SEATTLE PARKING MANAGEMENT STUDY

PREPARED FOR:

CITY OF SEATTLE

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1. INTRODUCTION

Heffron Transportation, Inc. together with Berk & Associates, Inc., prepared this comprehensive parking management study for the City of Seattle. This study evaluates the City's current on-street parking management practices, and recommends programs and policies to improve its parking management. In addition, very detailed analysis was performed to evaluate the feasibility of a parking tax, which is presented in a separate report.

1.1. Study Purpose

This study was performed because the City of Seattle desired information "to better understand the tradeoffs with respect to a parking tax and the opportunities to better manage City parking resources…" The contracted scope of work for this project identified the following purposes to guide this study:

- Document and analyze how the City currently manages parking, how other cities manage parking and monitor programs to ensure that policy goals are met, and whether changes are necessary in both how the City makes decisions and the parking tools that it uses.

- Analyze the economic, equity, and transportation impacts of a parking tax on downtown and neighborhood business district parking patrons, as well as parking owners and operators, including any expected behavior change with respect to retail customers. This task is documented in a separate report.

- Recommend a City Parking Management Plan for future City actions that would better incorporate parking into the City's Comprehensive Plan transportation goals and more efficiently use City on-street parking resources, including revenue generation.

1.2. Parking Management Options

All aspects of how the City of Seattle manages its on-street parking were evaluated for this study. In addition, information about new technologies and procedures that other cities use to manage on-street parking were researched. Finally, recommendations for how the City can change its management procedures were made. The following parking management options were included in this evaluation.

On-Street Parking Supply

- Parking meters
- Parking time limits
- Commercial vehicle loading zones
- Residential parking zones
- Handicapped-accessible parking
- Carpool permit parking
- Taxi/valet parking zones
- Bus zones
- Arterial parking restrictions
- Parking layout (e.g., parallel vs. angled parking)
- Meter hooding for service parking

Parking Enforcement

- Current enforcement practices
- Technology for enforcement
- Scofflaws
- Abandoned vehicles
- Enforcement revenue

In addition, this report evaluates how the parking management recommendations could affect revenue to the City, and discusses governance of all parking programs within the City.

1.3. Stakeholder Advisory Committee

City staff and consultants met twice with a Stakeholder Advisory Committee for the study. The Committee was formed to ensure that a broad cross-section of local parking interests and views were heard during the study's development. Stakeholder input on the parking tax analysis and parking management findings and recommendations has been incorporated into both this report and the parking tax analysis report. In addition, the final consultant reports will be distributed to the Stakeholder Committee to engage their feedback on the priorities and City staff response to the study's parking management recommendations.

2. EXISTING PARKING POLICIES

This section of the report describes the current City of Seattle policies and guidelines that direct parking decisions. These policies are from the City of Seattle's *Comprehensive Plan*, the *Transportation Strategic Plan*, and various neighborhood plans.

2.1. Comprehensive Plan

Seattle's Comprehensive Plan: Toward a Sustainable Seattle (1994) is the City of Seattle's response to Washington State's Growth Management Act of 1990, which required jurisdictions to plan for future growth by addressing land use, housing, transportation, capital facilities, and utilities. The 20-year plan presents goals and policies for each plan element. General goals for changing and managing travel behavior that have bearing on parking issues include:

- Meet the current and future mobility needs of residents, businesses, and visitors with a balanced transportation system.
- Provide a range of viable transportation alternatives, including transit, bicycling, and walking.
- Reduce use of the car over time.

The Transportation Element of *Seattle's Comprehensive Plan* includes three goals that specifically relate to parking:

- Provide enough parking to sustain the economic viability and vitality of commercial areas while discouraging commuting by single-occupant vehicle.
- Reduce use of cars over time, particularly commute trips.
- Make the best use of limited street space, seek balance among competing uses, and protect neighborhoods from overflow parking.

The Transportation Element of the plan gives a number of policies for parking that address the competing needs of providing enough parking to satisfy mobility and economic needs, while promoting alternatives to single-occupant-vehicle transportation.

- Coordinate Seattle's Parking policies with regional parking policies, and with those of adjacent jurisdictions, in part to preserve Seattle's competitive position in the region. (T25)
- Consider imposing a commercial parking tax. Use commercial parking tax revenues, at least in part, to enhance non-auto modes. Consider the concerns of neighborhood commercial areas in considering commercial parking taxes and strive to develop a regional approach. (T26)
- Consider establishing maximum parking limits for long- and short-term off-street parking to be provided by new non-residential development, tied to the changing availability of non-auto modes in a particular area. Review minimum parking requirements and maximum limits

periodically as conditions change, such as land use mix, land use density, and the availability of transit and other non-auto modes. (T27)

- The decision to remove on-street parking may require balancing a number of policy objectives. For arterials, policy objectives include safety, sufficient on-street parking to support business districts and prevent spillover parking in residential areas, a pleasant pedestrian environment, truck access and loading and effective operation of the street for high occupancy vehicles, including transit, and bicycles. For urban centers and urban villages the pedestrian environment and transit operations are particularly important considerations. (T28)

- Allow long-term parking on most collector arterials and local streets, limited only by safety, street design, and property access needs. Use strategies such as parking duration limits, time-of-day limits, or restricted parking zones (RPZs), where appropriate, to discourage commuter parking and to discourage parking from commercial areas or other activity centers from spilling over onto residential streets. (T29)

- Allow flexibility and strive toward efficiency in meeting long-term parking needs of new development in commercial areas, urban centers, and urban villages, by using strategies such as discouraging long-term accessory parking for single occupant vehicles, while allowing principal-use parking. (T30)

- Emphasize short-term parking over long-term parking in commercial areas, both on-street and off-street. (T31)

- Establish or maintain minimum long-term and/or short-term off-street parking requirements for new development for special vehicles and purposes, where appropriate, such as carpools, vanpools, bicycles, zero-emission vehicles, and vehicles for persons with disabilities. (T32)

- Discourage the development of major, stand-alone park-and-ride facilities within Seattle. Situations where additions to park-and-ride capacity could be considered include (T33):

    - ◊ At the-terminus for a major transit system (e.g. at the planned ends of the light rail line);

    - ◊ Where opportunities exist for "shared parking" (e.g., where transit commuter parking can be leased from another development, such as a shopping center, movie theater, or church), or to support continuing development in neighborhood business districts; and

    - ◊ In areas where alternatives to automobile use are particularly inadequate (e.g., lack of direct transit service, or pedestrian and bicycle access) or cannot be provided in a cost-effective manner.

Seattle's Comprehensive Plan also contains policies that pertain to parking in its Housing Element and Land Use Element. Relevant policies include:

- Provide for lower off-street parking requirements in locations where car ownership rates are low for resident populations, to help reduce housing costs and increase affordability. (H5)

- Because low-income elderly and low income disabled persons create lesser impacts than the general population, allow higher maximum density limits in the L3 and L4 zones for housing these populations to reduce costs and provide sufficient density to make the development of such housing feasible. (L127)

- Allow exceptions to parking requirements for projects in which the parking demand of occupants may be significantly different from those of the general population. (L139)

- Establish off-street parking requirements for new housing developments. Balance the need to meet the approximate parking demand generated by new development so as to avoid adding to the congestion of parked cars on surrounding streets, with the countervailing need to limit the effects structured parking can have on housing costs, and to recognize this Plan's policies encouraging the use of public transit and discouraging the use of automobiles. (L138)

- Encourage bicycle parking facilities in multifamily developments to encourage bicycle ownership and use to promote energy conservation, public health and reductions in traffic congestion. (L140)

2.2. Transportation Strategic Plan

The City of Seattle's *Transportation Strategic Plan* addresses the relationship between parking policies and the transportation goals associated with the City's urban village strategy. It is recognized that some of the City's existing parking requirements in the Land Use Code have not been updated to support the transportation goals in the *Seattle Comprehensive Plan*. The *Transportation Strategic Plan* deals with these incongruities by identifying several action strategies that pertain to off-street parking.

- Review and revise the minimum requirements for off-street parking. This effort will commence with a study of minimum parking requirements, the appropriateness of maximum parking requirements, and factors that can reduce parking demand. After completion of the study, the City will make changes to the Land Use Code and SEPA as necessary. (Parking Chapter, P1.1)

- Increase flexibility to respond to specific local conditions. Flexibility could be increased by modifying the conditions under which a developer may be granted a variance to build less parking than required; by reducing requirements for commercial development under certain conditions; by reducing the off-street parking requirements for multi-family housing under certain conditions; by allowing variances to potential maximum parking requirements under certain conditions; and by improving the way shared parking works in neighborhoods. (Parking Chapter , P1.2)

- Explore allowing off-site parking for multi-family residential development. (Parking Chapter P1.3)

  (Note: The City of Seattle's *Comprehensive Neighborhood Parking Study* was completed, in part, for this purpose. The Department of Design, Construction and Land Use (DCLU) has used the parking data in their analysis of the City's parking requirements. Off-street parking issues are not addressed in this report.)

- Provide parking management assistance to neighborhoods. (Parking Chapter P2)

- Support a transition to centralized parking. The *Transportation Strategic Plan* indicates that the City will assist neighborhoods in developing centralized parking facilities, although the City does not intend to fund the construction of such garages. (Parking Chapter P4)

- Make parking more pedestrian-friendly. The City will examine the current requirements for location, access and design to enhance conditions for pedestrians. The plan suggests that the Land Use Code be modified to require retail uses on the ground floor of parking garages on key pedestrian streets if such uses are economically viable. Where retail uses are not feasible, public art, street vendors, or landscaping would be required. (Parking Chapter P5)

- Develop technology-based off-street parking systems. Changeable, attractive signs are recommended for directing drivers to available off-street parking. (Parking Chapter P6)

- Establish a parking management strategies roundtable. The roundtable would include representatives of City agencies, business interests, transportation interests, and residents. The roundtable would explore parking management programs that limit the supply of parking while supporting local business needs. (Parking Chapter P7) [1]

2.3. SEPA Policies

The State of Washington's State Environmental Policy Act (SEPA) requires state agencies and local governments to conduct a review of the environmental effects of any major action (RCW 43.21C). An environmental impact statement (EIS) may be required where a government action, including government approval of a private project, has significant, adverse environmental impacts. An EIS discusses the affected environment, adverse environmental impacts, alternative actions, and possible mitigation measures. The Seattle Municipal Code requires that an EIS address impacts on parking as a component of the built environment (SMC 25.05.444).

In addition to the general requirement for an EIS to consider impacts on parking, parking impacts are specifically addressed in SMC 25.05.675. That section discusses the treatment of the cumulative impact of projects on parking. Most parking impacts are mitigated through the Land Use Code's minimum parking requirements. However, spillover parking may still have an adverse effect on the surrounding neighborhood. The SMC provides that project approval may be conditioned upon mitigating adverse parking impacts by using higher minimum parking ratios, transportation management programs, parking allocation and management programs, incentives to use modes other than single occupant vehicles, or reduced development densities.

Projects located in the Seattle Cascade Mixed (SCM) zone and residential uses located within the Pike/Pine Overlay District cannot be required to provide more than the minimum amount of parking specified in the Land Use Code, and projects downtown are not required to mitigate parking impacts as part of SEPA review. In the Alki area, specific multifamily projects may be required to provide more parking spaces per unit than is normally required by the Land Use Code. Parking impact mitigation for multifamily development, except in the Alki area, may be required to mitigate impacts only where on-street parking is at capacity, or where the development itself would cause on-street parking to reach capacity. In the University District, there is also a provision for areas impacted by the University of Washington to provide 1.5 spaces per unit.

2.4. Neighborhood Plans

In response to Seattle's Comprehensive Plan, the City of Seattle has completed 38 neighborhood plans. During the planning process, many community groups indicated that they perceived a parking problem in their neighborhood. All of the plans that were produced included recommendations that pertain to parking. Plans were developed by the following neighborhoods:

- Admiral
- Aurora Licton
- BINMIC (Ballard Interbay)
- Broadview-Bitter Lake-Haller Lake
- Capitol Hill
- Central Area
- Columbia City
- Commercial Core
- Crown Hill/Ballard
- Delridge
- Denny Regrade\Belltown
- Denny Triangle
- Downtown Urban Center (DUCPG)
- Duwamish
- Eastlake
- First Hill
- Fremont
- Georgetown
- Greenlake
- Greenwood/Phinney
- International District/Chinatown
- MLK@Holly Street
- Morgan Junction (MOCA)
- North Beacon Hill
- North Neighborhoods (Lake City Way)
- North Rainier
- Northgate
- Pike/Pine
- Pioneer Square
- Queen Anne
- Rainier Beach
- Roosevelt
- South Lake Union
- South Park
- University Community Urban Center
- Wallingford
- West Seattle Junction (FOJ)
- Westwood/Highland Park

Policy issues that surfaced in multiple neighborhood plans were compiled in the Neighborhood Planning Policy Docket. The City Council used the Policy Docket to track specific issues, the neighborhood plans that address the issue, the lead City department for each issue, and any Council action. The lead department is responsible for framing the issue, analyzing implications, presenting the Council with options for consideration, and recommending a course of action. This approach allows the Council to address policy issues which arose during the neighborhood planning process, but which have citywide policy implications. Five of the twenty-nine issues included on the Policy Docket relate directly to parking, and are listed in Table 1. City staff have addressed all five parking-related policies. Resolution 30196, passed by the Council in August 2000, responded to the issues associated with PD17, On and Off Street Parking. Resolution 30445 related to PD8 and PD21. PD22 was resolved through the 99-00 City budget that included authority for eight new Parking Enforcement Officers (PEOs) and a supervisor. [2, 3]

Table 1. Parking Issues on the Neighborhood Planning Policy Docket

Tracking Number	Policy Issue
PD8	Parking Meter Revenue: Should the City dedicate parking meter revenue generated from a neighborhood to pay for improvements in that neighborhood?
PD16	Parking Facilities: What role should the City plan in helping neighborhoods meet their parking needs?
PD17	On and Off Street Parking
PD21	Parking Meter Hours: Should the City expand the hours that parking meters are in effect? Are there other mechanisms that could help to achieve neighborhood goals?
PD22	Parking Enforcement

Source: City of Seattle Strategic Planning Office. "Working Draft – Neighborhood Planning Policy Docket." January 31, 2000.

In some neighborhoods where parking concerns were particularly acute, more detailed parking studies were performed as part of Neighborhood Planning. These neighborhoods include Capitol Hill, Pike-Pine, First Hill, Fremont, International District, and Pioneer Square.

The City of Seattle's Strategic Planning Office completed the *Comprehensive Neighborhood Parking Study* in August 2000. The study reflected the fact that parking issues are complex, and no one solution can achieve everyone's goals for parking. The study's final report identified the following "lessons learned:"

- More parking capacity can be added quickly and cost effectively by using the existing parking supply in most neighborhoods.
- The parking "problem" depends on who you are.
- The price of parking is critical to how it is used. In Seattle, short-term parking is often more expensive than all day commuter parking, discouraging retail shoppers and encouraging commuters.
- Cheap on-street unrestricted or un-enforced parking coupled with high transit service can attract commuters to use a neighborhood as a park and ride into downtown.
- The Land Use Code should allow the right kind of parking to be built at the right time.
- There is a high cost to building structured parking that makes it less financially feasible.[4]

2.5. Neighborhood Parking Management Program

With the results of the Comprehensive Neighborhood Parking Study and in coordination with Neighborhood Planning and other City transportation programs, the City established a "*Making the Parking System Work*" program through which City staff collaborate with neighborhood business and community organizations to identify and implement low-cost, common-sense local parking management strategies. The goal is to achieve an acceptable balance of residential, visitor, business customer and employee parking in a particular neighborhood.

At the outset of each neighborhood parking planning effort, City staff establish a "neighborhood parking workgroup" comprised of residents, community/neighborhood planning organizations, neighborhood chambers of commerce, staff from various City departments, and other key stakeholders. The intent is to create a team of "parking experts" that can formulate solutions, implement recommendations and educate and involve others.

Neighborhood parking workgroups are charged with developing a list of specific actions the community and City can implement. These actions include opportunities to better manage on-street and off-street parking and to implement transportation demand management strategies. This action plan is then presented to the neighborhood at a parking forum to solicit feedback and assistance. After refining the action plan, the collaborative community and City staff partnership continues through the implementation phase.

In 2000, the City Council adopted a work-plan for the *Making the Parking System Work* program. In the work-plan, the specific neighborhoods targeted in 2000-2002 were:

- Belltown
- Capitol Hill/Pike-Pine
- Columbia City
- First Hill
- International District
- U-District
- Uptown
- Wallingford

Information about those programs can be found on the programs web site at http://www.cityofseattle.net/td/neighborhoodparking.asp. [5]

3. ON-STREET PARKING MANAGEMENT

This section describes management techniques for on-street parking. It includes information about how the City of Seattle currently manages curbside parking, new technologies that are being used in other cities, and recommendations to improve the City's parking management programs.

The *Transportation Strategic Plan* recommended the following priorities for on-street curb space. In commercial zones, the priorities for curb space are bus zones, loading zones, and short-term parking, except when the lane is in use as a peak-period travel lane. In residential areas, the priority uses for curb space are bus zones and loading zones as well, but the third priority is for long-term residential parking.[6]

3.1. Meters

Parking meters have been used in Seattle since the 1950s. The SMC defines a parking meter as "any mechanical device placed or erected adjacent to a parking space, which, after deposit of specified coinage and activation of the timer where required measures the period of time that occupancy of such parking space is allowed" (SMC 11.14.425). The purpose of parking meters was described in a 1987 article in *Transportation Quarterly*. It explained that on-street parking meters are installed to: "promote parking turnover; to act as a means of distributing a limited amount of on-street spaces (mainly in commercial areas) where demand exceeds supply; to provide short-term parking spaces for shopping or personal errands (this in contrast to long-term parking for commuters); to improve traffic circulation and economic viability of downtown commercial areas by maximizing the number of patron visits by car; and to generate revenue for the City."[7]

Parking turnover occurs when several different vehicles occupy a single parking space over the course of a given time period. Meters encourage users to park for short periods (generally between fifteen minutes and two hours) for a fee that is generally less than longer-term off-street parking in the same vicinity. Parking turnover is more frequent at meters with shorter time limits. High turnover increases the potential that drivers searching for parking will find an acceptable space in close proximity to their destination. Parking meters and the resulting turnover benefit local businesses by increasing the parking supply available for customers. In fact, a conclusion reached in the 1987 *Transportation Quarterly* article stated that on-street parking meters "are essential for the vitality" of the central business district.

3.1.1. Existing City Practices

Policies for Installing Meters

The City of Seattle's policies for installing parking meters and establishing parking meter rates were outlined in a report prepared by the then Seattle Engineering Department entitled, "*Parking Meter Installation and Rate Policies, A Report As Required by 1993 Budget Statement of Legislative Intent,"* March 4, 1994. The report was adopted by City Council in 1994 (Resolution No. 28986). The policy for installing meters in new areas states :

> *The City shall formally consider installation of new parking meters [in areas of the city where meters do not yet exist] under the following circumstances:*

A. *Receipt of a petition signed by a majority of property owners or businesses (if businesses rent from an absentee landlord) who support the installation of meters in their community. After receiving the petition, the Engineering Department shall conduct an analysis to determine how the area meets the characteristics [described below]. Based upon its analysis, the Department shall make recommendations to the Mayor and the City Council about whether to install meters. If the recommendation is to install meters, the Department shall also recommend the number of meters, location and proposed rates.*

B. *The City Council or the Mayor may direct the Engineering Department to conduct an analysis using the criteria [described below] to determine whether parking meters should be installed in a particular area. Based upon its analysis, the Department shall make a recommendation to the Mayor and the City Council whether meters should be installed. If the recommendation is to install meters, the Department shall also recommend the number of meters, location and proposed rates.* [8]

In the same policy document, the City defined certain characteristics that would need to be demonstrated before parking meters would be considered for a business district. These are:

- business or services needing good turnover in parking;
- a relatively dense business base;
- heavily used, existing time-limited parking;
- limited or costly off-street parking;
- areas with curbs and sidewalks;
- unlikelihood of customers choosing neighborhood parking over metered parking; and
- community support. [9]

In areas that already have parking meters, new meters can be installed as long as they are contiguous to the existing area, a petition is received (as described above), and other technical transportation issues are met (sidewalk width, etc).

One of the limitations with the City's existing policies is that it does not allow a business group such as a chamber of commerce or neighborhood business improvement association (BIA) to independently study and/or recommend the installation of meters, even if it has its own public process associated with such a recommendation. With the new *Making the Neighborhood Parking System Work* program, City staff have been working with several neighborhoods related to installing or changing meters. However, even if the businesses association or community council endorses such a change, interested citizens still have to go door-to-door to obtain the required level of approval (typically 60%). This has most affected business areas that have developed on the fringe of the downtown core (e.g., Belltown, Pike-Pine and Uptown neighborhoods). In these areas, new parking meter installations are extensions of existing metered areas. Existing time-limited parking in downtown fringe areas is often abused by locals and by commuters who know that it cannot be enforced as easily as the nearby meters.

The other limitation of the existing policies and practices are that they are more restrictive than the Seattle Municipal Code (SMC 11.16.300) that grants authority to the City's Traffic Engineer to "establish parking metered areas and the time limit for parking therein; order installation or removal of parking meters where it is determined upon the basis of an engineering and traffic investigation that the

installation or removal or parking meters shall be necessary to aid in the regulation, control, and inspection of the parking of vehicles."

The City's practices can also create conflicts among businesses in a district by giving the impression that the adjacent curb parking is for that businesses' or residents' own use. There are some businesses and residents that have opposed or not endorsed short-term and/or meter parking in front of their sites so that they can continue to use the spaces for long-term parking (e.g., auto sales space, employee, or residential parking). This affects the economic viability of other businesses in the district and may not be the best use of curb parking in a commercial zone.

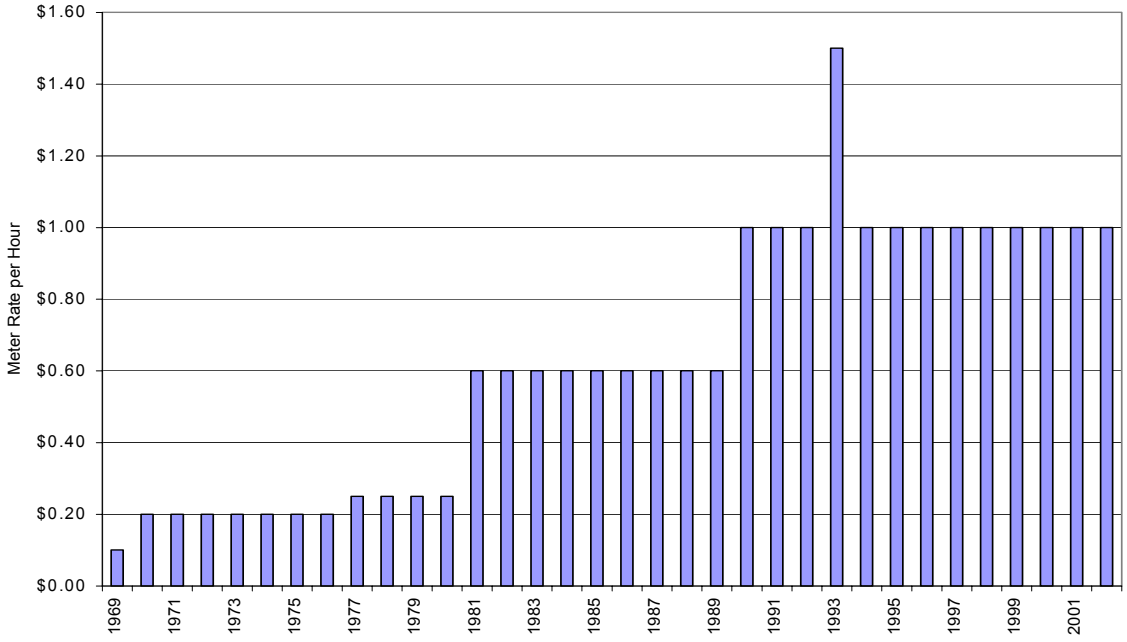
Meter Rates and Revenues

The City Council has the authority to set parking meter rates. In the past, meter rates have been set to meet one of two goals: 1) to improve parking management in a specific area, and/or 2) to generate revenue. The underlying purpose of meters is to create parking turnover on a street, and the cost of meter parking affects this turnover. For example, when on-street meter parking is substantially less expensive than off-street short-term parking, most motorists would choose the meter if one is available. Meter feeding and overtime parking also become more prevalent when there is a large discrepancy in the cost of on-street and off-street parking. Setting meter rates closer to the cost of off-street parking can reduce some of this abuse; thus, an increase in the meter rate can improve parking management. City Council Resolution 28986 included policies for setting meter rates. The policies developed included establishing a meter rate that results in parking turnover of 85% at two-hour spaces (e.g., 85% of users park for two hours or less); and result in a meter feeding rate of less than 15%.

