in 1993 to 47 percent in 1997.
- The district's employees require 850 fewer parking spaces as a result of the free bus pass program.
- The increase in available parking has encouraged more retail customers to shop in downtown Boulder.
- By taking public transportation, bicycling, carpooling, and walking, Boulder employees avoid 212,500 single occupancy vehicle trips per year. With an average commute trip in Boulder of 10.8 miles, over two million miles of pollution- and congestion-causing automobile use is prevented each year.

The City of Boulder offers EcoPasses – deeply discounted transit passes – for purchase by employers, property managers, or neighborhood groups. For employee EcoPasses, the program also features a Guaranteed Ride Home that provides a free taxi ride home in the event that an employee has an emergency or unexpected change in work schedule.

Residential EcoPasses are offered in several ways. Not only can residential building managers purchase EcoPasses for their tenants, but entire neighborhoods can buy them in bulk. Neighborhood volunteers collect contributions on an annual basis, and once the minimum financial threshold is met, everyone living in the neighborhood is eligible for the transit pass. Alternatively, a neighborhood can elect to increase property taxes to purchase neighborhood-wide EcoPasses. The city also provides financial incentives in the form of a startup subsidy to encourage new neighborhoods to join. In some neighborhoods, local retailers offer a small (5 or 10%) discount to people who have an EcoPass.

Source : Boulder Community Network, 1999.

Transit Improvements

Local government officials can also improve public transit to decrease auto dependence and associated parking needs. Improvements to consider include new transit modes, such as light rail, expanded transit service hours, increased bus lines, and revitalized transit stations. Portland, Oregon's MAX light rail system exemplifies the widespread benefits of transit improvements. The light rail system encourages transit-oriented development, decreases automobile commuting, and eases demand for parking. In fact, the light rail improvements eliminated the need for six downtown parking towers (U.S. EPA 1998). These improvements are also partially responsible for \$1.3 billion in new development in Portland over the last 10 years.

Transit Improvements

Portland, Oregon

Tri-Met, Portland's transit agency, recently added an 18-mile extension to the MAX light rail system. This \$944 million project includes 20 new MAX stations and connects Portland's eastern suburbs to its western suburbs. One of the benefactors of MAX improvements is the Lloyd District. Located just 1.25 miles east of Portland's downtown, the Lloyd District has seen more than \$790 million worth of development adjacent to its four MAX stations. MAX moderates the pressure of this wave of development on the Lloyd District's parking supply by providing an alternative to automobile use. Included in this development is Oregon's \$85 million Convention Center, a \$200 million renovation and expansion of the Lloyd Center Shopping Mall, and a \$262 million sports arena that hosts the Portland Trailblazer basketball team. Recognizing the benefits of MAX, the Convention Center paid for one of the district's new MAX stations.

The Lloyd District's development is not limited to large scale projects. Ashford Pacific, a developer new to the Portland area, saw opportunity in this region of the city and purchased 70 acres of land, all within close proximity to MAX stations. In conjunction with Liberty Mutual Northwest, Ashford Pacific developed Liberty Centre, a \$40 million office building located across the street from the Seventh Avenue MAX station. This 350,000 square foot building is home to Liberty Mutual Northwest, the headquarters of KinderCare as well as a number of local firms.

Source: Tri-County Metropolitan Transportation District of Oregon, 1999.

Pedestrian and Bicycle Amenities

Demand for parking can be reduced by providing pedestrian and bicycle amenities that make it easier and more pleasant for people to walk or bicycle rather than drive. These amenities and design changes can alleviate traffic congestion. In particular, improving the walkability and pedestrian orientation of employment centers can address the increasingly common "drive to lunch" syndrome. For example, the auto-orientation of Tyson's Corner, Virginia has resulted in terrible traffic at lunch time because people cannot walk to eating establishments or to do errands.

These low cost amenities can be as simple as providing bicycle racks and walkways. For example, officials in Schaumburg, Illinois, a suburb of Chicago, have incorporated provisions for bicycle use directly into their zoning ordinance to encourage use of nonauto transport modes. The ordinance requires all retail centers to have a minimum of 10 bicycle spaces located at each main building entrance. To increase awareness, the ordinance requires that bike racks be located in a place where they are highly visible; to promote safe bicycle use, the ordinance requires bicycle parking areas to be separated from automobile parking. Excerpts from this zoning ordinance are included in the Appendix. (See Section 154.125 "Bicycle Parking Requirements.") Providing shower and locker facilities also encourages bicycling, roller blading, and walking to work.

Promoting bicycle and pedestrian transport modes can also be accomplished through simple design changes, some of which can be implemented

at no cost. Instead of locating parking between the street and the buildings, requiring pedestrians and bicyclists to navigate through parking lots, parking should be set back behind buildings. The Downtown Master Plan for Kendall, Florida (Miami-Dade County), discusses several design concepts to improve pedestrian and bicycle access. Some of the key elements promoted, but not required, by this program are listed in the text box to the right.

Vehicle Trip Reduction Programs

Another direct form of demand reduction involves instituting vehicle trip reduction programs. Vehicle trip reduction programs combine several types of demand reduction components to meet explicit vehicle trip reduction goals. Thus, instead of capping the number of parking spaces, local officials limit the number of vehicle miles traveled in a particular region. These types of programs attempt to decrease the number of trips by single occupancy vehicles (SOVs) and increase the use of a variety of commuting alternatives, including transit, carpooling, walking, and bicycling.

To increase the effectiveness of vehicle trip reduction programs, cities or employers can incorporate an assortment of complementary program elements to encourage nonauto and non-SOV transport. The following are some examples:

- “Guaranteed ride home” services that allow employees who use public transit to get a free ride home (e.g., via taxi) if they miss their bus or if they need to stay at work late.
- Company fleet cars that can be used for running errands during the work-day (e.g., doctor appointments).

Pedestrian and Bicycle Amenities

Kendall, Florida

- Bicycle/pedestrian access via new sidewalks and pathways.
- Trees and shrubs along edges facing streets and sidewalks.
- Parking hidden in the rear or in parking garages.
- Shade and rain protection, such as colonnades, arcades, marquees, second floor balconies, wide awnings, or tree canopies, for pedestrians.
- Buildings positioned along the sidewalks at a deliberate alignment, giving a designed shape to the public space.
- Doors and windows spaced at close intervals to generate activity, direct views to merchandise, and make the walk sufficiently interesting.
- Minimal number of vehicular entries to parking areas that can diminish pedestrian mobility and erode space.

Source: Downtown Master Plan for Kendall, Florida, 1998.

Vehicle Trip Reduction Ordinance

South San Francisco, California

South San Francisco is one of the few cities in the U.S. to enact a city-wide vehicle trip reduction or Transportation Demand Management (TDM) ordinance that allows reduced parking requirements for projects implementing specified TDM requirements. The ordinance applies to all nonresidential developments that expect to generate 100 or more average daily trips, or to projects seeking a floor area ratio (FAR) bonus. Parking reductions are not fixed, but are subject to case-by-case review and are dependent on the number and extent of TDM elements. For example, the brownfield, mixed-use Bay West Cove development was able to reduce required parking by 10% by implementing the following TDM strategies:

- Parking charges of at least \$20 per month for all employee single-occupancy vehicle parking spaces
- Free parking for carpools and vanpools
- Late-night taxi service and feeder shuttle service
- Transit subsidy of \$25 per month for all tenant employees
- Guaranteed ride home program
- Provision of a transportation coordinator
- On-site project amenities such as child care, showers and lockers, electric vehicle charging, bicycle storage facilities, and a transit information kiosk.
- Close proximity to rail and bus services

- Preferential and/or reserved parking for vanpools/carpools.
- Carpooling and/or vanpooling with ride matching service. Ride matching can facilitate the identification of people who live close to one another. This service can be accomplished by providing “ride boards” or by using an employee transportation coordinator.
- Cellular phones for car and vanpooling to facilitate timing of pick-ups.

There is little incentive for employers to implement vehicle trip reduction programs if they are not granted reductions in minimum parking requirements. They would not be able to realize the potential cost savings from providing less parking, but would simply be faced with a large number of empty spaces. Several cities, such as South San Francisco, have acknowledged this through ordinances that reduce parking requirements for projects that include vehicle trip reduction programs.

Vehicle Trip Reduction At Genetics Institute

In order to meet the goals of the Massachusetts' State Implementation Plan, Cambridge, Massachusetts instituted a Vehicle Trip Reduction Ordinance in 1992 to reduce vehicle miles traveled in the city and to control automobile-related air pollution. Cambridge also implemented a Transportation Demand Management (TDM) ordinance to complement state legislation. The goal of the TDM ordinance is to improve mobility and increase accessibility, while reducing congestion and air pollution. The TDM ordinance requires that proposals for building permits include a TDM plan. The TDM plan is reviewed by the city in conjunction with other components of the development plan. In planning a TDM, developers must consider the impact of their development on transportation patterns.

To ensure that TDM plans are effective, employers must set goals to reduce the number of employees commuting in single-occupancy vehicles (SOV) relative to a baseline for the local area, and measure progress toward these goals using annual, employer-managed surveys. The City of Cambridge also makes employers aware of 1998 Transportation Efficiency Act for the 21st Century (TEA-21) which allows employees who commute by public transit or vanpool to deduct the cost of their commute from their taxable income. This legislation also allows businesses to provide tax-free transit subsidies.

Founded in 1980, Genetics Institute (GI) occupies two Massachusetts offices, one in Andover and one in Cambridge. As a corporate policy, GI independently designs TDM plans for its properties and was one of the founding members of the Alewife Transportation Management Association, an organization committed to improving access to, and ease of, public transit and encouraging alternative modes of commuter transportation. As part of its Cambridge TDM, GI has a goal of keeping single occupancy vehicle use to less than 59 percent.

Located within walking distance of a subway station and in close proximity to a paved bicycle path, GI provides fully subsidized public transit passes for all of its employees; enclosed, locked bicycle storage; and shower facilities. The company also offers a cafeteria, grocery service, exercise facilities, guaranteed ride home program, and an hourly shuttle between the two Massachusetts sites. These amenities afford all 704 of GI's Cambridge employees the opportunity to shop, eat, and exercise at work. The total annual cost for these transportation management programs is approximately \$184,000. The company's transportation management has been effective, boasting a low 56 percent SOV mode split, with over one quarter of GI's Cambridge employees commuting by public transportation.

In 1986, GI acquired additional land for its Cambridge site. With this land, the company plans to add a 246,000 square feet research and development facility to its existing 500,000 square feet office and laboratory space. GI expects to employ about 430 people at the new facility. In its parking transportation demand management agreement, GI agreed to construct no less than one space per 800 square feet of occupancy (307 spaces) and no more than one space per 400 square feet (615 spaces). GI ultimately constructed only 350 parking spaces, resulting in a parking ratio of 1.42 spaces per 1,000 square feet of space or 0.81 spaces per employee. The total cost for the additional structured and surface parking will be approximately \$1.2 million in construction costs, \$1,000 to \$2,000 for each of the 290 surface spaces, and \$10,000 to \$14,000 for each of the 60 structured spaces. By constructing 265 fewer spaces than their maximum requirement would permit, and assuming a weighted average cost per space of \$3,429, GI saved approximately \$900,000 in parking construction costs.

Pricing Strategies

Although it is often provided at no charge to the user, parking is never free. Each space in a parking structure can cost upwards of \$2,500 per year in maintenance, operations and the amortization of land and construction costs. Even on-street spaces incur maintenance costs and an opportunity cost in foregone land value.

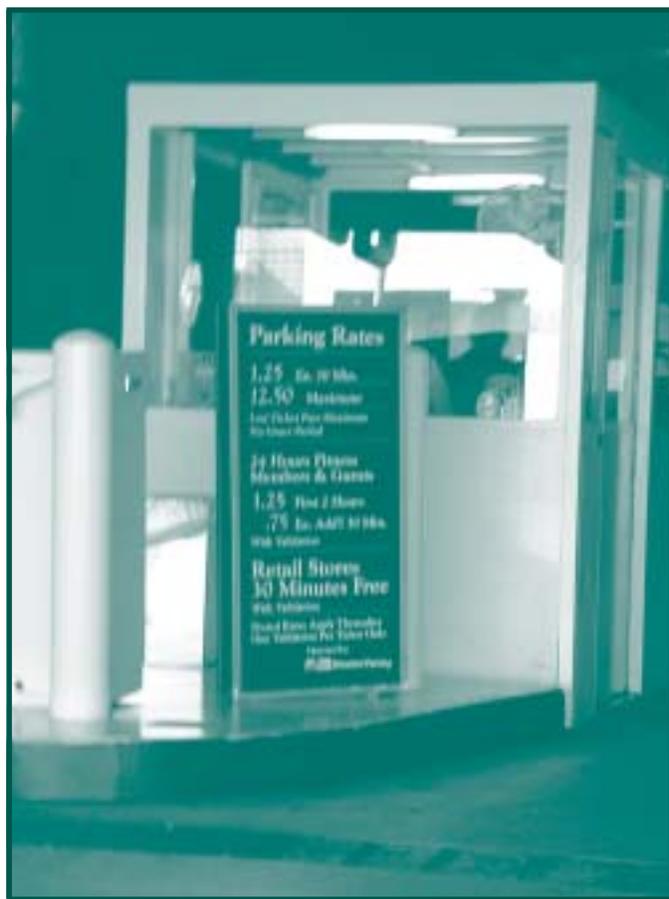
The cost of parking is generally subsumed into lease fees or sale prices for the sake of simplicity and because that is the more traditional practice in real estate. However, providing anything for free or at highly subsidized rates encourages over-use and means that more parking spaces have to be provided to achieve the same rate of availability. Charging users for parking is a market-based approach by which the true cost of parking can be passed through to parking users. If the fee charged to users of parking facilities is sufficient to cover construction, operation, and maintenance costs, it will likely cause some users to seek alternative transport modes. Even where there are few alternatives to driving, parking pricing can encourage employees to seek out carpooling partners. In addition to reducing the cost of parking provision, pricing strategies bring major environmental and congestion benefits, particularly since they tend to reduce peak-period vehicle trips the most.

Parking charges have been found to reduce employee vehicle trips, and thus daily parking demand, by between 7 percent and 30 percent or more, depending on factors such as the level of charges and the availability of alternatives to driving alone. Parking price elasticities generally range from -0.1 to -0.6, with the most common value being -0.3, meaning that each 1 percent rise in parking fees is accompanied by a 0.3 percent decrease in demand (Pratt, 2000).

Cash-Out Programs

Cash-out programs provide alternatives to directly charging users for parking. Under such programs, employers offer employees the choice of:

- Free or subsidized parking,
- A transit/vanpool subsidy equal to the value of the parking (of which up to \$100 is tax-free under current federal law),



- A taxable carpool/walk/bike subsidy equal to the value of the parking.

Employees who opt for the non-parking subsidies are not eligible to receive free parking from the employer, and are responsible for their parking charges on days when they drive to work.

