

TECHNICAL REPORT

UPTOWN NEIGHBORHOOD ON-STREET PARKING STUDY

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Table of Contents

1. INTRODUCTION.....	1
2. STUDY METHODOLOGY.....	3
2.1.Data Collection.....	3
2.2.Parking Utilization	3
2.3.Parking Duration, Turnover, and Compliance	4
3. PARKING SPACE INVENTORY	4
4. SURVEY RESULTS - DAYTIME PARKING	7
4.1.Subarea A (Residential).....	7
4.2.Subarea B (Shopping)	12
4.3.Subarea C (North Seattle Center)	19
4.4.Subarea D (Business)	23
4.5.Subarea E: (West Seattle Center)	27
5. SURVEY RESULTS- SONICS GAME NIGHT	33
5.1.Subarea A (Residential).....	33
5.2.Subarea B (Shopping)	33
5.3.Subarea C (North Seattle Center)	35
5.4.Subarea D (Business)	36
5.5.Subarea E (West Seattle Center)	37
5.6.Summary of Sonics Game Night Data	37
6. FINDINGS	38
6.1.Major Findings	38
6.2.Parking Utilization Summary	39
6.3.Parking Duration Summary	41
7. RECOMMENDED PARKING MANAGEMENT MEASURES	42

Tables

Table 1. Uptown Parking Inventory – Daytime Parking ¹ Restrictions	5
Table 2. Uptown Parking Inventory – Evening Parking Restrictions	6
Table 3. Load/Unload and Short-term Meter Parking Activity – Subarea A	11
Table 4. Load/Unload and Short-term Meter Parking Activity – Subarea B	18
Table 5. Load/Unload and Short-Term Parking Activity – Subarea C	23
Table 6. Load/Unoad Parking Activity – Subarea D.....	27
Table 7. Load/Unoad Parking Activity – Subarea E	32
Table 8. Parking Utilization Summary	39
Table 9. Parking Duration Summary	41

Figures

Figure 1. Study Area and Parking Inventory Subareas	2
Figure 2. Parking Utilization for One-Hour Spaces – Subarea A	7
Figure 3. Parking Duration for One-Hour Spaces – Subarea A	8
Figure 4. Parking Utilization for Two-Hour Parking Spaces – Subarea A	9
Figure 5. Parking Duration for Two-Hour Parking Spaces – Subarea A	9
Figure 6. Parking Utilization for Unrestricted Spaces – Subarea A	10
Figure 7. Parking Duration for Unrestricted Spaces – Subarea A	11
Figure 8. Parking Utilization for One-Hour Meter Spaces – Subarea B	12
Figure 9. Parking Duration for One-Hour Meter Spaces – Subarea B	13
Figure 10. Parking Utilization for Two-Hour Meter Spaces – Subarea B	14
Figure 11. Parking Duration for Two-Hour Meter Spaces – Subarea B	14
Figure 12. Parking Utilization for One-Hour Spaces – Subarea B	15
Figure 13. Parking Duration for One-Hour Spaces – Subarea B	15
Figure 14. Parking Utilization for Two-Hour Spaces – Subarea B	16
Figure 15. Parking Duration for Two-Hour Spaces – Subarea B	16
Figure 16. Parking Utilization for Unrestricted Spaces – Subarea B	17
Figure 17. Parking Duration for Unrestricted Spaces – Subarea B	18
Figure 18. Parking Utilization for One-Hour Spaces – Subarea C	19
Figure 19. Parking Duration for One-Hour Spaces – Subarea C	20
Figure 20. Parking Utilization for Two-Hour Spaces – Subarea C	21
Figure 21. Parking Duration for Two-Hour Spaces – Subarea C	21
Figure 22. Parking Utilization for Unrestricted Spaces – Subarea C	22
Figure 23. Parking Duration for Unrestricted Spaces – Subarea C	22
Figure 24. Parking Utilization for One-Hour Spaces – Subarea D	24
Figure 25. Parking Duration for One-Hour Spaces – Subarea D	24
Figure 26. Parking Utilization for Two-Hour Spaces – Subarea D	25
Figure 27. Parking Duration for Two-Hour Spaces – Subarea D	25
Figure 28. Parking Utilization for Unrestricted Spaces – Subarea E	26
Figure 29. Parking Duration for Unrestricted Spaces – Subarea E	26
Figure 30. Parking Utilization for One-Hour Spaces – Subarea E	28
Figure 31. Parking Duration for One-Hour Spaces – Subarea E	28
Figure 32. Parking Utilization for Two-Hour Spaces – Subarea E	29
Figure 33. Parking Duration for Two-Hour Spaces – Subarea E	29
Figure 34. Parking Utilization for Three-Hour Spaces – Subarea E	30
Figure 35. Parking Duration for Three-Hour Spaces – Subarea E	30
Figure 36. Parking Utilization for Unrestricted Spaces – Subarea E	31
Figure 37. Parking Duration for Unrestricted Spaces – Subarea E	32
Figure 38. Parking Utilization on Sonics Game Night – Subarea A	33
Figure 39. Parking Utilization for Unrestricted (meter) Spaces on Sonics Game Night-Subarea B	34
Figure 40. Parking Utilization for Unrestricted (signed) Spaces on Sonics Game Night-Subarea B	35
Figure 41. Parking Utilization on Sonics Game Night – Subarea C	36
Figure 42. Parking Utilization on Sonics Game Night – Subarea D	36
Figure 43. Parking Utilization on Sonics Game Night – Subarea E	37

1. INTRODUCTION

This technical report presents the inventory and findings of the December 2005 parking survey for the Uptown neighborhood. The purpose of this study is to document how often and for how long parking spaces are used in the area on a typical day. In addition, a parking demand survey was conducted on a Sonics game night. The study results were used to determine:

- the characteristics of existing single-space parking meters,
- load zone performance,
- whether and where new paid parking is appropriate, and
- whether and where an expanded residential parking zone is appropriate

The data and analysis are intended to determine if parking management techniques, including adjustments to the mix of time-limited parking and/or meters, would improve parking conditions in the Uptown neighborhood.

Full-day data collection occurred on Wednesday, December 7 and Thursday, December 8, 2005 from 10:00 A.M. to 8:00 P.M. Data were also collected on Tuesday, December 6, 2005 from 4:00 to 8:00 P.M. to determine the parking conditions during a Sonics game. There was no Nutcracker performance or other major events at the Seattle Center on the evening of the Sonics game.

The study area and inventory areas for the Uptown Parking Study are shown on Figure 1. The area was divided into five subareas for management and analysis of the data. Each subarea was given a name based on the most prevalent type of land use in that subarea; however, all subareas do have a mix of land uses. There are approximately 1,846 parking spaces in the Uptown study area.