The City Council can consider revenue generation purposes when setting meter rates. However, when it is the only consideration, businesses affected by the rate increase are likely to voice opposition. This was the case in 1993 when the Mayor proposed and the City Council raised the 2-hour meter rate in the downtown, U-District and Lower Queen Anne from $1.00 to $1.50. The rate increase was proposed as part of the 1993 Budget. The increase was rolled back at the end of 1993 because of strong opposition.

Meter rates in Seattle have increased slowly. Prior to 1970, the rate was $0.10/hour. The current meter rates were established in 1990 and are $1.00/hour for two-hour meters, and $2.00/hour for 15-minute and 30-minute meters. As previously discussed, the two-hour meter rate for downtown Seattle was briefly increased to $1.50/hour in 1993. In 1988, the City established a new parking meter structure for commercial loading zones throughout downtown, Broadway, and the University District. A rate of $1.00 per 20 minutes was established. Figure 1 shows the history of two-hour meter rates in the Seattle CBD.

Figure 1. Two-Hour Parking Meter Rates in the Seattle CBD



Source: City of Seattle, July 2002.

Up until 1993, some neighborhoods outside of the CBD had lower meter rates than those in the CBD. Now all neighborhoods have the same $1.00/hour parking rate, except Greenlake and Roosevelt which are at $0.60/hour because of meter equipment limitations. Meters are in operation from 8:00 A.M. until 6:00 P.M., Monday through Saturday, excluding holidays. The exceptions are along some arterial streets where peak period parking prohibitions apply.

About half of the City's meters are mechanical and the remaining are the electronic type. The City's mechanical meter stock will limit the ability to raise parking meter rates city-wide, because the meters cannot be "re-programmed" to a different rate. In addition, more coins increase the wear-and-tear on the meters and cause them to need to be emptied more frequently. Additional maintenance and revenue collection equipment and/or staff may be needed than is currently available.

The City of Seattle operates 8,598 parking meters (as of July 30, 2002), located downtown and in neighborhood business districts. This is fewer meters than have existed in the City for many years. Data for 1993 shows that the City of Seattle had 9,234 meters throughout the City, about 640 more meters than today. Of this decrease in meters, most were lost in the downtown core (minus 311 meters), West Seattle (minus 156 meters), First Hill (minus 124 meters), Harborview (minus 84 meters), and Roosevelt (minus 52 meters). The only districts with substantial increases in the number of meters were Howell (plus 92 meters) and Denny (plus 48 meters). The number of parking meters by zones for year 2002 and 1993 are summarized in Table 2. These zones were developed for the purpose of meter collection and do not necessarily correspond to urban village or other commonly-used neighborhood boundaries.

Table 2. Parking Meter Collection Districts in Seattle

District Name	Number of Meters		
	Year 2002	Year 1993	Net Change
Central Business District	2,109	2,420	-311
Ballard	160 [a]	224	-64
Broadway (within Capitol Hill)	531	503	28
Denny (within Denny Triangle)	954	906	48
First Hill	509	633	-124
Green Lake	88	107	-19
International District	142	107	35
Harborview (within First Hill)	8	92	-84
Howell (within Denny Triangle & South Lake Union)	508	416	92
King Street (within Pioneer Square and Intl. District)	1,095	1075	20
Pier 70 (along waterfront)	72	80	-8
Providence (Hospital)	66	69	-3
Queen Anne	162	174	-12
Roosevelt	93	145	-52
University District	776	743	33
Alaskan Way Viaduct (along waterfront)	781	800	-19
West Seattle Junction	4	160	-156
Southeast Queen Anne	80	88	-8
City Hall Plaza (Building demolished in 2002)	0	60	-60
Pike/Pine	175	172	3
Northwest Viaduct/Alaskan Way (along waterfront)	285	260	25
Total Citywide	**8,598**	**9,234**	**-636**

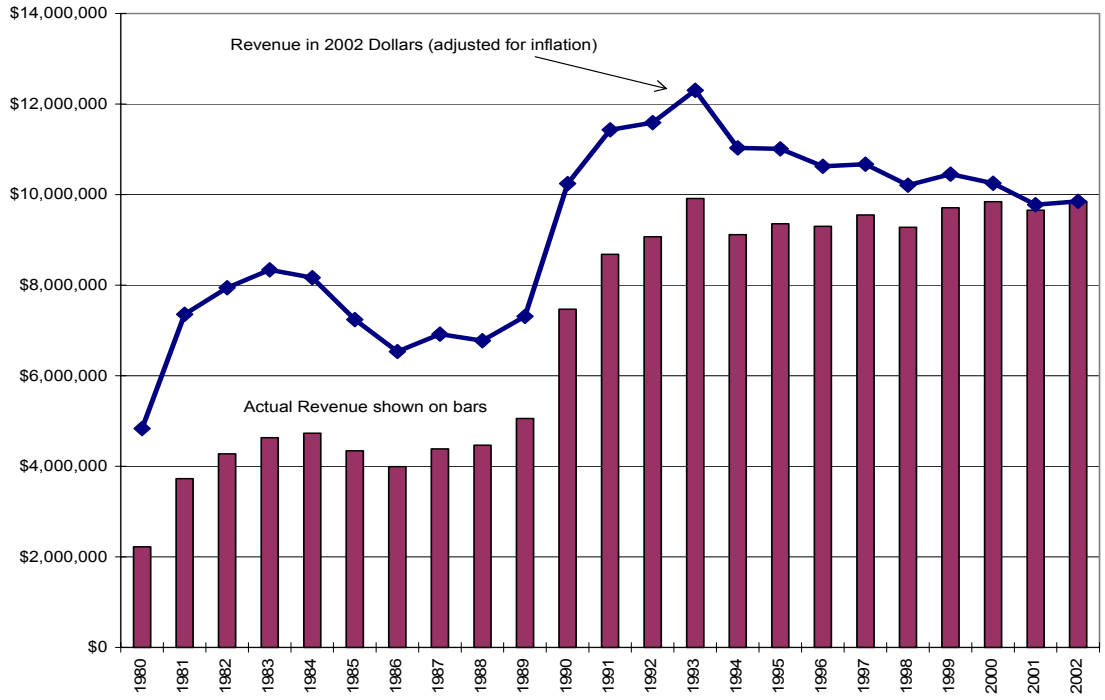
Source: Seattle Department of Transportation, July 30, 2002 and Seattle Engineering Department, 1993.

a. There are 227 meters in Ballard, of which 67 meters are hooded to take them out of service.

Revenues from parking meters are deposited in the City's General Fund. These revenues are designated as "fees to cover the costs of installations, inspection, supervision, regulation and maintenance involved in the control of traffic and parking upon the streets" (SMC 11.16.480).

Parking meter revenues from 1980 through the first quarter of 2002 were obtained from the Department of Finance and are shown in Figure 2. This chart shows that meter revenues have been relatively constant since about 1992 after the last rate changes were made. In fact, since the City has about 640 fewer meters in the year 2002 than in 1993, this means that the average revenue per meter has increased, which is likely due to increased utilization and turnover. While most of these meters are 2-hour meters, there are also 15-minute and 30-minute meters providing very short-term parking.

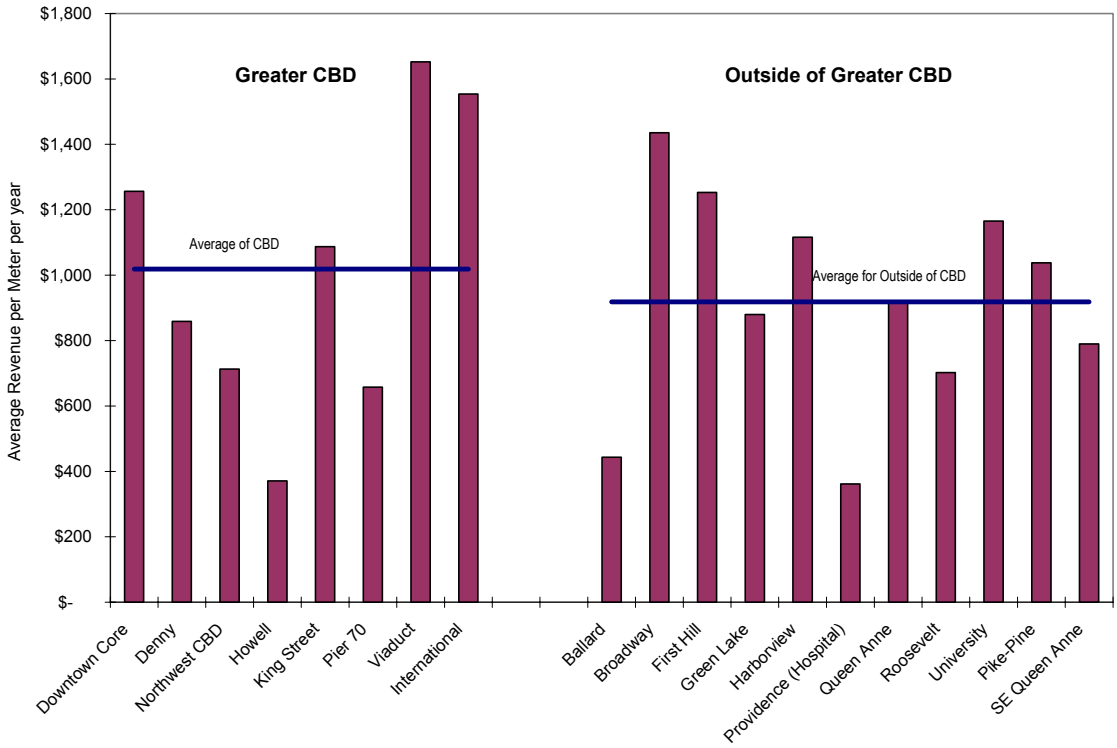
Figure 2. Meter Revenues



Source: City of Seattle Department of Finance, July 2002. Revenues for 2002 are projected. Adjusted for inflation based on calculation at www.minneapolisfed.org/research/data/us/calc

Revenue for the various meter zones throughout the city were compiled. The data shown in Figure 3 represent average meter revenue per year, which does not differentiate between revenue generated by the higher-fee 15-minute and 30-minute meters. The zones have been grouped by those within the greater central business district (CBD), and those outside of the CBD. It is interesting to note that the difference in annual revenues between the CBD meters ($1,019 per meter per year) and non-CBD meters ($919 per meter per year) is only about $100.

Figure 3. Average Annual Meter Revenue by Zone - 2001



Source: Seattle Department of Transportation, August 2002. Data are for all of 2001.

The City estimates that it costs approximately $76,000 to purchase and install 100 new meters (with the same technology that the City uses today), and about $26,000 per year to maintain and collect from them.

3.1.2. Alternative Meter Technologies

New parking control technologies exist that have the potential to expand payment options, ease the enforcement process, and better utilize on-street parking space. This section reviews these innovations and documents the experience of some jurisdictions that utilize them.

Pay-by-Space Multibay Stations

Pay-by-space (or pay-on-foot) multi-bay stations are typically kiosk units that manage time-limited parking for a number of individual parking spaces. One station can potentially provide control for an entire block face (depending on length) or parking lot. The parking spaces must be delineated and numbered so that a customer can deposit payment for the correct space. These units do not require a customer to return to their vehicle to display a receipt. These meters can provide two-way communications to a central office to indicate when coins need to be removed or maintenance is needed. This reduces collection needs for these types of meter. Advantages and disadvantages of these systems along with a list of cities found to use this technology are presented in the following table. Further information obtained from a sample of the cities is presented below.

Table 3. Pay-by-Space Multibay Stations

Advantages:	Disadvantages:	Used by:
The systems reduce sidewalk clutter Allow expanded payment options (e.g., credit cards and smart cards) Provide two-way communications with central office Allow flexible timing/rate setting Customers do not have to return to their cars to display the permit A paperless system, reducing waste, litter, and cost Officer can look to the central pay station to identify spaces where time has expired rather than checking every vehicle. Potential to enforce from a vehicle. Solar power or long lasting batteries (5-7 years) Will not accept payment when not in service Reduced meter down time	Parking spaces must be marked off and numbered No payment options when the meters are out-of-order (as can be done with pay-and-display techologies described later) Meter time cannot be used at another location (as can be done with pay-and-display techologies described later)	Montgomery County, MD Orlando, FL San Francisco, CA Berkeley, CA Houston, TX

San Francisco. The City of San Francisco is in the midst of a massive overhaul of its parking control system. The City's Department of Parking and Traffic issued an RFP for a package of new parking management equipment, software, and revenue collection services. They have recently entered into a five-year, $37 million contract for the provision of the requested services and hardware. Every meter in the City will be replaced over the next several years.

Based upon numerous field tests and the ensuing user feedback, the City selected two types of controls: electronic single-space meters, and multi-space pay-by-space pay stations, both of which accept coins and smart cards. The multi-space meter that was selected is the Reino produced by the Reinhart Corporation of Australia. Approximately 250 of these units will be acquired, providing control for approximately 1,300 parking spaces. A key factor in the decision to install pay-by-space rather than pay-and-display parking controls was the fact that pay-by-space systems could be enforced from a vehicle. Lights on the pay station indicate the spaces where paid time has expired, so the officer only has to visit those vehicles that are in violation. The Reino meters will operate on battery power, with a 15-volt battery that will last at least 15 months. The City is hoping that battery life proves to be 20 to 24 months. [10,11]

Berkeley. In 1998, the City of Berkeley began installing pay-by-space payment stations in its downtown area. The Reino stations each cover up to six parking spaces and accept any denomination of coin as well as Berkeley's smart card, the EPark card. During times when the meters are not enforced, such as in the evenings or on Sunday, the pay stations will not accept payment. When the Reinos were initially installed, the City held a "courtesy period," in which no tickets were written for Reino users while they became familiar with the new technology.

The Reino pay stations are powered by battery or A/C wiring. When new pay stations are installed, Berkeley is looking for locations with a power supply so that batteries do not have to be replaced. At this time, Berkeley's pay stations do not have wireless communication with the central office. It is possible, however, to transfer data from the pay station to a storage device to take back to the central office.

When the Reino pay stations were initially installed, parking enforcement officers did not like having to leave their vehicle and go to the central station to enforce. However, since the units were installed, Reinhart has added a lighting system that allows the spaces to be enforced from a distance. Lights on the unit indicate the spaces where paid time has expired. [12]

San Diego. The City of San Diego recently installed two pay-by-space units as a trial. The Reino units were purchased by the business improvement association in the Uptown neighborhood. The primary purpose of the installation of this type of parking control was to reduce visual blight on the streetscape. The pay-by-space units accept coins and smart cards, just as San Diego's electronic meters do.[13]

Pay-and-Display Stations

Pay-and-display systems also use kiosk units to manage time-limited parking for an entire block face or parking lot. However, instead of making payment for a designated space, the customer receives a receipt that is placed in or on the vehicle. Advantages and disadvantages of these systems along with a list of cities found to use this technology are presented in the table below. Further information obtained from a sample of the cities follows.

Table 4. Pay-and-Display Stations

Advantages:	Disadvantages:	Used by:
The systems reduce sidewalk clutter Allow expanded payment options (e.g., credit cards and smart cards) Provide two-way communications with central office, which reduces meter collection needs Allow flexible timing/rate setting It is not necessary to mark off parking spaces, which may increase parking supply Can allow vehicles to park elsewhere in the City with the same payment Provides receipt for parking Can require customers to purchase display tag at another kiosk when one is out-of-order Solar power or long lasting batteries (5-7 years) Will not accept payment when not in service Reduced meter down time	Customer must return to the vehicle after paying. Parking must be enforced on foot (which could be an advantage in some areas of the City that desire more police presence on the street). Enforcement is difficult if windshield is covered in snow Risk of black market receipt sales (as in Vancouver).[14]	Aspen, CO Nottingham (UK) Denver, CO Telluride, CO Breckenridge, CO Toronto, ON Houston, TX New York City, NY Ft. Lauderdale, FL Cincinnati, OH Mesa, AZ

Aspen. Aspen, Colorado was the first city in the United States to implement centralized pay stations for on-street parking management. The City has used pay-and-display parking in its commercial core since 1994. Prior to that time, the City was having problems with employees parking long-term on-street. Adoption of pay-and-display technology reduced on-street parking utilization from 95% to 70% capacity and greatly improved turnover. The increase in parking turnover is thought to be one significant factor driving an 11% increase in sales tax revenue that occurred after the pay-and-display system was installed.

Motorists in Aspen are directed to obtain a parking ticket from the pay station and place it on the dashboard of their car. The City currently operates 59 pay-and-display units and 30 traditional curb-side meters to manage 850 on-street spaces in the core area. The traditional meters are used only for very high turnover 15-minute parking spaces. One pay station is used to provide coverage for an entire block face. Since parking spaces are not marked with pavement stripes, more parking spaces are available than would exist without the pay-and-display system. The majority of Aspen's 59 units use A/C power and are mounted on light poles. The most recently acquired units use solar power. The units will soon have the capability of having cellular communication with the central office.

Aspen's pay stations accept coins, parking tokens from local merchants, debit "smart" cards that are available for purchase at City Hall, and most recently, credit cards. The response to credit cards has been very positive. Only three weeks after implementation of the credit card system, credit card revenue exceeded coin revenue. Now approximately 48% of Aspen's parking revenue is from credit card payments. The City implemented a rate increase at the same time as enabling credit card payment, and the combined effect has been a doubling of parking revenue.

In the past, the City of Aspen charged a flat rate of $1.00 per hour for parking in the core area. The City recently implemented a progressive parking rate structure in which the first hour is $1.00, the second hour is $2.00, the third hour is $2.00, and the fourth hour is $3.00. The City does not use different rates for different times of day. The shortest time period for which a driver may pay is 30 minutes. All of the pay-and-display parking zones have four-hour time limits. Prior to the increase in parking rates, parking revenues for the City were $1.5 million per year; with the progressive rate structure revenues are expected to increase to $2.4 million per year.

Parking enforcement in Aspen is handled by the Transportation and Parking Department. Their Parking Control Officers (PCOs) have responded very positively to the pay-and-display system. Since PCOs know exactly how far beyond the paid time a car has been parked they are afforded more flexibility in their response. Often they do not issue tickets until 15 minutes after the time has expired. Additionally, the pay-and-display system provides documentation for both the driver and the PCO, reducing the potential for conflict over ticketing. The pay-and-display receipts have recently been improved to allow PCOs to read them more easily. Since pay-and-display is a parking management technique unfamiliar to many drivers, Aspen indicates that the City will consider voiding the first parking ticket a person receives under pay-and-display as citizens become familiar with the new technology. Although initially the City voided 70% of all tickets under this program, now only about four to five percent are voided.

From the customer's perspective, benefits of the pay-and-display system include the ability to pay in a variety of ways and that the driver may move to a different parking space in the area while the receipt is still in effect. The principal disadvantage to the customer is that he or she must return to the car to place the receipt on the dashboard.[15]

Portland. The City of Portland tested centralized pay stations for six months, beginning July 2000. The City installed pay stations on twelve block faces, with six configured as pay-and-display units

and six configured as pay-by-space units. Units from Dambach, Reinhart, and Schlumberger were included in the evaluation. Criteria for inclusion of a block in the testing program were: blocks with a variety of meter time limits; high turnover locations; non-residential areas; close to downtown; low construction activity; and serving a variety of customers. A statutory change was necessary to allow the use of multi-space meters in Portland.

Portland issued an RFP for upgrading the City's parking controls in August 2001. In January 2002, Portland approved a contract to replace downtown parking meters with multi-space pay stations at a cost of approximately $6,100 each.[16] The multi-space meters, referred to as SmartMeters, will be phased in over several years. The installation of the first 150 of these meters began in July 2002. Each year between 2003 and 2005 an additional 250 units will be installed, for a total of 900 units. Because of the public reception and improved parking management capabilities with the new meters, the City is considering accelerating the installation schedule. Portland staff has indicated that the number of units installed may ultimately be higher, due to an expected increase in the number of controlled spaces from 7,100 to approximately 8,000 to 10,000. Eventually the City plans to replace 85% of its single space meters with multi-space units. Some single-space meters will remain where there are only a small number of meters on a block now.

Portland is installing one pay-and-display station per block face. Although pavement markings are not required for operation of pay-and-display systems, Portland is maintaining its existing parking space markings on the pavement and drivers are required to park within these spaces.[17] The new pay stations, produced by Schlumberger, will accept coins, smart cards, and credit cards. The City is expecting an increase in revenue by at least 15% due to the new payment options without any change in the rate structure or meter hours. The City is also exploring cellular phone payment options; however, they feel that while the technology is available, it does not have sufficient market penetration for implementation at this time. The City will probably add cell phone payment capabilities within three to five years. The stations have solar power and batteries that require replacement only every five to seven years. Portland staff noted that the solar power system does not require direct sunlight but only indirect light, and that even units in full shade operated well on the solar panels.

During the first weeks of implementation, Portland hired "Meter Greeters" to help educate the public concerning SmartMeter use.[18] In Portland's pay-and-display system, the driver pays for parking at the central pay station then returns to the vehicle to display the receipt. One difference between Portland's system and most others is that the receipt is affixed to the inside of the passenger window with a peel-off adhesive strip instead of the dashboard. This prevents the ticket from falling or blowing off the dash, and it facilitates enforcement. The receipt also is perforated so that drivers may take a small stub with them as a reminder of when the paid time expires.[19] If customers return to their vehicle before the paid time has elapsed, they have the option of driving to another location and continuing to use the paid time there. Portland had considered both pay-and-display and pay-by-space options as the City prepared to upgrade their parking controls. Staff indicated that while both systems have their advantages and disadvantages, Portland wanted customers to be able to take their time with them to a second location.

Another important feature of the Schlumberger pay station was its capability to provide two-way cellular communications with the City's central office. The pay stations notify the office when the coin compartment is nearly full, when the battery is low, if there is a jam, as well as transmitting other data. The central office is capable of changing rates, prohibiting parking, or sending other messages to the pay stations remotely. This proved to be the deciding factor in the selection of a vendor since only one of their final three bidders successfully demonstrated this capability. The City expects wireless communication to result in a 75% decrease in the amount of meter downtime. [20]

New York City. New York City uses approximately 500 Schlumberger pay-and-display units, referred to as Muni-Meters, for on-street parking management. The Muni-Meters were installed in about 1993. The units are powered either by solar panels or by electrical connections on a light pole. At this point the Muni-Meters do not have the capability of providing wireless communication with the central office. Vandalism has not been a problem with these units, since they are equipped with a coin slot that closes automatically if something other than a coin is inserted. The City is using the pay station's ability to implement different rates in its Theater District, where commercial rates are applied during the day and theater rates are applied in the evening. The City plans to expand the use of multi-space parking controls, eventually eliminating single-space meters. [21]

Toronto. The City of Toronto has been adding pay-and-display stations each year since 1999. Currently the City has 1,400 pay-and-display stations for on-street parking. The pay-and-display stations operate on solar power and they accept credit cards and coins. Each station covers an average of 8 parking spaces, although some stations control up to 12. The pay stations have wireless communication with the central office. Toronto staff indicated that it would not be possible for them to manage an operation of this scale without the wireless feature. Pavement markings delineating parking spaces have been removed, resulting in about a 10% increase in the number of available spaces in pay-and-display areas.