The cost-savings associated with cash-out payments depend on the amount of the payments. If the full cash equivalent is provided, this demand reduction program does not reduce the total costs of providing parking. However, employees may accept cash payments lower than the full equivalent of the parking subsidy. If partial cash payments are used, employers face lower overall transportation subsidy costs and employees still benefit.

Cash-Out Program

Santa Monica, California

In 1992, California instituted a mandatory cash-out program. The California Health and Safety Code Section 43834 reads, "Parking cash-out program' means an employer-funded program under which an employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space."

The effects of the cash-out program on transportation use in Santa Monica, California have been significant. A study conducted by Donald Shoup of the UCLA Institute of Transportation Studies found that for two Santa Monica employers, the share of solo commuters decreased by between seven and eight percent once the cash-out program was in place. This reduction in solo commuters is responsible for a decrease in annual commuting vehicle miles traveled (VMT) of 858 miles (Shoup, 1997a).

Cash-out programs provide significant environmental, social and broader economic benefits. For example, in response to California's mandatory cash-out requirement, eight firms reported an average 17 percent reduction in the total number of solo drivers (Shoup, 1997a). Thus, another benefit of cash-out programs is a reduction in traffic congestion and associated pollution.

Cash-out programs are often easier to implement than direct charges, as they are generally more acceptable to employees. However, their impact on travel behavior is usually lower, due to the administrative burden on employees, inertia in changing travel habits, and the fact that cash-out payments can be a taxable benefit whereas free parking is not.

Prioritizing Trips

Parking pricing can be used as a sensitive tool to prioritize some types of trip over others, according to their purpose and duration. It allows managers to cater for desirable trips, such as short-term shoppers, while discouraging undesirable commuter trips, which add to peak-hour congestion and occupy a parking space for an entire day. These pricing strategies allow the overall supply of parking to be minimized, while ensuring spaces are available for critical users. They can also alleviate pressure to provide more parking from retailers and businesses, who may be concerned that poor parking availability discourages shoppers. For example:

- Lower or zero rates for short-term parking encourage shopping trips, while proportionally higher rates for long-term parking discourage all-day commuter parking, freeing up spaces for cus-

tomers. Short-term parking allows many people to use a single space over the course of a day, rather than a single commuter, and generates revenue for businesses and sales tax dollars for cities.

- Parking charges that are levied by the hour or day, with no discounts for monthly parking, remove the financial disincentive to take transit occasionally. There is no perverse incentive to drive every day to “get your money’s worth” from the monthly parking pass.
- Parking charges at transit stations that only apply before a certain time (such as 9 or 10 am) encourage off-peak transit ridership where spare capacity is available, rather than contributing to crowding in the peak.

Residential Parking Pricing

Parking charges can also be introduced at residential developments, through separating or “unbundling” the cost of parking from rents or sale prices. Rather than being provided with a set number of spaces whether they need them or not, residents can choose how many spaces they wish to purchase or rent. An alternative to direct charges is to provide “rent rebates” or discounts to residents who own fewer vehicles and do not use their allocated parking spaces.

Parking Benefit Districts

Parking pricing strategies can also be implemented through Parking Benefit Districts. Under this concept, revenue from meters and residential permits is returned to local neighborhoods. Once administrative costs are covered, all money goes to transportation and neighborhood improvements such as undergrounding of utility wires (Shoup, 1995). Parking Benefit Districts allow developments to be built with less parking, while addressing potential spillover problems through market pricing of curb parking. Earmarking revenue to directly benefit the neighborhood or commercial district helps to generate support for charges from local residents and businesses, who might otherwise resist charging for parking that used to be free.

Cities such as San Diego and Pasadena, California, have implemented Parking Benefit Districts in their downtown business districts, using parking meter revenue. The concept is also applicable to residential areas, where residential parking permits could be priced at market rate. This is being considered in San Francisco, where the demand for on-street residential permits far outpaces the availability of on-street space. Furthermore, this concept can be refined based on the neighborhood. For example, a neigh-

neighborhood adjacent to an institutional land use, such as a hospital or university, might implement a two-tiered residential permit program. Permits to residents could be sold at a “resident” rate, while excess on-street capacity would be sold at market value to non-residents. However, no city in the United States has yet implemented this concept.

Case Studies

This final section of the document presents six case studies that illustrates how specific metropolitan areas have benefited from innovative parking alternatives:

- Portland, Oregon: Parking policies include maximums, location- and use-specific requirements, shared parking entitlements, car-sharing, and vehicle trip reduction or Transportation Demand Management (TDM) measures. Profiled developments are the Hilton Hotel and the Buckman Heights and Buckman Terrace apartments.
- Arlington County, Virginia: Policies addressed are location- and use-specific standards, and vehicle trip reduction strategies. Developments profiled are The Market Common, development and the 1801 North Lynn Street commercial development.
- NASA Research Park, Santa Clara County, California: This case primarily illustrates vehicle trip reduction strategies associated with a mixed-use development. The development is in the planning/construction stages and includes research, university, housing, visitor, business, and retail uses.
- The Shoppes of Wilton Manors, Wilton Manors, Florida: This case illustrates how shared parking arrangements can be used to reduce parking requirements for a mixed use redevelopment in one of the fastest growing areas of the country.
- SAFECO Insurance Company Expansion, Redmond, Washington: SAFECO responded to the state's transportation demand management requirements with an effective vehicle trip reduction program.
- The D'Orsay Hotel, Long Beach, California: This case illustrates how a downtown parking management plan that allows shared parking and in lieu parking fees can reduce development costs and put scarce land to productive use.

These six case studies were chosen both to highlight their range and depth of parking alternatives—either allowed on a specific development basis or written into code—as well as the number of developments that have taken advantage of the alternatives and reaped the ben-



efits. The six cases also cover a wide geographical range, representing both the East and West Coast, and urban, urban/suburban, and truly suburban developments.

In the case studies, parking alternatives are evaluated in terms of their impacts on parking costs and development decisions; the environmental impacts of resulting transportation mode shifts; the economic, fiscal, and social benefits of the alternatives; and the opportunity cost of providing parking.

While some of the innovative alternatives described in the cases are designed to address an entire municipality, others are targeted at specific developments. Often, the goal of these alternatives is environmental—reducing automobile use and improving air quality. Other times, the alternative is economically motivated—lowering project costs and encouraging urban development.

In these case studies, both the planners and developers recognized the advantages of alternative parking requirements, and the alternative parking requirements lowered the total cost of the development. As city and county jurisdictions, Portland and Arlington have some of the most forward thinking planning in the country. Arlington County is an example of very code-based parking reduction strategies—they encourage reduced parking primarily through lowered minimum requirements. Portland, on the other hand, has a varied toolbox of strategies to offer developers to reduce parking. NASA is unique because it represents a large-scale, suburban, brownfield project that had no dictated requirements, but took the initiative to go against development trends in the area and put together a comprehensive plan to reduce parking. For the Wilton Manors and D’Orsay Hotel cases, the lowered cost associated with parking alternatives was a key element of project feasibility. In all cases, parking alternatives also provided environmental benefits. SAFECO’s transportation management measures and development design limit air emissions associated with automobile commuting and protect water quality by preserving permeable surfaces that absorb rainfall and prevent polluted runoff. Parking alternatives used for The Shoppes of Wilton Manors and D’Orsay Hotel developments facilitated these infill projects, thus preventing additional sprawl and the associated air and water quality impacts.

Pioneering Innovative Parking Policies:

Portland, Oregon

Hilton Hotel

Buckman Heights and Buckman Terrace

Portland, Oregon has introduced some of the most innovative planning policies to reduce automobile trips in the United States. As well as pioneering such ideas as regional growth boundaries, “skinny streets,” traffic calming, neighborhood planning and downtown design guidelines, Portland has adopted a range of parking policies to promote infill development and alternatives to the private car, including:

- No parking minimums in the central city,
- Parking maximums in most neighborhoods, including downtown,
- Transferable parking rights in areas with parking maximums,
- Reductions for car-sharing vehicles,
- Reductions for vehicle trip reduction strategies, such as transit access and bicycle parking,
- Location- and use-specific standards, and
- Provisions for shared parking.

Two developments are profiled as specific case studies below—the Hilton Executive Tower Hotel in downtown Portland, and the mixed-use Buckman Heights Apartments and Buckman Terrace in the city’s Lloyd District. The Hilton Executive Tower Hotel actually has *more* parking than downtown Portland parking maximums allow. It serves, however, as an excellent example in illustrating not only the benefits of shared parking, but that parking maximums, if partnered with transferable parking entitlements, can boost real estate marketability and the business economy in an urban setting.

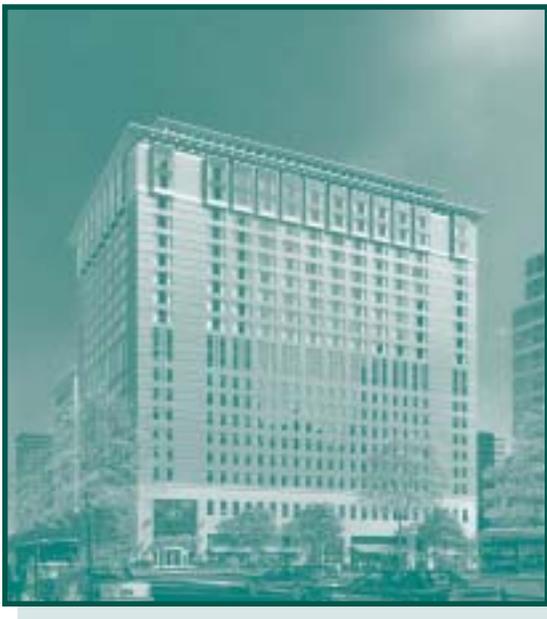
The second case study, the Buckman Heights development, represents a residential and mixed-use, mixed-income, pair of apartment buildings that utilize several of the city’s parking reduction strategies to achieve dramatically lower parking ratios than similar conventionally-parked apartments.

It is worth noting that these two developments are just a sample of the numerous projects that have taken advantage of the city’s parking reduction policies to achieve economic, environmental, and social benefits. Others, in brief, include:

- Stadium Station Apartments: 115 affordable apartments, with parking at 0.6 spaces per unit. Of the 40 units already leased, only one-third of households own automobiles. Despite already

low parking ratios, 50 percent of the parking remains currently unused.

- Collins Circle: 124 mixed-income apartments with 0.8 spaces per unit (reduced from the zoning code maximum of one space per unit), located near the Jefferson Street Light Rail Station.
- Orenco Station and La Salle Apartments: Both have parking reductions to 1.8 spaces per unit, and provide transit pass allowances to residents. This has achieved a large increase in transit ridership among occupants.
- Center Commons: 314 apartments with 0.6 spaces per unit.
- Russellville Commons Apartments: 480 apartments and townhouses with 0.95 spaces per unit. This is a mixed-use development located close to light rail.
- Liberty Centre: 300,000 square foot office/retail development close to light rail. The parking ratio is 2.1 spaces per 1,000 sq. ft.



Courtesy of Melvin Mark Companies

Hilton Hotel

Parking maximums in downtown Portland are lower than both the parking generation rates published by the Institute of Transportation Engineers, and the *minimums* adopted by most cities. The maximums for new office and retail development are 1 space per 1000 square feet; for hotels, the maximum is 1 space per room.

The city views the parking maximum as an “entitlement.” New developments can either build the parking “entitlement” (the maximum parking allowed) or can transfer those spaces to another development, as long as the transfer contract is signed before the foundation is laid. Buildings that choose not to build the parking they are entitled to, or historic buildings constructed before parking became an issue, are granted an entitlement of 0.7 spaces per 1,000 square feet—70 percent of the parking entitled to new construction—which they can transfer to other developments at any time. Transferred rights are generally not sold, but are granted under certain rules of contract that include the following:

- If Project X transfers its parking entitlement to Project Y, Project Y pays for the cost of construction.
- Project X retains the right to use its entitled number of spaces to lease to tenants or customers, but must pay market rate to Project Y.

- If Project X does not use its spaces, Project Y may sell them on a day-to-day or monthly basis for its own revenue.
- Project X must give Project Y 60 days notice if it wants to reclaim use (i.e. sell to a new tenant) of its spaces.
- Project X can commit all or portions of its entitlements to tenant leases as a means to attract and retain tenants in Project X.

In addition to parking limits, the city also restricts parking use. There are three different types of parking spaces applicable to the Hilton Hotel case study:

- **Hotel spaces:** By code, these spaces may only be sold to hotel users (e.g. hotel guests or visitors) between the hours of 7 am and 6 pm, weekdays. If the hotel is in a slow season, or if not all hotel visitors want parking, the remaining parking spaces go unused—a potential financial liability.
- **“Growth” spaces:** These are the spaces entitled to new development. They have no constraints, and can be sold however the developer sees fit during all hours and days of the week.
- **“Preservation” spaces:** These are spaces generally entitled to older and historic buildings that were constructed without parking, and are slightly more restrictive. Preservation parking is generally associated with older and historic buildings that were constructed without parking. If the spaces are not used for building occupants they can only be used for other cash uses on a daily or hourly basis.

The Hilton Executive Tower Hotel and garage, developed by Melvin Mark Companies, is located in the heart of the Portland downtown business district, within the Free Transit Zone. Constructed on a block that was the former home to the Greyhound bus terminal, the 20-story, 440,000 square foot project consists of 312 hotel rooms, conference space, 20,000 square feet of ground-floor retail, and 680 parking spaces. The Hilton Hotel is the owner of the hotel portion of the project and a Melvin Mark partnership owns the parking structure. Under the Portland zoning code, the maximum allowed parking for the development would have been 380 spaces—312 “hotel” spaces, plus 68 “growth” spaces for the retail.

Not only did the developers need to make the Hilton’s parking more profitable than allowed under “hotel space” use provision, but they also wanted to accommodate retail and office demand in the area, for which they needed extra parking. They were able to accommodate these needs and build 680 spaces in the following way:

- 100 “hotel” spaces allowed under the zoning code (only 30 percent of their entitlement).

- 68 “growth” spaces allowed for the retail space under the zoning code (100 percent of their entitlement).
- 512 spaces where the entitlement was transferred from other developments:
 - 200 “growth” spaces transferred from a concurrent project, the 250,000 square foot Pioneer Place mall. The project wanted the parking to attract customers, but did not want to assume development costs or lose retail density on the site to parking.
 - 312 “preservation” spaces transferred from seven buildings in the area. Most of these were office buildings built at a time when parking was not included.

Financial Feasibility and Cost Savings

Transferable parking rights made the Hilton/Melvin Mark development financially beneficial to all parties involved. The Hilton project would not have been as feasible to develop had they not been able to get the additional parking spaces and the flexibility to manage parking. As a major revenue component for developments, the transfer of parking entitlements allowed the developers to secure funding from lenders. They were able to sell 500 monthly parking passes to committed preservation buildings prior to development, which, like pre-leasing an office building, acted as a pre-commitment to revenue. The additional parking and more flexible “preservation” and “growth” parking spaces also reduced risk and seasonal fluctuations that the code’s “hotel” parking constraints present. The garage operates with day-to-day averages of 85 to 90 percent occupancy from being able to sell to many different users—a major source of revenue for the project.