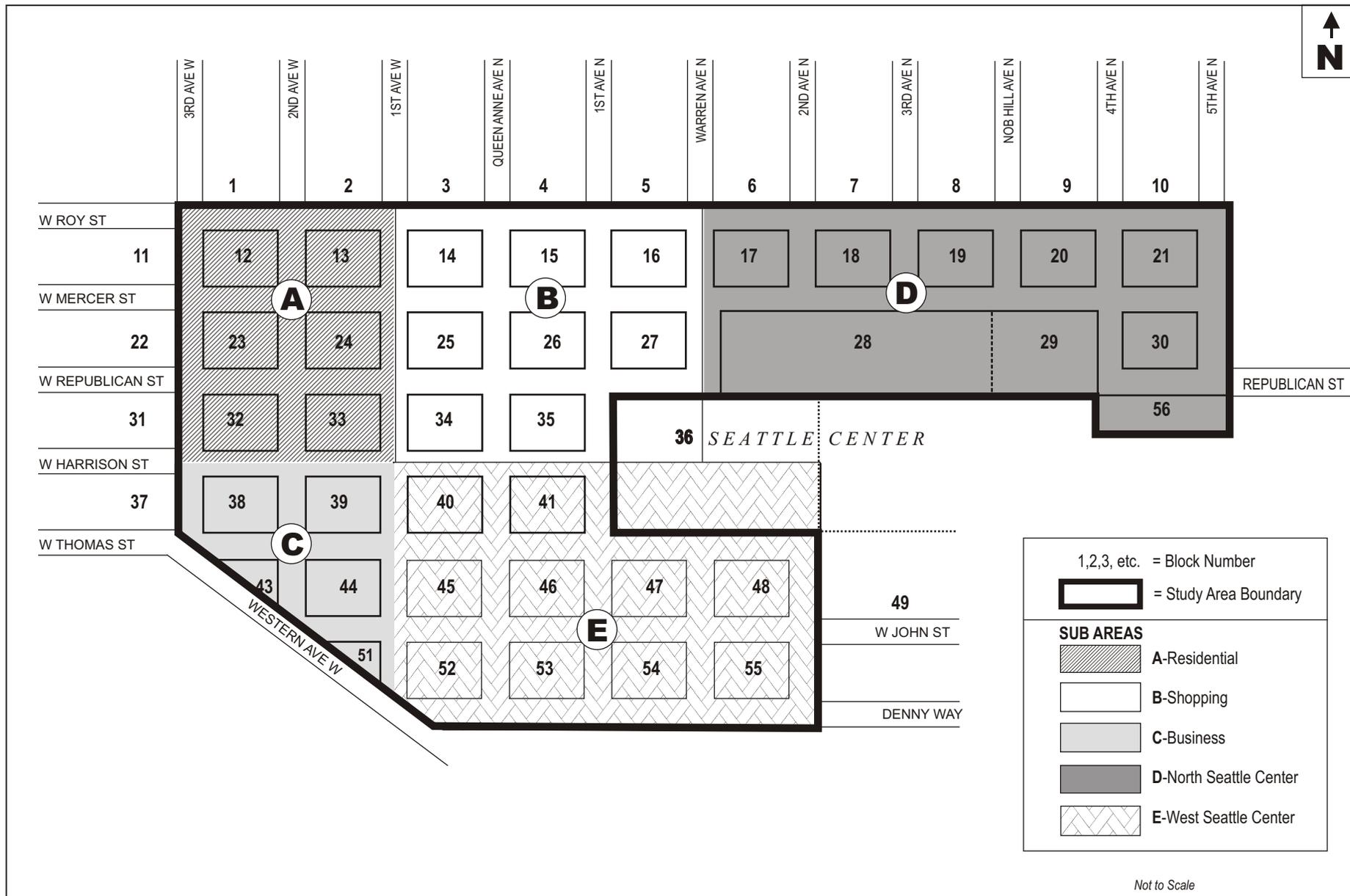


Figure 1. Study Area and Inventory Subareas
Uptown Parking Study

2. STUDY METHODOLOGY

2.1. Data Collection

The parking supply inventory and parking data collection for the Uptown neighborhood was performed by Operations Management Group (OMG), Inc. The all-day data collection was conducted on Wednesday, December 7 and Thursday, December 8, 2005, from 10:00 A.M. to 8:00 P.M. On each day, parking activity was recorded for one-half of the study area at 60-minute intervals. Parking data were also collected on a Sonics game night, Tuesday, December 6, 2005 from 4:00 P.M. to 8:00 P.M. using the same method. The Sonics played the New York Knicks that night.

Parking demand data were collected by OMG using their hand-held electronic data collection tool. A sequence number was assigned to every parking space within each map segment to ensure consistency in the data collection. The inventory and sequence numbers included all parking spaces by type, and all gaps such as bus zones, hydrants and other locations where parking is not allowed. In addition to recording vehicles parked in legally-designated spaces, the demand survey included “squeeze vehicles” on each street segment, which represent motorists who created their own space between other vehicles, at the end of the block, or in no parking zones.

The first three letters or numbers of the vehicle license plate were recorded into the hand-held electronic device during each 60-minute interval. This technique provided block-specific and area-wide utilization data in one-hour increments. Vacant spaces were noted in the manual count. All public parking spaces were counted and include load zones, bus zones, taxi zones, and specially-designated spaces such as van pool and disabled parking spaces. “Squeeze” spaces were also recorded. Visual observation indicated that there was much more squeeze parking activity in Uptown than observed in other neighborhoods such as along Westlake Avenue and Fremont.

Parking duration was calculated by counting the one-hour time periods occupied by the same vehicle. For each parking area and restriction type, the number of vehicles parked by duration was then summarized in charts. Turnover was estimated by summarizing the number of vehicles parked by duration. A high turnover rate is characterized by many vehicles parking for short periods of time. Compliance rates for one-hour and two-hour spaces were calculated from the number of vehicles parked in compliance relative to the total number of vehicles parked from 10:00 A.M. to 8:00 P.M.

2.2. Parking Utilization

Parking utilization by time of day was determined for each subarea and restriction type. The five subareas are shown in Figure 1. Within each subarea, the parking accumulation is plotted on graphs that are presented later in Section 4. The parking accumulation is presented by graphing the number of spaces occupied from 10:00 A.M. to 8:00 P.M. Parking accumulation charts for a Sonics game night began at 4:00 P.M. Each chart also shows the total number of available spaces.

The practical capacity for parking is defined at 85% utilization. It is important to provide a “cushion” in excess of necessary parking spaces to allow for the dynamics of vehicles parking (i.e., circulating in search of a space, and moving in and out of parking space). When occupancy exceeds the practical capacity, drivers will experience delays and frustration while searching for a parking space, as well as contribute to area traffic congestion while circling the block looking for parking. Practical capacity is used to determine the adequacy of a parking system. The City of Seattle considers utilization rates above about 80% to be the threshold where additional parking management techniques should be implemented. When utilization rates reach approximately 70%, the City should begin the process of

implementing parking management measures so that the measures are in place before parking reaches capacity. The City also uses parking management techniques to support the goal of reducing automobile trips, particularly for commuting. Short-term parking limits that favor retail and restaurant use are preferred to long-term parking that could be used by commuters.

2.3. Parking Duration, Turnover, and Compliance

Parking turnover is a measure of the number of vehicles that can park in a single parking space over a time period. It is a function of parking duration. High turnover rates occur when vehicles park for a short amount of time and many vehicles can park in a single space over the course of the day. Low turnover rates occur when vehicles park for long periods of time and few vehicles park in a single space during the day. Most retail, restaurant and service businesses require high turnover rates for on-street parking. The parking duration data is presented by showing the percent of all vehicles that parked throughout the day for various durations.

Parking compliance was evaluated to determine if existing parking time limits are being observed. The duration data show the compliance rate by adding the percent of vehicles parked and number of hours parked. For two-hour spaces, all vehicles parked for two hours or less are compliant and all vehicles parked for three hours or more are non-compliant. The duration data can reveal if there is unusual activity, such as numerous all-day parking in front of restaurants and retail, or a large number of vehicles non-compliant with the parking restriction type. Sections 4 and 5 describe the parking utilization, duration, and compliance for each subarea.

3. PARKING SPACE INVENTORY

The data collection effort provided a complete inventory of public parking in the Uptown neighborhood. Due to the size of the study area, Uptown was divided into subareas for analysis. Table 1 summarizes the number and type of parking spaces for each subarea. The subareas are named and identified on the map shown on Figure 1. In total, there are 1,846 parking spaces in the study area.

The parking restriction type was inventoried for each hour from 10:00 A.M. to 8:00 P.M. For the most part, changes in restriction type occur at 6:00 P.M. when restricted spaces become unrestricted spaces. There is little change in restriction type during the day and so the restriction type at 1:00 P.M. was used in the daytime analysis.

Table 1. Uptown Parking Inventory – Daytime Parking¹ Restrictions

Parking Type	Subarea A Residential	Subarea B Shopping	Subarea C North Seattle Center	Subarea D Business	Subarea E West Seattle Center	Total
Unrestricted	278	44	83	92	200	697
Meter Parking						
15-minute Meter		7				7
30-minute Meter		21				21
One-Hour Meter		18				18
Two-Hour Meter		127	2			129
Signed Parking Limits						
30-minute Signed Limit	2		2			4
One-Hour Signed Limit	23	53	30	33	85	224
Two-Hour Signed Limit	65	53	93	70	132	413
Three-Hour Signed Limit					30	30
Load/Unload						
24-Hour Load/Unload	6	15	6	11	46	84
Load/Unload	29	23	14	29	47	142
24-Hour Passenger Load/Unload	5	13	4	8	9	39
Passenger Load	4	13	3		2	22
Other Spaces		1 Load Meter 2 Motorcycle Two-hour meters 2 Taxi	4 Disabled		6 Disabled 1 VanPool	16
TOTAL	412	392	241	243	558	1,846

Source: Heffron Transportation, Inc., and Operations Management Group, Inc., December 2005

1. Parking Inventory at 1:00 P.M. reflecting daytime hours. Parking restriction type may change after 1:00 P.M. Most changes occur after 6:00 P.M.
2. Load/Unload zones change to Unrestricted at 6:00 P.M.