The public response to the pay-and-display units has been very positive. The increased reliability of the pay stations (in comparison to the old mechanical meters) has bolstered public confidence in the system. Customers like having a receipt for their parking expense, and they love the ability to pay with a credit card. Communities have appreciated the aesthetic impact on the streetscape. The only complaint the City occasionally hears relates to walking from the vehicle to the pay station.

Toronto reports a 30 to 40% increase in parking revenue in pay-and-display areas without any change in the parking rate charged. This is true despite the fact that Toronto is not currently obtaining credit card authorization prior to issuing parking receipts. The City does lose some revenue due to the use of invalid credit cards. These card numbers are placed on a "black list" so that they cannot be used at the pay stations again. The City has not had any problem with black market sales of parking receipts. Vancouver, BC at one time did have a black market resale problem in its off-street pay-and-display system. Pay and display receipts were systematically purchased using invalid credit cards and resold at a discount.

In-Vehicle Personal Meters

These are meters that are owned or leased to a vehicle's owner for use inside the vehicle. Time for the meter is purchased in bulk, similar to a postage meter. When a customer parks, they set the meter for the desired time. The meter can be viewed through the windshield for enforcement. Because the time is pre-sold in discreet increments, these types of meters cannot respond to variable meter rates.

Table 5. In-Vehicle Personal Meters

Advantages:	Disadvantages:	Used by:
Customers pay for parking in real time – they don't overpay or underpay After the customer vacates the space it can be "sold" again The customer doesn't have to visit a pay station that may be several car lengths away The customer does not have to return to the car to display a receipt. The jurisdiction receives parking revenue in advance	The driver can inadvertently leave the meter running The units can be stolen They are inappropriate for open air vehicles such a motorcycles, convertibles The customer has to come in to the office to get the meter or to have time added When left on the rear view mirror they could present a safety hazard by obstruction the driver's view The meters must be enforced on foot Cannot respond to variable meter rates	Israel – nationwide Aspen, CO University of Wisconsin, Madison University of Wisconsin, Milwaukee University of Oregon Arlington County, VA Ft. Lauderdale, FL

Aspen. The City of Aspen has been using in-vehicle personal meters since approximately 1995. Duncan AutoPark is the meter that is in use, and while Aspen staff have indicated that it is not the most advanced meter on the market, they feel that it is very user friendly. Aspen acquires the meters at a cost of $30 per unit. They are made available to citizens for a refundable deposit of $35, along with a $15 handling fee, and the value of parking credit added to the card (limited to $200). The City initially acquired 300 units, and these were all sold on the first day they became available. The City has since distributed 10,000 meters, double the City's population of 5000. Parking rates using the in-car meters are the same as at Aspen's pay-and-display stations.

Motorists using the personal meters acquire the meters and purchase parking time from the City. When they park, they place the meter on the rear view mirror and start the timer. Customers appreciate that the meters run in real time so they do not have to estimate how long they will be parked, and they do not run the risk of over-paying or under-paying. They also like the fact that they do not have to return to the car to display their payment receipt, as in the pay-and-display system. Occasionally drivers forget to turn the meters off, but the meters are programmed to stop running after a certain period. Parking enforcement officers have responded positively, indicating that the meters' location on the rear-view mirror is easy to read. Aspen staff indicated that the primary disadvantages of personal meters are that customers must come into the City office to pay for additional time on their meters, that the meters are inappropriate for open air vehicles such as convertibles or motorcycles, and that the meters hanging from the mirror can be a safety hazard if they are not removed prior to driving.

Toronto. The City of Toronto is exploring the possibility of using in-vehicle meters for parking in commercial loading zones. They are planning a pilot project in cooperation with an organization of couriers in the City.[22]

Computerized & Smart Meters

Computerized and "smart" meters are similar in concept to existing mechanical meters; however, they have advanced features. Most computerized and smart meters accept debit, credit, and/or smart cards for payment. Some meters can sense when a vehicle is present and if that vehicle is in violation. Still

others can be programmed from a central location, which allows a jurisdiction to easily change rates and enforcement times and/or monitor maintenance needs. Advantages and disadvantages of computerized meters, as well as descriptions about several cities that use them are presented below.

Table 6. Computerized and Smart Meters

Advantages:	Disadvantages:	Used by:
Allow for expanded payment options Existing meter poles/housing may sometimes be used Less expensive than multi-space meters Customers do not have to walk to a pay station	Adds clutter to the street The area available to post meter hours and rates is very small Unless the meter has optical capabilities, unexpired time remaining on a meter can be used by another driver More meters to maintain and collect cash from Batteries must be replaced approximately once a year	Vancouver, B.C. Pittsburgh, PA Charlotte, NC Sacramento, CA Ottawa, Quebec Orlando, FL New York City Denver, CO San Diego, CA Monterey, CA San Francisco, CA

San Francisco. The City of San Francisco is in the process of replacing all the parking meters in the City. Of the approximately 23,000 controlled on-street parking meters, 22,000 will be replaced with new electronic meters, the MacKay EPurse. An additional 3,000 McKay meters will be acquired and held in inventory. Although EPurse units have been used in Hong Kong, San Francisco will be the first city in the United States to install it. The meters will accept coins and the same smart card that is used by San Francisco's regional transit agencies. The display on the meter will be fully pixilated, enabling banners, scrolling messages, and the potential to display messages in Chinese or Spanish. [23]

San Diego. The City of San Diego uses meters with a digital display produced by POM. The City's 5,262 meters have been in service since 1998, and there are no plans to replace them with another technology. The meters accept coins and Smart Cards, but not credit cards or dollar bills.[24]

Monterey, CA. The City of Monterey operates approximately 1,100 meters. The meters accept coins and Smart Parkcards issued by the City. The Parkcards are available at several locations in the City and may be purchased with $10, $25, $50, or $200 of parking credit. The City provides Parkcards at a 10% discount relative to paying by cash. For example, the $10.00 Parkcard costs the customer $9.00. When the cards are inserted in a meter, the meter displays the amount of credit remaining on the card. The meter then begins to deduct 25 cents every few seconds until the desired amount of parking time is reached and the customer removes the card from the meter. Generally meters are enforced from 9:00 A.M. until 6:00 P.M., although in tourist areas meters are enforced until 9:00 P.M. during the off-season and later in the evening during the busy summer months. [25]

New York City. New York City is in the process of replacing approximately 63,000 traditional parking meters. To date about 48,000 new meters have been installed, including Duncan and MacKay products. The new individual space meters accept coins and smart cards. The City has been pleased with the new meters, although their intent is to eventually convert most on-street parking to multi-space controls. [26]

Berkeley, CA. The City of Berkeley has approximately 3,200 Duncan Eagle meters throughout the city. These were installed in 1998 following an epidemic of meter vandalism, particularly decapitation of the meter. The new meters are more rugged than the former single space meters, and vandalism has decreased. The Duncan meters are electronic with a digital display. They accept nickels, dimes, or quarters or Berkeley's smart card, the EPark card. To discourage vandalism and add interest to the streetscape, the City of Berkeley has installed some decorative, triangular meter poles, the artistic creation of Berkeley's Chief of Police.[27]

Vancouver, B.C. The City of Vancouver has been replacing the remainder of its mechanical meters with electronic meters in 2001 (830 meters) and 2002 (2,800 meters). The meters that are being installed accept coins as well as smart cards. In order to reduce vandalism and theft, Vancouver collects the coins from meters seven days per week.

Within the next six months Vancouver plans to implement a wireless payment option using customers' cell phones and the handheld computer system used by parking enforcement officers. Customers will pay for parking via their cell phones, identifying their license plate number and the time period for which they wish to pay. [28] Enforcement personnel, after inputting a vehicle's license plate number into the handheld computer, will see if the driver has paid. Just before paid parking time expires, the system will be able to call the driver on his or her cell phone as a reminder. As an added benefit, drivers can take their paid parking time with them to another metered location, since the paid time is linked to their license plate number rather than a particular parking location. Customers will be billed for parking fees on their cell phone bill, which can also serve as a parking receipt. [29]

3.1.3. Practices of Other Cities

This section summarizes various practices used by other cities related to parking meters. This includes rates, meter hours, and the process used to install meters.

Meter Rates

Portland. Current parking rates downtown are $1.00 per hour for parking less than four hours and $0.60 per hour for parking at five-hour meters. [30]

San Francisco. San Francisco uses four different rate structures at its meters: the downtown core, the ring around downtown, the wharf area, and neighborhood commercial districts. In the central core area parking costs $1.50 per hour, although meters only allow parking for 30 minutes. In the area immediately surrounding downtown and in the Fisherman's Wharf area, the parking rate is $1.00 per hour. In neighborhood commercial districts parking is generally $0.50 per hour.

Berkeley, CA. At the single space and pay-by-space meters, parking rates are $0.75 per hour. [31]

Vancouver, B.C. The City of Vancouver has four parking rate categories, with hourly rates of $3.00, $2.00, $1.50, and $1.00. Vancouver's policy has been that on-street meter rates should reflect off-street rates to reduce the amount of time drivers circulate in search of parking and increases the availability of on-street parking spaces. [32]

Denver. In June 2002, the City of Denver raised its meter rates from $1.00 to $1.50 per hour. This was done in conjunction with installing pay-and-display stations in several areas of the city.

Boston. Throughout the City of Boston parking meters charge $0.25 for 15 minutes of parking. [33]

Meter Hours

Portland. Generally meters are enforced from 8:00 A.M. to 6:00 P.M. Monday through Saturday. In the arena/convention center area parking is enforced until 10:00 P.M. Monday through Saturday, and in the area near the baseball stadium parking enforcement continues until 10:00 P.M. seven days per week.[34]

Denver, CO. Prior to opening Coors' Field, the City of Denver extended its meter hours near the stadium. It has since expanded this city-wide so that all meters are in effect from 8:00 A.M. until 10:00 P.M. The City recently rejected a controversial proposal that would have further extended the meter hours from 7:00 A.M. until 11:00 P.M.[35]

Berkeley, CA. Meters are in use Monday through Saturday from 9:00 A.M. until 6:00 P.M.[36]

Vancouver, B.C. Parking meters in Vancouver are in effect from 9:00 A.M. until 8:00 P.M. seven days per week, including official holidays.[37]

Toronto, ON. In the core area meters are enforced from 8:00 A.M. until 9:00 P.M. Monday through Friday, and from 1:00 P.M. until 9:00 P.M. on Saturday and Sunday. Metered parking is limited to two hours in the daytime and three hours after 6:00 P.M. and on weekends.[38]

Authority to Install Meters

Portland. In Portland the City is divided into geographic areas, each of which has a parking control representative. This individual responds to requests for changes in parking controls and has the authority to place a work order for the installation of new meters. The City works with property owners to determine the type of control that will be used on a street; however, there are not specific criteria for evaluating what is most appropriate. Although 99% of parking related changes are made with no City Commission involvement, the Commission does occasionally step in to the decision-making process due to citizen complaints. [39]

San Francisco. In San Francisco, meters are usually installed at the request of local merchants. After receiving such a request, the Traffic Engineering Division evaluates the appropriateness of meters based upon the desire for parking turnover and the amount of commercial uses relative to residential uses. Following this analysis, a public hearing may be held. The Traffic Engineering Division then makes a recommendation to the Board of Supervisors. Approval of the Board of Supervisors is necessary prior to the addition or removal of parking meters.[40]

Berkeley, CA. A City Council Resolution is required to add or remove parking meters. Parking meter zones are identified by specific location in Berkeley's municipal code. Considerations when evaluating new meter zones include the need for turnover in parking, a high demand for parking, and the type of businesses requiring parking. Pay stations are considered especially suitable for diagonal parking locations since the drivers do not have to walk as far to the station.[41]

Boston. The Boston Transportation Department has the authority to install or remove parking meters. No City Council action is necessary. In general, the City locates meters Downtown and near colleges and universities where there is a high demand for short-term parking. [42]

Vancouver, B.C. Petitions are circulated amongst affected businesses to evaluate support for any proposed action concerning the addition or removal of parking meters. Engineering Services assesses the appropriateness of meters on a given street, giving consideration to existing parking conditions, public input, staffing impacts, and financial impacts. The results of this analysis are summarized and forwarded along with recommendations to the City Council. A Council resolution is required prior to any change in parking controls. [43]

Toronto. A Council action is required prior to installing or removing metered parking areas. When meters are requested, the City reviews the area, evaluating whether turnover and occupancy indicate that meters are appropriate. There is no requirement for a certain percentage of businesses to support changes in parking controls prior to making a change.

3.1.4. Recommended Changes to Meter Practices

Based on information about the City's existing practices and research into other jurisdictions, the following changes to the City of Seattle's existing meter policies and practices are recommended:

- In areas adjacent to already metered streets, allow neighborhood business groups (e.g., chamber of commerce or business improvement association) to conduct their own process and recommend installation of meters. The established process should include documented outreach and majority approval from affected businesses.

- For areas where meters do not yet exist, use City Traffic Engineer current authority to recommend installation of meters to City Council, based on documented considerations or criteria. Review related enforcement needs.

- Convert meters to new technologies that eliminate single-space meters and replace with one or two meter kiosks per street frontage. These include pay-and-display systems and/or pay-by-space systems. Provide systems that allow electronic payment (e.g., smart cards or credit cards). Review related enforcement needs.

- Increase meter rates in neighborhoods where short-term off-street parking is more than twice the cost of meter parking, and/or meter turn-over is less than 85% for 2-hour meters. If electronic meters are used, consider variable parking rates (e.g., higher parking rate for mid-day peak periods or higher per-hour parking rates for longer periods of time).

- Allow meter hours to be extended in areas that need parking turnover in the evenings or on Sundays. Such areas would be those with a high number of restaurants and clubs, or areas affected by event parking. If electronic meters are used, consider lower parking rate and/or a longer duration for evening parking. Review related enforcement needs.

- With new meter technologies, consider longer-duration parking in areas removed from a commercial retail core to reduce all-day commuter parking, and improve enforcement. Signed durations longer than 2 hours are very difficult to enforce without such a meter. Consider longer duration parking in areas with high tourist parking needs such as along the waterfront.

3.2. Meter Hooding

Occasionally certain metered spaces are made unavailable to the general public due to the use of those spaces as service parking by private utilities and other building service providers. This section review's the City of Seattle's current policies related to meter hooding for service parking, the practices of other jurisdictions, and recommendations.

3.2.1. Existing City Practices

The SMC defines service parking as "the use of parking space while rendering service in cleaning, painting, adjusting, or making minor repairs or replacements in or to buildings or building equipment or to public utilities in the vicinity of the service parking space" (SMC 11.14.555). When a metered space is in use as service parking, the meter is covered with a hood provided by the City and padlocked in place. The City has three different types of service hoods:

1. **Building service permits (Blue Hoods)** are intended to be used for service work in adjacent buildings. This could include work such as plumbing, electrical, machine repair and other services. The annual permit for this hood is currently at $700.

   The City established the program in 1959 (ordinance 88463) and set the fee at $24/year or $2/month for portions thereof. The annual hood fee has increased over time to account for inflation and administrative cost increases: $60/year or $5/month for portions thereof in 1975; $300/year or $25/month for portions thereof in 1982; and $600/year in 1988.

   The City has issued 520 service permits this year, and has stopped issuing more hoods despite a waiting list because of the potential negative impact to public parking supply. The building service hoods are the most likely to be abused and misused because they do not require proof (such as a companion street use permit) to hood on-street meters. Common infractions include hooding meters at construction sites, using hoods to park passenger vehicles, using hoods in front of the service-provider's place of business, and using a hood at the same location for more than two consecutive days. However, the City only has two commercial vehicle enforcement officers who occasionally patrol use of the hoods. The penalty for such infractions is a $28 parking ticket.

2. **On-street service permits (Red Hoods for 24-hour and Yellow Hoods for 8:00 A.M. to 6:00 P.M.)** allow a space to be used by a commercial vehicle that functions as a mobile shop, while loading or unloading, or when a street needs to be cleared for roadwork. The permits for these hoods include a $9.25 one-time installation/removal fee for each meter, plus $6.00/day for the lost meter revenue. The lost revenue charge is less than the $10.00 maximum daily revenue potential of a meter in service for 10 hours. The City installs/removes these meter hoods, unlike the blue service meter hoods that are rented annually to businesses. The fee was established in 1985 at $8.15 for installation and $3.60 per day for lost meter revenue and was subsequently increased in 1994 to the rates that are in effect now. In addition, contractors must have a complementary permit such as a street-use permit or a traffic permit to obtain these meter hoods. Because of the companion permit requirement, these types of meter hoods have few infractions. The most common infraction is parking passenger vehicles in the hooded area, which results in a $28 violation.

3. **Filming permits (Green Hoods)** are for use by film crews. The cost of the permit is the same as the on-street service permits (red/yellow hoods).

3.2.2. Experience from Other Cities

This section summarizes various practices used by other cities related to service parking. This includes methods for reserving spaces and fees imposed on those obtaining service parking.

San Francisco. The City of San Francisco is in the process revising its process for bagging (hooding) parking meters. Currently, a bagging fee is charged. However, they would like to coordinate this with the permitting process. A proposal is currently before the Board of Supervisors to modify the fee collection schedule, fee refund policies, and other procedures.[44] Currently, a charge of $4 per meter per day (including Sunday/holidays) is issued for "exclusive temporary use of parking meter zones" similar to Seattle's red/yellow on-street service meter hoods. Contractor annual permits are issued at $325 ($225 if issued under 6 months) similar to Seattle's blue building-service meter hoods.

Portland. The City of Portland currently places hoods over meters when there are reserved for use by construction-related vehicles. When SmartMeters (pay-and-display kiosks) are installed, the City will use portable signs called "space delineators" to mark off reserved areas. The delineator signs will indicate that space at the curb is reserved. The City charges $950 for an annual maintenance hood. Hoods can be rented for $16.00 on a daily basis. The charge is intentionally more than the lost meter revenue to discourage excessive use.

Berkeley. The City of Berkeley issues permits for contractors working at a construction site through its Permit Service Center. The permits must be displayed on the meter one to three days in advance. This permit advises the public about the period during which the parking space will be reserved. There is an initial fee for this service as well as a per day charge. For spaces covered by pay-by-space stations, a barricade is erected that indicates a space is reserved, and a notice appears at the pay station. The City of Berkeley does not issue any annual permits for contractors. [45]

Toronto. The Parking Authority of Toronto only handles short-term requests for on-street parking for contractors. Contractors who require street space for an extended period of time must obtain permission from the city's Right-of-Way Control Division. Individual meters are hooded while pay-and-display spaces are cordoned off. The City does not issue any annual service parking permits or hoods.

3.2.3. Recommendations

Based on information about the City's existing practices and research into other jurisdictions, the following changes to the City of Seattle's service parking policies and practices are recommended:

- Increase the annual fee for blue service hoods to reduce abuse. An appropriate rate would be full recovery of lost meter revenue (about $1,400 per year) or half the market rate for off-street parking in downtown Seattle (about $1,200 per year).

- Increase charges related to red/yellow on-street parking meter hoods to account for inflation and the "true" lost meter revenue.

- Increase the penalties for misuse of meter hoods. Consider revoking the hood after three infractions for misuse.

- Increase the number of commercial vehicle enforcement officers who enforce meter hoods, or involve PEOs in the enforcement of meter hoods.

- Review hood allocation process to ensure fair access by service companies.
- If kiosk meter technologies are implemented, adopt a new mechanism for denoting reserved spaces for service vehicles (e.g., Portland's space delineators).
- If kiosk meter technologies are implemented, consider using an in-vehicle meter to control commercial-vehicle parking in conjunction with pay-and-display meters. Instead of an annual fee that is the same for all users, the cost could be based on the level of use. Frequent users of these commercial in-vehicle meters would pay more than infrequent users.

3.3. Time-Limited Parking

The City of Seattle uses signed time limits in some neighborhoods to increase turnover where parking meters are not appropriate. The City has time limit signs for 1-hour, 2-hour, 3-hour and 4-hour parking. Load zones typically have a time limit of 30 minutes. The 3-hour and 4-hour signs are typical around City parks and along transportation corridors where the City intends to restrict commuter parking. City practice has been to install the least time restrictive sign as necessary to create parking turnover, e.g., 4-hour before 2-hour, 2-hour before 1-hour and any time limit sign before installing parking meters.

Information related to parking durations was collected in many neighborhoods as part of the City of Seattle's *Comprehensive Neighborhood Parking Study*. [46] These data were condensed in Table 7 to show areas where vehicles are overstaying the limit of the parking meter or signed parking restrictions. It should be noted that some of the districts (shown in bold) allow vehicles with an RPZ permit to park for longer than the signed limits. Signed parking restrictions of one-hour are most often abused. Areas such as North Rainier, the University District, and West Seattle Junction experienced parking durations ranging from 3.0 to 4.7 hours in one-hour time-limited areas. Load zones are also heavily abused with durations over two hours in many neighborhoods.

Table 7. Parking Durations at Meters and Time-Limited Parking

Study Area Name	Unrestricted	2 hr (meter or sign)	1 hr sign	Load (30 min. typ.)
North Rainier	3.7	2.9	4.7	3.5
Univerisity District Greek Row	**5.3**	**2.3**	**4.5**	**3.7**
West Seattle Junction	3.1	1.5	3.0	1.1
Uptown Residential area – West	3.9	n/a	2.9	1.8
Upper Queen Anne	2.5	1.6	2.8	1.5
Capitol Hill-Broadway	2.8	2.0	2.7	1.0
Eastlake	3.2	1.9	2.4	1.2
Capitol Hill Residnetial - West	**5.5**	**n/a**	**2.3**	**4.6**
Capitol Hill Residential - East	**5.5**	**4.4**	**2.3**	**4.5**
University District – the Ave	4.2	2.4	2.3	2.0
Belltown	1.8	1.5	2.3	1.4
Denny Triangle	3.5	2.4	2.0	2.0
South Lake Union - Mercer	3.7	2.1	1.9	1.7
Crown Hill	2.7	1.4	1.8	1.0
Fremont - SPU	3.3	2.3	1.8	1.4
Greenlake	2.7	1.3	1.7	1.1
Ballard	2.7	1.3	1.6	1.1
Roosevelt	3.4	1.5	1.6	1.4
Uptown/Lower Queen Anne	2.1	1.7	1.6	1.6
Pike-Pine	2.6	1.7	1.6	1.3
Wallingford	2.7	1.7	1.4	1.4
Fremont	2.9	1.6	1.4	1.6
South Lake Union-Cascade	3.6	2.3	1.3	2.0
First Hill	2.0	1.6	1.3	1.5
Columbia City	2.5	1.9	1.2	1.4

Source: Data from Strategic Planning Office, collected as part of the Comprehensive Neighborhood Parking Study, August 2000.
Highlighted cells indicate average durations in excess of posted limit.
Bold rows indicate areas where RPZs are also in effect. Vehicles with RPZ permits can park longer than signed duration. These RPZ durations are included in the average.

Time-limited parking is more difficult to enforce than meters, since enforcement officers must visit a vehicle twice to determine if it has stayed over the limit. Meters, on the other hand, only require one visit. Four-hour time limits are nearly impossible to enforce with the City's existing staffing level. Time-limited parking, however, is useful in those areas of the city that cannot yet support meters.