Environmental Benefits

Transferable parking entitlements have helped attract major developments such as the Hilton to downtown Portland. The policy retains the advantages of maximum parking requirements such as reduced vehicle trips and reduced land area devoted to parking, while making them more flexible to cater for the particular needs of different developments. In this way, transferable parking entitlements reinforce the role of the central city and reduce the pressure for peripheral development that tends to be more auto-oriented.

Social and Other Benefits

Downtown development ensures that the City of Portland retains its property tax base, promotes an active and pedestrian-friendly downtown with multiple amenities, and produces more foot traffic for surrounding businesses. Pioneer Place mall, for example, reaps the benefit of being able

to attract more customers by having available parking at a site adjacent to the mall, without adding the risk of parking development and/or the loss of retail space to the overall project.

The preservation buildings that “transferred” their spaces to Melvin Mark Companies also reap significant financial benefit. Typically older, commercial buildings are at a market disadvantage for leasing space because they can’t provide or commit parking for their tenants in office leases. With parking built at the Hilton/Melvin Mark garage and preferential rights to lease to their tenants, the older buildings compete on a more level playing field with newer buildings for prospective tenant marketability.

Buckman Heights Apartments

- Completed in 1998.
- 144 units.
- 40% of units are affordable.

Buckman Terrace

- Completed in March 2000.
- 122 market-rate apartments.
- 1,978 sq ft commercial space.

Buckman Heights and Buckman Terrace

Located adjacent to Portland’s central city Lloyd District and along the edge of a light industrial area, the site of the Buckman Heights mixed-use development was used for decades as a car dealership. Despite a heated real estate market, however, the 3.7 acre site had been on sale for well over a year, unattractive to most developers. Prendergast & Associates saw an opportunity to build housing on site, given its prime location—the project is located nine blocks from light rail, within five blocks of four high-frequency bus lines, and surrounded by a growing network of bike lanes and routes. It is also within easy walking distance of jobs in the Lloyd District, the Central Eastside, and downtown, is directly adjacent to a city park to the west, and has access to nearby retail. Prendergast purchased the site in 1997, sold the dealership building to a retail user, and converted the remaining 2.5 acres of vacant parking lots into sites for 274 units of housing—an 8-unit townhouse project, a 144-unit mixed income apartment building, and a 122-unit apartment building with a small retail space.

The City of Portland has very low parking requirements in the area. Zoned for general employment, with housing allowed but not actively encouraged, the minimum parking requirements were just 0.5 spaces per unit—already a significant reduction from the typical urban standards of between 1 and 2 spaces per apartment. The proximity to transit and employment centers provide the rationale that residents can use alternative transportation and still retain full mobility without cars.



Courtesy of Prendergast & Associates, Inc.

Both developments have extremely low parking ratios. Buckman Heights has 58 on-site parking spaces for a ratio of 0.4 spaces per unit. Buckman Terrace has 70 spaces at a ratio of 0.57 spaces per unit, with only on-street parking for the retail. These spaces are a mix of carport style, surface, and at-grade structure spaces.



Courtesy of Pendergast & Associates, Inc.

Besides favorable zoning and proximity to transit, the developments were able to both reduce the parking required and keep parking demand lower than supply through the following set of strategies:

- **Bicycle Facilities:** Buckman Heights Apartments eliminated 14 required on-site parking spaces by providing 56 additional secure, covered bicycle parking spaces in addition to the 36 spaces required by code. Portland zoning provision allows four covered, secure bike parking spaces to be substituted for one automobile parking space, up to a maximum of 25 percent of the required parking. The developer also provided lockers, floor pumps, and a workstand in the bike rooms. The bicycle parking has been so well used that the developer added even more bike parking to Buckman Terrace.
- **On-street parking:** The Buckman Heights development included restriping a wide street between the two apartment buildings to accommodate angled parking, increasing the supply of on-street spaces as well as creating a more pedestrian-friendly feel to the neighborhood through the addition of generous sidewalks, landscaping and street lamps. Although this did not directly replace the requirement for off-street spaces in this case, it provided a buffer, and allowed the development to build as little parking as possible.



Courtesy of Pendergast & Associates, Inc.

- **Shared parking:** The development made use of on-street parking in the adjacent area where a sewing/assembly plant and nearby high school were located. The adjacent uses had huge on-street parking demand during the day (when residents are typically at work) but were empty on evenings and weekends (when residents are typically home and parking their cars). This unique setting allowed the developer and the lenders to feel comfortable with the sharply reduced on-site parking ratios.

■ **Unbundled Parking Costs:** Paying for parking separately from rent helps keep residents aware of parking costs, and creates a disincentive to having a car (or a second car, in many cases). Parking at Buckman Heights costs between \$15 and \$30 per month, depending on surface or covered spaces. Buckman Terrace parking (structured) costs \$50 per month.

- **Car-Sharing:** FlexCar (originally CarSharing Portland) now has two vehicles at the complex. Since car-sharing was not available at the time of construction, it did not reduce the amount of parking that had to be built, but it now reduces the need for residents to own cars, and consequently the demand for parking.

Financial Feasibility and Cost Savings

Building less parking for the two projects helped keep development costs low. This was particularly important because the project was not eligible for property tax abatements which are given to low-income and central city market-rate housing, because it lies just outside the central city boundary. By cutting costs, partially from parking, they were able to secure the funding needed for development.

Considering per-space construction costs in Portland of \$5,000 to \$7,000 for surface parking, upwards of \$15,000 for surface structures, and \$25,000 to \$30,000 for below-grade structures, parking reductions in the Buckman developments significantly reduced development costs. Buckman Terrace was constructed with no surplus land, so additional parking would have been forced to go underground. By forgoing the construction of 50 additional spaces, the developers saved between \$875,000 and \$1,125,000. For Buckman Heights Apartments, the developers were able to add additional apartment units to the project using the money saved from parking, especially helpful for revenue given rent-restrictions on the affordable units.

Environmental Benefits

The attention to a pedestrian-oriented development has made the projects more conducive to automobile alternatives and improved the quality of life for residents, and also made the project marketable. Both developments have been at or near full occupancy (95 to 100 percent leased) since the openings in 1999 and 2000, even outperforming the soft Portland housing market in recent months.

More housing in central Portland reduces the need for commuters to travel in from suburban districts. The mixed-use nature of the project also allows residents to buy groceries and fulfill many of their basic needs within walking distance, while cycling is promoted through the provision secure bicycle parking and a workstand.

Social Benefits

The developments have provided more than 80 new affordable housing units. In addition, charging for parking separately from rents benefits households who do not have cars—particularly low-income families. Infill housing also increases the city's tax base.

Location- and Use-Specific Standards and Vehicle Trip Reduction Strategies:

Arlington County, Virginia

The Market Common, Clarendon

1801 North Lynn Street Development

Arlington County is an urban area of about 26 square miles located directly across the Potomac River from Washington, DC. Arlington County has adopted countywide development standards and guidelines, including lower parking ratios, to support future growth of high-density commercial and residential development around Metro rail stations in their two corridors—the Rosslyn-Ballston Corridor and the Jefferson Davis

Corridor. Two specific projects are profiled here—a high-density residential development, and a commercial development. Both have taken advantage of the county’s location- and use-specific parking requirements.

Arlington County dictates minimum parking requirements based primarily on distance from Metro stations. (See text box.) Parking requirements for commercial development are particularly transit-sensitive, with lowest ratios closest to Metro stations. According to Richard Best from the County Public Works Planning Division, if a development is within ¼ mile of a Metro station, the county is open to granting retail or commercial development a zero parking requirement, although this is not specifically written in the code.

Every project that goes through the site plan process for development along Metro corridors is required to have a transportation plan, that varies depending on density and use. Further reductions in minimum parking requirements, beyond the location- and use-specific standards, are granted for projects that include vehicle trip reduction strategies, such as free or discounted transit passes for employees, other transit subsidies, ridesharing, and information on transit.

While not written into code, Arlington also enforces urban design criteria in parking construction. All parking is encouraged to be below ground, or if at surface level, it must be in a structure that is wrapped with occupiable ground floor space, in order to reduce the impact of the parking on the walkability of the street. There are no codes dictating such design, but since all new development must go through site plan review, precedents suggest that failure to follow these guidelines is likely to result in denied approval.

Arlington County Minimum Parking Requirements

Commercial Development:

- Commercial Office Zoning area outside of station areas: 1 space per 530 square feet.
- Commercial Redevelopment Zone (along Metro Corridor): 1 space per 580 square feet.
- Rosslyn-Ballston Metro Corridor Development and developments within ¼ mile of a Metro station: 1 space per 1000 square feet.

Retail:

- For retail and service-commercial uses within 1500 feet of a Metro station, then there is no parking required for the first 5000 square feet GFA.
- Any square footage above that has the same parking requirements as commercial in the area (either 1:580 sf or 1:1000 square feet, depending on its location in the Corridor).

Residential Development:

- High density residential: 1.08 spaces per unit (1:1 + visitor).
- Townhouses: 2.2 per unit (2:1 + visitor).
- Single Family Homes: 1 space per house. This ratio assumes space in a driveway or on the street.

The Market Common, Clarendon

The Market Common in Clarendon is a mixed-use development with destination retail and restaurant space, 300 market-rate apartment units on upper floors, and adjacent office space. Located 3 blocks from two Metro stations along the Rosslyn-Ballston corridor, and in close proximity to a dense employment and retail corridor, the area provided a level of mixed-use conducive to dramatically reducing vehicle trips, and consequently, parking. Realizing that patrons of retail establishments would be using the parking during the day while residents would have peak demand for parking at night, developers of The Market Common devised a shared parking strategy.

Under the Arlington County Code, the project would have required 1,504 spaces for the retail, housing, and office space. Using the shared parking strategy, the development was able to reduce the requirement by 25 percent—to 1,160 spaces. The Market Common is the first recent development approved in the county with no assigned spaces for residential units—all spaces are equally available for all uses.

Parking demand is mitigated through several strategies:

- Parking costs are unbundled from rent for residents: \$25 per month for the first car, \$75 to \$100 per month for the second.
- Daily parking costs for other users: \$1 to \$4 per hour, with the highest hourly rates for longer stays.
- Provision of bicycle parking.
- Transit proximity.

It could be argued that even the 25 percent reduction in parking was not enough. One study by County staff indicates only a 40 percent parking occupancy at peak hours. It must be noted, however, that this is with two thirds of the apartments leased, and two restaurants still to open. Given the “village” design of the project and neighborhood services offered, however, it is likely that walk and transit mode splits will be higher than region standards.

The Market Common, Clarendon

- Mixed use development.
- 225,000 square feet of retail/restaurant.
- 300 market-rate apartment units.
- Built on a former Sears parking lot.
- Transit proximity--within 2 blocks of two stops along the Rosslyn-Ballston Metro corridor.
- Parking: 25% reduction below County code and ULI standards.
- Shared parking strategy.



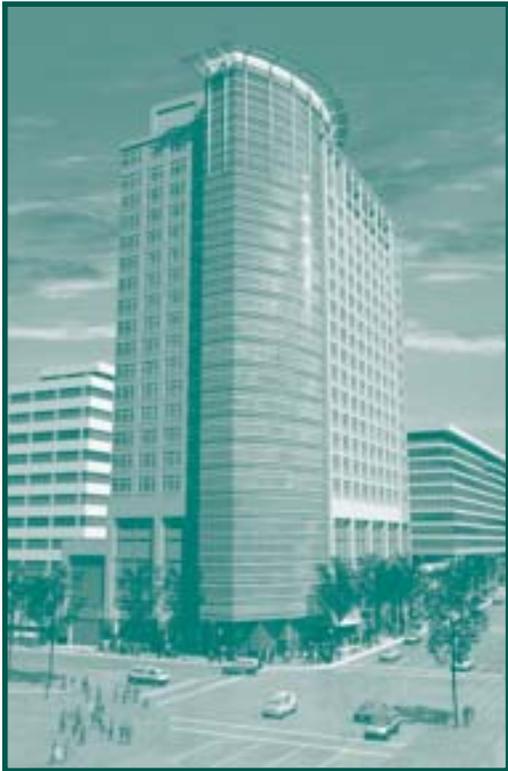
Courtesy of McCaffery Interests



Courtesy of McCaffery Interests

1801 North Lynn Street Development

The 1801 North Lynn Street development is a new commercial building located in the Rosslyn Metro Corridor, zoned for parking requirements of 1 space per 1,000 square feet, dependent upon the adequacy of a project's vehicle trip reduction program. The "C-O Rosslyn" zoning in the district permits increases in density and height when the County Board finds that the development offers important community benefits, including provision of a vehicle trip reduction program to support a higher parking ratio.



1801 North Lynn Street development has 347,295 square feet of office space, 6,065 square feet of retail, and a total of 386 parking spaces. Given that most cities adopt the Institute of Transportation Engineers' standard of 3.3 spaces per 1,000 square feet of office space, the development has achieved a 67 percent reduction below national standards.

As part of the parking reduction to the 1 space per 1,000 square feet ratio, the vehicle trip reduction program included the following elements:

- Full-time on-site Employee Transportation Coordinator to manage the program;
- Financial contribution to the Rosslyn Commuter Store;
- Transit fare subsidies for employees;
- Implementation of several ridesharing and parking strategies, including promotion of ridesharing information and provision of computerized ridesharing services, and provision of preferential parking and subsidized parking rates for group riding and off-peak commuting; and
- Bike facilities and showers to encourage bicycle commuting (Rosslyn Metro Center only).

Financial Feasibility and Cost Savings

Financial benefits to the two Arlington County projects are obvious—reduced parking requirements sharply reduce construction costs, which in Arlington can mean upwards of \$15,000 per space for structured parking, and up to \$60,000 or more for below-grade spaces. Being able to build less parking is a major part of making the project financially feasible, in terms of balancing land costs, construction costs, revenue, and lending. The Market Commons project, for example, saved \$16 million from the 400 forgone parking spaces, without which it would not have been a feasible project.

Environmental Benefits

Arlington has done an excellent job of promoting high density mixed-use developments along the corridors with reduced parking. This kind of design promotes walk and bike trips as people can go from home to work and shopping in very short distances. Urban design in both projects pays close attention to pedestrian comfort, by providing usable public space, circulation paths, services, landscaping and sensitive architecture.

Vehicle Trip Reduction for Mixed-Use Development NASA Research Park Santa Clara, California

The NASA Ames Research Center (ARC) is a 1,500 acre site of federally-owned land that lies between the southwestern edge of the San Francisco Bay and Silicon Valley, in Santa Clara County, California. The former Naval Air Station was opened in 1933 as a military base, while NASA began operations on its 430 acres in the early 1940s. The former Naval Air Station, except for the military housing, was transferred to NASA's control in 1994 after shifts in federal policies and cost cuts forced the decommissioning of most of the military activity there.