There are a wide variety of parking types and parking restrictions in the study area. Thirty eight per cent (38%) of the spaces are unrestricted. These spaces are concentrated in Subarea A and Subarea E (West Seattle Center). These two subareas contain 69% of the unrestricted spaces. The next most prevalent parking type is two-hour time-limited spaces that comprise 22% of all spaces. Subarea E on the south side of the Seattle Center has the greatest number of two-hour spaces. Subarea B, which has many retail and restaurant uses, contains all but two of the metered spaces, of which there are 127 two-hour, 18 one-hour, and 21 half-hour metered spaces. There is one meter at a single load/unload parking space. Parking spaces without meters are regulated by signs indicating the restriction.

There are a large number of load/unload spaces and load zone restriction types. In total there are 287 load/unload parking spaces in Uptown, or 15% of the total spaces. Many of the load zones are associated with the needs of Seattle Center and have 24-hour load/unload designations. Appendix A contains a map of parking space inventory, by block face, prepared by the City of Seattle with inventory data collected for this study. The loading zone types include: 24 Hour Load/Unload, Load/Unload, 24 Hour Passenger Load/Unload, and Passenger Load/Unload. The difference between the 24-hour designations and the simple Load/Unload designation is that the Load/Unload spaces become unrestricted after 6:00 P.M. The load/unload spaces have a 30-minute limit. A few passenger load spaces are marked with a 3-minute limit.

Two block faces had construction activity and temporarily prohibited parking. The east side of 2nd Avenue between W Mercer and W Roy Streets had the equivalent of 4 spaces eliminated due to construction. The west side of 1st Avenue W between Western Avenue and W John Street had the equivalent of 5 spaces where parking was prohibited due to construction.

The restriction type used for the Sonics game night analysis is the restriction at 6:00 P.M. when most of the restrictions are lifted. It was observed in the field that parkers destined for Key Arena began filling on-street parking spaces at 5:00 P.M. These arrivals could park at 5:00 P.M. to 6:00 P.M. and then beyond without violating the parking duration limit. Table 2 presents the summary of evening parking restrictions.

Table 2. Uptown Parking Inventory¹ – Evening Parking Restrictions

Parking Type	Subarea A Residential	Subarea B Shopping	Subarea C North Seattle Center	Subarea D Business	Subarea E West Seattle Center	Total
24 Hour Load/Unload	6	15	6	11	46	84
24 Hour Passenger Load/Unload	5	13	4	8	9	39
Meters that are not in effect (unrestricted)		173				173
Unrestricted	400	185	221	224	503	1,533
Other Spaces	1 -24 Hour Night Dep	1 Load Meter 2 Motorcycle Two-hour meters 3 Taxi	4 Disabled			11
TOTAL	412	392	235^a	243	558	1,840

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. *Parking Inventory at 6:00 P.M. reflecting evening hours. Most changes occur at 6:00 P.M., converting to unrestricted.*
- a. *Six 2-Hour parking spaces changed to "No Parking" after 5:00 P.M. Total number of spaces is six less than the 1:00 P.M. inventory.*

Miscellaneous spaces included two motorcycle meters, disabled spaces, two taxi spaces and one van-pool space. Disabled spaces were located in only the North and West Seattle Center Subareas. Squeeze spaces were noted in the data collection, but not the inventory. Squeeze spaces were not counted in the inventory, because although used, they would not be available with additional enforcement and would not contribute to the inventory. In addition, the utilization rate of squeeze spaces was below that of a legal space since not all vehicles fit in such locations and not all motorists are bold enough to park in spaces where they could be ticketed.

4. SURVEY RESULTS - DAYTIME PARKING

4.1. Subarea A (Residential)

Subarea A is in the northwest corner of the study area. This area is nominally referred to as the residential subarea because it includes a larger portion of residential units than other subareas. The subarea is located between 1st Avenue W and 3rd Avenue W, and between W Harrison Street and W Roy Street.

One-Hour Time-Limited Parking

Parking utilization for the **23 one-hour spaces** is presented in Figure 2. Utilization was 70% at 10:00 A.M., the beginning of data collection period. Utilization dropped mid-day, after 1:00 P.M. and then reached 95% by 5:00 P.M. and into the evening.

Parking duration for the one-hour spaces in Subarea A is presented in Figure 3. Parking duration is reported for the hours from 10:00 A.M. to 5:00 P.M. because after 6:00 P.M. the parking is unrestricted and no time limit applies. During the daytime, 66% of all parked vehicles were non-compliant, or parked for longer than the one-hour limit. Forty-six percent (46%) parked for two hours or less. The very poor compliance rates could be because drivers know that signed parking restrictions are difficult to enforce, or that drivers just parked in the most convenient space and stayed for the length of time needed.

Figure 2. Parking Utilization for One-Hour Spaces – Subarea A

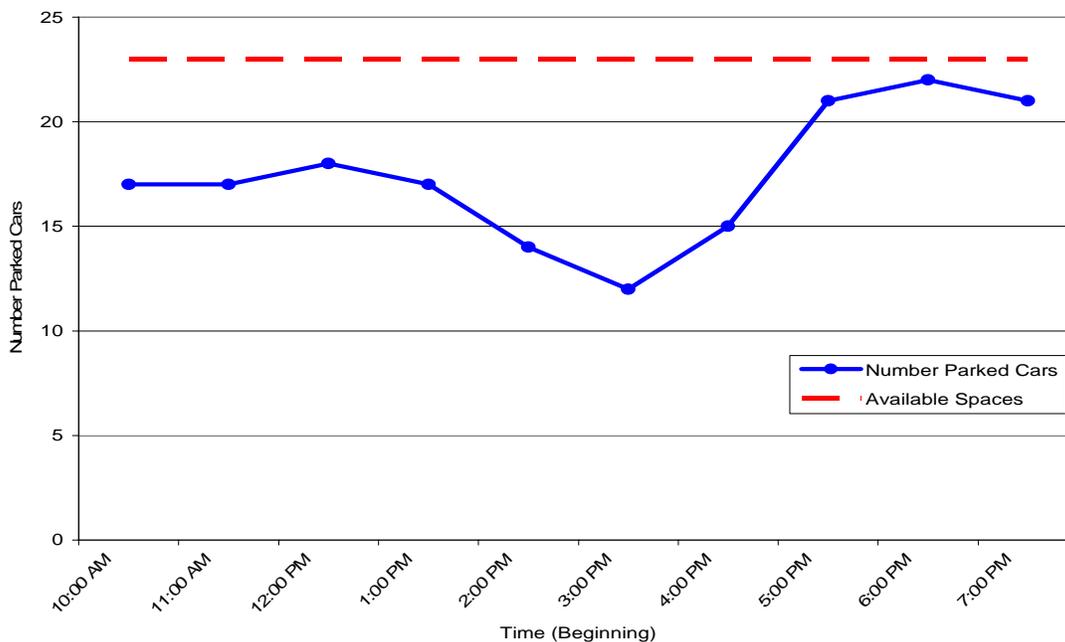
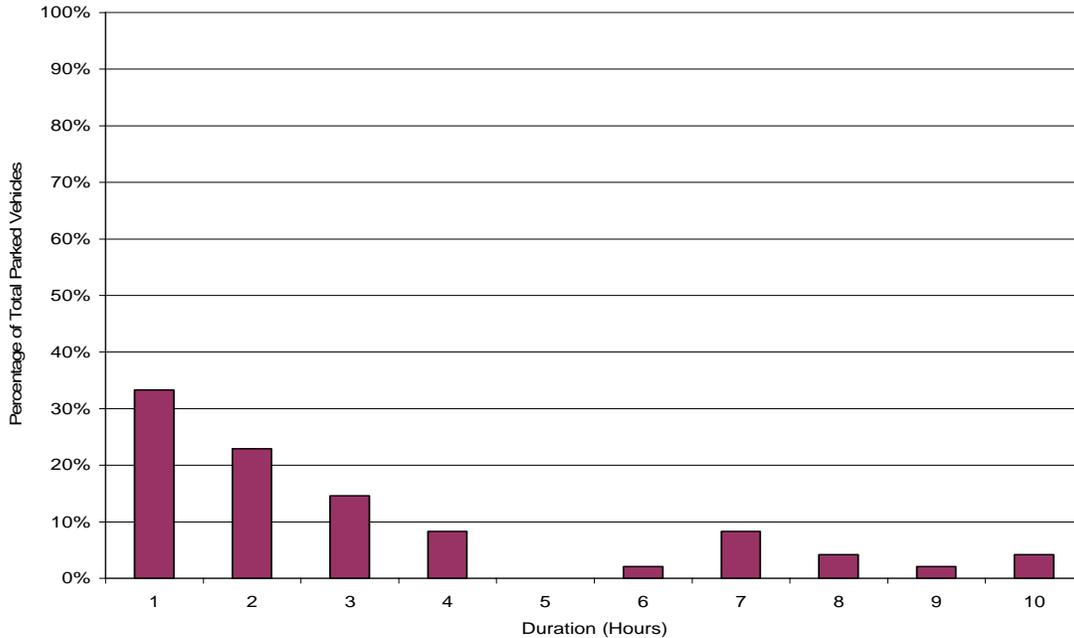


Figure 3. Parking Duration for One-Hour Spaces – Subarea A



Two-Hour Time-Limited Parking

Parking utilization for the **65 two-hour spaces** is shown in Figure 4. Parking utilization was at 75% at the beginning of data collection, at 10:00 A.M. Utilization remained at approximately 75% up to 3:00 P.M. when it dropped slightly to 65% until it increased slightly at the 7:00 P.M. count. Parking duration is shown in Figure 5. Thirty nine percent (39%) parked for two hours or less in these signed spaces. An additional 10% parked in the third hour. Sixty one percent (61%) were non-compliant and exceeded the two-hour time limit. .