The City currently requires a petition process of abutting building owners or managers with a 60% approval before time-limited signs are installed.

3.3.1. Recommendations

Time-limited parking is a useful tool. However, some changes to how the time limits are implemented as well as the length of the time limits are recommended.

- Allow neighborhood business groups (e.g., chamber of commerce or business improvement association) to conduct its own process and recommend installation of time-limited parking along streets that are adjacent to commercially-zones properties.
- Standardize format for petition.
- Issue new Seattle Department of Transportation practices (Division Operating Instructions) on installing time-limit signs, consistent with the Traffic Code's current authority for the Traffic Engineer to approve the installation of time-limited parking.
- Discontinue use of 3-hour and 4-hour signed parking restrictions near commercial districts because they are almost impossible to enforce. Consider use of long-duration meters instead.
- Evaluate areas where time-limits are highly abused, and consider increasing the time-limits or installing meters.

3.4. Commercial Vehicle Loading Zones

Commercial vehicle loading zones provide access to local businesses for pickups and deliveries. This section reviews current City practices, the practices of other jurisdictions, and recommends modifications to the City's commercial vehicle loading policies.

3.4.1. Existing City Practices

The City of Seattle has two types of loading zones for commercial vehicles: 1) Commercial Vehicle Load Zone, which is a metered space used in areas that are metered, and 2) Truck Load Zone, which is used in un-metered areas. Both have 30-minute time limits. Only one commercial loading zone may be located per block face.[47] Meter rates for Commercial Vehicle Load Zones were established in 1988 for downtown, Broadway, and the University District. The meter rate in these areas was set to $1.00 per twenty-minute period.

Vehicles that meet the City's definition of a "commercial vehicle" may park in these zones without an additional permit. SMC 11.14.115 defines a commercial vehicle as, "(1) a 'motor truck' or 'truck' except a passenger car or (2) a station wagon or van that has been permanently modified to carry no more than three seated passengers. Such vehicles shall be properly licensed as a truck and shall have the name of the business to which the vehicle is registered permanently displayed on both the left and right sides in letters no less than two inches in height."

The City does have an exception in its code (SMC 11.23.030) that allows passenger cars to obtain a permit to park in commercial vehicle or truck load zone. In order to do this, the passenger vehicle must be licensed as a truck (e.g., two-digit license plate number), and the owner has a City of Seattle business license. The City issues about 6,000 of these permits per year. Currently, the permit fee is

$90 for first permit and $40 for subsequent permits for one company (set in 1994). The permit is often raised by the trucking community as the biggest parking issue in downtown Seattle because passenger cars use spaces that should be reserved for trucks. Passenger cars have many parking options, including parking inside downtown parking garages. Trucks have few parking options. In addition, the commercial vehicle truck zones were originally installed to reduce double-parking by trucks. Since so many passenger vehicles have been given permits to park in these spaces, it has increased the occurrence of truck double-parking in downtown.

3.4.2. Experience from Other Cities

The section to follow provides several examples of how other jurisdictions handle the need for commercial vehicle loading zones.

Boston. The City of Boston has limited areas downtown which have full-street loading zones in the early morning and then return to general metered use after 10:00 A.M. To park in such a zone, a vehicle must have commercial license plates and meet Boston Transportation Department's requirements for commercial vehicles, including having the business' name and address displayed on the vehicle. These zones are established in areas where high volumes of truck deliveries were causing severe double parking. Once the full-street zones were implemented, most truck drivers and merchants scheduled the deliveries to occur earlier in the morning when parking spaces for the trucks are most available. [48]

San Francisco. San Francisco has a significant number of metered loading zones. Large truck zones are designed to accommodate trucks meeting specified weight and wheel requirements, while general load zones are intended for vehicles with commercial plates. The location of loading zones is determined by the level of business activity and the input of local businesses. [49]

Portland. The City of Portland has commercial loading zones downtown without any time limits. The City's traffic code was changed several years ago to disallow SUVs and station wagons from parking in commercial loading zones. In order to park in a commercial loading zone a vehicle must be registered as a truck, van, or pickup. All meters in the City may be used as truck loading zones before 10:30 A.M. for a maximum of 30 minutes.[50] The City is interested in instituting paid parking for loading zones. [51]

New York City. New York City is piloting a metered parking program for commercial vehicles in Midtown Manhattan. On designated streets, commercial vehicles may not park except in commercial vehicle spaces that are controlled by Muni-Meters, New York's pay-and-display pay stations. The City is using an escalating rate structure, in which users pay $1.00 for one hour, $3.00 for two hours, and $6.00 for three hours. These rates are in effect Monday through Friday from 7:00 A.M. to 6:00 P.M. After 6:00 P.M., commercial vehicles in the Theater District and Times Square may park for $0.25 per 15-minute period. A special New York City Parking Card is available for payment by commercial vehicles.[52]

Berkeley, CA. Curbs that are painted yellow are 20-minute commercial loading zones in Berkeley. In addition, there are some metered spaces that may be commercial load zones during certain hours. Most commercial loading spaces are not metered, although the City is considering the use of pre-paid in-vehicle meters for commercial load zone parking in the future. Loading zones are enforced from 7:00 A.M. to 6:00 P.M. Monday through Friday. Parking is limited to twenty minutes within the loading zones, and the vehicle must be actively loaded or unloaded during that period. Vehicles that qualify for parking in a loading zone include those that bear a Berkeley business license decal on their bumper, those that are marked with commercial lettering or a logo, and those with commercial license plates.[53]

Toronto. Toronto removed meters for commercial parking because drivers were required to deposit an inordinate amount of coins into the meters. They are currently considering some changes in the way commercial parking is handled, particularly for tour buses. One option under consideration is the use of an in-vehicle meter for commercial parking.[54]

Burlington, VT. The City of Burlington implemented an aggressive enforcement effort in the late 1990's. This included towing double parkers and vehicles with multiple tickets (scofflaws). United Parcel Service (UPS) was one of the most flagrant violators of the no double-parking law and was not paying its tickets. The City felt it would be a bad precedent to tow citizens for such infractions, but not tow the UPS violators. Therefore, the City aggressively pursued UPS by learning various delivery routes and being ready with a commercial-vehicle tow truck when a UPS truck violated the City's parking laws. Now UPS pays all of its parking fines in Burlington on time.

3.4.3. Recommended Changes

Based upon a review of current City practices and other jurisdictions' procedures relating to commercial loading zones, the following changes are recommended.

- Eliminate ability for passenger cars to park in commercial vehicle load zones since passenger cars have other parking options. This should minimize double-parking of trucks if more load zone spaces are available.

- On streets with high truck loading activity, consider commercial loading time limits for which trucks have exclusive access to spaces prior to 10:00 A.M., after which the spaces revert to metered parking. Retain one load space for use by trucks after 10:00 A.M.

- Continue to look for opportunities to consolidate load zones or move to the ends of blocks.

3.5. Residential Parking Zones

Certain neighborhoods are particularly susceptible to long-term parking by non-residents, especially if the neighborhood has good transit access to downtown (resulting in "hide and ride"), or if it is near a major institution or sports arena. This section reviews how Seattle deals with these issues, discusses other jurisdictions' programs, and draws conclusions about potential improvements to Seattle's practices.

3.5.1. Existing City Practices

The City of Seattle established the Residential Parking Zone (RPZ) Program to help ease parking congestion in residential neighborhoods. An RPZ is established in a neighborhood to discourage long-term parking by non-residents on residential streets. It is appropriate where parking congestion in residential areas is being caused by a nearby business or institution such as a hospital or school. An RPZ will not ease parking congestion when it is caused by residents themselves owning more cars than there are parking spaces available.

To obtain an RPZ permit, a resident must submit the following information to the City: 1) Current proof of residency showing resident's name and address. This can be a bill, bank statement, rent

receipt, or other form of official mail dated within the last 30 days. 2) A copy of the resident's current Washington State Vehicle Registration. The vehicle must be registered in the resident's name or the same last name as the proof of residency. Titles, temporary registrations and bills of sale are not accepted. Out-of-state registration is accepted only for active duty military personnel or out-of-state students providing proof of non-resident status. The cost of the permit is currently $27.00 and is usually valid for two years. The fees collected pay for the administrative cost of the permits and are deposited in the Transportation Fund (since 1984). There is no limit to the number of permits each household can obtain so long as the permitted vehicles are registered to that household. Elderly/low-income permits are available at a lesser charge. The fee has been $27 since 1988, when it was increased from $10.

Each household that purchases an RPZ permit may receive one free guest permit that is transferable. Temporary permits for up to 60 days can also be obtained for construction, out-of-state students, and new vehicles. Temporary permit fees are $5 to $10.

According to SMC 11.16.317, "the Director of Transportation may establish a restricted (residential) parking zone whenever seventy-five percent (75%) or more of the capacity of the streets available for parking in such designated area is generally occupied during regular business hours or any consecutive eight (8) hour period during evenings or during any consecutive eight (8) hour period on both Saturdays and Sundays; at least twenty-five percent (25%) of the vehicles parked on the street in the area during such hours are not owned by residents of the designated area; a petition signed by, or a survey indicating that, a majority of the residents in the designated area approves the restricted (residential) parking zone; and the public interest would be served. In cases where the criteria listed above are not all met, the Director of Transportation is authorized to establish a restricted (residential) parking zone when, in his or her judgment, the parking problem will be ameliorated by a restricted (residential) parking zone and the public interest would be served."

SDOT will consider an RPZ after receiving a request for an RPZ from a neighborhood community council or letter signed by at least 25 residents equally representing a five-block area. SDOT reviews these requests to make sure that the parking problem exists on at least five blocks, that there appears to be 75% or more of the parking spaces being utilized, and that there is an identifiable non-residential parking generator affecting the neighborhood. If an RPZ has merit, SDOT will contact the interested party and perform a parking study to make sure that the requirements of SMC 11.16.317 are met. If the neighborhood decides to proceed with the project, then petition forms will be given to the applicants and signatures must be gathered from at least 60% of the households within the affected area. Only one signature per household is required. [55] The City of Seattle has 22 RPZ zones and currently issues approximately 20,000 RPZ permits each year.

3.5.2. Experience from Other Cities

Residential parking zones have been instituted in many cities throughout the U.S. Most of these programs are similar to Seattle's. Some of these programs are described below.

Portland. The City of Portland has issued approximately 15,000 permits through its Area Parking Permit Program (APPP), and they expect the program to grow in years to come. All five existing APPPs are in effect from 7:00 A.M. to 6:00 P.M. Monday through Friday. The program is designed to help citizens who live or work in non-metered areas by controlling commuter parking. Thus, the APPP is not referred to as "residential" since the City realized that business areas also have the potential to be overrun with commuters heading downtown. Permits cost between $15 and $21 per year per vehicle and there is no permit limit per resident. Business permits are limited to half the

number of full time employees. Each resident holding a current APPP decal can obtain a maximum of 99 complimentary permit hours per year to use for special occasions (guests, parties, funerals, service calls, etc.). These permits are issued for specific dates and times only. For businesses, the local APPP committee has the discretion to determine what percentage of business employees may receive permits. The City is considering implementing a graduated scale in which each subsequent permit is more expensive than the last. To obtain a permit an individual must show proof of identity and proof of residence/business location. The City is also considering allowing permit holders to renew their permits over the Internet.

Berkeley, CA. Berkeley operates 14 Residential Parking Permit (RPP) areas. Within these areas it is necessary to have a permit in order to park for longer than two hours. Most of these are enforced Monday through Friday, 8:00 A.M. to 7:00 P.M., although a few zones do have enforcement on Saturdays. In order to obtain a permit an individual must show a picture identification and proof of vehicle registration at their address. The permit fee is $21.00 per vehicle per year, although persons who qualify as low income are eligible for a 50% discount. Visitor permits may be purchased for one day ($0.50 fee) or fourteen days ($2.00 fee). Only three fourteen-day visitor permits per resident or 15 one-day visitor permits per resident may be obtained each year. When getting a visitor's permit, the applicant must provide the vehicle license plate number of the vehicle to be using the permit, as well as the intended dates of use. [56] Merchants located within an RPP may purchase a Merchant Parking Permit by showing their business license with the local address. Only one permit per business can be issued, with a fee of $78.00 per year. [57]

In order to establish a new RPP, at least 51% of resident addresses in the proposed area must sign a petition form provided by the City. If this condition is met, the Traffic Engineer orders a survey of the neighborhood to determine if available parking is at least 75% utilized. Council approval is required to formally establish the new RPP.

Vancouver, B.C. Vancouver has three ways of protecting an individual's ability to park near their residence. The first is the "Three Hour By-Law." Vancouver's By-Law 2849 prohibits non-resident parking in front of any property for more than three hours. This is enforced only in response to citizen complaints. A second measure is the establishment of a Resident Parking Only (RPO) zone. These zones are created where on-street parking utilization is near 100%; where some residents have no off-street parking; where most residences are one or two family units; and where 67% of the residents have expressed support for the action by signing a petition. The zone normally reserves 30 to 50% of the block face for resident parking. Again, these zones are enforced only in response to complaints.

When parking problems are particularly severe within a neighborhood impacted by commuters or nearby institutions, the City considers a Resident Permit Parking (RPP) system. The City began this program in 1980, and currently there are 17 RPPs. Permit charges range from $26 to $48 (Canadian). A permit enables a resident to park anywhere in the zone where parking is allowed. Usually a portion of each block is left available for parking by non-residents, but time restrictions normally apply. Permits are issued for specific vehicles and they are not transferable. Temporary permits are available for special circumstances for residents (borrowing a car or using a rental car) and for non-residents (house sitters, contractors, in-home care, and out of town guests.) [58]

Toronto. In Toronto, Right of Way Management is responsible for handling the City's Residential Permit Parking Program (RPPP). Permits are issued that allow residents to park in designated locations, either on an area basis or a street name basis. The permits are intended for residents who do not have access to off-street parking facilities. Each local household is able to obtain one RPPP permit. If, after all RPPP priorities are met, there is additional parking available, then more than one vehicle owner in a household can acquire a permit. In one zone, there is a maximum of two permits per

household. Permits are issued on a six-month basis, although a driver may pay for 12 months in advance. High priority permits cost $8.50 (Canadian) per month, while low priority permits cost $25.00 (Canadian) per month[59] High priority permits are available to those who have no parking on their property or who do not have access to the off-street parking which is present. To obtain a high priority permit when off-street parking is present, a property owner must document the vehicles registered and parked at the address, while renters must provide a letter from their landlord stating that no parking is available.

Boston. The City of Boston operates a number of Residential Permit Parking (RPP) zones. To be eligible, an applicant must have their vehicle principally garaged at their Boston residence and have no unpaid Boston parking tickets. Residents are allowed to have one permit per vehicle, with no upper limit on the number of vehicles that are eligible. There is no charge for an RPP permit. Violations of RPP regulations accounted for 11% of all tickets issued in Boston in FY 2002. [60]

Denver. The City of Denver offers residential parking permits to residents of permit zone areas. Permits are provided at no charge. Each residence is entitled to one permit per licensed driver at the residence, plus one additional permit. Permits are valid for a period of three years. [61]

3.5.3. Recommended Changes

In light of this review of existing City practices and the practices of other cities in the United States and Canada, the following changes to Seattle's RPZ program are recommended.

- In areas with high-density residential, allow a neighborhood group (e.g., neighborhood planning committee or community council) to recommend the establishment of an RPZ. In lieu of a petition process, establish minimum outreach and publication criteria that would need to be met before SDOT would consider an RPZ.
- Consider use of a "mail-back" approval form in lieu of a petition in high-density neighborhoods.
- In areas with more permits than parking spaces, establish a permit limit per household. The limit could vary by RPZ area.
- Increase permit fee to cover the City's full cost to set up, manage and enforce the RPZ programs.
- Tighten restrictions on guest permits to reduce abuse. Set guest parking permit to the same rate as the permanent permit. Consider Internet registration of guest vehicles with a limit on number of days the guest permit will be in effect.
- Consider programs similar to Portland,. Berkeley and other cities where businesses located within an RPZ are allowed to purchase a limited number of parking permits.

3.6. Disabled Permit Parking

In addressing parking programs for the physically disabled, special care must be given to providing those who need disabled parking the appropriate access, while preventing abuse of the program. This

portion of the report addresses Seattle's existing disabled parking practices, discusses other cities' programs, and identifies potential improvements.

3.6.1. Existing State Law and City Practices

Special parking privileges for disabled persons are mandated by state law (RCW 46.16.381). That law outlines the criteria for obtaining a disabled parking permit, as well as the penalties for misuse of the permit. The law states that, "any unauthorized use of the special placard, special license plate, or identification card is a traffic infraction with a monetary penalty of two hundred fifty dollars."

Washington State law (RCW 46.61.582) requires that parking for disabled persons be free. It states that, "Any person who meets the criteria for special parking privileges under RCW 46.16.381 shall be allowed free of charge to park a vehicle being used to transport that person for unlimited periods of time in parking zones or areas including zones or areas with parking meters which are otherwise restricted as to the length of time parking is permitted. This section does not apply to those zones or areas in which the stopping, parking, or standing of all vehicles is prohibited or which are reserved for special types of vehicles. The person shall obtain and display a special placard or license plate under RCW 46.16.381 to be eligible for the privileges under this section."

The state law also specifies a time limit for reserved parking. It states, "A local jurisdiction providing non-metered, on-street parking places reserved for physically disabled persons may impose by ordinance time restrictions of no less than four hours on the use of these parking places. A local jurisdiction may impose by ordinance time restrictions of no less than four hours on the use of non-reserved, on-street parking spaces by vehicles displaying the special parking placards. All time restrictions must be clearly posted." (RCW 46.16.281) In the City of Seattle; however, no such restriction have been imposed by ordinance.

RCW 46.16.381(13) allows a law enforcement agency to appoint volunteers to help enforce the disabled permit parking. That section states,

> (a) A law enforcement agency authorized to enforce parking laws may appoint volunteers, with a limited commission, to issue notices of infractions for violations of this section. Volunteers must be at least twenty-one years of age. The law enforcement agency appointing volunteers may establish any other qualifications the agency deems desirable.
>
> (b) An agency appointing volunteers under this section must provide training to the volunteers before authorizing them to issue notices of infractions.
>
> (c) A notice of infraction issued by a volunteer appointed under this subsection has the same force and effect as a notice of infraction issued by a police officer for the same offense.
>
> (d) A police officer or a volunteer may request a person to show the person's identification card or special parking placard when investigating the possibility of a violation of this section. If the request is refused, the person in charge of the vehicle may be issued a notice of infraction for a violation of this section.

The City of Seattle currently does not use volunteers to enforce the disabled parking permit provisions.

3.6.2. Experience from Other Cities and States

The disabled parking permit is mandated by state law, thus, the City of Seattle has little ability to change the way in which disabled parking permits are issued, regulated, and enforced. However, some measures are being applied in other cities that would not require a change in the state law. For example, Stockport in Britain uses a "talking meter" at designated disabled parking spaces. The meter announces that the person is parked at a disabled space and that parking without the disabled permit carries a fine.

The most popular and thus far successful programs uses volunteers. Several states have enacted programs to monitor the use of disabled parking spaces. Volunteer groups including the physically challenged are given the responsibility of monitoring the disabled parking spaces located within city limits. Some examples of programs are described below.

Florida. In the State of Florida, anyone who uses a permit that does not belong to them can be charged with a second degree misdemeanor and a $500 fine, twice the fee of a disabled parking violation or up to six months in jail. To assist in enforcing disabled parking, disabled volunteers, after completing a background check and state-mandated training, patrol in their own vehicles, citing motorists who violate disabled parking regulations**.** Similar volunteer programs have been enacted in Fremont and San Diego California, and in the City of Kent and Kitsap County in Washington.

California. In California, on-street parking is available to disabled individuals without any time limit. Under state law it is a misdemeanor to misuse a disabled parking placard. In 1996 the City of Sacramento instituted the Sacramento Task Force on Placard Abuse (STOP) program in response to the increasing number of handicapped placards used for parking on-street. The purpose of the task force is to reduce the abuse of handicapped placards. STOP provides an online form which citizens can use to report instances of suspected disabled placard abuse. Citizens may also phone or fax in the information, or return the form to a parking enforcement officer. The citizen reports the number of the placard, the name of the suspected violator, a description of the driver, the time and place the parked vehicle was observed, the license plate number of the vehicle, and other vehicle information. All information received by the STOP program is held in strict confidence. [62]

Massachusetts. In 2001, Massachusetts passed legislation increasing fines associated with violating disabled parking provisions. The fine for parking in a disabled space without a permit increased from $25-$100 to $300-$500. The fine for misusing a placard increased from $100 to $500 for the first offense and $1,000 for the second offense.

3.6.3. Recommended Changes

Based upon the evaluation of current City of Seattle practices and the practices of other jurisdictions, the following changes to the disabled parking program are recommended.

- Consider imposing a maximum time limit of four hours on metered spaces in the downtown core. Required signage would be easier to implement if the City converts to pay-and-display or other single meter technology.

- Consider establishing a volunteer enforcement patrol to enforce the disabled parking permit limits. Involve the disabled community in setting up the volunteer patrols. This could include volunteers at agencies and services that generate a high demand for disabled parking.

3.7. Carpool Parking Permits

3.7.1. Existing City Practices

The City of Seattle has a carpool parking program that allows registered carpools to qualify for discounted on-street and off-street parking in designated areas throughout the City. Registration of the carpools requires:

- At least two adults who commute to work sites located near a designated carpool parking area.
- That the carpool members live and work near one another or share more than 50% of a common route to and from work.
- That the carpool members commute together to and from work at least fours days a week.
- That no member of the carpool has had a permit revoked.

Permits for the carpool parking currently cost $300 per quarter for a two-person carpool and $200 per quarter for a three-person carpool. In January 2003, these rates will increase to $300 per quarter regardless of size of the carpool. Vanpools certified by a local transit agency (which usually have between 8 and 13 passengers each) are free. These rates were established by City Ordinance 120641.

There are currently 758 designated carpool spaces that are primarily located on City streets with some located in off-street areas (e.g., parking lots underneath Interstate 5 at James Street). These are divided into 16 zones located in downtown Seattle, Eastlake, and near the Fauntleroy Ferry Terminal. Redevelopment has occurred near some of the designated carpool spaces where office or vacant space has been replaced with retail space. In these locations (e.g., Western Avenue), the carpool parking reduces parking turnover needed by the adjacent retail uses.

Carpool permits allow a vehicle to park in only one of the 16 zones. Within each zone, carpool permit parking is only allowed in designated spaces. The City does not issue more carpool parking permits in each zone than there are carpool parking spaces. The program is currently at capacity, and no more permits are being issued.

On-street carpool parking areas have posted reserved times, usually between 7:00 and 10:00 A.M. At other times, these spaces are available to the general public. There are no “in-out” privileges for carpool parkers over the course of the day.

The low cost of the carpool parking permit has created some abuse of the system. The average cost for monthly off-street parking in the downtown core was about $200 in the year 1999. [63] The carpool permit at $300 per quarter is equal to $100 per month. This is about one-half of the market rate for parking. Also, because the cost of this parking is shared among carpool members, the average cost per member is $50 per month or less. This is lower than the cost of a typical two-zone monthly transit pass, and past studies have shown that many carpools are formed by people who previously rode the bus to work. Because the permit parking locations are not attended, many people abuse the parking permit by continuing to use it after the carpool has disbanded. Also, there are only two commercial vehicle enforcement officers at the City who occasionally patrol the parking. The penalties for misuse of the permit may result in a citation, vehicle impound, revocation of the permit, and fines of $250. However, the fines and impound options are seldom used.