The majority of redevelopment on NASA's land will occur in the NASA Research Park (NRP), a 213-acre parcel on the southwest part of the site. Plans for development include the restoration of existing historical buildings, as well as adding nearly two million square feet of educational, office, research and development, museum, conference center, housing and retail space.

Also being developed as part of the project is 28 acres of a 95-acre parcel on the north side of the site called "The Bay View." This area is slated for predominantly housing uses, in addition to supporting retail, childcare, and other services. The remainder of Bay View will remain as open space and natural habitat.

The EIS was finalized in July 2002. Design and construction will begin sometime after 2003, with the final phase of the project slated for completion sometime after 2014.

Key Facts

NASA Research Park (NRP)

- 213-acre site.
- Currently has approx. 1.6 million square feet of space.
- Demolition of 560,000 square feet and renovation of 600,000 square feet of historic buildings.
- Addition of approximately 2,100,000 square feet of new buildings.
- Preservation of approximately 9 acres for burrowing owls.

Bay View Development

- 95-acre site.
- Currently predominantly grassland.
- Preservation of 6.2 acres for burrowing owl habitat.
- Addition of 1,240,000 square feet of residential, retail, childcare, and support services.

At project build out, NRP and Bay View would add:

- 6,626 employees (7,088 total including additional jobs on existing ARC site),
- 3,000 students,
- 1,120 town home apartments for 3,300 residents,
- 810 dormitory-style housing units for 1,560 students.

Parking

Because the NASA land is federally owned, it is exempt from city or county codes that dictate parking requirements, as well as other development restrictions. Despite the lack of restrictions, however, and the suburban-style sprawl that dominates surrounding land uses, the NRP project sought from the beginning to reduce its automobile mode share—to at least 32 percent below the typical rates for Santa Clara County.

Had the site been developed using Institute of Transportation Engineers' suggested parking ratios, plans would have called for 7,542 parking spaces. Instead the Transportation Demand Management (TDM) Plan

calls for a total of 5,200, with parking ratios determined by the actual number of people expected to be on-site and reduced based on trip reduction goals.

Strategies

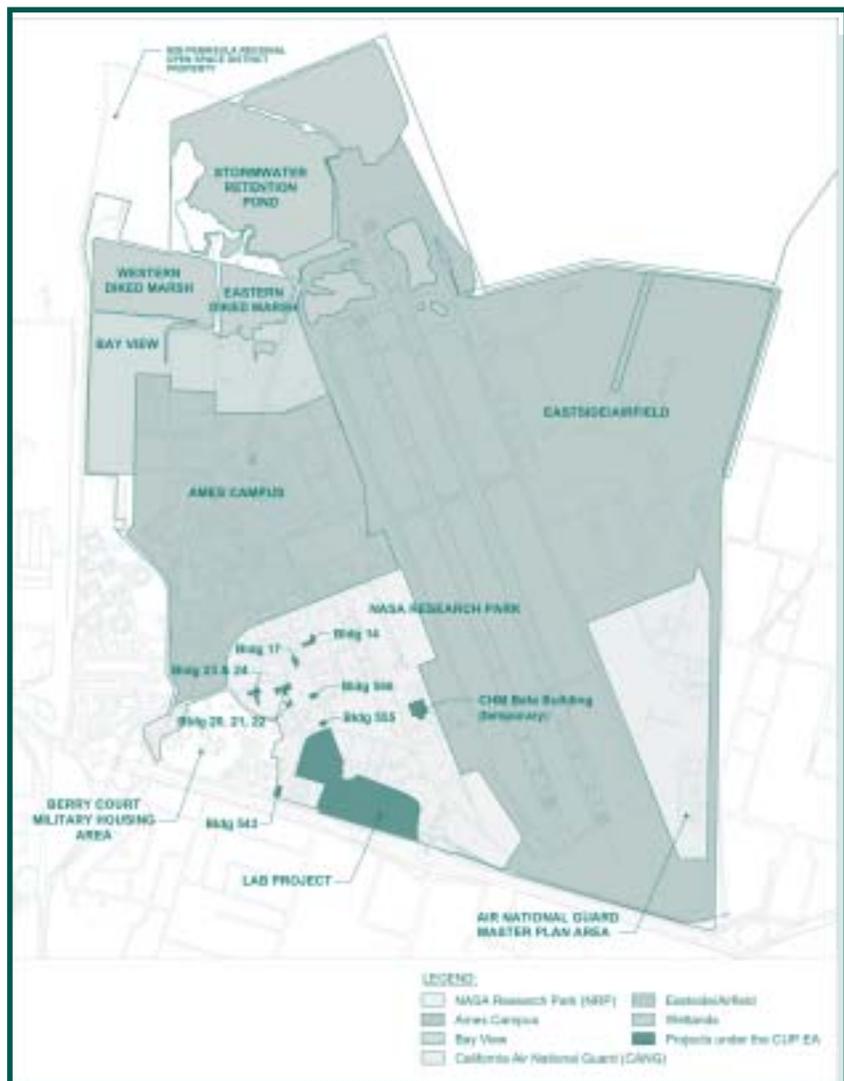
The NRP and Bay View TDM Plan not only reduces the parking supply, but also outlines a range of trip reduction strategies to ensure that parking demand can be accommodated. The TDM Plan will be binding on all partners, lessees, permittees, concessionaires, cooperators and other tenants located at the NRP and Bay View developments, pursuant to the provisions of the EIS.

The TDM strategies to achieve these goals are innovative and numerous. They include:

- Trip reduction goal of 58 cars per 100 employees/students (32 percent reduction in vehicle trips from Santa Clara average);
- Supportive TDM site design, consisting of:
 - Bicycle Network: Bicycle paths connecting all residences/workplaces, including ample bike parking;
 - Pedestrian Network: A connecting network of paths and sidewalks throughout the site;
 - Mixed-use development;
 - On-campus housing; and
 - 28 percent fewer parking spaces than typical development.
- Site-wide TDM programs, including site-wide shuttle program and bus pass;

Trip Reduction Goals of the TDM Plan

- Reduce external-to-internal commute vehicle-trips 22% below typical Santa Clara commute trip-generation rates.
- Reduce internal-to-internal commute vehicle-trips 100% (e.g. work trips from Bay View/NRP to the NRP)
- Reduce total commute vehicle trips at least 32% below typical Santa Clara commute trip-generation rates.
- No set goals to reduce visitor trips or internal-to-external vehicle trips (e.g. work trips made by spouses or non-work trips from NRP/Bay View residences to off-site destinations), but the comprehensive strategies included in the plan will have a residual effect on these types of trips.



- Partner/lessee programs: Partners, lessees, & tenants *must* pass on the cost of parking or offer parking cash-out;
- Parking charges (in year 2015; 2002\$) of \$75/month for carpools and \$165/month for reserved spaces;
- Parking fees established by an hourly rate, payable by debit card; no discount for monthly passes—the less you park, the less you pay;
- 75 percent of all spaces shared between land uses.

If the TDM Plan's trip reduction goals are not met, parking prices will increase proportional to the amount by which the trip reduction goal is not met. This compliance mechanism not only provides additional revenue to support more TDM programming, but it also directly impacts the travel behavior that does not support the trip reduction goal.

Financial Feasibility and Cost Savings

The TDM program means significant cost savings for developers, while reducing the environmental impact and improving the pedestrian environment of the future campus.

If the development were to be built without the TDM program, an additional 2,342 parking spaces would be needed. In addition, the TDM program requires that those who park bear the cost of paying for the parking supply. As such, the developers will save the following:

- 2,342 parking spaces not built = Estimated \$3,050,000 savings per year to developers.
- 5,200 spaces built = Estimated at \$6,975,000 per year; paid for by parking fees.
- TDM program costs = Estimated at \$4,000,000 per year (at end of Phase 4); paid for by parking fees.

Environmental Benefits

A key tenet of the project is sustainable development. The land itself is considered to have both brownfield status and environmentally-sensitive habitat (it is home to the burrowing owl—a California species of special concern), demanding development that focuses on both remediation and preservation. The development plan goes a step further to ensure conservation for a sustainable future—it incorporates the principles of energy efficiency, water conservation, transportation demand management, and seismic safety. This represents a striking change from typical development patterns in an area prone to auto-oriented development and sprawl.

The NRP TDM plan will reduce impervious pavement, a damaging element of development to nearby ecosystems because of reduced habitat, limited rainwater re-absorption, and increased polluted storm-water runoff. Reduced parking in the NRP saves land, which contributes to the project's ability to put aside 81 acres of preserved land for the endangered burrowing owl.

By combining uses on the land, and requiring that each household have one member who works or goes to school at the site, the development will not only reduce the need for people to commute from out of the region, but will sharply reduce internal vehicle trips. The development will house nearly 5,000 people, at least half of whom will work or study on the campus. These employees will be able to find services on-site, reducing the need for lunch-hour vehicle trips.

Social and Other Benefits

NASA has committed to assuring that a minimum of 10 percent of the housing on site is offered at an affordable rate. Finally, the reduced parking and emphasis on pedestrian and bicycle networks contributes to better urban design and improved walkability, increasing quality of life of residents, employees, students, and visitors.

Reduced Parking Requirements: The Shoppes of Wilton Manors *Wilton Manors, Florida*

Southeast Florida, comprising Palm Beach, Broward, and Dade Counties, is one of the fastest growing regions of the United States. In 1960, the population of the region was 1.5 million people; in 1990, the population reached 4.1 million. Projections for 2015 suggest that the population will reach 6.2 million people, an increase of over 50 percent from 1990.

With the growing population and increasing development, fragile ecosystems are being lost and water supplies threatened. This area epitomizes the negative aspects of sprawl, and there is a desire to reverse the trend by revitalizing the inner core areas and promoting “smart growth” development which is environmentally, economically, and socially sustainable. Reducing parking requirements to reduce the amount of impervious surface and encourage urban infill and brownfields redevelopment is one element of southeast Florida’s move toward smart growth and development.

In the City of Wilton Manors, located in Broward County, parking reductions were partly responsible for enabling a financially deteriorating neighborhood shopping center to be redeveloped into a successful mixed-use development, featuring restaurants, art galleries, and other entertainment uses, as well as professional offices. At its peak in the 1960s, the shopping center housed a Grand Union Supermarket, a bank, a fast food restaurant, and many other stores. In the 1990s, the shopping center lost several businesses, reducing the tenant occupancy rate to 30 percent.

To accommodate redevelopment of the property and revitalize the area, the city teamed with a private development company, Redevco, creating a public-private partnership to transform the shopping center. Because a host of “big box” retail stores had recently located in nearby outlying areas, this property could not support additional retail stores. Instead, the city and Redevco identified an untapped market niche—entertainment, cultural attractions, and restaurants. To enable these uses, the city created a new zoning overlay district that not only changed zoning requirements to allow for arts and entertainment uses, but also exempted the developer from standard parking requirements by allowing for shared parking in planned off-site public parking structures. The new zoning district also allowed for outside cafes and seating to make the restaurants more inviting and attractive.

Financial Feasibility and Cost Savings

Under the city’s generic parking requirements, art and entertainment uses would have required 390 new parking spaces, in addition to the

existing spaces at the site required for previous retail use. Construction of the additional 390 parking spaces would have cost approximately \$1.9 million and would have also necessitated demolition of existing buildings, further increasing redevelopment costs (by approximately \$30,000) and reducing rental income.⁵ Reducing the parking requirements and allowing for shared parking reduced development costs enough to make the redevelopment financially feasible for the developer.

The Shoppes of Wilton Manors now boast full occupancy, and rental rates of \$32 per square foot (up from \$8 per square foot). These two complementary factors—increased occupancy and increased rental rates—account for an increase in total annual rental income of \$26 million, from \$2 million to \$28 million, 12 times its former rental income.

Environmental Benefits

While this redevelopment with parking reductions has not caused a change in transport mode splits (more people are driving to the Shoppes of Wilton Manor because of its increased attractiveness and desirable restaurants and arts and entertainment facilities), the project provides other environmental benefits. By revitalizing an existing development and spurring additional redevelopment in the area (see below), the parking reductions played a part in preventing further sprawl and greenfields development. In Southeast Florida, curbing sprawl is especially important because of the sensitive ecosystem west of the area—the Florida Everglades. As noted in a December 1998 report prepared by the South Florida Regional Planning Council, most of the current developments in the region are located on land that was once part of the Everglades system. In addition, as part of the development agreement, 80 percent of the trees along Wilton Drive were preserved; without the new zoning overlay district, this street would have been widened, requiring that trees be razed.

Other Benefits

In addition to the financial success of the project and the related environmental benefits, the revitalization of the Shoppes of Wilton Manors has provided economic, fiscal, and social benefits to the community.

- **Economic benefits.** The project has stimulated adjacent economic development. An office building next door that was vacant for 18 months now houses a law firm with 100 employees, many of whom frequent the restaurants and entertainment facilities at the Shoppes of Wilton Manors. Property values in the surrounding area are also improving; rental rates have almost doubled, increasing from \$6 per square foot to rates of between \$11 and \$14 per square foot of leased space.

⁵The building demolition would have also slightly reduced the additional parking requirements, but not by enough to make the development financially feasible.

- **Fiscal benefits.** The increased property value of the Shoppes of Wilton Manors—increasing by more than 10 times the initial value, from \$226,000 to over \$3.3 million—will add an estimated \$80,000 to the city in property tax revenues. In addition, the other private investments along Wilton Drive have resulted in a 10 percent increase in city-wide property tax revenues.
- **Other social benefits.** The project has contributed aesthetic improvements and a safer, more pedestrian-friendly community environment. Storefront and landscaping improvements make the area more attractive. There has been a reduction in criminal activity due to the increased activity and vibrancy of the area. The pedestrian flavor of the town center is enhanced as a result of improved site access. All of these benefits contribute to an improved quality of life for local residents and business people.

Lessons Learned

Some of the key elements related to the success of the Wilton Manors revitalization effort include the following:

- The developer's and the city's willingness and commitment to work together. According to Redevco Executive Vice President, Debra Sinkle, the project was successful because of the public/private partnership between the city and Redevco. The city's flexibility with regard to zoning requirements and its commitment to the project created the confidence necessary for the investment of private dollars into the project.
- The city's flexibility in reducing parking requirements to support different redevelopment uses that would otherwise require more parking than the original use.
- Substantial cost savings resulting from parking reductions, making the redevelopment financially feasible.

Excerpts From Ordinance Z-195: Establishment of an Arts and Entertainment Special Overlay District

Wilton Manors, Florida

Purpose and Intent

The purpose of the Wilton Drive Arts and Entertainment Overlay District is to create the opportunity for, and to encourage the development of, new mixed-use development providing entertainment, cultural facilities, restaurants, shopping and professional offices within the Wilton Drive Central Business District.