Figure 4. Parking Utilization for Two-Hour Parking Spaces – Subarea A

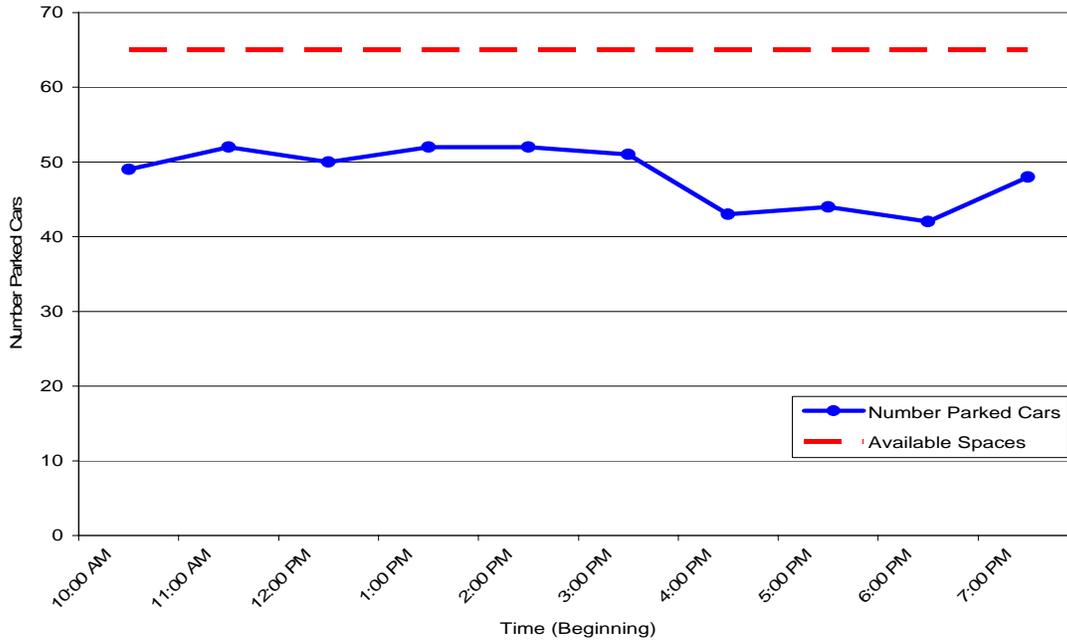
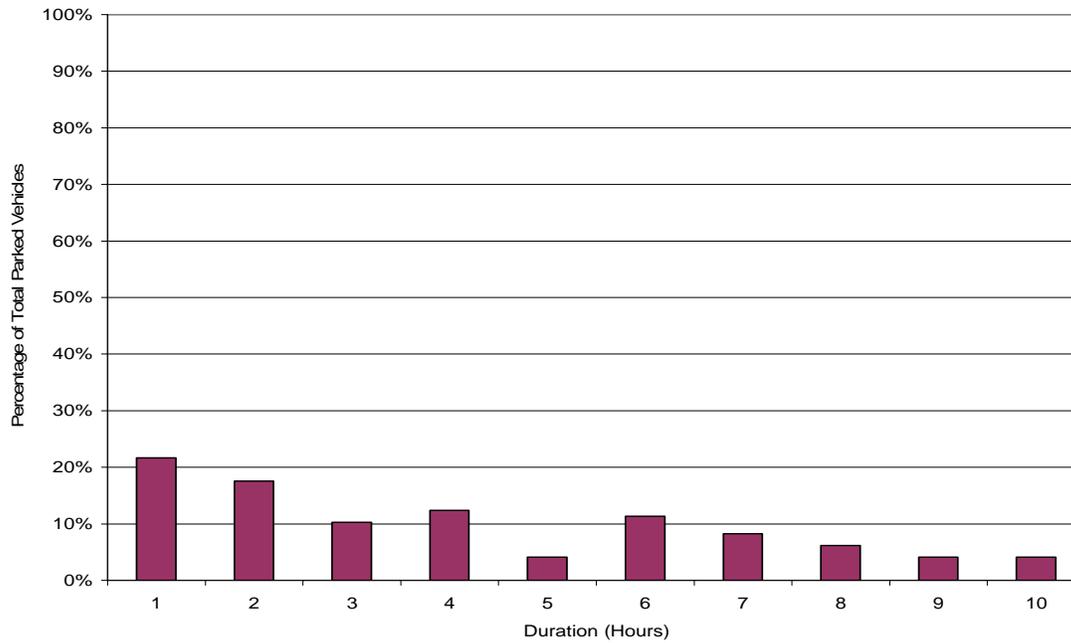


Figure 5. Parking Duration for Two-Hour Parking Spaces – Subarea A



Unrestricted Parking

There are **278 unrestricted parking spaces** in this Subarea A. Figure 6 presents the parking utilization. Parking utilization was at approximately 88% at 10:00 A.M. and stayed above 75% throughout the day. Parking duration is shown in Figure 7. The greatest number of vehicles (34%) parked for one hour or less. Cumulatively, 45% of all vehicles in this area parked for three hours or less.

Long-term parking in this area was prevalent. Approximately 17% parked for the entire 10-hour survey period. The data indicates that there are likely vehicles parked overnight and then all day related to the residential units in the subarea.