3.7.2. Experience from Other Cities

The carpool parking policies and programs of selected other jurisdictions are summarized below.

Portland. The City of Portland has on-street parking spaces that are dedicated to registered carpools from 6:00 A.M. until 10:00 A.M. Once a carpool has parked in a designated space, it may remain parked there all day. If no carpool occupies the space during the dedicated morning period, then the space returns to general use for the remainder of the day. In addition to designated carpool spaces, permitted carpools may park in any metered five-hour parking space without being subject to the five-hour limitation. Downtown carpools must have three participants, although in the Lloyd neighborhood some two-person carpools are allowed. Carpool permits are available for $50.00 per month. [64]

San Francisco. The San Francisco Department of Parking and Traffic operates a carpool and vanpool parking program in conjunction with local employers. Workplaces with over 200 employees which are located in primarily residential areas qualify for the program. When an employer submits a proposal, the City conducts a parking study and holds public hearings. If the proposal is approved, a perimeter area is designated as carpool parking until 9:00 A.M. Once a permitted carpool parks in the space, it may remain there all day; after 9:00 A.M. the space returns to one-hour use by non-permitted vehicles. The distribution of parking permits is handled by the employer's transportation coordinator. The Department and the transportation coordinator are jointly responsible for ensuring that those who utilize the spaces are actually carpools.

Carpool permits are available to those in a three or more person carpool for a $21 annual fee. The permit is transferable between vehicles in the carpool. Individuals in the carpool do not all have to work for the employer sponsoring the carpool program as long as their workplace is located within ½ mile of the carpool permit parking area.

San Francisco also operates a vanpool program, providing preferential on-street parking on the fringe of downtown. The vanpool program is administered by the Department of Parking and Traffic and RIDES, a non-profit organization providing commute assistance. Vanpools must have at least five riders who commute from outside San Francisco. The vanpool spaces are located in strips or blocks of metered spaces which are reserved for permitted vanpools until 9:00 A.M. A permitted vanpool may park in the space all day free of charge. After 9:00 A.M., the spaces return to one-hour metered use. RIDES helps organize riders, obtain a van, and certify the carpool. A vanpool permit is not transferable between vehicles.[65]

Santa Barbara, CA. Santa Barbara's carpool parking program issues on-street permits for $20.00 per quarter. A limited number of permits are issued for each block where carpool spaces exist. Carpool spaces are located on ten block faces in the downtown area. [66]

Salem, OR. The City of Salem has on-street carpool parking available in 20 areas downtown. A limited number of permits are issued for each area. When all of the permits for a particular area have been issued, a waiting list is created for permits that become available. Newly available permits are offered to the carpool with the most participants. In order to qualify as a carpool, at least two individuals must carpool together at least four days per week. Participants must work or attend school within designated boundaries. There is a $35 monthly fee for an on-street carpool permit. If a carpool dissolves, the permit holder has 14 days to reorganize the carpool or the permit is forfeited. If a permit holder abuses the program, the permit is revoked and he or she is placed at the bottom of a waiting list. A second violation results in the loss of parking privileges for two years. [67]

3.7.3. Recommended Changes

Evaluation of Seattle's carpool parking program and that of other cities resulted in the following recommendations.

- Periodically review on-street carpool parking locations. Consider a policy that would not allow (or would remove) carpool parking on streets where more than 50% of the block is occupied by street-front retail space.

- Gradually increase rates for carpools to match market rate for monthly parking in the neighborhood or lost parking meter revenue to the City. The current monthly parking rate in downtown Seattle averages about $200 per month, or about $600 per quarter. This is approximately equal to the lost meter revenue per quarter when only weekdays are considered. An increase in these rates would require adoption of a new City Ordinance.

3.8. Car-Sharing Parking

Car-sharing programs make motor vehicles available for those who normally use other modes of transportation (e.g., transit, walking), but need a car on an occasional basis. The City of Seattle, King County Metro, and a private car-sharing company established a car-sharing program called Flexcar in Seattle in 2000. The Flexcar company also has vehicles located in the Bay Area, the greater Washington D.C. region, and Kirkland. In Seattle, cars are parked near members in Ballard, Belltown, Capitol Hill, First Hill, South Lake Union, Central District, Downtown, Eastlake, Fremont, Green Lake, International District, Pioneer Square, Queen Anne, University District, Wallingford, and West Seattle.

Car-sharing programs can target several markets: residents who need a car in the evening or on weekends, small businesses that need a vehicle for daytime deliveries, and large employers that could use car-sharing to augment or replace motor pools. These programs typically operate similar to a cooperative where members pay a one-time refundable deposit, and then pay a per-mile and/or per-hour fee when a vehicle is used to cover insurance, gas, and other costs. Car-sharing vehicles are usually parked within short-walking distance to member residents and businesses. Car-sharing programs can reduce parking demand in a neighborhood by providing a pool of vehicles that can serve many members. Residents, for example, often own a car to make occasional evening errands or weekend trips. Having access to shared vehicles may reduce the need for each resident to own a separate car. Car-sharing programs also reduce the cost of car ownership by sharing fixed cost such as parking, insurance, and maintenance among many users.

SDOT has designated on-street parking spaces for car-sharing vehicles in Seattle neighborhoods. On-street spaces are selected on a demonstration basis in locations that are close to a concentration of car-sharing members and where they would not detrimentally affect short-term parking needs.

3.8.1. Recommendation

- Continue providing car-sharing parking on a demonstration basis. Evaluate the impacts and benefits of this parking.

- Codify provision of public parking spaces for car-sharing uses within the City's Traffic Code.

3.9. Bus Zones

Many transit service providers operate in the City of Seattle, including King County Metro, Sound Transit, Pierce Transit, and Community Transit (from Snohomish County). SDOT works in conjunction with these agencies to locate and size bus stops on City streets. King County Metro has an ongoing process to consolidate bus stop locations along its routes. These are being considered on a corridor by corridor basis as Metro evaluates transit speed and reliability improvements. Stop consolidation not only increases the service times for transit, but also increases the curb space available for on-street parking or other uses.

Metro has also been evaluating the length of its bus stops. In many locations, the existing stops are too short to accommodate an articulated bus or more than one bus at a time. Longer stops usually eliminate some on-street parking.

In addition to transit priority and bus stop improvements, most of the transit agencies need layover space throughout the City where buses stage between service runs. Layover areas require removal of on-street parking. SDOT works together with these transit agencies to evaluate parking, traffic operations, and transit service impacts of layover options.

3.9.1. Recommendations

- SDOT should continue to work with Metro and other transit agencies to consolidate stops in neighborhood business districts to create additional space for on-street parking, and to find the most appropriate layover locations.

- Where longer transit stops would remove on-street parking in neighborhood business districts, the need for additional length should be reviewed to make sure that it is warranted by the existing transit service.

3.10. Taxi and Valet Parking Zones

Taxi and valet services have a need for curb space to reduce the likelihood of double-parking. This section discusses how Seattle treats taxi and valet services' parking needs, how other jurisdictions deal with these services, and recommends changes.

3.10.1. Existing City Practices

Taxi and 3-minute passenger load zones are often granted at the request of a local business that needs such curb space. The 3-minute passenger load zones are installed instead of a dedicated valet zone, and can be used by anyone, even those not needing the valet. The City will not install such a zone if it would adversely affect other parking needs in the area or cause traffic congestion. The City does not charge for the use of this curb space even though it may lose meter revenue.

The City does issue a permit for a "temporary valet parking zone," which can be used for special events. This permit costs $50 per day and requires a valet parking operator to have valid certificates of insurance. The operator must also document where vehicles will be parked in off-site parking lots.

3.10.2. Experience from Other Cities

Selected other cities' practices regarding taxi and valet zones are reviewed below.

Taxi Zones

Toronto. The Consumer Policy Institute performed an evaluation of the taxi industry in Toronto. The study pointed out several problems with taxi stands in the City: since the space was provided at no charge, taxi drivers had no incentive to have a fast turn-around; first-in, first-out traditions maintained by drivers discourage competition by preventing passengers from comparing the quality of the available taxis and selecting the taxi with the most appeal; and the taxi stands invite the least ambitious of taxi drivers to sit in their vehicles.[68]

Portland. The City of Portland has a number of designated taxi zones where taxis may park for a maximum of 15 minutes. These zones are created in cooperation with local hotels. Generally they are signed as five minute parking zones. At this time there is no charge to the hotel for providing the passenger loading area. However, a cost of service study recently demonstrated that the cost of providing the loading spaces was approximately $1,300 per space per year. An attempt was made to charge hotels and/or taxis for this service; however, the City Commission stepped in to exempt taxis and hotels from these expenses. [69]

In 1998 the Cascade Policy Institute completed an economic analysis of the taxi industry in Portland. That study had several observations about taxi stands in the City: the first-in, first-out requirement effectively prohibited competition between companies; of the City's 80 taxi stands, some were heavily used, while others were underutilized; and the City does not have any clear criteria for adding or removing taxi stands. The study proposed charging individual taxi companies/associations for the rental of curb space which could be used exclusively by their company or association. These zones would be auctioned off in such a way as to prevent the creation of a monopoly by one group. The "owner" of the curb space would monitor its use, reporting any violators, and the number of taxi stands in the City would be reduced to those that are economically viable. [70]

Boston. The Hackney Carriage Division of the Boston Police Department licenses taxi stands, where portions of the roadway are designated for taxi use.

Montreal. In the City of Montreal, local hotels contract with individual taxi companies to have exclusive use of their stands. The contracts between the hotels and the taxi companies can be complex and may include requirements for the quality of service provided, including vehicle specifications, driver's dress, and provision of baggage assistance.[71]

Valet Zones

Toronto. Near some restaurant and entertainment spots, passenger loading zones have been installed at the request of business owners who want to operate valet services. Anyone can use the load zones, but they are primarily used by the valets. The business requesting the zone must pay an annual fee for this zone, which includes any revenue lost due to meter removal. [72]

Monterey, CA. The City of Monterey has a number of designated valet parking zones. A business desiring a valet parking zone must present the request to the City's Traffic Committee, although the final decision to install such a zone rests with the City Council. In evaluating a request the City would

consider the impact on general parking conditions in the area. In some cases the City allows the business to mark off an area for valet parking just during the evening using placards. Businesses that have special valet parking zones must pay rent to the City for using the street space.

Philadelphia. Philadelphia's code was amended in 1998 to allow the creation of valet parking zones. At the request of a local business, the Philadelphia Parking Authority will evaluate the appropriateness of a valet zone in the desired location. Factors considered in this evaluation include parking regulations and controls in place at the proposed location, local traffic conditions, property uses at the location, and the proximity of other valet services.

The business requesting a valet parking zone is required to pay an annual valet permit fee. In the core area, the annual fee is $250 for every 20 feet of curb space, plus $250 for each parking meter that must be removed. In other areas, the initial fee is $150 for every 20 feet of curb space, $75 for each meter removed, and $75 each year the permit is renewed. [73]

Boston. The Boston Transportation Department (BTD) has the ability to create special zones for valet services. Merchants who desire a valet zone may request one from the BTD's Off-Street Parking Facilities Board. The fee for the zone is $40.00 per linear foot of curb space per year, and a $150 fee per sign every five years.

3.10.3. Recommended Changes

Based on the taxi and valet parking practices in Seattle and other cities, the following changes are recommended:

- Review need for additional or longer taxi zones in downtown Seattle to improve taxi service and to reduce double parking by taxis at major generators such as hotels.
- Consider establishing a mechanism for a valet parking zone though which businesses can request a signed valet zone. A fee could be charged for these zones (similar to service permits) that would allow exclusive use of the zone by the permitted valet service. Vehicles parked in such a zone should not be subject to the 3-minute load zone requirements.

3.11. Arterial Parking Restrictions

This section discusses arterial parking restrictions' policies and experiences at the City of Seattle, the experience of other cities, and proposes changes to existing practices.

3.11.1. Existing City Practices & Policies

SDOT manages traffic flow in arterial corridors and there are many corridors throughout Seattle where parking is not allowed during the morning and/or evening. As part of an area-wide study, corridor study, or transit priority improvement project, the City has implemented parking restrictions to improve traffic flow and/or transit service speed and reliability. Restrictions could occur during the commuter peak periods, or all-day. The City installs spot restrictions (e.g., near an intersection only), along just one side of a street (e.g., peak direction restrictions), or along both sides of a street. The

City also removes on-street parking for vehicle and nonmotorized safety reasons (e.g., near intersections).

Two recent corridor improvements for which parking was restricted include Madison Street (First Hill) and First Avenue South (Downtown). On Madison Street, parking was removed in several locations to improve transit service and traffic flow. On First Avenue S., a through lane of traffic was removed to widen the sidewalk. As a secondary benefit, the lane reduction was also predicted to improve the merge/weave between the intersection and the SR 99 ramp. Parking was previously restricted during the peak period, and the City maintains this restriction. As a concession to businesses concerned that the lane reduction would cause congestion all day, the City stated that it would remove parking all the time if needed. Traffic operations did improve as predicted, and no further parking restrictions have been required.

For both of the above projects, the City conducted outreach to businesses along the affected arterial streets. In addition to the loss of parking, pedestrians can also be adversely affected by the removal of on-street parking since the loss of parking removes a barrier between the sidewalk and moving traffic. The primary beneficiaries of arterial parking restrictions—transit riders and through-traffic commuters—usually have little organized opportunities for input into a process to remove parking from arterial streets. These broader interests must be represented by SDOT.

Removing on-street parking will continue to be an issue in the future as SDOT strives to improve traffic flow through the City's principal traffic corridors, and as King County Metro proposes further transit priority improvements. As the City engages in these processes, it should be clear about the Citywide policies related to arterial streets. There are several Comprehensive Plan policies that relate to this issue:

- Policy T16 states, "Design, operate, and regulate access along principal arterials to accommodate and facilitate through traffic and connect with regional facilities."

- Policy T20 also includes language about principal arterials, including, "Increase capacity of principal arterials where and as appropriate either by expansion or by operating changes… Reallocate street space among various uses (e.g., general traffic, transit, trucks, carpools, bicycles, parking, pedestrians) as needed to enhance the key function(s) of a street."

- Policy T28 states: "The decision to remove on-street parking may require balancing a number of policy objectives. For arterials, policy objectives include safety, sufficient on-street parking to support business districts and prevent spillover parking in residential areas, a pleasant pedestrian environment, truck access and loading and effective operation of the street for high occupancy vehicles, including transit, and bicycles. For urban centers and urban villages the pedestrian environment and transit operations are particularly important considerations."

These existing policies help to confirm that parking is a lesser priority on a principal arterial than the need to move traffic and transit.

3.11.2. Experience from Other Cities

Toronto. Selected major arterials are designated as rush hour routes where no parking is allowed during peak periods.[74]

Boston. Boston recently implemented an aggressive parking management program on major corridors. Demonstration projects were implemented on several major commuter corridors to show how parking management could be used to improve traffic flow. Double parking is the primary issue in Boston as it affects all uses of the street—vehicular throughput, transit access, commercial loading, and general parking. Each street was evaluated individually to determine the parking management techniques that might work best for that street. To measure the successes (and failures), extensive before and after studies were performed of each corridor. These studies evaluated operating characteristics such as the number of illegal parkers, parking duration, parking utilization, truck parking, travel time through the corridor, and other measures before and after implementation of these measures. Based on the success of the demonstration corridors, the program will be expanded to other corridors.[75]

3.11.3. Recommended Changes

Evaluation of Seattle's arterial parking regulations and the experience of other cities has resulted in the recommendation that follows.

- Establish a needs evaluation process and considerations for City Traffic Engineer to implement arterial parking restrictions related to transit speed and reliability, pedestrian and bicycle travel, and general traffic flow benefits.

- Continue to remove on-street parking where necessary for safety reasons, under the City Traffic Engineer's existing authority.

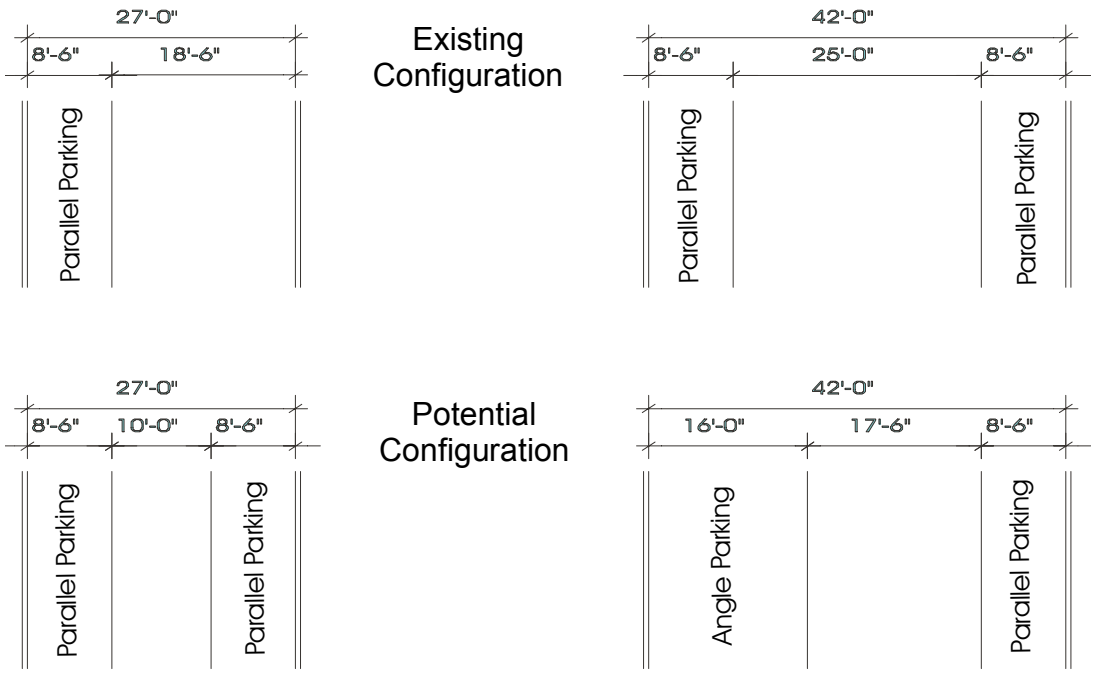
3.12. Angled vs. Parallel Parking

Many streets in Seattle have parallel parking on both sides of the street, even when this restricts the travel lane to a single lane of traffic. If the street is wide enough, then angle parking can be added to one side of the street and parallel parking can be retained on the other side of the street. The primary benefit is that converting parallel parking to angle parking on one side of a street can increase the parking supply by up to 50% depending on the location of driveways and other obstacles such as fire hydrants. Narrower travel lanes also can have a traffic calming effect as drivers tend to reduce their speeds. A curb-to-curb width of about 42 feet would be adequate to provide 16-foot angle parking stalls on one side of the street, 8.5-foot parallel parking stalls on the other side of the street, and maintain a driving lane for two-directional traffic (17.5 feet wide). On low volume streets, it may be possible to reduce the width and depth of the parking stalls by one foot; thus reducing the curb-to-curb width required to 40 feet.

The width of the sidewalk should also be considered when converting a street from parallel parking to angle parking since the end of a car will overhang the sidewalk by about 1.5 to 2.0 feet depending on the parking angle. Because of this, the sidewalk should be at least 6 feet wide or have a landscape strip to accommodate angle parking. Angle parking can affect traffic operations on higher volume streets and arterials, and can limit or eliminate locations for truck loading. Other issues include visibility to adjacent businesses, and safety of backing into an angle stall.

There are also many streets in the city where parking is restricted on one side of the street to allow a wider driving lane. However, on some of these low volume streets, parallel parking could be provided on both sides of the street. This would retain one lane for through traffic, although vehicles approaching from opposite ends of the street may need to yield to one another (e.g., many streets in Seattle's neighborhoods). A street width of 27 feet curb-to-curb would allow two 8.5-foot parking lanes and a 10-foot driving lane. Streets as narrow as 25 feet could be considered for parallel parking on both sides of the street (this would provide two 7.5-foot parking lanes and a 10-foot driving lane). Eligibility for two-sided parallel parking will depend on the street's traffic volume, truck access requirements, and whether or not there is space available for a vehicle to wait for an approaching vehicle to pass. Figure 4 illustrates the street dimensions used by several parking configurations.

Figure 4. Sample On-Street Parking Configurations



Source: Parking lane dimensions from "Fundamentals of Traffic Engineering", ITTE provided by City of Seattle.
Note: The width of the parking areas may be able to be reduced by one foot on low volume streets.

3.12.1. Recommendations

Converting parallel parking to angle parking can substantially increase the parking supply in a neighborhood. However, such parking can create issues associated with traffic operations, pedestrian mobility, and truck loading. Therefore, the following measures are recommended related to the implementation of angle parking:

- Establish criteria for the conversion from parallel to angle parking. Detail locations where such conversion should not be performed such as streets where a narrow sidewalk is adjacent to the curb, and where traffic congestion or truck loading needs would be compromised. Back-in angle parking should be maintained as the preferred method for safety purposes.

- Allow business association or neighborhood community council to conduct their own process to recommend angled parking on commercial streets in lieu of a petition.

3.13. Information / Marketing Campaign

3.13.1. Existing City Practices and Policies

The City of Seattle distributes information about parking rules and regulations in several ways. Information about Seattle parking rules helps people know how to park legally and thus avoid getting a parking ticket. Various programs have brochures available, such as for the Residential Parking Zone program. The following information is available on various City departments' web pages:

- Parking regulations and requirements for new development in the Land Use Code are available at www.cityofseattle.net/dclu/LandUse/RelatedCodes-Rules.asp

- Residential Parking Zone information is available from SDOT at www.cityofseattle.net/td/rpznew.asp

- Information about most other SDOT parking controls are available from the SDOT web page at www.cityofseattle.net/td

- The Comprehensive Neighborhood Parking Study, including parking data, is available at www.cityofseattle.net/td/plan_parkingstudy_home.asp

- Information about parking ticket infractions (fines, etc) is available from the Municipal Court by searching at www2.cityofseattle.net/courts/asp/bailn.asp

In addition, in 2000, City staff developed the "Parking: Your Guide to Parking Management" pamphlet to help residents, businesses and community groups that are trying to improve parking in their neighborhood and business districts. The pamphlet is available by mail or by downloading on SDOT's web page.

3.13.2. Experience from Other Cities

Numerous cities use the Internet to distribute public information about parking rules and regulations. Several examples include:

- Berkeley's "Parking Questions Most Often Asked and Frequently-Made Parking Mistakes" and the City of Vancouver, BC, "Top 10 Ways to Avoid Getting a Parking Ticket."

- Finding off-street parking in New York City, London and San Francisco with their cities' parking guides, some of which are private providers of the information.

- The Village of Oak Park's (Chicago) Parking Services Division maintains a list of private property owners with parking spaces available for rent throughout the Village for Oak Park residents.

3.13.3. Recommended Changes

Evaluation of Seattle's public information related to parking rules and regulations and the experience of other cities has resulted in the following recommendations:

- Provide more information about the City's parking rules and regulations on the City of Seattle web site, including a Seattle version of "10 ways to avoid getting a parking ticket by parking legally."

- As pay-and-display meter technology and other on-street parking changes are made, incorporate a broad public education campaign to ensure that ordinary citizens are aware of the new parking controls.

4. PARKING ENFORCEMENT PRACTICES

Parking enforcement is necessary for any successful parking management program. When enforcement is successful, the number of tickets written by Parking Enforcement Officers (PEOs) should decrease because drivers will be more likely to obey the regulations. If this were to occur, lost enforcement revenue would be replaced by increased meter revenue, increased sales tax revenue, and increased B&O tax revenue from the City's neighborhood business districts. The need for better enforcement is recognized by most neighborhoods throughout Seattle, and increased enforcement was often cited in neighborhood plans as a desired action.