.....

The parking regulations are intended to promote the location of restaurants, entertainment facilities and other intense uses by exempting the properties within the district from the off-street parking requirements ... and providing standards for parking within the district [shared parking provision].

.....

Exemptions from Parking Requirements:

A. Exemptions from Parking Requirements

1. Restaurant or other establishment for consumption of food or beverages on the premises: One space per two hundred (200) square feet of floor area in rooms or spaces for customer service.
2. Auditorium, theater, gymnasium, stadium, arena, or convention hall: One space per three hundred (300) square feet of floor area.
3. Amusement place, dance hall, skating rink, or exhibition hall without fixed seats: One space per two hundred (200) square feet of floor area.
4. Retail store, personal service establishment and banks: One space per three hundred (300) square feet of floor area.

B. On-Street parking to count toward parking requirements

On-street parking immediately adjacent to a lot on which the business is located shall count toward fulfilling the parking requirement of that lot.

C. Valet Parking

Valet parking and the stacking of vehicles shall be permitted...

D. Joint use and off-site facilities to count toward parking requirements

Joint use and off-site facilities [for parking] shall be permitted ...

Source: City of Wilton Manors, Ordinance No. Z-195.

A Vehicle Trip Reduction Program: SAFECO Insurance Company Expansion *Redmond, Washington*

The State of Washington's Commute Trip Reduction Law (CTR) was passed in 1991 with goals of improving air quality and mitigating traffic congestion. This transportation demand management measure targets the state's largest counties (those with populations greater than 150,000 people), requiring employers with more than 100 employees to implement programs to reduce single occupancy vehicle (SOV) trips to and from work. Through the state's CTR, employers monitor commuter mode splits by administering employee surveys, which are written and processed by Washington state. The CTR established a goal of a 35 percent reduction in trips by 2005 compared to 1993 levels.

Maximum Parking Limits

Redmond, Washington

The City of Redmond instituted maximum parking limits in the early 1990s to manage growth and traffic. These requirements limit the total number of parking spaces that can be developed by land use. For example, general commercial land uses are limited to five spaces per 1,000 square feet of gross floor area (GFA), and business parks are confined to three spaces per 1,000 square feet GFA.

SAFECO Insurance Company of America, Redmond Campus, located in King County, one of the nine Washington counties affected by the CTR, has responded to the CTR by implementing transportation management measures as part of its Transportation Management Plan (TMP). These measures consist of employee transit passes, special reserve parking for high occupancy vehicles (HOV), ride matching, vanpooling, and guaranteed ride home services. Provision of these services has allowed SAFECO to reduce its parking requirements for its recent expansion project below the City of Redmond's maximum levels.

SAFECO has undertaken a large-scale construction project to accommodate anticipated growth at its corporate headquarters in Redmond, adding three additional buildings (385,000 square feet of office space) and three parking structures (843 parking spaces) for the new office space. To preserve the attractive park-like setting of the 48-acre campus and to maintain a pedestrian-friendly environment, SAFECO chose to construct all three parking structures underground. These subterranean spaces, while expensive to construct at \$18,000 per parking space, will preserve greenspace and make it easier to walk around the business park campus. The City of Redmond has maximum parking limits that would allow SAFECO to construct 1,155 spaces. Instead, SAFECO built 843 spaces, resulting in a parking ratio of 2.2 spaces per 1,000 square feet for the new office space. This amounts to a savings, relative to the maximum limits, of 312 parking spaces. Reducing the total number of spaces allowed SAFECO to mitigate the high cost of underground parking.

Financial Feasibility and Cost Savings

While these parking reductions were not implemented as cost-cutting measures, the gross cost savings associated with the parking reductions (relative to the maximum limits) amount to \$5.6 million in parking construction costs, or about \$491,000 annually.⁶ SAFECO's exemplary transportation management program (TMP) reduced parking demand and allowed the company to build fewer parking spaces. Thus, a portion of SAFECO's expenditures on its TMP represents the indirect cost of the parking reductions and resulting savings. The total cost of SAFECO's TMP at its Redmond campus is approximately \$261,000 per year, including \$75,400 for transit subsidies.

When both the full cost of transportation demand management at the Redmond campus and the savings from parking reductions are considered, SAFECO's net savings from parking reductions are \$230,000 annually. Given that SAFECO would have incurred some of the costs of transportation demand management at its Redmond campus regardless of the parking reductions, the net savings actually exceed \$230,000. SAFECO's decision to increase the density of its existing property, rather than move to another (likely ex-urban) location, also avoided the cost of procuring additional land.

Environmental Benefits

Under their TMP, SAFECO agrees to maintain an SOV rate at or below 60 percent. Since 1997, SAFECO has kept its total number of SOV trips to between 57 and 59 percent of total commute trips relative to the overall transport mode split for East King County of 81.4 percent SOV commuting and 13.4 percent carpooling.⁷ Rather than drive alone, 15 percent of SAFECO employees carpool, 12.5 percent use vanpool services, 8 percent use public transit, and the remaining 7 percent bicycle, walk, or telecommute. The company also maintains information on commuter vehicle miles traveled (VMT). On average, SAFECO employees travel between 6.5 and 7 miles one way. Thus, by maintaining an average 58 percent SOV rate for its 1,700 employees, SAFECO averts as many as 4,635 VMT each day, or about 1.2 million miles each year. These VMT figures assume two people per carpool and four people per vanpool. Thus,

King County Metro King County, Washington

King County is Washington's most populous county (almost 2 million residents) and includes the cities of Seattle, Kirkland, Bellevue, and Redmond. The county's transit agency, King County Metro (Metro), serves a total of 75 million riders annually. The agency operates bus service throughout the county and runs the largest vanpool in the United States, transporting 5,000 commuters each day. Metro also works closely with employers, cities, and institutions to provide supportive services that encourage alternatives to automobile transport including transit passes, guaranteed ride home, ride matching, and commuter bonus programs.

⁶This annual amount is only associated with construction costs. Annual amount assumes constant payments, an interest rate of 7.25 percent, and a 25-year payment period (per discussion with SAFECO transportation manager).

⁷Washington State Department of Transportation, 1999.

if the carpools or vanpools transport a greater number of passengers, this reduction in VMT would be greater.

- **Air Quality Benefits:** The environmental benefits associated with this reduction in automobile commute miles are significant. By avoiding almost 1.2 million miles of automobile travel, approximately 27.56 tons of carbon monoxide, 3.85 tons of nitrogen oxides, and 2.20 tons of hydrocarbons associated with commuting are averted each year.⁸
- **Water Quality Benefits:** Another significant, yet less quantifiable, environmental benefit of reduced parking is the preservation of pervious surfaces to absorb rainfall and prevent polluted runoff. Increasing the amount of impervious areas through paving can alter the area's hydrologic system and cause runoff mixed with oil and other contaminants to pollute receiving streams, rivers, lakes and estuaries. With approximately 40 inches of precipitation each year and many fishable streams, the King County ecosystem is especially susceptible to polluted runoff. An additional 312 parking spaces in aboveground lots account for approximately 100,000 square feet of impervious surfaces.

Lessons Learned

Several key factors contributed to the success of SAFECO's Vehicle Trip Reduction Program. These include:

- The City of Redmond's flexibility and cooperation in allowing SAFECO to increase density on the existing property.
- SAFECO's environmentally-responsible corporate ethic of reducing parking below the maximum limits and maintaining its location in Redmond, thus preventing additional sprawl in the area.
- Available bus service to the area. Frequent and reliable public transit through King County Metro enables SAFECO employees to use alternative modes of transportation even when commuting from other towns in the county.
- SAFECO did not require outside financing. SAFECO's transportation management director believes that had they required outside funding, lenders might have resisted making loans unless more parking was provided in the development plan.

⁸We use average emissions factors from EPA's Office of Mobile Sources' *Compilation of Air Pollution Emissions Factors, Volume II: Mobile Sources: (AP-42)*. The AP-42 provides the following emissions factors: 21.05 grams of carbon monoxide emitted per VMT, 2.97 grams of nitrogen oxides emitted per VMT, and 1.71 grams of hydrocarbons emitted per VMT.

Shared Parking and In-Lieu Fees: D'Orsay Hotel *Long Beach, California*

The City of Long Beach, California recognizes that parking is expensive and consumes valuable land. In its Downtown Parking Management Plan, the city's redevelopment agency promotes small- and large-scale urban development by allowing for shared parking and in-lieu parking fees. The types of development projects eligible for these parking alternatives cover non-residential new construction on lots less than 22,500 square feet, additions or rehabilitation to existing buildings, and renewal of historic landmark buildings.

Long Beach's Downtown Management Plan has proven effective in encouraging redevelopment. The four-star D'Orsay Hotel, which was proposed to the city in 1998, provides an example of how cities can facilitate redevelopment with parking reductions. The proposed D'Orsay Hotel includes a 162-room boutique hotel with 35,000 square feet of retail space. The property, located on a three block pedestrian walkway in downtown Long Beach, was used for office space until the late 1980s when the buildings were deemed unsafe and demolished. In recent years, the property was used as a surface parking lot. Other development proposals for this property had been made to the city, but fell through in part due to the financial burden imposed by the city's minimum parking requirements.

For the D'Orsay Hotel proposal, Long Beach's minimum parking requirements would have required the developer to construct one parking space per hotel room, and four spaces per 1,000 square feet of gross floor area (GFA) of retail space, totaling 302 spaces. With construction costs of \$16,000 per parking space, the parking costs would have totaled \$4.83 million, making the project financially infeasible.

After conducting a traffic study to assess parking demand at other Long Beach downtown hotels, the city's planning department determined that this mixed-use hotel/retail development did not require the minimum number of parking spaces and modified the requirements to three spaces per 1,000 square feet of retail space, and 113 spaces for the 162 hotel rooms. The Downtown Management Plan allowed for the reduction of the parking requirements for the retail space and the hotel's valet parking system allowed for the reduction of parking requirements for the hotel space. Thus, the revised total number of spaces required was 218 spaces, 84 fewer than would otherwise be required.



Even with the reduction of 84 parking spaces, the developer determined that the project was financially infeasible given the high cost of underground parking. At about \$16,000 per space in construction costs, parking for this project, even with the revised requirements, totaled \$3.49 million.

Upholding its mission to encourage urban revitalization, the City of Long Beach Redevelopment Bureau agreed to adjust the parking requirements for this mixed-use project in the form of in-lieu fees for parking. The city allowed the developer to pay in-lieu fees for 56 of the 218 required parking spaces. The in-lieu fee was \$3,000 per parking space plus an additional \$50 per space per month to cover parking operating and maintenance expenditures.

Cost Savings and Financial Feasibility

As shown in the table below, the revised parking requirements decreased the developer’s parking construction costs by \$1.34 million relative to the generic requirements. With additional savings of \$730,000 from the in-lieu fee arrangement included, the total parking cost savings to the developer totaled over \$2 million, enough to make the project financially feasible. These cost savings significantly improved the projected financial net returns for the proposed project, and facilitated revitalization of the surrounding area.

Environmental Benefits

The hotel development is expected to encourage pedestrian traffic in the area, rather than cause additional automobile travel. In addition, the infill redevelopment of the D’Orsay Hotel property may have averted a greenfield development. These types of urban infill projects reduce addi-

Modified Parking Requirements for the D’Orsay Hotel

	Requirement	Gross Floor Area (GFA)	# of Spaces Required	Cost per Space	Total Cost (millions)
Generic Requirements					
Retail	4 spaces/1,000 square feet GFA	35,000 square feet	140	\$16,000	\$2.24
Hotel	1 space/room	162 rooms	162	\$16,000	\$2.59
Total	--	--	302		\$4.83
Revised Requirements					
Retail	3 spaces/1,000 square feet GFA	35,000 square feet	105	\$16,000	\$1.68
Hotel	0.70 spaces/room	162 rooms	113	\$16,000	\$1.81
Total	--	--	218		\$3.49
Revised Requirements and In-Lieu Fees					
Retail & Hotel On-Site	N/A	N/A	162	\$16,000	\$2.59
Retail & Hotel Off-Site	N/A	N/A	56	\$3,000	\$0.168
Total	--	--	218		\$2.76
(With In-Lieu Fees)					

tional sprawl in California, a state already plagued with an overload of cars, highways, and sprawl development.

Other Benefits

- **Economic Benefits.** The D’Orsay Hotel promises to provide economic benefits to downtown Long Beach by attracting additional pedestrian traffic. Specifically, the D’Orsay will help existing businesses that are struggling to stay in the area, and will likely promote additional redevelopment projects.
- **Fiscal Benefits.** The D’Orsay Hotel is expected to generate approximately \$300,000 annually in additional property tax revenues for the city.⁹ Because this property is located in an economically troubled area qualified to receive special assistance as a “California Redevelopment Project Area,” the property tax revenue generated from the project will be directed back into the area for further redevelopment and infrastructure improvements. In addition, the state will receive revenues from California’s 8.25 percent sales tax and the city will receive revenues from the 10 percent hotel tax.
- **Other social benefits.** The D’Orsay Hotel will provide social benefits to the residents of Long Beach by promoting an active and pedestrian friendly downtown with multiple amenities. By reducing the minimum parking requirements, the Long Beach Redevelopment Bureau reduced the development’s need for surrounding land. In addition, historic buildings were preserved that may otherwise have been demolished to provide space for constructing parking at the city’s minimum levels.

Lessons Learned

This successful redevelopment was made possible for several reasons:

- The City of Long Beach’s flexibility and recognition that parking is expensive and consumes valuable land. This enabled the developer to negotiate reduced parking requirements and in-lieu fees that made the project feasible.
- Combining two different types of innovative parking requirements (shared parking and in-lieu fees). This was necessary to make the development project financially feasible.
- Conducting a development-specific traffic study to estimate the number of parking spaces needed for development. The study of other downtown Long Beach hotels showed that applying the city’s parking standards would have resulted in an excess supply of parking at the D’Orsay Hotel.

⁹At the property tax rate of one percent on the project’s incremental value of \$30 million.

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**Examples of
Innovative Parking Ordinances
and Programs**

Examples Of Innovative Parking Ordinances And Programs

This appendix provides examples of municipal zoning ordinances, urban master plans, and transportation programs that employ innovative alternatives to generic parking requirements. These examples offer “real world” illustrations for some of the alternatives described in this guidebook. Below, we list the cities with ordinances, plans, or programs included in this appendix, along with the key elements of their approaches to parking issues. For each city, we only include excerpts from the ordinances, plans, or programs that apply specifically to these key elements.