Figure 6. Parking Utilization for Unrestricted Spaces – Subarea A

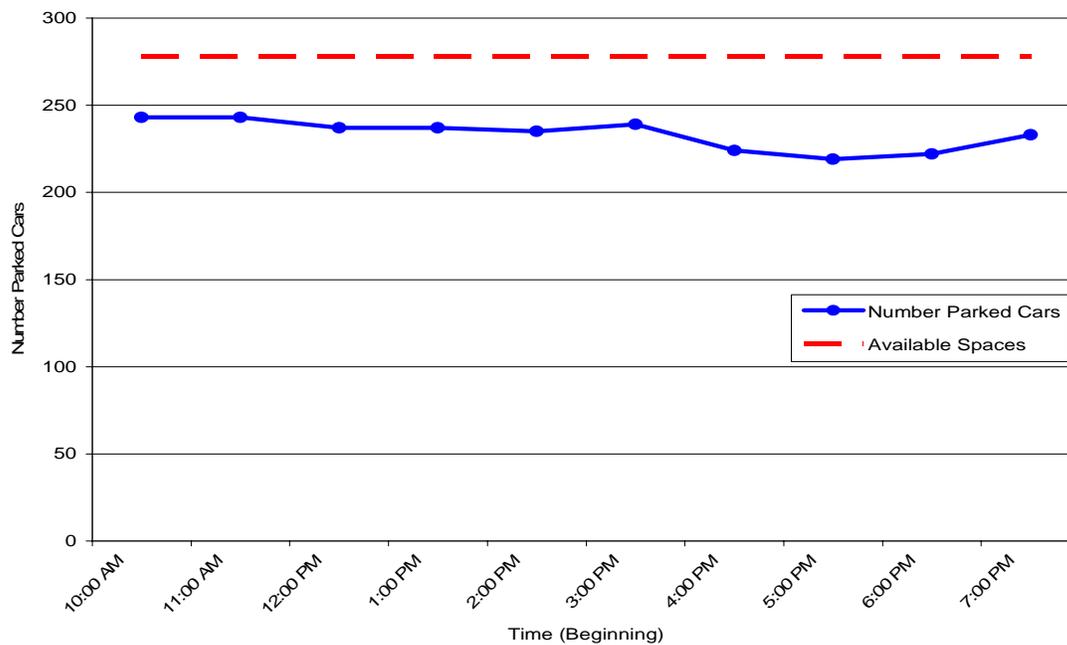
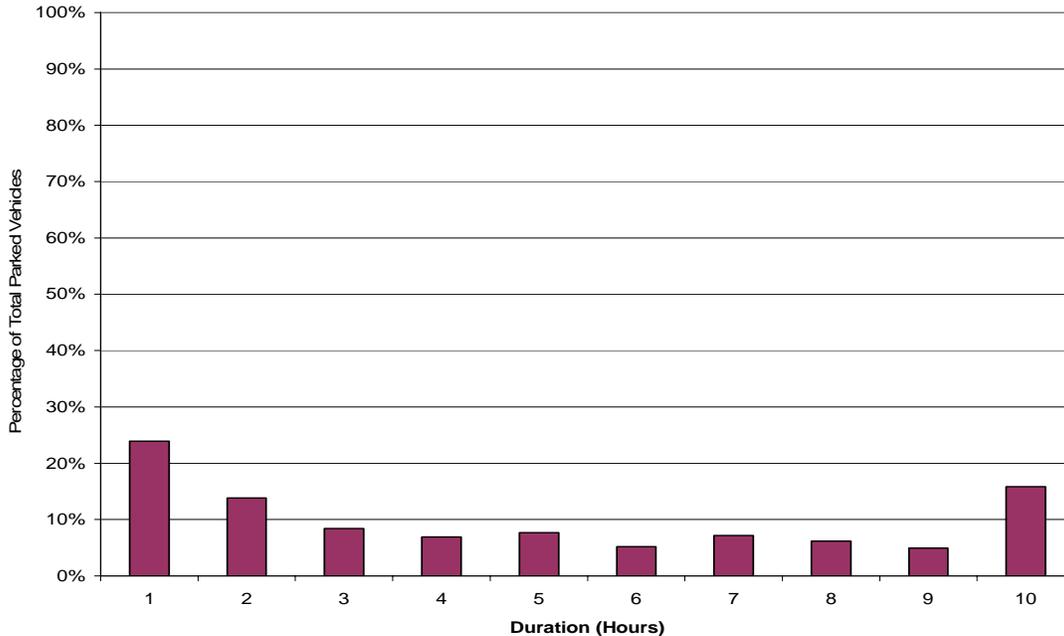


Figure 7. Parking Duration for Unrestricted Spaces – Subarea A



Load/Unload and Short-Term Meter Parking

There are four types of load/unload zones in this subarea. The load/unload spaces are restricted to 30-minute time limits. In addition, there are two 30-minute meter spaces. A summary of load zone activity is presented in Table 3.

Table 3. Load/Unload and Short-term Meter Parking Activity – Subarea A

Parking Type	Number Spaces	Average Occupancy			Total number parked	Number parked over limit ²
		10:00 A.M. to 6:00 P.M.	6:00 P.M. to 8:00 P.M.	10:00 A.M. to 8:00 P.M.		
24 Hour Load/Unload	6			2.1	5	3
24 Hour Passenger Load/Unload	5			0.9	8	1
Load/Unload ¹	29	4.5	10.0		31	10
Passenger Load/unload ¹	4	0.25	1.0		3	0
30-minute meter spaces	2	1.25	1.5		4	2
TOTAL	46					

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Restriction ends at 6:00 P.M. Total number parked and over limit is from 10:00 A.M. to 6:00 P.M.
2. Over-limit is defined as more than one hour because data collection only occurred once per hour.

The load/unload parking spaces may appear to have a low utilization, but the data collectors only passed by once per hour due to the size of the study area. This means that there could be a high rate of occurrence that the space was unoccupied at the time the data collector passed by, even though the load zone may be used appropriately and necessary for the adjacent use. There are 29 standard load/unload spaces in Subarea A. There were 10 vehicles that parked over limit (between the hours of 10:00 A.M. and 6:00 P.M.) indicating that there may be an excess of load/unload parking spaces in Subarea A.

4.2. Subarea B (Shopping)

This subarea is in the north and middle of the study area. The subarea is from Warren Ave N to 1st Avenue N and from W Harrison to W Roy Street. (Refer to Figure 1.) This subarea is nominally referred to as the shopping subarea with more commercial land uses than in the other subareas.

One-Hour Meter Parking

In this subarea there are **18 one-hour meter spaces**. The utilization of these spaces fluctuated as show in Figure 8 from two low points at 25% and 39% to two high points at 89% and 94%. The duration data, Figure 9 shows that 76% of all vehicles parked for one hour or less. One-hour meter spaces work well to encourage turnover, in contrast to the one-hour signed parking described below. An additional 15% parked in the second hour, and 5% in the third hour.

Figure 8. Parking Utilization for One-Hour Meter Spaces – Subarea B

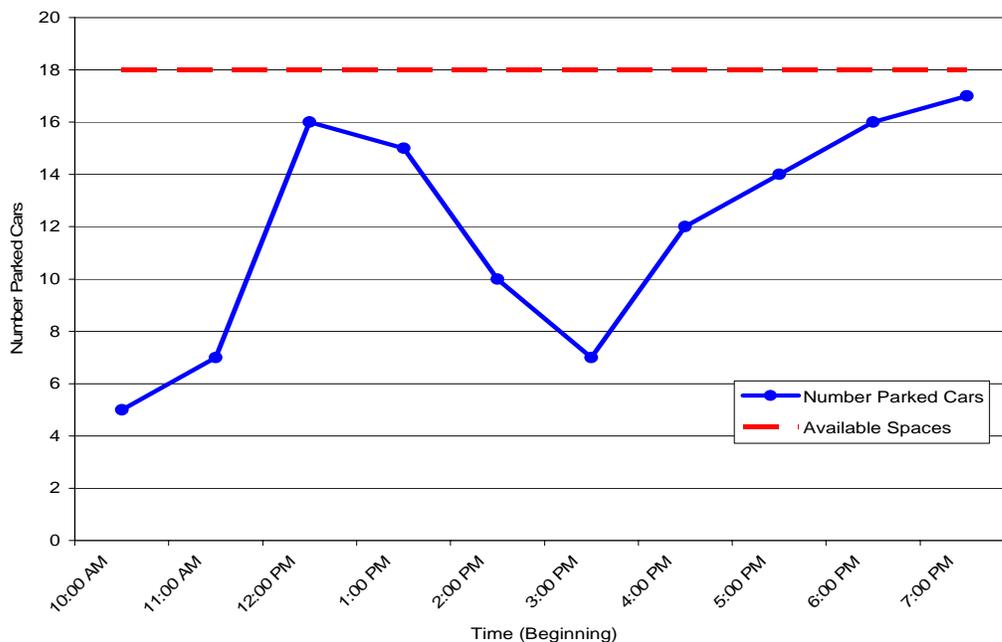
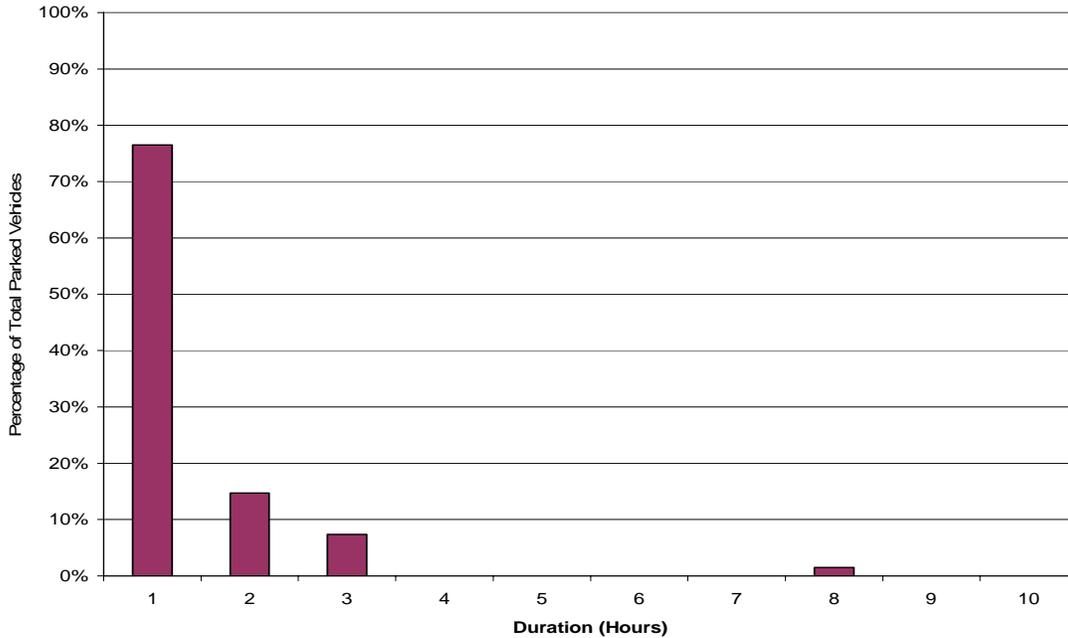


Figure 9. Parking Duration for One-Hour Meter Spaces – Subarea B



Two-Hour Meter Parking

There are **127 two-hour meter spaces** in Subarea B. The utilization fluctuated in the same pattern as the one-hour spaces, as shown in Figure 10. There were two low points and two high points. The high points occurred at approximately 12:00 P.M. and after 6:00 P.M. At noon, the utilization reached 81%. The duration data shown in Figure 11 indicates that 86% parked for two hours or less, and were in compliance.