4.1. Staffing and Deployment

Deploying parking enforcement officers throughout a city to enforce parking regulations with varying hours and restrictions is a challenging and complex endeavor. Municipalities must seek to utilize their enforcement personnel efficiently so that parking may be effectively enforced. This section reviews the ways in which Seattle and other jurisdictions deploy parking enforcement personnel into the field and how they approach the task of enforcing parking regulations.

4.1.1. Existing City Practices

Parking is currently enforced by PEOs within the Seattle Police Department (SPD), where it has resided since 1973 when the functions were transferred from the City Treasury Office. The exception of this is commercial vehicle parking and carpool parking, which are enforced by Commercial Vehicle Enforcement Officers within the SDOT.

In September 2002, the Parking Enforcement Unit at SPD had one sworn Police Lieutenant, 63 full-time civilian PEOs, and 6 full-time civilian PEO supervisors. The department is authorized to have up to 67 PEOs and is in the process of hiring up to this limit. The principal responsibility of PEOs is enforcement of the City's parking regulations, including but not limited to downtown and neighborhood commercial districts and restricted parking zones (RPZs). In addition to parking related responsibilities, PEOs are also called upon to provide traffic control assistance, respond to complaints regarding abandoned vehicles, report missing or incorrect regulatory signs and traffic signals, and provide other services related to public safety. Hourly records of PEO staff show that about 50% of the on-duty time is spent on "routine patrol." About 15% of the on-duty time is spent on traffic control, radio dispatch, special assignment and special events. About 7% of on-duty time is spent on the abandoned vehicle task force and the remaining on-duty time is spent on administrative, training and other responsibilities. This arrangement is different from some other jurisdictions where PEOs only have predominantly parking responsibilities.

The SPD currently uses a geographic method of deploy its PEOs. The City is divided into 40 districts that vary significantly in size. One PEO is assigned to each district. Parking staff are active between 5:30 A.M. and 11:00 P.M. Monday through Saturday, although not all districts are staffed by a PEO throughout that time period. When PEOs are away from their districts due to vacation, court responsibilities or other reasons, those districts are not covered. In such an instance, enforcement calls within the district would be handled by another district's PEO. Between 6:00 A.M. and 9:00 A.M. and between 3:00 P.M. and 6:00 P.M., a PEO's top priority is to clear zones where peak period parking is prohibited to ensure the mobility of transit and motor vehicles. Devoting staff to clearing these zones diminishes the staff available to enforce meters and other parking restrictions.

A PEO's workday includes reporting to central headquarters to pick up the handheld ticketing device, which must be charged and downloaded overnight. Next, each PEO reports to their district in a scooter, which cannot travel on the freeway and operates at a relatively low speed. At the end of their shift, the PEOs return to headquarters to charge the handheld ticketing device overnight.

In general, PEOs pay for themselves by generating additional revenue for the City when most of their time is spent on parking enforcement. The parking ticket revenue generated by a PEO is approximately three times the cost of labor and necessary equipment. However, effective parking enforcement increases revenue not only through ticketing, but also through improving meter revenues, and increasing sales tax and B&O tax revenues from the businesses that benefit from improved parking turnover.

Staffing Levels, Work Hours, and Retention

The City of Seattle currently has one supervisor for every 12 PEOs, which is less than the desired 1:8 ratio. Also, the department does not have adequate administrative staff. Therefore, the supervisors or in-office PEOs are also required to manage the hotline for abandoned vehicles, enter data into a database, and other administrative tasks. SPD has requested additional administrative support that could perform these tasks at a lower rate.

Retention of trained PEOs has been an issue at SPD. Last year SPD lost about 25% of the PEO staff; about half of these retired and half left for other jobs. Several reasons could be contributing to the high turnover rate, including: low pay relative to the responsibilities needed to be a PEO, lack of training, and lack of opportunities for career advancement. The PEOs salary ranges between $47,000 and $54,000, including benefits and other City costs, depending on whether a supervisor or regular staff.

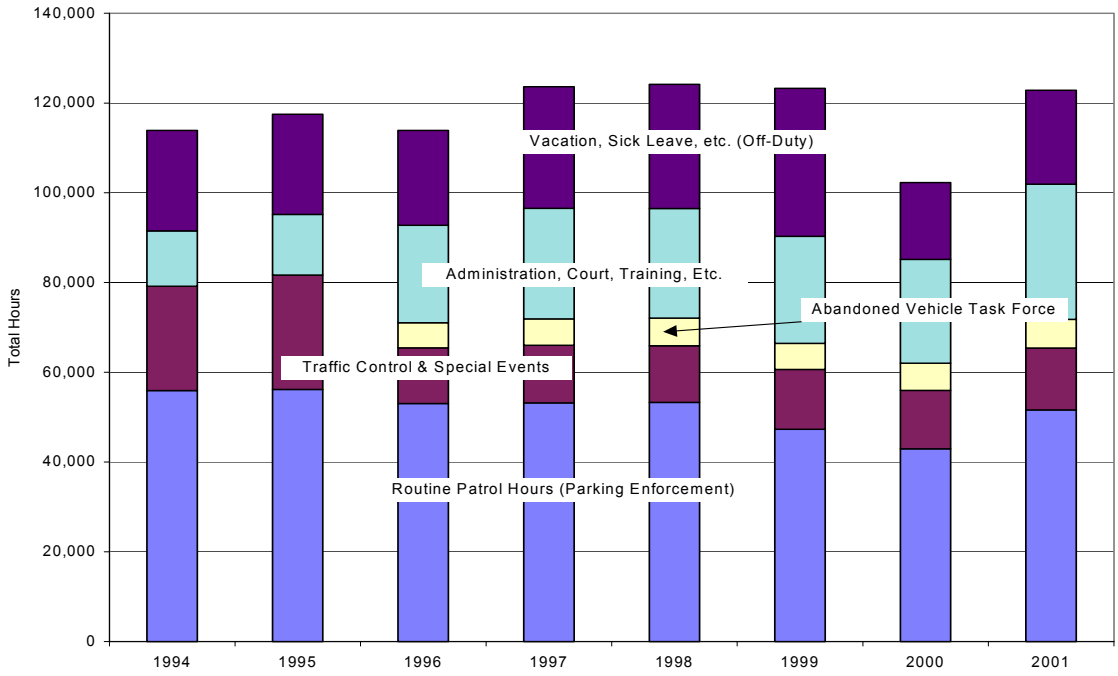
Non-Enforcement Duties

The primary duty of PEOs is to enforce citywide parking laws, focusing on downtown and neighborhood business districts as well as residential parking zones. However, PEOs also provide traffic control services, direct traffic during events, resolve complaints of abandoned vehicles, investigate and report improper regulatory signs and malfunctioning traffic signals and work to ensure the flow of traffic throughout the City.

PEOs are currently used to provide traffic control for Seattle Public Utilities and other construction projects, when traffic control is required. Such duties could last several hours, which reduces the enforcement ability of that PEO. In 2001, PEOs spent a total of 673 hours performing such traffic control for utilities. Because the average PEO generates about $240 per hour in ticket revenue (collected revenue), this is not a cost-effective use of a PEOs time.

Figure 5 shows the total hours spent by all PEOs since 1994. These have been divided into general categories: routine patrol hours; traffic control and special events; abandoned vehicle task force; administrative, court appearances, training, etc.; and off-duty hours. The off-duty hours include paid vacation, holidays, sick leave, etc. The percentage of total time spent on routine patrol (the time spent in the field enforcing parking) compared to the total on-duty time (not including vacation and sick leave) has decreased steadily from a high of about 61% in 1994 to about 50% in 2000 and 2001.

Figure 5. Total Hours for All PEOs



Source: City of Seattle Department of Finance, August 2002.

4.1.2. Experience from Other Cities

The parking enforcement practices of several other jurisdictions are summarized below.

San Francisco. Parking Enforcement in the City of San Francisco is handled by the Department of Parking and Traffic. The former Parking and Traffic Commission and Parking Authority were dissolved and placed under the Municipal Transportation Agency effective July 2002. The Department has a ratio of 12 parking control officers (PCOs) to one supervisor. The civilian PCOs have salaries that range from approximately $36,000 to $43,000. Officers are assigned to different types of details, such as general parking enforcement, street cleaning, street closures, special events, etc. Approximately 10 to 15% of PCOs time is spent on non-parking enforcement responsibilities. Officers are deployed to various beats, which are adjusted in response to any staff shortage. Residential parking zones are enforced by individual officers.

PCOs in San Francisco track parking duration by recording the position of the tire stem on their handheld units ("electronic chalking") along with a vehicle's license plate number. Currently, the

handheld computers include data on scofflaws but not on stolen vehicles. Data are downloaded to the handhelds once per day. The City plans to replace PCOs handheld units in about two years.

Supervisors in San Francisco monitor PCO productivity by looking at the tickets that are written to ascertain that the correct areas are covered and that tickets are written correctly. By exporting data from PCOs handheld devices, the Department is able to examine the ticket writing trends for each officer. Officers are not required to write a certain number of tickets.[76]

The City of San Francisco's Department of Parking and Traffic's Enforcement Division is organized into several units. The Community Services Unit includes street sweeping detail, response to citizen complaints, boot/scofflaw detail, and abandoned auto detail, among other functions. PCOs assigned to street sweeping detail precede Department of Public Works' street cleaning vehicles and issue citations to vehicles that are in violation of street sweeping zone regulations. The City of Boston operates a similar program in which vehicles that are not removed during street sweeping periods are ticketed and towed.[77]

Portland. Parking enforcement in Portland is directed by the Bureau of Transportation System Management. Parking control officers are deployed by geographic area. Generally they have walking or biking beats. Scooters are used to enforce area parking permit programs. The officers do not have any traffic control duties. The only non-parking responsibilities include ticketing for missing license plates, expired license plates, and double parking (considered a moving violation).

Currently, Portland's parking enforcement officers use a paper ticketing system. Officers track parking duration by recording license plate numbers and tire valve stem placement and parking tickets are written by hand. The City is in the process of selecting handheld devices for its officers. They intend to place barcodes on City parking signs so that the officer can scan the code to identify the location and parking limitations that are in place. The officer would then enter the data into the handheld device to track parking duration. Integrating this system with license plate recognition (LPR) is also under consideration. Longer term, having the State Department of Motor Vehicles require bar codes on license plates is also a possibility.

Berkeley, CA. The Berkeley Police Department's PEOs are deployed through geographic zones in the City. In addition to parking enforcement, they are called upon to assist in traffic control, clearing the streets for street cleaning, and other duties. Each supervisor is responsible for approximately 12 PEOs. In 1999, the Berkeley City Council passed a resolution allowing parking enforcement officers to rescind parking tickets if the driver returns before the ticket is placed on the dashboard.[78]

Toronto. Parking enforcement in Toronto is the responsibility of a special civilian unit within the Toronto Police Department. The unit also reports to the City Finance Department. The parking enforcement officers are organized into five rotating platoons. Each platoon has a supervisor and an acting supervisor who is in training. In general the City has 75 to 80 PEOs in the field during peak periods, 50 during the day, and approximately 30 in the evening. In addition to parking enforcement responsibilities, PEOs check to ensure that parking signs are correct.

PEOs walk, bike, or use vehicles on their enforcement beats. Currently, they hand write their tickets, although the City is moving to handheld computers in the next year. They generally use chalk to track parking duration, but are interested in evaluating license plate recognition technology. PEO productivity is monitored through the completion of daily logs.

Vancouver, B.C. Vancouver's civilian PEOs are deployed in five squads throughout the City, patrolling on foot, in vehicles, and on bicycles. They do not have any duties other than parking enforcement. PEOs

are rotated through geographic areas of the City in order to familiarize them with all the various beats and to increase safety for PEOs by decreasing the risk of escalating conflicts through repeated contact with specific violators. PEOs are deployed from 6:00 A.M. until 10:30 P.M., although the City is considering 24-hour staffing. PEOs work nine-day fortnights, in which one week they work four shifts and the following week they work five shifts. PEO shifts are just under eight hours long.

Vancouver uses state of the art handheld computers in its parking enforcement operations. In tracking parking duration, officer may note the odometer reading, the tire valve stem position, or chalking. In all cases they record the license plate number. Any data collected are entered into the handheld computer using Palm Pilot "graffiti" shorthand. These data are integrated into the central database in real time, making the information accessible to all PEO handhelds.

Aspen, CO. Aspen's parking enforcement operations are performed by the Transportation and Parking Department. Since the resort town wishes to set forth a friendly image, the Parking Control Officers (PCOs) appear in casual uniforms and aim to be approachable by visitors. PCOs carry Smart Cards with them in the event they encounter someone having difficulty paying so that they can step in to pay on their behalf. In this small city with 850 metered spaces downtown and a residential parking zone program covering approximately 3,000 spaces, PCOs issue approximately 40,000 tickets per year. They are staffed by six PCOs and one supervisor.

Aspen's PCOs are on foot in the commercial core and have the option to use three wheel (Go-4s) in residential areas. They may also walk or use bikes in residential areas. The PCOs utilize handheld computers while they are in the field. In areas with pay-and-display meters, officers track parking by the receipts placed on cars' dashboards. In un-metered residential parking zones that have parking time limits, PCOs utilize chalk or the "chalk feature" on their handheld computer to track parking duration. The computer allows the PCO to enter license plate numbers to track parking duration for specific cars. The City has not seriously considered license-plate recognition technology.

San Diego. The City of San Diego has one supervisor assigned to every six parking enforcement officers. The PEOs are responsible for performing a full range of parking related enforcement tasks, as well as identification of stolen vehicles and scofflaws. The PEOs do not have any traffic duties. PEO salaries range from $16 to $19 per hour. Officers are deployed by geographic zones and have written tickets using handheld units since 1989. When an officer identifies a vehicle in violation of parking regulations, he inputs the license plate number to check for scofflaw or stolen vehicle status, and prints the ticket. [79]

Boston. The Boston Transportation Department enforces parking regulations in the City. PEOs have a starting annual salary of $27,800 and they do not have any responsibilities other than parking enforcement. They are deployed into the field by geographic zones and their productivity is monitored by examining their ticket issuance. In time-limited zones, PEOs track parking duration by recording license plate numbers on paper. They do not have any link to city databases while in the field. Vehicles with multiple parking tickets may be booted or towed by a special division of the BTD, not by PEOs. Scofflaws are also prohibited from obtaining a Residential Permit Parking program permit. [80]

Information related to the number of PEOs, controlled spaces, and ticket revenues were obtained from these other cities, and are summarized in Table 8 below.

Table 8. Parking Enforcement Benchmarks in Selected Cities

	Boston	Portland	San Francisco	San Diego	Vancouver	Toronto
Number of Parking Enforcement Officers	150	30	260	58	120	350
Number of Controlled On-Street Spaces (Individual Meters +Central Pay Spaces)	7,500	7,100	23,000	4,900	7,000	15,100
Ratio of PEOs to Controlled Spaces	1:50	1:237	1:88	1:84	1:58	1:43
Total Number of Parking Tickets Issued per Year	1.7 M	308,122	2.2 M (FY 99/00)	NA	NA	2.5 M
Ticket Revenue (Fines Actually Collected)	$50-55 M	$3.2 M (2001)	$63.3 M (FY 01-02) -	NA	NA	$60 M (Canadian)

Sources: City of Boston[81], City of Portland[82], City of San Francisco[83], City of San Diego, City of Vancouver, City of Toronto.
NA = Not Available

4.1.3. Recommendations

- Increase staffing to provide consistent coverage to all districts over all time periods of the parking controls. Increase in-office administration staff to relieve PEOs of non-enforcement duties. As the number of PEOs increases, additional staff should not need to spend as much time with traffic control duties (since these duties are assumed to be covered by existing staff); therefore, the patrol time for each PEO should increase.

- Limit on-duty PEOs to ½-hour of traffic control for scheduled construction. Consider use of off-duty PEOs or other options for longer-duration traffic control needs, since it is more cost-effective to pay overtime than to incur lost enforcement revenues.

- Consider 10-hour shifts, four days per week to reduce lost efficiencies associated with travel to enforcement area and other required non-enforcement activities (e.g., check in, roll-call, etc.).

- Implement geographic information system (GIS)-based deployment that would better match PEO assignments to current parking restrictions. In the interim, continue to manually assess deployment to better match enforcement needs to PEO availability.

- Review enforcement needs with new technology and expansion of parking controls. If the City changes to a pay-and-display meter system, PEOs would need to patrol streets by foot or other means.

4.2. Use of Technology

Certain technologies have the potential to expand enforcement capabilities and/or improve efficiency in enforcement. This section reviews current practices in Seattle and other jurisdictions, and makes recommendation for potential improvement in Seattle.

4.2.1. Existing City Practices

Historically, enforcement began in the downtown core and University District where meters existed. As new meters, time-limited parking , and RPZs were added, new districts were created. The district are periodically reviewed based on the workload required, number of spaces to be enforced, number of infractions, etc.

GIS technology has the potential to improve parking enforcement in Seattle by allowing SPD to better identify exactly when and where parking restrictions need to be enforced. A geographically referenced database would identify the parking restrictions on every block face, including the duration of parking allowed and the hours that meters or signs are enforced, as well as any other parking restrictions that may be in place. This information could enable SPD to better estimate the required staffing levels to effectively enforce the parking restrictions that exist in a district. Such a database would be beneficial to other City departments as well, and would not necessarily need to be housed within SPD. Information about technology being used by other cities is presented in the next section of this report.

The City's existing meters do present some enforcement challenges to SPD. Some of the meters have a plastic meter face, which becomes cloudy or scratched so that the meter cannot be read from afar. Removal of signs with parking restrictions is also a problem because tickets are easier to challenge (or are not issued). RPZ signs are often intentionally removed. GIS technology could facilitate tracking and locating missing signs. A GIS database such as this will take extensive time to develop. Although useful, it would not necessarily result in increased ticketing.

4.2.2. Experience of Other Cities

This section reviews several technologies that have the potential to improve parking enforcement and the experience of selected cities that employ them.

License Plate Recognition

License-plate recognition technology uses a video or infrared camera to scan license plate numbers into a computer. The computer can track various infractions including scofflaws, stolen vehicles, overtime parking, and residential parking permits. At this point there is only one manufacturer that has an operational mobile LPR system, AutoVu Technologies of Canada. AutoVu produces the AutoFind system for mobile LPR applications. Advantages and disadvantages of LPR systems along with a list of cities found to use this technology are presented in Table 9. Further information obtained from a sample of the cities is presented below.

Table 9. License Plate Recognition Technology

Advantages:	Disadvantages:	Used (or piloted) by:
Raises capture rate for scofflaw and stolen vehicles Improves efficiency for enforcing time restricted parking Can be used for planning and other studies	Privacy concerns License plate misreads Expense PEO vehicle may obstruct traffic flow when driving slowly Difficult to read license plates when vehicles are parked very close together	North Vancouver, BC Tampa, FL (10/02) San Marcos, TX Los Gatos, CA Boston, MA Monterey, CA Ottawa, Canada Salt Lake City, UT North Vancouver, B.C.

Salt Lake City. Salt Lake City was the first jurisdiction in the United States to use the AutoFind System. A pilot test was conducted during the 2002 Winter Olympics. The system was used to identify vehicles with more than six unpaid parking tickets and stolen vehicles, for management of time-limited parking, and for security during the Olympics.

Overall the results of the pilot study were positive, leading to the decision to acquire the system. There were, however, some drawbacks. Initially the City had difficulty with errors reading license plates due to the reflectorized plates used in Utah. AutoVu replaced the cameras with infrared cameras from France, which resolved the problem. The infrared cameras cannot read non-reflectorized plates, however, so officers either input such plate numbers by hand or skip those vehicles. During the test period, residents of Salt Lake City and the local media expressed concerns about privacy. License plates are photographed during patrolling, although only the photographs of violators are retained. A final difficulty with the pilot test was resistance from parking officers who feared that the new system would eliminate jobs. Because of such concerns, Salt Lake City staff stressed the importance of selecting an objective person to operate the system during a test period.

Since the pilot study the City has purchased the system, and the cost of the pilot study was credited toward the purchase of the system. The City is in the process of acquiring a new vehicle on which to mount the system (which would likely rotate through their various beats). When the vehicle is acquired, AutoVu staff will mount the system and calibrate it. The City hopes to eventually integrate the AutoFind system with their handheld computers used for ticket writing. Ideally, upon finding a violation, the officer could simply note the ordinance was violated and press “print” to issue the ticket. AutoVu is in the process of developing this capability. [84]

Tampa, FL. The City of Tampa conducted a pilot test of the AutoFind system, in which the system was mounted on a van driven by the officer responsible for booting vehicles. The system was used primarily to identify scofflaws and stolen vehicles, although it was also used to enforce time-limited parking in a small area. The City initially had difficulty with misread license plates, but the AutoVu staff adjusted the system and the performance improved significantly.

The City of Tampa planned to purchase the $70,000 system for implementation in October 2002; however, purchase of the system has been delayed due to budgetary constraints. The City still plans to acquire the system and use it for scofflaw identification. Currently Tampa has over 7,000 vehicles on its scofflaw list. Based upon the pilot study, the City estimates that use of the AutoFind system would result

in the collection of an additional $20,000 in unpaid parking tickets per year. Thus, Tampa expects that the system would pay for itself in three to four years through identifying scofflaws alone.[85]

San Diego. The City of San Diego conducted a five-week pilot study of the use of LPR technology in 2001. The primary use of the system was to identify scofflaws, but the AutoFind unit was also tested for use in the enforcement of time-limited parking. Overall, parking management staff were very pleased with the system. During the study citizens expressed concerns about privacy. The test period occurred in the midst of a controversy surrounding the use of cameras to enforce red-light signal violations, possibly contributing to this reaction. Citizens also objected to what was perceived as too much parking enforcement. Staff indicated that the system was 80 to 90% effective in correctly reading license plate numbers, depending on the plate background, the presence of grime, and how closely vehicles were parked. Given the public reaction to the system it was not feasible to acquire LPR following the pilot study. The City intends to revisit the possibility of acquiring such a system in the future.

Monterey, CA. The City of Monterey is in the process of acquiring an LPR system from AutoVu after conducting a three-week pilot test. City staff expect to proceed with their purchase toward the end of this year and mount the system on a Go-4 scooter. Feedback from PEOs who tried the system was very positive. The City plans to use the system to manage time-limited parking and RPZs, as well as to identify scofflaws and stolen vehicles. Monterey presently uses tire chalking in time-limited areas, which has resulted in a high level of workers' compensation costs. They are hoping that the new system will help them reduce injuries in their PEO staff. Additionally, they hope that the system will add to their efficiency in enforcing areas. Currently, RPZs are only enforced on a random basis because the staffing level and the length of time required to chalk tires do not permit full coverage. With LPR in place they hope to provide better coverage to these areas. It is possible that the addition of LPR will allow the City to reduce its PEO staff through attrition; however, the City is waiting to see how the system functions following implementation. [86]

Toronto. The City of Toronto completed a pilot study of using LPR for parking enforcement, identification of scofflaws, and identification of stolen vehicles. The pilot study was funded by the local insurance bureau, which has a strong interest in the system's ability to locate stolen vehicles. The pilot lasted approximately three months. During that time the LPR system was used in one-hour parking zones, as well as in residential permit zones. City staff indicated that the LPR system was not well suited to congested urban areas, since enforcement requires driving slowly down the street. [87]

Boston. The City of Boston completed a pilot study of AutoVu LPR in cooperation with Standard Parking Company. They were interested in gathering data for parking studies as well as identifying boot-eligible vehicles. The results of the pilot were excellent for identifying boot eligible vehicles. They have not yet evaluated the system's potential for assisting in parking studies. [88]

Handheld Computers

Handheld computers for parking enforcement personnel have capabilities such as electronic ticket writing, global positioning, cellular communication, electronic chalking, and allowing payment by cellular phone, among other features. The experience of other jurisdictions using advanced handheld units is discussed below.