Coral Gables, Florida

Coral Gables Zoning Code (1998)

- Parking requirement reductions in the central business district
- Shared parking

Schaumburg, Illinois

Parking Ordinance (1998)

- Transportation demand management
- Bicycle amenities
- Reduced parking requirements if landbanking occurs

West Palm Beach, Florida

Downtown Master Plan (1995)

- Shared parking
- Centralized parking
- Improvements in pedestrian amenities
- Parking re-design

Montgomery County, Maryland

Montgomery County Code Zoning Ordinance (1997)

- Shared parking for mixed-use development
- Parking reductions for transit-oriented or central business district development
- Reduced parking requirements for owners that participate in ridesharing efforts

Long Beach, California

Downtown Parking Management Plan (1993)

- In-lieu parking fees to fund off-site, public parking

Portland, Oregon

Title 33: Planning and Zoning Code (1999)

- Maximum parking limits

Cambridge, Massachusetts

Cambridge Municipal Code (1998)

- Transportation demand management
- Reduced parking requirement

CORAL GABLES, FLORIDA
Coral Gables Zoning Code (1998)

- ◆ *Parking requirement reductions in central business district* ◆
- ◆ *Shared parking* ◆

Section 13-5.

Commercial and Industrial Classification of Uses
and the Central Business District

(d) Central Business District

1. The central business district shall consist of all commercially zoned property bordered by LeJeune Road on the west, Douglas Road on the east, Navarre Avenue on the north, and Almeria Avenue on the south.
2. Any building used for other than residential purposes and located in the City of Coral Gables central business district, as herein defined, shall be exempted from the off-street parking requirements of Article XV of this code, provided, however, that the Floor Area Ratio (F.A.R.) of such buildings shall not exceed 1.25.
3. New buildings containing a Floor Area Ratio (F.A.R.) of more than 1.25 and existing buildings being enlarged to contain a Floor Area Ratio (F.A.R.) of more than 1.25 shall provide off-street parking in accordance with the requirements of Article XIII of this code.

Source: Coral Gables Zoning Code (1998)

Section 13-6.

Minimum Parking Requirements - By Use

Coral Gables Minimum Off-Street Parking Requirements - By Use					
<i>Commercial Uses</i>					
One parking space required per square feet of gross building area shown below:					
100 sq. ft.	200 sq. ft.	250 sq. ft.	300 sq. ft.	350 sq. ft.	400 sq. ft.
Business Schools; Trade Schools; Vocational Schools	Beauty Shops; Clinics; Medical & Dental outside the Central Business District; Post Office	Animal Hospitals; Cat Beauty Shops; Civic Clubs; Clinics; Medical & Dental in the Central Business District; Community Centers; Dog Beauty Shops; Fraternal Buildings; Libraries; Lodge Buildings; Museums; Private Clubs; Union Halls; Veterinary Clinics	Banks; Business & Profession Offices outside the Central Business District; Dry Cleaners; laundries; Savings Institutions; Self-service Laundries	Art Galleries; Artist Studios; Barber Shops; Business and Professional Offices in the Central Business District; Credit Unions; Finance Companies; Finance Institutions; Photographers; Photo Galleries; Retail Shops; Sales Shops; Travel Agencies; Trust Companies	Blueprinting; Cleaning Plants; Dyeing Plants; Engraving Plants; Newspaper Plants; Picture Framing; Photocopy; Photostatic Copying; Photo Developing & Printing; Printing Plants; Repair Shops (shoes, clothing, appliances, etc.)
One and one-half (1 1/2) parking spaces required per square feet of gross building floor area shown below:					
100 sq. ft.			200 sq. ft.		
Outside Central Business District			In the Central Business District		
Bars; Delicatessens; Beer Gardens; Lunch Counters; Cafes; Restaurants; Cafeterias; Taverns; Cocktail Lounges			Bars; Delicatessens; Beer Gardens; Lunch Counters; Cafes; Restaurants; Cafeterias; Taverns; Cocktail Lounges		
<i>Mixed-Uses:</i> Off-street parking for mixed-uses shall be provided in accordance with Section 13-7 C.					
<i>Central Business District:</i>					
a) For delineation of the Central Business District refer to Section 13-5 (d) 1.					
b) Buildings not exceeding a F.A.R. of 1.25 located within the Central Business District and used for other than residential purposes are not required to provide off-street parking (Section 13-5).					
<i>Off Street Loading:</i> Off-street loading spaces shall be provided in accordance with Section 13-9.					

Source: Coral Gables Zoning Code (1998)

Section 13-14.

Shared Municipal Off-Street Parking

Shared off-street parking shall be permitted to serve two or more individual land uses at municipally owned or operated parking facilities for parking spaces required under this Code for private uses in any C, M or S-Use District subject to the following conditions and restrictions: (3316)

- A) A maximum of fifty (50) percent of the required number of parking spaces for one or more off-peak, nighttime or Sunday/holiday uses (activities) may be provided, up to a maximum percent of the municipal facility's available daytime parking capacity as determined in the application process.
- B) Unlimited additional parking for one or more off-peak, nighttime or Sunday/holiday uses (activities), in excess of that required by this Code, shall be permitted up to a maximum percent of the municipal facility's available daytime parking capacity as determined in the application process.
- C) A recordable agreement for such shared use, in the form of a reciprocal easement acceptable to the Office of the City Attorney shall be filed with the Zoning Administrator and recorded with the City Clerk. The City shall be named in that agreement as one of the parties with right of enforcement.
- D) An insurance policy must be obtained and furnished to the City to the satisfaction of the City Manager and City Attorney and such policy shall hold the City harmless from any and all claims or causes of action which may accrue as a result of use of premises or due to an incident or occurrence on the premises.
- E) A municipal off-street parking facility required for the purpose of complying with the provisions of this Code shall not include off-street parking similarly required for another private use, unless the Parking, Planning, Public Works and Building and Zoning Directors have reviewed the application and determined that the periods of peak usage of such uses will not be simultaneous or in conflict with each other.
- F) A site plan, landscape plan, lighting plan, circulation and traffic plan, peak use analysis and written description of the proposed use of shared facility shall be submitted by the applicant with each request for shared use approval for properties operated but not owned by the City. Only a peak use analysis and written description of the proposed use shall be required for parking facilities owned by the City.
- G) Shared required parking must commence within 1/4 mile of the building site. Additional parking, in excess of code requirements, shall not be subject to this distance requirement.
- H) All development orders or permits covering such approval shall include the requirement that the order or permit shall be valid only so long as the conditions described in the application or the permit exist.

Source: Coral Gables Zoning Code (1998)

- I) Nothing in this section shall be construed to prevent the joint use of municipal off-street parking for two or more uses if the total of such spaces, when used together, will not be less than seventy-five (75) percent of the sum of the requirements of the various individual uses computed separately in accordance with the requirements of this Code.
- J) Shared use parking approval described in this section shall not be transferable in any manner.
- K) An agreement shall be executed by the parties as to the minimum maintenance requirements which shall be the sole responsibility of applicant and which failure to maintain shall result in immediate revocation of the permit herein granted.

Source: Coral Gables Zoning Code (1998)

SCHAUMBURG, ILLINOIS Schaumburg Parking Ordinance (1998)

- ◆ *Transportation demand management* ◆
- ◆ *Bicycle amenities* ◆
- ◆ *Reduced parking requirements if landbanking occurs* ◆

§ 154.126 Adjustments to Required Parking

A) Incentives for Development of Transportation Demand Management Programs.

- (1) **Purpose.** Transportation demand management is a means of modifying travel and encouraging use of alternative modes of transportation in order to increase the efficiency of the transportation system. In the following cases, the Village Board may grant relief to the parking regulations through the variation procedure in specific cases without meeting the hardship requirements of § 154.45.
- (2) **Shared Ride Programs.** These programs decrease parking demand by increasing passengers per vehicle. Examples are employer sponsored vanpooling, carpooling and subscription bus service. For buildings or complexes of a minimum of 30,000 square feet gross floor area, a reduction of up to 20% of required parking may be allowed based on substantial projections of reduction in demand. However, in order to qualify, the petitioner must submit evidence to the satisfaction of the Zoning Board that meets the minimum requirements as stipulated within the following programs.
- (3) **Vanpooling or Subscription Bus Service.**
 - (a) The petitioner is participating or shall participate in an approved carpooling program established under the provisions of § 154.126(A)(4) below and either:
 - (i) Petitioner will obtain or lease to qualified employees vans, buses or other high passenger capacity vehicles, for the purpose of providing transportation of additional passengers (vanpooling); and/or
 - (ii) Petitioner will operate or hire vans, buses or other high passenger capacity vehicles to provide exclusive or non-exclusive commuter transportation of employees from residential areas, train stations, and/or other transit terminals.
 - (b) In furtherance of the petition, the petitioner may show any other activities that will ease the creation of vanpools and carpools. For example:
 - (i) Petitioner will develop an alternative work schedule program that shall include staggered work starts and stops, flextime and/or compressed work weeks.

Source: Schaumburg Parking Ordinance (1998)

- (ii) Petitioner will provide adequate lunch facilities on the site.
- (iii) Petitioner will provide preferential parking.

As part of his request for a variation, the petitioner shall show to the satisfaction of the Zoning Board that the actions proposed by the petitioner shall reduce the parking demand by the amount requested.

- (4) **Carpooling Programs.** A variation of up to 10% of required parking based on substantiated projections of reduction in demand may be granted for any building or complex of 30,000 square feet of gross floor area which institutes or proposes to institute a carpooling program which meets the following minimum requirements:
 - (a) Carpooling program must be a specific responsibility of a designated individual or department.
 - (b) Program must provide an active matching service using manual or automated matching of addresses and providing employees with potential carpools (passive matching alone such as bulletin boards is not acceptable).
 - (c) Program must endeavor to register all existing and all new employees.
 - (d) Program must actively promote carpooling to employees through newsletter, posters and other materials.
- (5) **Public Transportation Programs.** A reduction of required parking may be granted for any complex within one-quarter mile of any regularly scheduled bus route or commuter train station, with service available during commuting hours, equal to the substantiated projection of use of public transportation by employees of such complex.
- (6) **Enforcement of Carpooling and Shared Ride Programs.** Development plans, wherein parking is reduced for shared ride or carpooling programs, shall have an area designated where parking could be constructed equal to the number being reduced. If the programs are not being conducted as testified to the Zoning Board, the owner must construct the parking required to meet the regulations of the village, during the next construction season. The petitioner, in accepting a parking reduction, agrees to construct such additional parking as would otherwise be required under the provisions of the Zoning Ordinance, if the Village Board shall determine after hearing by the Zoning Board that the reasons for granting said reduction no longer exists.

Prior to the issuance of any occupancy permit, the employer(s) must verify that such ridesharing plans, shown at the time the variation was granted, is being implemented. Such verification must include copies of any contracts, lease agreements, purchase agreements and other documentation to show that such transportation demand management has taken or is about to take place.

Source: Schaumburg Parking Ordinance (1998)

Prior to the issuance of an annual business permit, the employer(s) shall submit a report evaluating its ridesharing program. Such report shall include the number of participants involved, the percentage of participants to total work force, number and types of vehicles used, and the percentage of parking spaces normally used by employees.

The commitments agreed to by the petitioner and recommended by the Zoning Board and approved by the Village Board shall be applicable to all successors in title and to all tenants. The petitioner shall record a covenant, the content and form of which must be approved by the Director of Planning or his/her authorized designee, acting in the capacity of Zoning Administrator, which binds all successors in title to the commitments approved and the petitioner shall include in all leases a clause, the content and form of which must be approved by the Director of Planning or his/her authorized designee, acting in capacity of Zoning Administrator, which binds all tenants to this commitment made by the petitioner. (Ord. 163, passed 12-5-61; Am. Ord. 2124, passed 5-25-82; Am. Ord. 92-112, passed 10-13-92; Am. Ord. 95-62, passed 6-13-95; Am. Ord. 97-152, passed 12-9-97).

Source: Schaumburg Parking Ordinance (1998)

§ 154.125 Bicycle Parking Requirements

(A) Required number of spaces. The following uses are required to install bicycle parking:

(1) **Retail Centers.**

Minimum of ten spaces to be located at each main building entrance(s).

(2) **Office and Professional Uses (sq. ft. gross floor area).**

0 - 49,999	One rack or five spaces
50,000 - 99,999	Two racks or ten spaces
100,000 or more	Four racks or 20 spaces

(3) **Restaurants.**

Type A (full service)	One rack or five spaces
Type B (carry out)	One rack or five spaces
Type C (full/carry out)	Two racks or ten spaces

(4) **Cultural, Recreational and Entertainment Uses.**

Health clubs; racquetball; handball and tennis clubs; swim clubs and pools; community centers; and similar uses as determined by the Director of Planning.

Minimum of 30 spaces.

(5) Bowling alleys; skating rinks; movie theaters; similar uses as determined by the Director of Planning or his/her authorized designee.

To be determined on a case by case basis by the Director of Planning or his/her authorized designee, acting in the capacity of Zoning Administrator.

(B) **Location.** Bike racks shall be located such that they are highly visible from the street and/or building entrance from where bicyclists approach. Bicycle parking areas shall be separated from motor vehicle parking areas.

(C) **Design Criteria and Dimensions.**

(1) Bicycle racks must be capable of locking the bicycle and of supporting the bicycle in an upright position.

(2) A hard surfaced parking area is required. Racks must be securely anchored to supporting surface.

(3) Installation of bike racks shall conform with the requirements set forth by the bike rack manufacturer with a rectangular space no less than two and one-half feet wide by six feet long per bicycle unless a locker or permanent device to stand the bicycle on end is provided.

Source: Schaumburg Parking Ordinance (1998)

(4) Bicycle rack shall be installed with adequate space beside the parked bicycle so that a bicyclist will be able to reach and operate the locking mechanism.

(D) **Collective Provisions.** Off-street bicycle rack facilities for separate uses may be provided collectively if the total number of spaces provided collectively is not less than the sum of the separate requirements for each such use and provided that all regulations governing location of accessory parking spaces in relation to the use served are adhered to. (Ord. 163, passed 12-5-61; Am. Ord. 1992, passed 5-26-81; Am. Ord. 92-112, passed 10-13-92; Am. Ord. 95-62, passed 6-13-95).

§ 154.123 Schedule of Parking Requirements

<u>Use</u>	<u>Required Spaces</u>
(C) Retail Uses.	5.0 per 1,000 sq. ft. NFA for 0-1,000,000 sq. ft. NFA
	4.5 per 1,000 sq. ft. NFA for 1,000,001 1,500,000 sq. ft. NFA
	4.0 per 1,000 sq. ft. NFA for 1,500,001 or more sq. ft. NFA per building
(D) Service Uses.	5.0 per 1,000 sq. ft. NFA for 0-1,000,000 sq. ft. NFA per building
	4.5 per 1,000 sq. ft. NFA for 1,000,001 1,500,000 sq. ft. NFA per building
	4.0 per 1,000 sq. ft. NFA for 1,500,001 or more sq. ft. NFA per building

Reductions in parking requirements may be granted for retail and service uses if the difference between the above rate and the reduced rate is landbanked.¹⁰

Source: Schaumburg Parking Ordinance (1998)

¹⁰ Landbanking allows reductions in minimum parking requirements for owners or developers who: 1) show that the minimum requirements exceed parking demand, 2) substitute “green space” (i.e., land left undeveloped) for the avoided parking spaces, and 3) develop the property so that additional parking could be constructed in the event of a parking shortage.