Figure 10. Parking Utilization for Two-Hour Meter Spaces – Subarea B

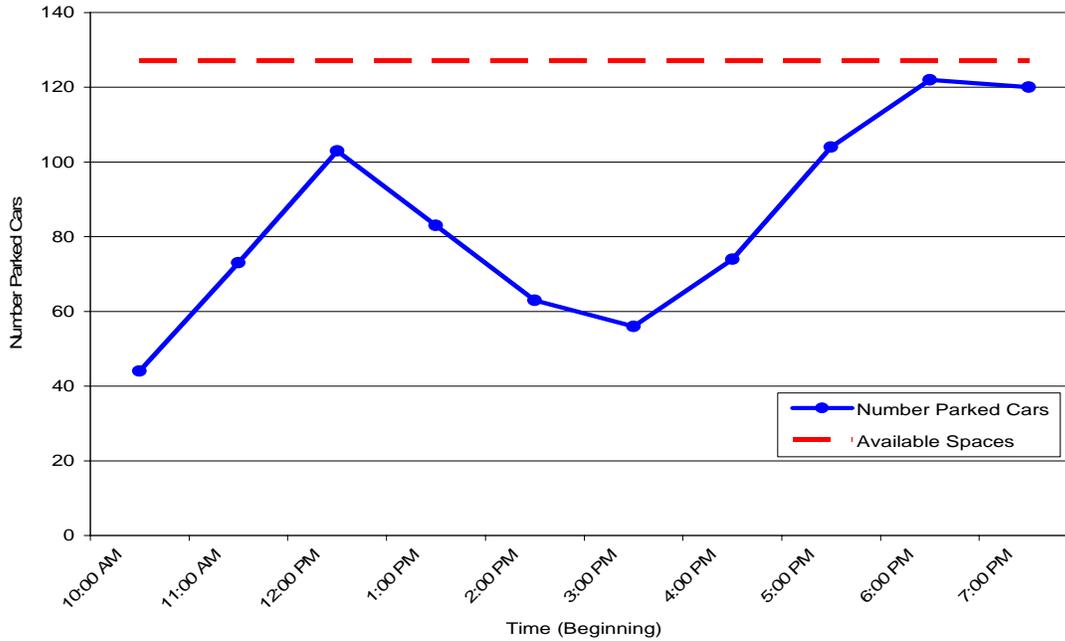
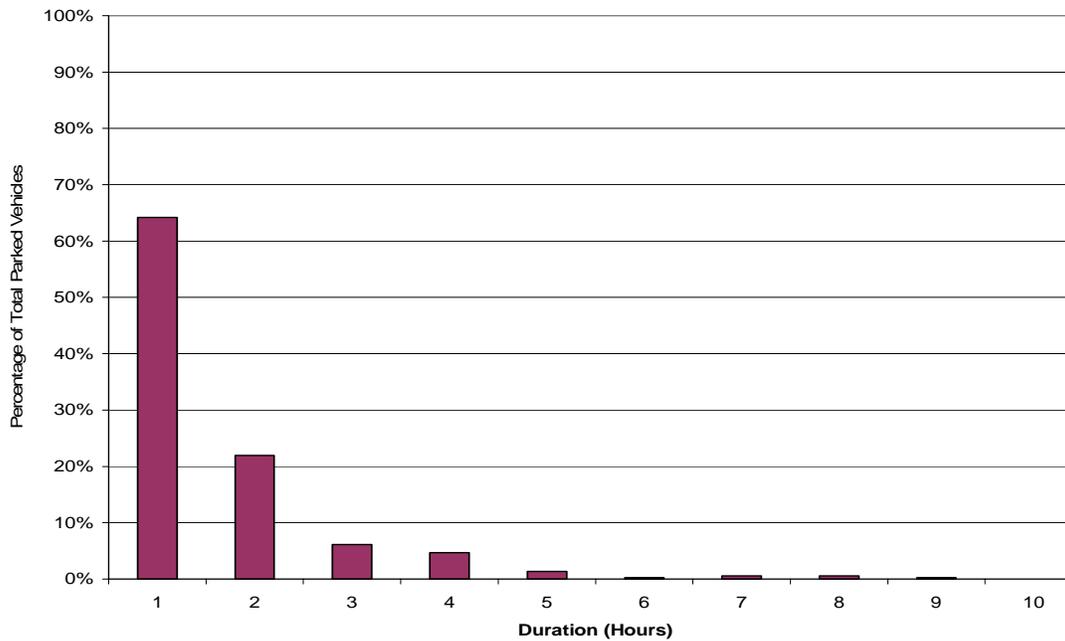


Figure 11. Parking Duration for Two-Hour Meter Spaces – Subarea B



One-Hour Time-Limited Parking

In Subarea B there are **53 one-hour spaces** for which the time limits are posted on signs. The utilization is relatively low, as shown in Figure 12, at approximately 53%, and not exceeding 75% until the restriction is lifted after 6:00 P.M. The duration chart, Figure 13 shows that only 14% of all parked

vehicles were compliant with the one-hour restriction. Seventy five percent (75%) parked for 2 hours or less, and an additional 12 percent parked for 3 hours. Both the utilization and compliance could be increased if these spaces were converted to two-hour meter spaces.

Figure 12. Parking Utilization for One-Hour Spaces –Subarea B

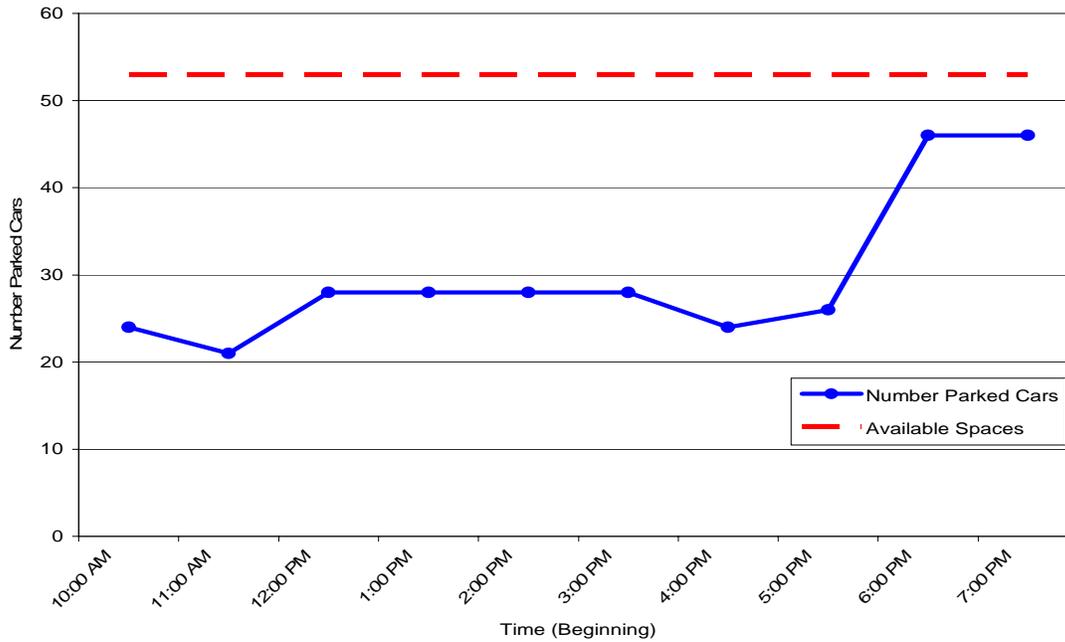
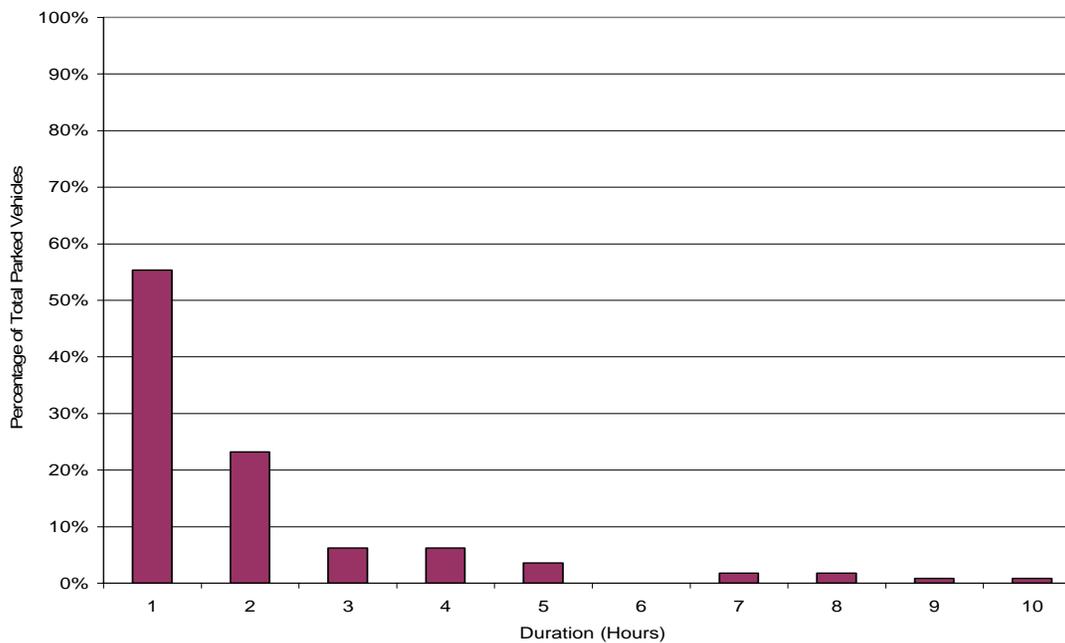