Vancouver. Vancouver was the first city in Canada to begin using handheld computers with real time cellular communication for parking enforcement. The Palm Pilot units were acquired from Real Data Systems and were outfitted with software by Epic Data. After inputting a vehicle's license plate number, the officer immediately has information about unpaid parking tickets and vehicles with multiple

unpaid tickets are towed. Other advantages include the ability for customers to receive information by phone about their tickets immediately after they are issued; the ability for PEOs to instantly communicate with the City's towing contractor; the ability for PEOs to print tickets quickly and clearly; the ability for officers to detect residential parking permits that have been illegally obtained; and improved communication with the Police Department regarding stolen or wanted vehicles.[89] In the next six months, Vancouver expects to begin allowing payment for parking via cellular phone. The customer would identify his or her license plate over the phone, then payment information would be accessible to enforcement personnel through their handhelds. Vancouver staff indicated that since the wireless handhelds were implemented parking compliance has improved. [90]

Vancouver's Palm Pilots are equipped with a bar code reader which may be used to obtain license plate information if the provincial government chooses to add barcodes to license plates in the future. In the near term, the City may affix bar codes to all of its hardware such as meters, signs, etc. In this way PEOs could report maintenance needs automatically by scanning the bar code rather than inputting the information manually. [91]

Vancouver has experienced some difficulties with these handhelds, which include problems with water resistant paper used to print tickets, PEOs having difficulty learning the shorthand that is necessary to operate the unit, and weather-related damage to cellular antennae. [92]

New Jersey. The New Jersey State Administrative Office of the Courts upgraded its Parking Authority Ticketing System (PATS) in 2001 with the purchase of Symbol Technologies' handheld devices for parking enforcement. The handhelds will be used by 21 municipal parking authorities whose PEOs will have instant access to the State's central database.

Geographic Information Systems

Geographic Information Systems (GIS) are powerful analysis tools, for they can integrate databases with geographic and non-geographic data, and allow spatial analysis to be performed. The ways in which several other jurisdictions use GIS for parking related applications is found in this section.

San Francisco. The City of San Francisco is currently able to download data from PCOs' handheld devices to track the ticketing activity of each officer. The Department of Parking and Traffic is exploring the possibility of expanding its mapping capabilities to provide graphic representations of parking violations. They intend to develop software that will allow them to obtain a geocode from the address associated with each ticket. By integrating information about parking violations into the City's already extensive GIS, the Department would improve its ability to evaluate officers' performance, design beats, and communicate to the public and local officials about parking issues.

San Diego. The City of San Diego is in the process of acquiring handheld units for PEOs that integrate global positioning system (GPS) and geographic information systems (GIS) into their enforcement process. The City is considering products produced by Reino and Etec. The use of GIS would enable the City to graphically display where parking violations are written throughout the City. This capability would assist Parking Management in identifying parking violation "hot spots" for the purpose of determining staffing needs, as well as in evaluating the productivity of PEOs to ensure that they are enforcing parking during the time period that they are in the field and throughout the zone to which they are assigned. [93]

Toronto. The City of Toronto uses a parking information system (PINS) to track the ticket writing activity of parking enforcement offices. PEOs complete a log of their activity at the end of each day.

For each ticket issued, the system records the address of the violation, the time issued, the nature of the violation, and the identity of the officer.

Portland. The City of Portland has a very detailed geographic information system with accuracy within one foot. Eventually, the City plans to have a great deal of parking data included in the GIS, including pavement lines, signs, meter locations, parking restrictions, etc. The City plans to use this system to track its physical assets, direct maintenance work orders, estimate budget requirements, and estimate necessary staffing levels. [94]

Berkeley, CA. In 1999 the City of Berkeley purchased two global positioning satellite units for the purposes of surveying and mapping. City staff undergoing training for the devices were able to locate items such as parking meters and signs within three feet of their location shown in the City's existing GIS system. When used in conjunction with known survey points, the handheld devices provide location information that is extremely accurate. Berkeley intends to use these devices to acquire data that can be integrated into its GIS databases. The City is not currently using GPS for parking applications, although they may use this in the future. [95]

4.2.3. Recommendations

- Consider new enforcement technologies that integrate with GIS systems to track parking restrictions by location.
- Consider new technologies that would provide real-time information related to scofflaws and stolen vehicles. This could include installing on-board computers in PEO scooters for access to abandoned vehicle database.
- Consider PEO use of video license-plate recognition technology that can track overtime vehicles, stolen cars, abandoned vehicles, and other parking infractions.

4.3. Handling of Scofflaws

Webster's defines "scofflaw" as "one who scoffs (or jeers) at the law." In parking terms, the scofflaw is one who is repeatedly ticketed for parking violations, but does not pay the fines. The scofflaw is a major issue in most cities because they make the parking management strategies less effective, and because of the lost revenue associated with lack of payment.

4.3.1. Existing City Practices

The City of Seattle currently impounds vehicles that have five or more violations. The license-plate numbers of scofflaws are downloaded onto the handheld citation units based on information received from Municipal Court. Once identified, the PEO then writes a scofflaw ticket and calls in for an impound. The tow companies often are able to tow the vehicles within one hour. There is no additional charge to the violator for the scofflaw violation (since SPD's current handheld units do not allow two violations to be written on one ticket, so separate tickets are issued.) Once impounded, the violators do have to pay the towing and potential storage fees. Only the registered owner can get a car released after an impound.

4.3.2. Experience of Other Cities

Vancouver. Vancouver's PEOs have access to extensive information about the vehicles they encounter through their handheld computers. When a Vancouver PEO encounters a vehicle with five or more outstanding tickets that are being ignored (e.g., no court date has been set), the PEO may order the vehicle to be towed. Approximately 30 vehicles per day are towed for this reason.[96]

Palo Alto. Palo Alto is authorized to impound vehicles with five or more unpaid parking tickets. The owner of the vehicle is responsible for towing costs in addition to unpaid fines and any overdue penalties that apply. Palo Alto PEOs use handheld computers that allow them to identify scofflaws as they enter their license plate numbers. Palo Alto also deals with scofflaws by filing liens against certain license plate numbers with the California Department of Motor Vehicles. Drivers are not able to renew their vehicle registrations until all tickets associated with their license plate number have been paid. [97]

Portland. The City of Portland has implemented a ticket collection system in which the State Department of Revenue checks overdue ticket databases before issuing any state income tax refunds.[98]

Chicago. The City of Chicago is currently offering a period of amnesty for violators with under $5000 in unpaid tickets. Between September 3, 2002 and October 4, 2002, scofflaws may pay their parking fines without additional overdue penalties. After October 4, 2002 the City is lowering the number of violations for boot eligible vehicles to three unpaid tickets. [99]

San Francisco. In extreme cases the City of San Francisco is able to put a lien on a scofflaw's paycheck for unpaid parking tickets. [100]

Charlotte, NC. In Charlotte, PEOs are able to boot vehicles that have three or more parking tickets that are 90 days or more overdue when they are parked illegally. The PEO is able to access information about unpaid tickets via the handheld computer. Booted vehicles are left with a tag displaying the total amount that must be paid prior to the removal of the boot device. [101]

Denver. PEOs in Denver are authorized to act not only on parking scofflaws, but on those who have ignored photo radar speeding citations. Those who are booted are responsible for any fines owed, plus $50 for booting and $20 for personal service. [102]

Wisconsin. The State of Wisconsin's Traffic Violation and Registration Program assists participating jurisdictions to collect unpaid ticket revenues. Violators are not allowed to renew their vehicle registrations with unpaid tickets. In some cases the current registration may be suspended immediately.[103]

4.3.3. Recommendations

Based upon review of the City's current practices and those of other cities, the following change to Seattle's means of handling scofflaws is suggested.

- Consider other means of impounding vehicles of repeat offenders. Devices such as the "Denver Boot" are useful to send deterrent messages to other potential offenders and violators do not need to wonder what has happened to their car when it is missing from their curb spaces.

- Require payment of all outstanding tickets before an impounded car will be released.

- Work with State Department of Licensing to require payment of outstanding tickets before vehicle licenses can be renewed.

4.4. Abandoned Vehicles

Abandoned vehicles are an ongoing problem in Seattle, not only because such vehicles use precious parking in dense neighborhoods, but they can be an eyesore and potential safety hazard. The need to remove abandoned vehicles from City streets has been raised by many neighborhood and business groups.

4.4.1. Existing City Practices

SPD currently receives thousands of calls each month with reports of abandoned vehicles. These calls are hand-logged by PEOs who are taken off routine patrol to answer phones and log messages. PEOs investigate more than 4,500 leads each month. The PEOs must post a notice on each vehicle and then wait 72 hours before calling a private tow-truck company (the time-limit was established in 2000 by City Ordinance 120097). Because of other duties, it may take longer than 72 hours to return to an abandoned vehicle. After the vehicle has been tagged, a tow company has 48 hours to remove the vehicle. Junk vehicles, which are defined by SMC 11.14.268 as being extensively damaged, with a fair-market value of less than $500, and not having current vehicle licensing, are not subject to the 72-hour limit.

Once impounded, the tow contractor sends the owner a notice of impound and impending sale at auction. If the car is not picked up by the owner within 45 days, the car is auctioned to the highest bid (which can be as low as $5). Many vehicles are purchased at auction for parts. These are dragged onto the street where the parts are removed and the car is once again abandoned and the cycle begins again.

A new state law was passed in June 2002 (RCS 46.12.102) to improve the accountability for vehicles bought at auction. Under this new law, the tow operator selling the vehicle at an abandoned vehicle auction sends an abandoned vehicle report (AVR) to the Department of Licensing, which transfers ownership to the buyer at an auction. This allows the new owner of a vehicle to be tracked if the vehicle is again abandoned.

4.4.2. Experience of Other Cities

This section reviews the way in which several other jurisdictions deal with abandoned vehicles.

Portland. In Portland any vehicle that remains parked in the public right of way for more than 24 hours is subject to citation and/or towing. The City of Portland investigates all reports of abandoned vehicles. The City allows abandoned vehicles to be towed after 72 hours without prior written notice to the owner. When a vehicle without current registration and/or inoperable condition is found, a warning is placed on the vehicle indicating that it will be towed. If the vehicle remains after 72 hours it is ticketed and towed and the owner is notified in writing.[104]

Detroit. The City of Detroit kicked off its “Motor City Makeover” in April 2002. The ten-week cleanup effort included the removal of abandoned vehicles throughout the City. Inoperable vehicles and those without license plates were tagged; if they remained in place after 48 hours they were towed by the Detroit Police Department’s Abandoned Vehicle Task Force. During the cleanup effort approximately

150 tow trucks were mobilized to remove abandoned vehicles. Towed vehicles were only held for 20 days before going up for auction in order to conserve storage space for newly towed vehicles.[105]

Chicago. The City of Chicago contracts with a private towing company to tow abandoned vehicles to specific auto pounds. The City imposes a fine of $60 for an abandoned vehicle. In addition, if the vehicle is towed the owner must pay $150 as a towing fee, plus $10 per day for the first five days of storage and $35 per day for the sixth through fifteenth days of storage. After the fifteenth day of storage the City auctions off the vehicles or sells them for scrap.[106]

Sacramento. In 1991, the Sacramento Abandoned Vehicle Service Authority (SAVSA) was created to assist in removing abandoned vehicles in Sacramento County and several local municipalities, including the City of Sacramento. The authority is funded by a $1.00 surcharge on vehicle registrations, collected by the Department of Motor Vehicles. SAVSA considers a vehicle to be abandoned if it is parked on street and has not been moved in three days; if it is parked on-street or in a driveway and is not in operating condition; if it is parked on dirt or a lawn; or if it is parked and does not have a current license or vehicle registration.

When a citizen reports an abandoned vehicle, the local jurisdiction investigates the claim. Registered owners have three days to move an abandoned vehicle parked on-street and 10 to 14 days to remove abandoned vehicles parked off-street, depending on the specific jurisdiction. After the appropriate time period has elapsed the vehicle is towed. [107]

Philadelphia. The Philadelphia Police Department's Abandoned Vehicles Unit considers a vehicle to be abandoned when one of the following conditions is met: the vehicle is inoperable and has remain parked on-street for 48 hours; the vehicle has been illegally parked on-street for 48 hours; the vehicle has been parked on-street and does not have a current license or vehicle registration; or the vehicle has been parked on private property without the owner's consent for 48 hours. If the vehicle presents a health or safety hazard or the registration and inspection sticker have been expired for over 90 days the vehicle may be towed immediately. Otherwise, the Police must notify the owner that he or she has eleven days to remove the vehicle. If the vehicle is not moved it is towed. Philadelphia citizens are provided an online form on which to report abandoned vehicles. [108]

4.4.3. Recommendations

- Develop a database, possibly integrated with GIS, to track abandoned vehicle reports. Use the database to also track when these vehicles are tagged by PEOs.
- Renegotiate contracts with tow companies to shorten the response time for impoundment.
- Consider contract provisions that allow junk vehicles to be taken directly to wrecking yard so that they do not return to the street after auction.
- Review existing ordinance that requires 72 hours before an abandoned vehicle can be impounded to determine if a shorter limit is needed.
- Consider new procedures for the Municipal Court to track owners of abandoned vehicles using provisions in the new state law.

4.5. Enforcement Revenue

Parking enforcement results in revenues through the imposition of fines for violations, penalties for non-payment of fines, and towing/storage fees.

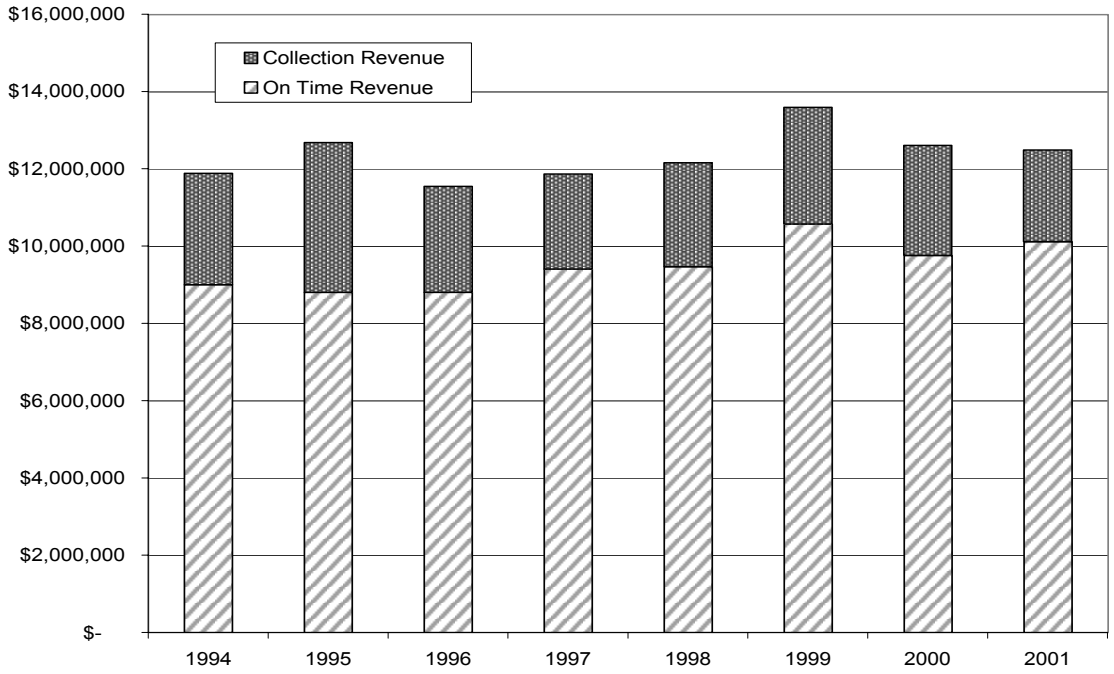
4.5.1. Existing City Practices

Parking fines are established by City ordinance, and are listed in the Seattle Municipal Code. PEOs and commercial vehicle enforcement officers in SDOT are authorized to write parking tickets for various infractions. Uncollected or challenged tickets are referred to the Municipal Court. Parking fines for various infractions are summarized later in Table 10. Most of the fines range from $25 to $44, with the exception of disabled parking permit infractions, which are $265 for unauthorized use or unlawfully obtaining a disabled parking placard to $500 for providing false information to obtain a disabled parking placard. Payment through the Internet is available at www.cityofseattle.net/courts/ticket/ticketinformation.htm

As off-street parking costs have increased in Seattle, the cost for parking is approaching the cost of the fine to illegally park. During special events, such as the baseball playoffs, the cost for parking has exceeded the cost of most fines. Coupled with the potential of actually getting a ticket, many drivers elect to illegally park and take their chances.

Enforcement revenues were provided by the City of Seattle's Department of Finance. Revenue data are divided into "on-time revenue" and "collection revenue," which are those payments made through the Municipal Court. Since 1994, collections have been relatively steady, averaging about $12 million per year. Historic enforcement revenues are shown on Figure 6.

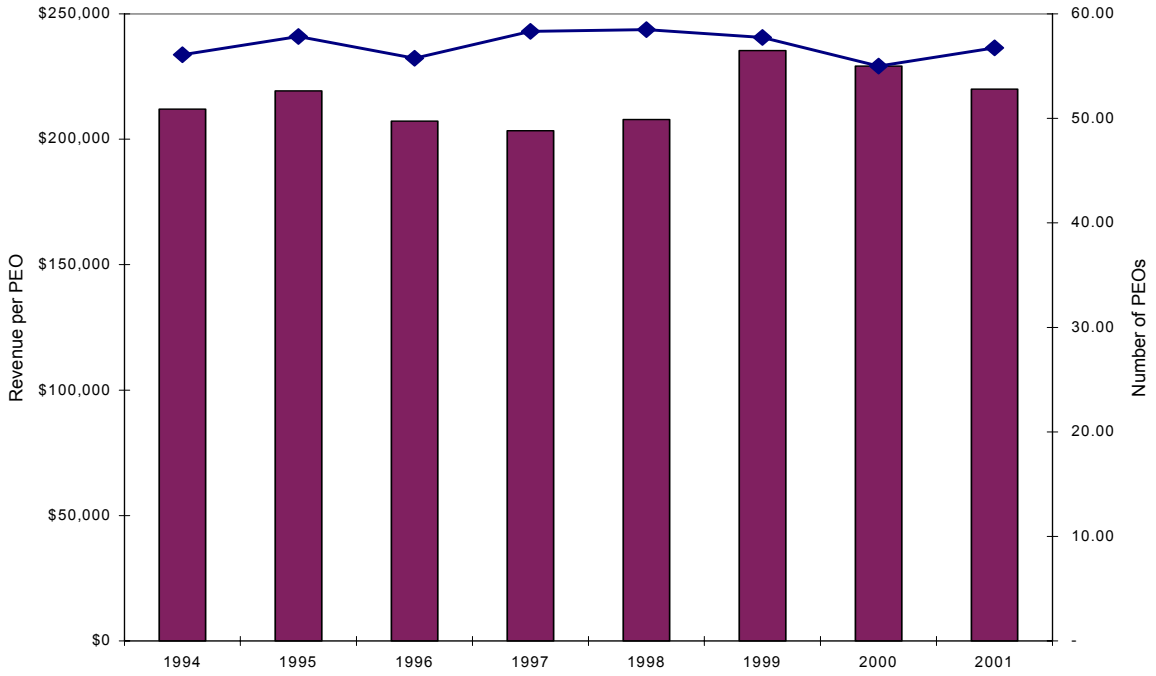
Figure 6. Enforcement Revenues



Source: City of Seattle Department of Finance, August 2002

The revenue data were also used to determine the revenue per PEO. The actual number of assigned PEOs for each year were used in this calculation. Figure 7 shows that the revenue per PEO has varied substantially over the years, but ranged from about $205,000 to $235,000 per PEO. In 1999, the average cost per PEO was $47,500. There are also first-year costs for scooters and other equipment. Thus, PEOs more than pay for themselves.

Figure 7. Revenue per PEO



Source: City of Seattle Department of Finance, August 2002.

The above figure shows that additional PEOs does not necessarily translate to more revenue. How the PEOs spend their time is a better indicator. As previously discussed, the percentage of total time spent on routine patrol (the time spent in the field enforcing parking) has decreased steadily from a high of about 61% in 1994 to about 50% in 2000 and 2001. If more PEOs are added to SPD, it is likely that the percentage of time spent on enforcement will increase since the time needed for traffic control is relatively constant.

In 2001, approximately 23% of all tickets written in the City of Seattle were sent to collections, meaning they were not paid or dismissed. This amounts to over 100,000 tickets. The average ticket value for on-time collections is approximately $32.25 per ticket. Thus, these tickets have a value of approximately $3.2 million.

If tickets are sent to collections, a collection agency fee is added on (currently 32.45%) and kept by the agency. Interest collected by the agency is split 75% to the City and 25% to the agency. The court receives 100% of the amount of the fines & fees owed the court when paid. Of the tickets sent to collections, 27,326 (about 27%) had been paid as of August 30, 2002, and 221 had been canceled after protest and research. The low percentage of tickets paid after they are sent to collections combined

with the increased cost of collections means that the City realizes on a fraction of the revenue on these unpaid tickets.

4.5.2. Experience of Other Cities

Fines for various parking infractions were obtained from other comparable cities. These are summarized in Table 10. The City of Seattle's fines for expired meter, over time limit, and commercial parking infractions are similar to other cities. However, Seattle's fines for double-parking and parking in a no parking zone are much lower than for other cities. Both San Francisco and Chicago have differential fine systems for inside and outside the CBD.

Table 10. Fines for Parking Violations in Selected Jurisdictions

	Seattle [a]	San Francisco [b]	Portland [b]	Boston [b]	Chicago [b]
Expired Meter	$25	$35 – CBD $25 – Outside CBD	$16	$25	$50 – CBD $30 – Outside CBD
Over Time Limit	$25	$35 – CBD $25 – Outside CBD	$16	$25	$50 – CBD $30 – Outside CBD
Parking in a commercial loading zone without a permit	$44 comm. zone $28 truck zone	$50	$40	$30	$50
Parking in a disabled zone without a permit	$265	$275 (CA law)	$190	$75	$150
Abuse of a disabled permit	$265 or $500 [c]	$500 & confiscation of placard	$190 (second violation, $450)	NA	NA
Parking in a residential zone without a permit	$44	$33	$40	NA	$50
Abuse of residential permit	$44	$23	$50	NA	NA
Double Parking	$28	$50	$40	$45	$30
Parking in a no parking zone	$28	$50	$40	$40	$50

a City of Seattle Municipal Code. SMC 11.76.020 – meter time limit; SMC 11.72.260 – overtime at time-limit sign; SMC 11.72.075 – restrictions in commercial load zone; SMC 11.74.020 – truck load zone, commercial vehicle; SMC 11.23.400 – unauthorized use of a disabled placard; SMC 11.23.400 – unlawfully obtaining a disabled parking placard; SMC 11.23.400 – false information in obtaining disabled parking permit; SMC 11.72.351 – Restricted zone; SMC 11.72.100 – double parked; SMC 11.72.300 – Peak hour restriction.

b Sources for other Cities: City of San Francisco [109], TheBostonChannel.com[110], City of Chicago Department of Revenue[111], City of Portland[112]

c The fine for unauthorized use of a disabled placard or unlawfully obtaining a disabled parking placard is $265. The fine for using false information to obtain a placard is $500.

NA = Not available or not applicable.

4.5.3. Recommendations

Enforcement revenues could be increased in several ways:

- Increase the number of PEOs, which should increase the number of tickets written.
- Increase collection of unpaid tickets through increased enforcement of scofflaws.
- Review current fee structure, and confirm the fees are high enough to be a disincentive to illegal parking.
- Consider differential infraction fees for downtown versus other areas of the City.