WEST PALM BEACH, FLORIDA Downtown Master Plan (1995)

- ◆ *Shared parking* ◆
- ◆ *Centralized parking* ◆
- ◆ *Improvements in pedestrian amenities* ◆
- ◆ *Parking re-design (i.e., parking concealed behind attractive building facades)* ◆

2. Transportation Strategy

Parking

A large portion of land area in Downtown West Palm Beach is devoted to parking facilities, both surface lots and garages. When facing the street as they often do, these interrupt the continuity of building frontage which makes a street pedestrian friendly.

Street-front parking lots and garages contribute in large measure to the perception that walking in the downtown area is unpleasant. During the charrette, several participants expressed surprise that distances between destinations were short, and they mentioned that they often drive between Downtown destinations. Improving pedestrian continuity on Downtown streets would decrease short trip automobile use and iterative parking, increase transit viability, and ultimately require less parking.

The ultimate goal for parking in Downtown is a centrally managed system of strategically located multiple parking facilities concealed behind habitable building facades facing streets. The Master Plan recommends the following:

1. Institute a single system to manage parking Downtown as described below;
2. Modify off-street parking requirements to encourage shared parking in a managed system, reducing ratios as follows:
 - 2 spaces per 1,000 square feet of commercial space;
 - 1 space per multi-family residential unit;
 - 2 spaces per single-family residential unit;
 - none required for residential development on lots less than 55 feet wide;
 - allow on-street parking to be included in parking requirements of residential units;
3. Allow substitution of off-street parking requirements with a one-time payment to a central system parking fund as per existing ordinance;
4. Institute a plan for strategically located parking garages to replace surface lots as the need evolves;

Source: West Palm Beach Downtown Master Plan (1995)

5. Require all existing surface parking lots to be landscaped within a year with a street-front hedge 3' 6" in height at the sidewalk and shade trees at every third parking space;
6. Discourage replacement of buildings with surface parking lots.

Overall in Downtown West Palm Beach, there is currently an oversupply of parking spaces. There are about 12,000 spaces, and 200 - 300 will be added with the restoration of on-street parking to Dixie Highway and Olive Avenue.

Much of the parking supply in Downtown West Palm Beach is in public lots that are shared by a variety of users, including Downtown employees, shoppers and office visitors. These lots are scattered throughout Downtown, usually close to major travel attractions (for example, City Hall). This pattern of numerous, smaller public lots and garages is highly desirable for two reasons: 1) Downtown vitality, and 2) traffic access.

Small, scattered public parking lots promote Downtown vitality by encouraging a "park once" travel pattern on the part of motorists. With numerous scattered lots, drivers don't expect to drive directly to their final destination and park in an attached garage or lot (as in a suburban office park) and repeat the process for every trip throughout the day (for example, for lunch, shopping, bank, and so forth). Rather, with scattered public parking, drivers expect to "park once" for the entire duration of their stay Downtown, and access multiple destinations during the day as a pedestrian. Combining multiple trip purposes in a "park once" environment is further encouraged when the walking experience between parking and ultimate destination is safe, comfortable and interesting. The small-scale grid of Downtown streets present, a large number of possible routings between parking lot and ultimate destination, and pedestrians can continually vary their routes.

Numerous scattered lots are also preferable for traffic operations. Traffic generated by multiple small lots tends to have a gradual rate of entry/discharge, and is rapidly dispersed to the surrounding street network. This diffusion of traffic contrasts sharply with the traffic "hot spots" that are created at the access points of major attached parking structures. At such concentration of parking, the number of spaces and the high entry/exit rate (due to single purpose occupants) often creates problem intersections, frequently requiring street widening and signalization to accommodate garage operations.

Existing parking and future parking additions to Downtown should be treated as a single system. To do so, it is not necessary to combine operation or ownership of the parking supply into a single entity. Rather, what is required is to assess parking distribution for all of Downtown as a single system, considering all sources of supply and need. Additional parking (whether privately or publicly supplied) should be directed in a manner that yields the most benefit to Downtown as a whole. A longer term parking policy should therefore focus on several major directions:

Source: West Palm Beach Downtown Master Plan (1995)

1. Better use of the existing supply of off-street parking, through directional signs, public information, leasing and other organizational measures;
2. Strategically expanding existing parking locations;
3. Meeting needs of new Downtown tenants (for example, the County Judicial Building) through a combined use of existing parking facilities, carefully targeted expansion of existing lots and construction of new public lots.

A major objective of the parking program should be to encourage visitors to circulate as pedestrians through Downtown commercial streets, such as Clematis Street, on their way to and from parking.

MONTGOMERY COUNTY, MARYLAND
Montgomery County Code Zoning Ordinance (1997)

- ◆ Shared parking for mixed-use development ◆
- ◆ Parking reductions for transit-oriented or central business district development ◆
- ◆ Reduced parking requirements for owners that participate in ridesharing efforts ◆

Sec. 59-E-3.1. Mixed Uses.

(a) When any land or building is under the same ownership or under a joint use agreement and is used for 2 or more purposes, the number of parking spaces is computed by multiplying the minimum amount of parking normally required for each land use by the 5 time periods shown. The number of parking spaces required is determined by totaling the resulting number in each column; the column total that generates the highest number of parking spaces then becomes the parking requirement.

	<i>Weekday</i>		<i>Weekend</i>		<i>Nighttime</i>
	Daytime (6 am-6pm)	Evening (6pm-midnight)	Daytime (6am-6pm)	Evening (6am-midnight)	(Midnight-6am)
Office/Industrial	100%	10%	10%	5%	5%
General Retail	60%	90%	100%	70%	5%
Hotel, Motel, Inn	75%	100%	75%	100%	75%
Restaurant	50%	100%	100%	100%	10%
Indoor or Legitimate Theatre, Commercial Recreational Establishment	40%	100%	80%	100%	10%
Meeting Center	50% ¹	100%	100%	100%	10%
Multi-family dwellings in Commercial Districts	50%	100%	100%	100%	100%
Personal Living Quarters	50%	100%	100%	100%	100%
All Other Uses	100%	100%	100%	100%	100%

¹ The Board of Appeals may reduce this parking requirement in areas where public parking is available or when the meeting center will be utilized by other commercial or industrial uses which are located within 800 feet of the meeting center and provide their own parking spaces.

Source: Montgomery County Code Zoning Ordinance (1997)

Sec. 59-E-3.2. Computing Parking Requirements for Office Development.

Base parking requirements for offices shall be determined in accordance with a property’s Office Parking Policy Area designation and the proximity of the property to a Metrorail station. The Office parking Policy Areas are identified on the Adopted Office Parking Policy Area Map which was approved by the District Council on June 28, 1984, and is maintained by the Planning Board. A copy of this map is reproduced at the end of this section. The base parking requirements within individual Office Parking Policy Areas vary according to the proximity of a property to a Metrorail station which is defined in subsection 59-E-3.21 which follows. The following table establishes the base office parking requirements for each policy area:

<i>Base Requirements for Office Parking</i>				
Minimum Parking Requirements (Spaces/1000 GSF)				
Proximity to Metro Station	Southern Area	South Central Area	Northern Central Area	Northern Area
Less than 800'	1.9	2.3	2.6	N/A
800'-1600'	2.1	2.4	2.7	N/A
More than 1600'	2.4	2.7	2.9	3.0

N/A = Not Applicable

59-E-3.21. Proximity to a Metrorail Station.

Proximity to the METRO station is defined as the straight-line distance between a main pedestrian entrance of a building for which the parking reduction is to be granted and a station entrance controlled by the W.M.A.T.A. This station entrance is defined further as the street-level entrance of any escalator or the gate or similar barrier of any station entrance which has no escalator.

An existing or planned metrorail station may be used as a basis for the office requirement if:

- (a) It is currently in use as part of an operating transit line; or
- (b) the director/planning board has received a certified letter from the W.M.A.T.A. stating that a construction contract has been signed for any portion of the construction phase which is located on the same transit line immediately south of the phase of construction in which the proposed building or buildings will be located.

(Legislative History: Ord. No. 10-32, ‘ 11; Ord. No. 12-1, ‘ 1.)

...

Source: Montgomery County Code Zoning Ordinance (1997)

Sec. 59-E-3.3. Credits for Specific Uses.

Percentage reductions in the required number of parking spaces, as specified in this article, may be approved by the directory/planning board and must be enforced by the director. Where multiple credits are granted, each credit allowance is applied only on the marginal parking requirements. After an initial percentage reduction is approved for one credit, an additional percentage reduction for each successive credit applies to the balance of the parking supply required.

59-E-3.31. Credits for General Office Building

Parking credits are allowed for office developments that actively participate in the county share-a-ride program and/or provide private incentives for ride-sharing. A schedule of parking credits for offices, based on specific criteria for reductions and penalties for noncompliance, is presented in the following schedule:

- (a) Sites within share-a-ride districts. Share-a-ride districts are defined in chapter 42A of the Montgomery County Code.
 - (1) A 15 percent reduction for participation in share-a-ride's continuous, personalized ridesharing assistance program may be approved if the owner of the development submits a written agreement, with the parking facility plan, that stipulates the following conditions:
 - a. The owner or lessees with more than 25 employees designate a person who shall promote the program to employees in accordance with established county procedures for the share-a-ride program.
 - b. The owner or lessees shall reserve a sufficient number of conveniently located parking spaces to accommodate all employee carpools and vanpools.
 - c. The owner shall make an annual payment to the ridesharing account of the mass transit facilities fund for basic share-a-ride services in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - d. The owner shall certify semi-annually to the director that the above requirements are being satisfied.
 - e. In the event of noncompliance, the director shall require the owner to pay an annual penalty payment to the ridesharing account for supplementary share-a-ride services, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - (2) A percentage reduction between one and 15 percent may be approved for private incentives (e.g., in-house carpool promotion/matching system, private shuttle bus, van lease or purchase, reserved carpool spaces, and transit pass discount programs) if the owner of the development

Source: Montgomery County Code Zoning Ordinance (1997)

submits a written agreement, with the parking facility plan, that stipulates the following conditions:

- a. The owner shall, as a contingency, set aside land for a parking facility or allow for future construction or expansion of a structured parking facility, sufficient to provide additional parking spaces equal in number to the reduction granted.
- b. The owner shall make an annual payment to the ridesharing fund for monitoring and enforcement, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
- c. The owner shall certify to the director semi-annually that the above requirements are satisfied.
- d. In the event of noncompliance, the director shall require the owner to satisfy at least one of the following penalties:
 1. Construction of additional parking spaces, equal in number to the spaces originally reduced.
 2. Pay an annual penalty payment to the ridesharing account for basic or supplementary share-a-ride services, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 3. Suspension of occupancy permit.

The requirements and penalties of Section (a)(2)a., (a)(2)d.1., and (a)(2)d.3, above are not applicable to mixed use projects in the TS-M zone located within 1000 feet of a Metrorail station where such requirements and penalties may preclude fulfillment of master or sector plan objectives for the provision of affordable housing as determined by the Montgomery County Planning Board.

(b) Sites within a share-a-ride outreach area. share-a-ride outreach areas are defined in chapter 42A of the Montgomery County Code.

- (1) A 15 percent reduction for participation in share-a-ride's continuous, personalized ridesharing assistance program may be approved if the owner of the development submits a written agreement, with the parking facility plan, that stipulates the following conditions:
 - a. The owner or lessees with more than 25 employees designate a person who shall promote the program with employees in accordance with established county procedures for the share-a-ride program.
 - b. The owner or lessees shall reserve a sufficient number of conveniently located parking spaces to accommodate all employee carpools and vanpools.

- c. The owner shall make an annual payment to the ridesharing account for basic share-a-ride services in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - d. The owner shall certify semi-annually to the director that the above requirements are being satisfied.
 - e. In the event on noncompliance, the director shall require the owner to pay an annual penalty payment to the ridesharing account for supplementary share-a-ride services, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
- (2) A percentage reduction between one and 15 percent may be approved for private incentives (e.g., in-house carpool promotion/matching system, private shuttle bus, van lease or purchase, reserved carpool spaces, and transit pass discount programs) if the owner of the development submits a written agreement, with the parking facility plan, that stipulates the following conditions:
- a. The owner shall, as a contingency, set aside land for a parking facility or allow for future construction or expansion of an structures parking facility, large enough to provide additional parking spaces equal in number to the reduction granted.
 - b. The owner shall make an annual payment to the ridesharing account for monitoring and enforcement, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - c. The owner shall certify to the director semi-annually that the above requirements are satisfied.
 - d. In the event of noncompliance, the director shall require the owner to satisfy at least one of the following penalties:
 - 1. Construction of additional parking spaces, equal in number to the spaces originally reduced.
 - 2. Pay an annual penalty payment to the ridesharing account for basic or supplementary share-a-ride services, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - 3. Suspension of occupancy permit.
- (c) Sites in remaining areas (locations where share-a-ride services are unavailable):
- (1) A percentage reduction between one and 15 percent may be approved for private incentives (e.g., in-house carpool promotion/matching system, private shuttle bus, van lease or purchase, reserved carpool spaces, and transit pass discount programs) if the owner of the development submits a written agreement with the parking facility plan that stipulates the following conditions:

Source: Montgomery County Code Zoning Ordinance (1997)

- a. The owner, shall, as a contingency, set aside land for a parking facility or allow for future construction or expansion of a structured parking facility, large enough to provide additional parking spaces equal in number to the reduction granted.
 - b. The owner shall make an annual payment to the ridesharing account for monitoring and enforcement, in accordance with the payment schedule of chapter 42A of the Montgomery County Code.
 - c. The owner shall certify to the director semi-annually that the above requirements are satisfied.
 - d. In the event of noncompliance, the director shall require the owner to satisfy at least one of the following penalties:
 1. Construction of additional parking spaces, equal in number to the spaces originally reduced.
 2. If located within a parking lot district, satisfy condition (1) above or pay the annual ad valorem tax as specified in chapter 60 of the Montgomery County Code.
 3. Suspension of occupancy permit.
- (d) For any office development eligible for parking reductions under this section, the percent reductions are applied to the development's base parking requirement, as described in section 59-E-3.2 which is concerned with computing the parking requirements for office development.

59-E-3.32. Credits for Specified Commercial Uses.

- (a) For general retail uses, regional shopping centers, restaurants, theatres, furniture stores and auxiliary retail uses, the director may approve a 15 percent reduction in the standard parking requirements provided in section 59-E-3.7. This reduction is allowed if the entrance of the proposed use is located within 1,600 feet of a metrorail station entrance as defined in section 59-E-3.21.
- (b) For regional shopping centers, off-site parking spaces may be allowed under the following circumstances:
 - (1) The off-site parking facility shall be used only by employees of the regional shopping center during seasonal peak periods to help satisfy peak parking requirements;
 - (2) The off-site parking facility will contain no more than 20 percent of the total parking spaces provided for the regional shopping center; and
 - (3) The director/planning board finds that there are appropriate contractual or lease agreements guaranteeing the continued availability, for specified peak shopping periods, of such off-site parking spaces for the

Source: Montgomery County Code Zoning Ordinance (1997)

regional shopping center. In addition, the director/planning board must find that appropriate administrative mechanisms exist to ensure that employees will be required to use the off-site parking facility during specified peak shopping periods.