Figure 13. Parking Duration for One-Hour Spaces – Subarea B



Two-Hour Time-Limited Parking

There are also **53 two-hour spaces** in Subarea B that are marked by signed restrictions. The utilization as shown in Figure 14 is between 55% and 79% throughout the day. The duration data, Figure 15, shows that 66% parked for two hours or less.

Figure 14. Parking Utilization for Two-Hour Spaces – Subarea B

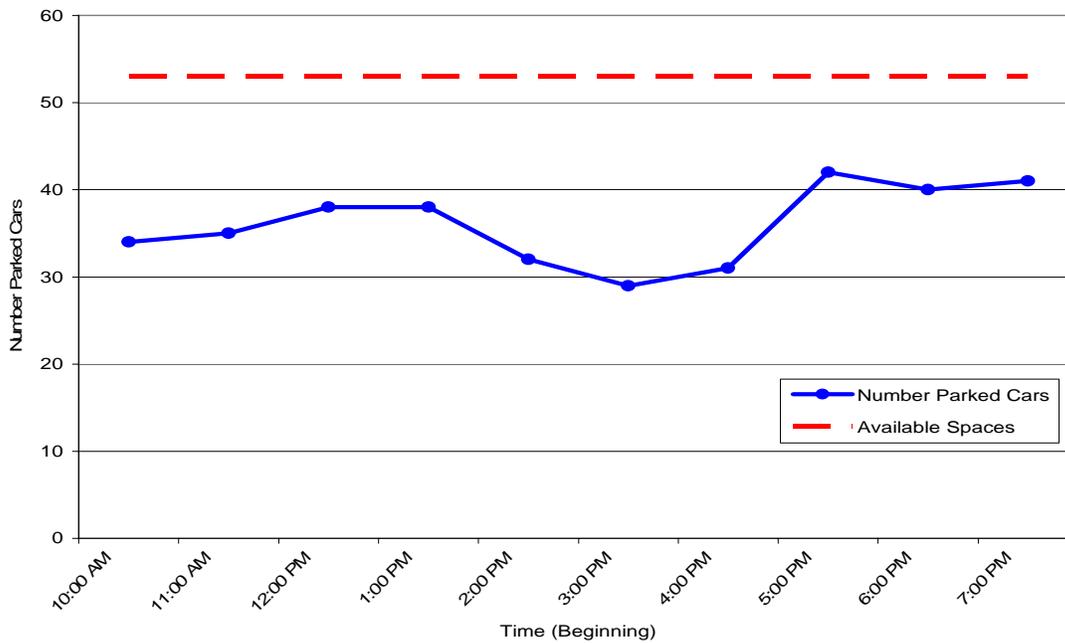
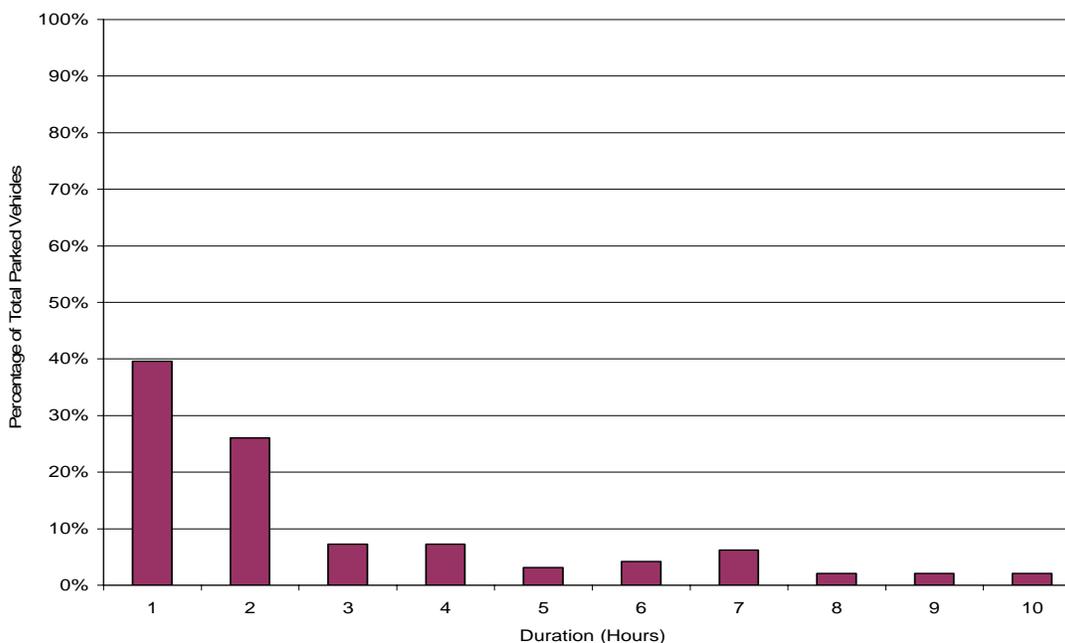


Figure 15. Parking Duration for Two-Hour Spaces – Subarea B



Unrestricted Parking

There are **44 unrestricted spaces** in Subarea B. The utilization was above 75% throughout the day, as shown in Figure 16, reaching a high of 84% at 7:00 P.M. The duration data, in Figure 17, shows that the length of time parked is fairly evenly distributed. The vehicles parked for 10 hours duration were parked from the beginning of data collection; at 10:00 A.M. to the end of data collection at 8:00 P.M.