5. PARKING REVENUES

Several of the recommendations in this study could increase City revenues. Table 11 briefly outlines these changes and describes how gross revenues could increase. The figures given here represent planning-level revenue estimates; more analysis is needed to determine how costs would affect the net revenue of these programs.

Table 11. Potential Parking Revenues Associated with Parking Management Recommendations

Element	Revenue Associated with Change	Potential Increase in Gross Revenue
Meter Technology	Several cities have experienced a substantial increase in parking revenues by changing from single-space meters to pay-and-display meters. Toronto, for example, experienced a 30 to 40% increase in meter revenues without an increase in the meter rate. Portland expects at least a 15% increase in revenue.	A 40% increase = $3.9 million/year A 20% increase = $1.9 million/year
Meter Rates	Increase 2-hour meter rates by $0.50 per hour in downtown area	$1.4 million/year
Hours of Operation	Extend meter hours to 10:00 P.M. Could use a lower meter rate for hours after 6:00 P.M. (Assumed 80% utilization.)	$470 per meter/year at $0.50/hr $940 per meter/year at $1.00/hr $1,410 per meter/year at $1.50/hr
Sunday Operation	Enforce some meters on Sunday (e.g., downtown Seattle retail core.)	$520 per meter/year at $1.00/hr
New meters	Convert time-limit signs to 2-hour meters in neighborhood business districts (assume current turnover and collection rate per meter).	$ 1,100 per meter/year at $1.00/hr
Meter hoods	Increase fees for "blue" service and "red/yellow" on-street meter hoods. ▪ Blue: increase to $1200 (½ market rate parking). Assume 520 permits at $1,200 per year ($500 more than current annual rate). ▪ Green/Red/Yellow: increase lost meter revenue charge to $12/meter/day.	▪ Blue meter hoods: $230,000/year ▪ Green/Red/Yellow meter hoods: $900,000/year
Residential Permit Fees	Increase fees for residential permits. The current fee is $27 for two years.	$540,000/year at $27/vehicle/year $160,000/year at $35/vehicle for two years
Carpool Parking Permit Fees	Increase fees for carpool permits to market rate. Assume 758 permits at $600 per quarter ($300 more per quarter than current rate).	$910,000/year
Valet Parking Zone Fee	Charge fee for valet curb space.	$1,000 to $1,500 per space per year in lost revenue at current meter rates.
Increased enforcement	Increase PEOs and hours of parking enforcement	$220,000/PEO/year minus additional labor and equipment costs.

Element	Revenue Associated with Change	Potential Increase in Gross Revenue
Reduce Scofflaws	Collect higher percentage of uncollected ticket revenue. About 100,000 tickets are sent to collections each year (about 25% of all tickets), and only about 25% of these are paid.	$32.50 average per collected ticket.
Ticket Fines	Increase fines for tickets and/or adopt differential fines for inside and outside of CBD	A $5 increase in fines would result in approximately $1.25 million based on 250,000 tickets paid in the year 2001 for the entire city. No information available to determine how differential fees would affect gross revenues.

6. GOVERNANCE

6.1.1. Existing Practices

Five City departments currently oversee parking at the City of Seattle: SDOT manages on-street parking, Department of Executive Administration-Treasury Office (formerly Executive Services Department-ESD) collects parking meter revenue; DCLU regulates off-street parking, through the Land Use Code; the Department of Fleets and Facilities (also formerly a part of ESD) contracts with parking operators and manages City-owned off-street public parking (e.g., SeaPark Garage and Pacific Place Garage), and SPD provides on-street parking enforcement. Staff from these departments, together with staff from the Department of Finance, Department of Neighborhoods and other staff as necessary, meet twice monthly to discuss parking management issues. This communication between departments has proven helpful. In particular, SPD has stressed the importance of having adequate coordination with SDOT regarding the addition of meters, residential parking zones, and other parking regulations.

6.1.2. Experience from Other Cities

Several cities interviewed for this project have single departments or an authority that manage all aspects of parking. While this study did not conduct an exhaustive search of organizational structures, the experiences from other cities offer insights into how the City of Seattle might improve communication, decision-making and efficiencies of parking management.

Boston. The Boston Transportation Department is responsible for both on-street and off-street parking management, including developing and updating curbside parking regulations, maintaining signs and meters, enforcing curbside regulations, and processing parking tickets and holding hearings. Its Off-Street Parking Division maintains and operates surface parking facilities in neighborhood commercial districts and regulates off-street parking and transportation demand management programs in new development (comparable to Seattle's Land Use Code parking requirements).[113]

Berkeley. Currently, on-street parking is managed and enforced by three separate departments. The Berkeley Police Department is responsible for parking enforcement; the Finance Department handles collection from meters; and the Public Works Department installs and maintains the meters. The City is considering consolidating these operations under a single department. [114]

Toronto. Prior to January 1, 1998, Toronto had a metro regional government with seven individual cities. Each city had its own way of managing and enforcing parking. In 1998, amalgamation dissolved each of the cities and a single city government was created. At this time, all parking management, maintenance, and revenue collection functions became the responsibility of the Toronto Parking Authority. The Toronto Police Department is responsible for parking enforcement. [115]

6.1.3. Recommendation

Consider consolidating management, enforcement, and revenue functions. Land use-related functions should remain with DCLU.

7. RECOMMENDATIONS

Table 12 summarizes Heffron Transportation's recommendations for parking management and enforcement for the City of Seattle. The new Policy Planning and Major Projects Division-Parking Management within the Seattle Department of Transportation will use these recommendations to create an action plan for implementation. Priorities in this plan will be established with feedback from the Mayor's Office, City Council, the Director of SDOT and other SDOT staff, other City departments, and the Study Stakeholder Advisory Committee that helped guide this study. It is expected that the overall list of recommendations could take several years to implement, and that community input would be sought on each recommendation before they are implemented.

Table 12. Summary of Recommendations

Element	Current Policy, Practice, or Procedure	Recommended Change
A. Parking Meters		
1. Installation Process	Generally requires explicit support of adjacent businesses for new meter installation contiguous with existing meters. Installation of new, non-contiguous meters requires approval by City Council.	In areas adjacent to already metered streets, allow neighborhood business groups (e.g., chamber of commerce or business improvement association) to conduct their own process and recommend installation of meters. The established process should include documented outreach and majority approval from affected businesses. For areas where meters do not yet exist, use City Traffic Engineer current authority to recommend installation of meters to City Council, based on documented considerations or critieria. Review related enforcement needs.
2. Meter Hardware	Coin-operated, mechanical and electronic meters.	Convert meters to new technologies that eliminate single-space meters and replace with one or two meter kiosks per street frontage. These include pay-and-display systems and/or pay-by-space systems. Provide systems that allow electronic payment (e.g., smart cards or credit cards). Review related enforcement needs.
3. Meter Rates	$1.00 per hour at 2-hour meters, $2.00 per hour at 15-minute and 30-minute meters.	Increase meter rates in neighborhoods where short-term off-street parking is more than twice the cost of meter parking, and/or meter turn-over is less than 85% for 2-hour meters. If electronic meters are used, consider variable parking rates (e.g., higher parking rate for midday peak periods or higher per-hour parking rates for longer periods of time).
4. Hours of Operation	Most meters are in effect from 8:00 A.M. to 6:00 P.M., except where a meter is located along an arterial where period peak parking is restricted. Meters operate from Monday through Saturday.	Allow meter hours to be extended in areas that need parking turnover in the evenings or on Sundays. Such areas would be those with a high number of restaurants and clubs, or areas affected by event parking. If electronic meters are used, consider lower parking rate for evening parking. Review related enforcement needs.

Element	Current Policy, Practice, or Procedure	Recommended Change
5. Meter Duration	The City operates 15-minute, 30-minute, and 2-hour meters.	With new meter technologies, consider longer-duration parking in areas removed from a commercial retail core to reduce all-day commuter parking, and improve enforcement. Signed durations longer than 2 hours are very difficult to enforce without such a meter. Consider longer duration parking in areas with high tourist parking needs such as along the waterfront.
6. Meter hooding	The City issues approximately 500 Blue Service Zone hoods each year, which allow service companies to use a metered space to perform services such as plumbing, electrical, machine repair etc. The cost of these hoods is $700 annually. The City will not issue more than 500 per year, and is currently at that limit, so additional requests for blue hoods are unfilled.	To lessen the abuse and misuse of blue hoods the City should: 1. Increase the annual fee for the blue service zone hoods. An appropriate rate would be full recovery of lost meter revenue (about $1,400 per year) or half the market rate for off-street parking in downtown Seattle (about $1,200 per year). 2 Increase charges related to green/red/yellow on-street parking meter hoods to account for inflation and the "true" lost meter revenue. 3. Increase the penalties for misuse of the hoods. Consider revoking the hood after three infractions for misuse. 4. Increase the number of commercial vehicle enforcement officers who enforce these rules, or involve PEOs in the enforcement of meter hoods. 5. Review hood allocation process to ensure fair access by service companies.
7. Meter hooding technology	Hoods are currently put over single-space meters.	If kiosk meter technologies are implemented, adopt a new mechanism for denoting reserved spaces for service vehicles (e.g., Portland's space delineators). If kiosk meter technologies are implemented, consider using an in-vehicle meter to control comercial-vehicle parking in conjunction with pay-and-display meters. Instead of an annual fee that is the same for all users, the cost could be based on the level of use. Frequent users of these commercial in-vehicle meters would pay more than infrequent users.

Element	Current Policy, Practice, or Procedure	Recommended Change
B. Time-Limited Parking (Signed)		
1. Sign Installation Process	Requires petition of abutting building owners or managers with 60% approval.	Allow neighborhood business groups (e.g., chamber of commerce or business improvement association) to conduct its own process and recommend installation of time-limited parking along streets that are adjacent to commercially-zones properties. Standardize format for petition. Issue new Seattle Department of Transportation practices (Division Operating Instructions) on installing time-limit signs, consistent with the Traffic Code's current authority for the Traffic Engineer to approve the installation of time-limited parking.
2. Long-Duration Time Limits	Four-hour and three-hour time limits are now allowed in some areas of the City.	Discontinue use of 3-hour and 4-hour signed parking restrictions near commercial districts because they are almost impossible to enforce. Consider use of long-duration meters instead.
3. Time Limit Abuse	Several areas of the city have time-limited parking where the average parking duration greatly exceeds the time limit.	Evaluate areas where time-limits are highly abused, and consider increasing the time-limits or installing meters.
C. Commercial Loading Zones		
1. Commercial Vehicle Definition	Commercial vehicles are defined by the City code; however, passenger vehicles that are licensed as trucks (e.g., two-letter plates) and have a City of Seattle business license can get a permit to park in commercial vehicle zones.	Eliminate ability for passenger cars to park in commercial vehicle load zones since passenger cars have other parking options. This should minimize double-parking of trucks if more load zone spaces are available.
2. Types of Load Zones	The City has truck load zones, commercial vehicle meters, commercial vehicle load zones, and load/unload zones.	On streets with high truck loading activity, consider commercial loading time limits for which trucks have exclusive access to spaces prior to 10:00 A.M., after which the spaces revert to metered parking. Retain one load space for use by trucks after 10:00 A.M.
3. Load Zone Consolidation	City will work to remove or consolidate load zones where more than one zone exists on a block.	Continue to look for opportunities to consolidate load zones or move to the ends of blocks.

Element	Current Policy, Practice, or Procedure	Recommended Change
D. Residential Parking Zones		
1. Installation Process	Requires petition of local residents with 60% approval per block before SDOT will consider creating or expanding an RPZ.	In areas with high-density residential, allow a neighborhood group (e.g., neighborhood planning committee or community council) to recommend the establishment of an RPZ. In lieu of a petition process, establish minimum outreach and publication criteria that would need to be met before SDOT would consider an RPZ. Consider use of a "mail-back" approval form in lieu of a petition in high-density neighborhoods.
2. Number of permits per household	No current limit to the number of parking permits a resident can obtain; they can obtain as many permits as there are vehicles registered to the address.	In areas with more permits than parking spaces, establish a permit limit per household. The limit could vary by RPZ area.
3. Fees for Residential Parking Permits	RPZ permits currently cost $27 for a two-year permit. There are also some institutions that reimburse the City for permits, which reduces the out-of-pocket expenses for residents.	Increase permit fee to cover the City's full cost to set up, manage and enforce the RPZ programs.
4. Visitor/Guest Permits	One guest permit is allowed per household. Guest permit fees range from $0 (if you already have an RPZ permit) to $27 (if you don't). The City also issues temporary permits for up to 60 days for construction, out-of-state students, and new vehicles. Temporary permit fees are $5 to $10.	Tighten restrictions on guest permits to reduce abuse. Set guest parking permit to the same rate as the permanent permit. Consider internet registration of guest vehicles with a limit on number of days the guest permit will be in effect.
5. RPZ permits for businesses	Generally businesses are not allowed permits to park in an RPZ. Businesses located within the Husky Stadium RPZ can obtain one parking permit each for use on game days.	Consider allowing businesses located within an RPZ to purchase a limited number of parking permits.
E. Disabled Parking Permits		
1. Time restrictions	The requirements for disabled parking permits are outlined in RCW 46.16.381, which states that "A local jurisdiction may impose by ordinance time restrictions of no less than four hours on the use of nonreserved, on-street parking spaces by vehicles displaying the special parking placards. All time restrictions must be clearly posted."	Consider imposing a maximum time limit of four hours on metered spaces in the downtown core. Required signage would be easier to implement if the City converts to pay-and-display or other single meter technology.

Element	Current Policy, Practice, or Procedure	Recommended Change
2. Increase enforcement	RCW 46.16.381(13) allows a law enforcement agency to appoint volunteers, with a limited commission, to issue notices of infractions for violations of the disabled parking permit laws. It also states that a notice of infraction issued by a volunteer has the same force and effect as a notice of infraction issued by a police officer for the same offense. Either a police officer or a volunteer may request a person to show the person's identification card or special parking placard when investigating the possibility of a violation of this section. If the request is refused, the person in charge of the vehicle may be issued a notice of infraction for a violation of this section. The RCW sets the parking fine at $250 per violation.	Consider establishing a volunteer enforcement patrol to enforce the disabled parking permit limits. Involve the disabled community in setting up the volunteer patrols. This could include volunteers at agencies and services that generate a high demand for disabled parking.
F. Bus Zones		
1. Bus Stop Consolidation	Metro recommends bus stop consolidation on a case-by-case basis or along corridors where service improvements are proposed.	SDOT should continue to work with Metro and other transit agencies to consolidate stops in neighborhood business districts to create additional space for on-street parking, and to find the most appropriate layover locations.
2. Bus Stop Length	Metro often requests longer bus stops to accommodate articulated buses, and in some cases more than one bus at a time.	Where longer transit stops would remove on-street parking in neighborhood business districts, the need for additional length should be reviewed to make sure that it is warranted by the existing transit service.
G. On-Street Carpool/Car-Sharing Parking		
1. Location	Locations are currently scattered around the City, usually on the fringe of the business district. Many of these spaces have posted reserved times (usually between 7:00 and 10:00 A.M.) and if the space is not used after 10:00 A.M. then non-permitted vehicles may use the space.	Periodically review on-street carpool parking locations. Consider a policy that would not allow carpool parking on streets where more than 50% of the block is occupied by street-front retail space.
2. Cost of carpool parking permit	Currently set at $300 per quarter for a 2-person carpool, and $200 per quarter for 3-person carpool. In January 2003, these rates will increase to $300 per quarter regardless of the size of the carpool. Vanpools are free.	Gradually increase rates for carpools to match market rate for monthly parking in the neighborhood or lost parking revenue to the City. The current monthly parking rate in downtown Seattle averages about $200 per month, or about $600 per quarter.

Element	Current Policy, Practice, or Procedure	Recommended Change
3. Car Sharing	SDOT has designated on-street parking spaces for car-sharing vehicles in Seattle neighborhoods. On-street spaces are selected on a demonstration basis in locations that are close to a concentration of car-sharing members and where they would not detrimentally affect short-term parking needs.	Continue providing car-sharing parking on a demonstration basis. Evaluate the impacts and benefits of this parking. Codify provision of public parking spaces for car-sharing uses within the City's Traffic Code.
H. Taxi Zones/Valet Parking Zones		
1. Taxi Zones	City will install a taxi zone on a street frontage when it is requested by an adjacent business.	Review need for additional or longer taxi zones in downtown Seattle to improve taxi service and to reduce double parking by taxis at major generators such as hotels.
2. Valet Parking Zones	No current provision for valet parking zones. Businesses can now request a 3-minute passenger load zone for use by valets; however, these are not for the exclusive use by a valet. Also vehicles can be ticketed when parked for longer than 3-minutes.	Consider establishing a mechanism for a valet parking zone though which businesses can request a signed valet zone. A fee could be charged for these zones (similar to service permits) that would allow exclusive use of the zone by the permitted valet service. Vehicles parked in such a zone should not be subject to the 3-minute load zone requirements.
I. Arterial Parking Restrictions for Traffic Management		
1. Implementation	SDOT manages traffic flow on arterial corridors. As part of an area-wide study, corridor study, or transit priority improvement, the City may implement parking restrictions to improve traffic flow and/or transit service and reliability. Such restrictions could be peak hour restrictions, all-day restriction, or extensions of existing peak hour restrictions.	Establish a needs evaluation process and considerations for City Traffic Engineer to implement arterial parking restrictions related to transit speed and reliability,pedestrian and bicycle travel, and general traffic flow benefits. Continue to remove on-street parking where necessary for safety reasons, under the City Traffic Engineer's existing authority.

Element	Current Policy, Practice, or Procedure	Recommended Change
J. Parking Layout		
1. Angle Parking	Angle parking is possible on some streets that now have parallel parking. A petition process, with at least 60% approval, is required for angled parking.	Establish criteria for the conversion from parallel to angle parking. Detail locations where such conversion should not be performed such as streets where the sidewalk is adjacent to the curb, and where traffic congestion or truck loading needs would be compromised. Back-in angle parking should be maintained as the preferred method for safety purposes. Allow business association or neighborhood community council to conduct their own process to recommend angled parking on commercial streets in lieu of a petition.
K. Information and Marketing Campaign		
1. Information	The City of Seattle distributes information about parking rules and regulations in several ways. Information about Seattle parking rules helps people know how to park legally and thus avoid getting a parking ticket. Various programs have brochures available, such as for the Residential Parking Zone program. Some information about City programs, as well as parking infraction fines is available on various City department web pages.	Provide more information about the City's parking rules and regulations on the City of Seattle web site, including a Seattle version of "10 ways to avoid getting a parking ticket by parking legally".
2. Marketing	No current program exists.	As pay-and-display meter technology and other on-street parking changes are made, incorporate a broad public education campaign to ensure that ordinary citizens are aware of the new parking controls.
L. Parking Enforcement		
1. Staffing	PEOs are currently not able to provide consistent coverage to all districts during the periods that restrictions are in force. An increase in the number of PEOs has been discussed and the authority for one unit (8 PEOs/supervisor) was given in 2000.	Increase staffing to provide consistent coverage to all districts over all time periods of the parking controls. Increase in-office administration staff to relieve PEOs of non-enforcement duties. As the number of PEOs increases, additional staff should not need to spend as much time with traffic control duties (since these duties are assumed to be covered by existing staff); therefore, the patrol time for each PEO should increase.

Element	Current Policy, Practice, or Procedure	Recommended Change
2. PEO Responsibilities	On-duty PEOs can be reassigned from enforcement activities to perform traffic control. It ranges from 25%-50% of an average PEO's day spent on traffic control. In addition, there is "lost" enforcement time spent in roll call and travel to deployment area.	Limit on-duty PEOs to ½-hour of traffic control for scheduled construction. Consider use of off-duty PEOs or other options for longer-duration traffic control needs, as can be more cost-effective to pay overtime than to incur lost enforcement revenues.
3. Deployment	Parking enforcement officers (PEOs) are currently deployed by geographic area.	Implement geographic information system (GIS)-based deployment that would better match PEO assignments to current parking restrictions. In the interim, continue to manually review deployment of PEOs.
4. Technology	PEOs use hand held ticketing devices that record infraction information.	Consider new enforcement technologies that integrate with GIS system to track parking restrictions by location. In the interim, continue to manually assess deployment to better match enforcement needs to PEO availability. Consider new technologies that would provide real-time information related to scofflaws and stolen vehicles. This could include installing on-board computers in PEO scooters for access to abandoned vehicle database. Consider PEO use of video license-plate recognition technology that can track overtime vehicles, stolen cars, abandoned vehicles, and other parking infractions.
5. Work hours	PEOs currently work 8-hour shifts, five days per week.	Consider 10-hour shifts, four days per week to reduce lost efficiencies associated with travel to enforcement area and other required non-enforcement activities (e.g., check in, roll-call, etc.)
6. New Parking Meter Technology	PEOs currently patrol meters in vehicles, which may present challenges to enforcing pay-and-display meters.	Review enforcement needs with new technology and expansion of parking controls. If the City changes to a pay-and-display meter system, PEOs would need to patrol streets by foot or other means.

Element	Current Policy, Practice, or Procedure	Recommended Change
7. Abandoned Vehicles	SPD currently receives nearly 4,500 calls (includes duplicates) per month with reports of abandonned vehicles. The PEOs must post a notice on each vehicle and then wait 72 hours before calling a tow-truck, which have up to 48 hours to impound the vehicle.	Develop a database, possibly integrated with GIS, to track abandonned vehicle reports. Use the database to also track when these vehciles are tagged by PEOs. Renegotiate contracts with tow companies to shorten the response time for impoundment. Consider contract provisions that allow junk vehicles to be taken directly to wrecking yard so that they do not return to the street after auction. Review existing ordinance that requires 72 hours before an abandonned vehicle can be impounded to determine if a shorter limit is needed. Consider new procedures for the Municipal Court to track owners of abandonned vehicles using provisions in the new state law.
8. Repeat Parking Violators (Scofflaws)	Currently, vehicles with five or more tickets can be impounded.	Consider other means of impounding vehicles of repeat offenders. Devices such as the “Denver Boot” are useful to send deterrent messages to other potential offenders and violators don’t need to wonder what’s happened to their cars when they are missing from their curb spaces. Require payment of all outstanding tickets before an impounded car will be released. Work with State Department of Licensing to require payment of outstanding tickets before vehicle license can be renewed.

Element	Current Policy, Practice, or Procedure	Recommended Change
9. Enforcement Revenues	The City's current fees are set by the Municipal Court. Fees for an infraction downtown are the same as elsewhere in the City. During special events, the cost to park in an off-site lot can exceed the infraction fee.	Increase the number of PEOs, which should increase the number of tickets written. Increase collection of unpaid tickets through increased enforcement of scofflaws. Review current fee structure, and confirm the fees are high enough to be a disincentive to illegal parking. Consider differential infraction fees for downtown vs. other areas of the City.
M. Parking Revenues	Parking revenues are derived from many sources including parking meters, RPZ permits, carpool parking permits, meter hooding permits, and payment of parking tickets.	Many of the parking management recommendation have revenue and cost implications. Evaluate all potential changes to determine impact to net parking revenue.
N. Governance	Five City departments currently oversee parking in the City of Seattle: SDOT manages on-street parking, Dept of Executive Administration (formerly ESD) collects parking meter revenue; DCLU regulates off-street parking, through the Land Use Code; The Department of Fleets and Facilities (also formerly a part of ESD) contracts with parking operators and manages City-owned off-street public parking (e.g., SeaPark Garage and Pacific Place Garage), and SPD provides on-street parking enforcement.	Consider consolidating management, enforcement, and revenue functions. Land use-related functions should remain with DCLU.

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