59-E-3.33. Credits for Specified Residential Uses.

- (a) For multiple-family dwelling units, townhouses, fourplex units, and individual living units in personal living quarters, the director/planning board may approve a 10 percent reduction in the standard parking requirement provided in section 59-E-3.7, if such units are located within a central business district or transit station development area. A 5 percent reduction is also allowed where such units are located within 1,600 feet of a metrorail station entrance as defined in section 59-E-3.21. This credit does not apply to parking for housing for elderly or handicapped persons or a life care facility that is constructed in accordance with the credit provisions enumerated in Paragraph (b), below.
- (b) For housing and related facilities for elderly or handicapped persons, the Director/Planning Board may approve reductions in the standard parking requirements contained in Section 59-E-3.7. Any reductions granted must be in accordance with the following parking credit schedule, which must be applied sequentially, with succeeding percentages applying to the balance:

(1)	Located within 1,000 feet of Metrorail station entrance:	5%
(2)	Provision of private shuttle bus service for a minimum of 7 years, with a schedule assured by a special exception granted in accordance with Section 59-G-2.35 or 59-G-2.35.1, a site plan enforcement agreement in accordance with Section 59-D-3.3 or other long-term agreement. Continued shuttle bus service after that period is subject to the parking needs of the specific project, as determined by the Board of Appeals, Planning Board of Director.	10%
(3)	Provision of units that are required to be at or below the price levels for moderately priced dwelling units specified in accordance with Chapter 25A of this Code:	up to 20% ¹
(4)	Facilities or programs for assisted living, including a dining facility large enough to serve meals to at least 50 percent of the residents, that are assured by a special exception granted in accordance with Section 59-G-2.35 or 59-G-2.35.1 or by a similar long-term agreement:	20%

¹ The percentage reduction must be no greater than the percentage of price-controlled dwelling units in the facility.

Any credit granted for a life care facility approved in accordance with Section 59-G-2.35.1 applies to the computation of the requirement for the dwelling units only and not to the requirement for the nursing home.

(Legislative History: Ord No. 10-32, ‘ 11; Ord. No. 10-63, ‘ 1; Ord. No. 11-72, ‘ 10; Ord. No. 11-73, ‘ 11; Ord. No. 12-49, ‘ 1; Ord. No. 13-46, ‘ 7.)

Source: Montgomery County Code Zoning Ordinance (1997)

LONG BEACH, CALIFORNIA Downtown Parking Management Plan (1993)

◆ *In-lieu parking fees to fund off-site, public parking* ◆

Policy 4

In-Lieu Parking Fees

Limited availability of land, small lot sizes and existing buildings make providing required on- or off-site parking very difficult for small-scale new construction or rehabilitation of existing buildings. In addition, financial feasibility often prohibits individual businesses from developing their own parking.

To assist small-scale new developments and rehabilitation of existing buildings within the District, the Agency shall not require parking be provided by the project on-site. In exchange for the payment of an in-lieu fee, the Agency will provide required off-site parking on behalf of eligible developments seeking shared-use parking.

The following types of developments are eligible for Agency provided, off-site parking to meet shared-use parking requirements upon payment of in-lieu fees:

- Non-residential new construction on lots of less than 22,500 square feet in size.
- Additions to existing buildings, rehabilitation of existing buildings, or changes in use or occupancy in existing buildings.
- Designated City Historic Landmark buildings.
- Existing buildings desiring access to additional parking resources but not required to provide those resources by the Zoning Code.

All off-site parking provided by the Agency will be non-exclusive, shared-use parking from the pool of publicly available parking within the District. Participants using such parking will not be assigned or guaranteed use of specific spaces or facilities. The Agency will, however, be responsible to insure that sufficient parking exists within the District to accommodate the demand generated by participants paying in-lieu fees to the Agency for use of off-site parking.

Each development using shared-use parking in-lieu of constructing parking creates a demand for spaces that must be satisfied from the pool of available public parking. Since the availability of public parking is limited, and the Agency will be responsible for insuring that sufficient parking exists, the Agency shall require that each project that uses Agency-provided public parking help pay a portion of capital cost and operational costs needed to develop and operate public parking resources.

Source: Montgomery County Code Zoning Ordinance (1997)

Eligible projects desiring the Agency to provide shared-use parking off-site in-lieu of providing on-site parking, shall pay to the Agency an in-lieu fee for each space required but not provided. The fee shall be due at the time a building permit or business license is issued. This payment shall be deposited in an Agency account to be used to cover capital costs of providing additional shared-use public parking resources. The in-lieu fee shall be set by the Redevelopment Agency on an annual basis and may be paid either in a lump sum or on an installment payment basis. To encourage the rehabilitation of City Historic Landmark structures, the Agency may postpone or waive in-lieu fees if it can be demonstrated that such fees would impair the feasibility of the rehabilitation.

Along with the payment of an in-lieu fee to cover a portion of capital costs, participants using Agency provided, off-site parking facilities shall pay a share of the operational costs. These costs may include the user's payment of full-market rates for the use of parking, charges to participating businesses for the privilege of validating short-term parking, and monthly parking rates for the use of long-term or employee parking.

Projects eligible for Agency-provided off-site parking are not required to choose to use Agency provided off-site parking to meet their parking requirements; they may instead choose to provide their own private-parking or provide shared-use parking to meet the parking requirements.

Source: Downtown Parking Management Plan (1993)

PORTLAND, OREGON
Title 33: Planning and Zoning Code (1999)

◆ *Maximum parking limits* ◆

§ 33.510.263 Parking in the Core Area

6. Maximum Ratios

Parking is limited to the maximum ratios in Table 510-2. Where there is more than one use, the amount of parking allowed is calculated based on the net building area of each use.

Table 510-2
IN THE CORE AREA GROWTH PARKING: MAXIMUM NUMBER OF
PARKING SPACES PER 1,000 SQUARE FEET OF NET BUILDING AREA

District/Sector (See Map 510-8):

Use	Downtown 2, 3	Downtown 4	Downtown 1, 5; University District	River District 5	River District 3, 4; Downtown 6
Office	0.7	0.8	1.0	1.5	2.0
Retail Sales and Service, except theaters, hotels, motels	1.0	1.0	1.0	1.5	2.0
Medical Centers	1.5	1.5	1.5	1.5	2.0
Schools, Colleges	1.0	1.0	1.0	1.5	2.0
Manufacturing and Production, Warehouse and Freight Movement, Wholesale Sales, Industrial Service			0.7		
Community Service, Religious Institutions, Theaters, Other Uses			0.25		

Source: Downtown Parking Management Plan (1993)

**CAMBRIDGE, MASSACHUSETTS
Cambridge Municipal Code (1998)**

- ◆ *Transportation demand management* ◆
- ◆ *Reduce parking requirement* ◆

§ 10.18.050 Parking and Transportation Demand Management Plans

- (a) No person shall build, expand, or operate a parking facility subject to the Parking and Transportation Demand Management (PTDM) Plan requirements of this Chapter absent a PTDM Plan approved by the Planning Officer.
- (b) The PTDM requirements of this Chapter shall apply to each of the following:
 - (i) any commercial parking facility for which a certificate of occupancy or operating license, variance or special permit was not obtained prior to the effective date of this chapter;
 - (ii) an existing commercial parking facility at which the number of parking spaces is increased after the effective date of this chapter;
 - (iii) any parking facility at which the use of existing or permitted parking spaces is changed to commercial use after the effective date of this chapter;
 - (iv) any new project to build or create by change of use twenty or more non-residential parking spaces; and
 - (v) any new project to expand an existing parking facility resulting in a total number of non-residential parking spaces of twenty (20) or more.
- (c) The PTDM Plan shall be designed to minimize the amount of parking demand associated with the project and reduce single-occupant vehicle trips in and around Cambridge. The PTDM Plan shall be based on the following facts, projections and commitments:
 - (i) Facts and Projections:
 - nature of development and property use;
 - proximity of project to public transit and other non-Single-Occupant Vehicle facilities;
 - availability of and accessibility to offsite parking spaces which could serve the project;
 - number of employees and their likely place of origin; and
 - type and number of patrons/users of proposed parking supply and their likely place of origin.

Source: Title 33: Planning and Zoning Code (1999)

- number of vehicle trips expected to be generated by the project and description of measures to reduce associated traffic impacts on Cambridge streets; and
- other factors published by the Planning Officer.

(ii) Commitments:

- commitment to work with the Cambridge Office of Work Force Development;
- commitment to implement vehicle trip reduction measures including some or all of the following:

subsidized MBTA passes and other incentives; shuttle services; ride-sharing services; bicycle and pedestrian facilities; flexible working hours; preferential parking for Low Emission Vehicles/Zero Emission Vehicles/bicycles/carpools/vanpools (Note: this list is not meant to preclude implementation of other types of vehicle trip reduction measures). This commitment must be accompanied by a detailed description of the measures proposed to be implemented; and

- commitment to establish and make reasonable efforts to achieve a specified, numeric reduction (or percent reduction) in single-occupant vehicle trips in and around Cambridge. The percent reduction will be based on PTDM practices successfully implemented in reasonably comparable environments and as identified in professional and academic literature and based on analysis of existing trip reduction measures in Cambridge.

Each PTDM Plan shall identify the total number of existing and proposed parking spaces at the facility and specify how many existing and proposed spaces fall within each of the following categories (explain how many spaces are used for multiple purposes):

- residential
- commercial
- non-commercial
- customer
- employee
- patient
- student
- client
- guest

Where the parking facility includes or proposes a combination of commercial and non-commercial parking spaces, the Plan shall specify how the parking facility will prevent commercial use of the non-commercial parking spaces.

Each PTDM Plan shall contain the following certification signed by an authorized corporate officer:

“I hereby certify that a commercial parking permit has been obtained for each space being used for commercial parking. None of the other existing or proposed parking spaces at this parking facility have been or will be available as commercial parking spaces until a commercial parking permit therefor has been obtained.”

- (d) The Planning Officer shall review, condition, approve and/or deny the PTDM Plan based on the above-listed facts, projections, and commitments. The Planning Officer shall issue his/her decision in writing within 60 days of receipt of the proposed PTDM Plan. The required time limit for action by the Planning Officer may be extended by written agreement between the proponent and the Planning Officer. Failure by the Planning Officer to take final action within said sixty (60) days or extended time, if applicable, shall be deemed to be approval of the proposed PTDM plan. If the project proponent elects to make a request pursuant to 10.18.060, the decision of the Planning Officer shall be expanded to include a recommendation about whether offsite parking should be allowed at distances greater than those allowed in the Zoning Ordinance and/or whether fewer parking spaces than the minimum required in the Zoning Ordinance should be allowed. Decisions of the Planning Officer may be appealed by the project proponent to a review committee composed of the City Manager, or his designee, and two other City staff members designated by the City Manager none of whom may have participated in the initial review of the Plan.
- (e) The Planning Officer shall also make available sample PTDM plans which a project proponent may adapt for their project, such to approval by the Planning Officer.
- (f) No permit, commercial parking permit, special permit, variance, building permit, certificate of occupancy, or operating license shall be issued for any project subject to 10.18.050 by the Planning Board, Commercial Parking Control Committee, Board of Zoning Appeal, Commissioner of Inspectional Services, or License Commission absent a written decision indicating approval from the Planning Officer of the project proponent’s PTDM Plan. Any such permit or license shall be consistent with, and may incorporate as a condition, the decision of the Planning Officer and shall include written notice of the requirements of 10.18.050 (g) and (h), below. Nothing in this ordinance shall be construed to limit the power of the Planning Board or Board of Zoning Appeal to grant variances from or special permits under the provisions of the Zoning Ordinance. No project proponent shall be required by

the Planning Officer to seek such relief under the Cambridge Zoning Ordinance.

- (g) Approvals issued by the Planning Officer shall be automatically transferable by and among private parties, provided that the proposed new owner (the “Transferee”) shall continue to operate under the existing PTDM Plan and shall submit to the Planning Officer within thirty (30) days of the title transfer a certification that the existing PTDM plan will remain in effect. The certification shall be submitted on a form issued by the Planning Officer and shall certify that such Transferee commits to implement the existing PTDM plan, as approved; and acknowledges that failure to implement the plan is subject to the enforcement provisions of this Chapter. Where such certification is submitted, the approved plan shall remain in effect as to the Transferee. The Transferee may elect instead to and consult with the Planning Officer within thirty (30) days of title transfer regarding appropriate revisions to the existing plan. Based on such consultation, the Planning Officer may require information from the Transferee concerning proposed changes in use of the parking facility and associated buildings and the relevant facts and projections regarding the proposed changes. Within thirty (30) days of receipt of such information, the Planning Officer may issue a written approval of the revised plan and obligations to the Transferee, or the Planning Officer may require submittal of a new PTDM Plan from the Transferee for review, condition, approval and/or denial. Until such time as a new or revised plan has been approved, the existing PTDM plan shall remain in effect.
- (h) Each PTDM Plan approval issued by the Planning Officer shall contain, at a minimum, the following conditions:
 - (i) The parking facility owner and operator each commit to implement all elements of the PTDM Plan, as approved, including annual reporting requirements, and to maintain records describing implementation of the Plan;
 - (ii) The City shall have the right to inspect the parking facility and audit PTDM implementation records; and
 - (iii) The parking facility owner and operator each commit to notify and consult with the Planning Officer thirty (30) days prior to any change in ownership, use or operation of the facility.

§10.18.060 Reduction in Minimum Parking and Maximum Distance Requirements

- (a) A project proponent may elect to request that the Planning Officer include as an element of its PTDM Plan a plan for fewer parking spaces than the minimum set forth in the Zoning Ordinance. Upon the written request of the project proponent, based on an evaluation of the facts, projections, and commitments listed at 10.18.050 (c), the Planning Officer may make a written recommendation about the maximum number of parking spaces for the project. This recommendation shall remain subject to review and approval by the Planning Board or Board of Zoning Appeal as appropriate.

- (b) A project proponent may elect to request that the Planning Officer include as an element of its PTDM Plan a plan for utilizing off-site parking spaces that are farther from the project site than the maximum distance requirements set forth in the Zoning Ordinance. Upon the written request of the project proponent, based on an evaluation of the facts, projections, and commitments listed at 10.18.050 (c), the Planning Officer may make a written recommendation about how many parking spaces serving the project may be appropriately located at an off-site location and at what distance from the project site. This recommendation shall remain subject to review and approval by the Planning Board or Board of Zoning Appeal as appropriate.