Figure 16. Parking Utilization for Unrestricted Spaces– Subarea B

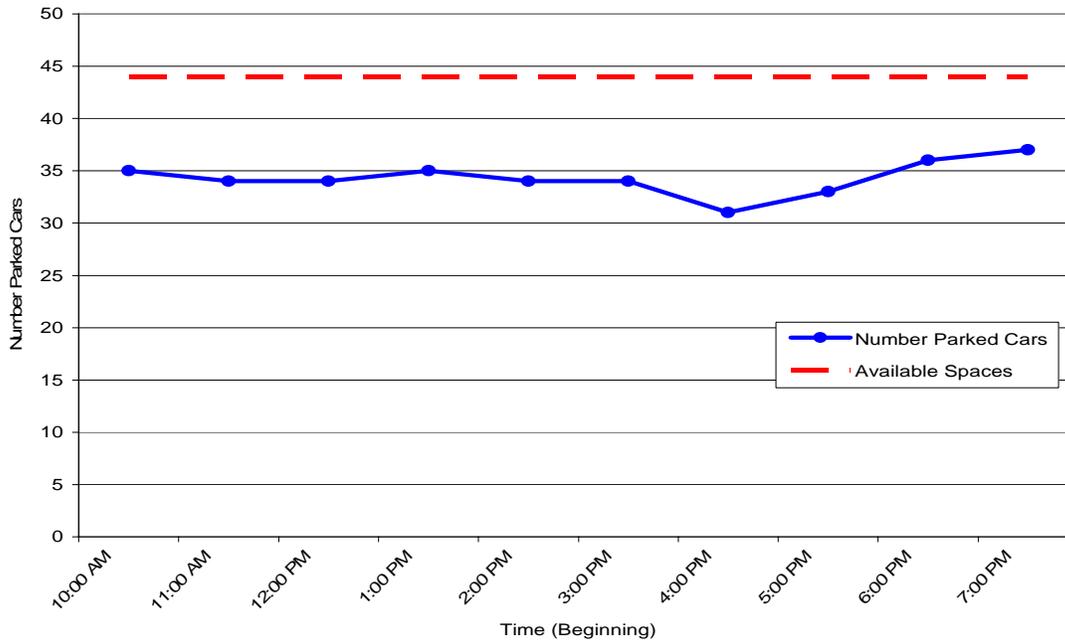
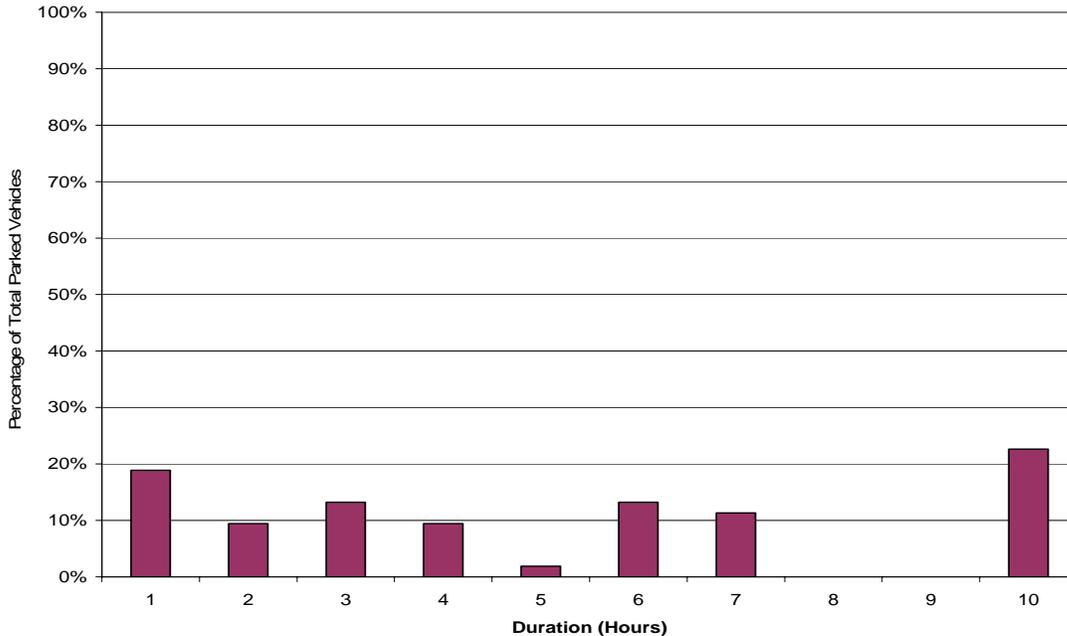


Figure 17. Parking Duration for Unrestricted Spaces – Subarea B



Load/Unload and Short-term Meter Spaces

There are four types of load/unload zones in this subarea. In addition, there are seven 15-minute metered spaces and 21, 30-minute metered spaces. A summary of load/unload and other short-term parking space activity is presented in Table 4.

Table 4. Load/Unload and Short-term Meter Parking Activity – Subarea B

Parking Type	Number Spaces	Average Occupancy			Total number parked	Number parked over limit ²
		10:00 A.M. to 6:00 P.M.	6:00 P.M. to 8:00 P.M.	10:00 A.M. to 8:00 P.M.		
24 Hour Load/Unload	15			3.9	26	9
24 Hour Passenger Load/Unload	13			1.9	14	0
Load/Unload ¹	23	6.5	16.5		55	10
Passenger Load/unload ¹	13	1.0	3.0		11	0
15-minute meter spaces	7	2.8	6.0		26	2
30-minute meter spaces	21	6.3	9.0		66	7
TOTAL	92					

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Restriction ends at 6:00 P.M. Total number parked and over limit is from 10:00 A.M. to 6:00 P.M.
2. Over-limit is defined as more than one hour because data collection only occurred once per hour.

Subarea B has a large number of load/unload parking spaces including the 15-minute and 30-minute meter spaces. The 24 Hour Load/Unload spaces showed the lowest level of compliance, with 35% non-compliant vehicles. The long-term parking that occurs in these spaces indicates that motorists may not be aware that the restriction is always in effect, or concluded that there is little to no enforcement after 6:00 P.M. when there are no events at the Seattle Center. Passenger load/unload spaces appear to be well respected whether the space is 24 hours or not. There was very little long term parking in the passenger load/unload in spaces where the restriction ended at 6:00 P.M. There is one metered load/unload space not included in Table 4. A total of two vehicles were observed in this space during the survey, with none over the time limit. The 15-minute and 30-minute metered spaces essentially operate as load/unload space and may not be necessary to support local businesses.

4.3. Subarea C (North Seattle Center)

This subarea is on the north side of Seattle Center, from 5th Avenue N to Warren Avenue N, and from W Republican Street to W Roy Street. This area is simply referred to as North Seattle Center. The area includes many restaurants and other miscellaneous commercial uses. The area also includes public and private parking lots that serve Seattle Center and other parking needs. There are only two metered spaces in this subarea which are adjacent to Subarea B. The data for these two metered spaces is included with the load/unload parking data.

One-Hour Time-Limited Parking

There are **30 one-hour spaces** in Subarea C for which the time restriction is posted on signs. Utilization was under 70% until after 4:00 P.M. as shown in Figure 18. The duration data on Figure 19, show that 49% of the vehicles parked for one hour or less. An additional 34 % parked for two-hours.

Figure 18. Parking Utilization for One-Hour Spaces – Subarea C

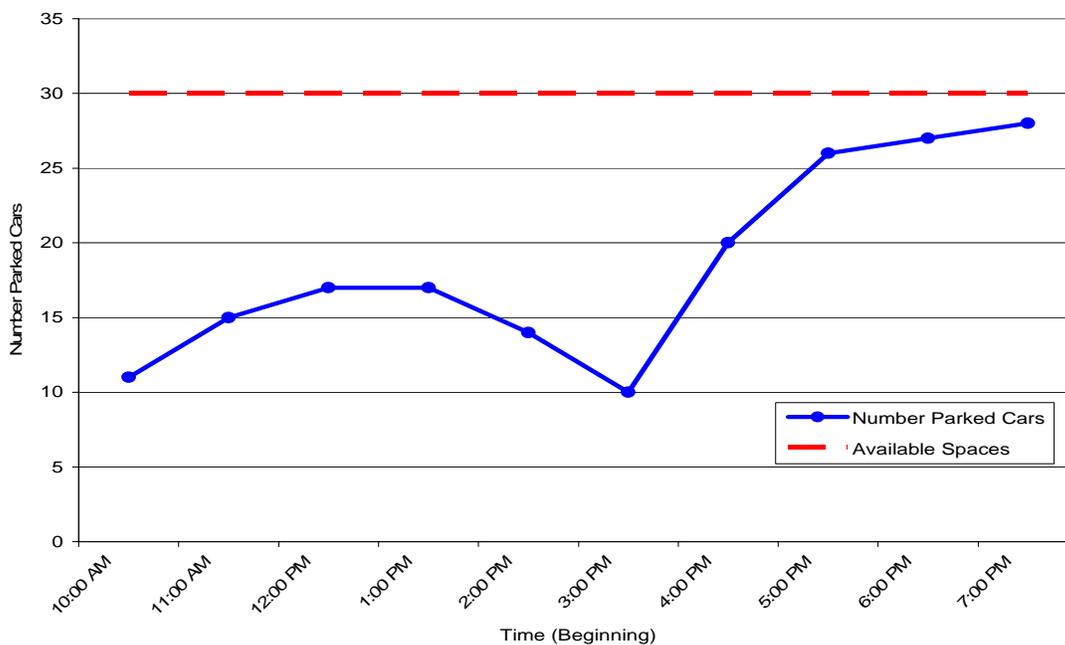
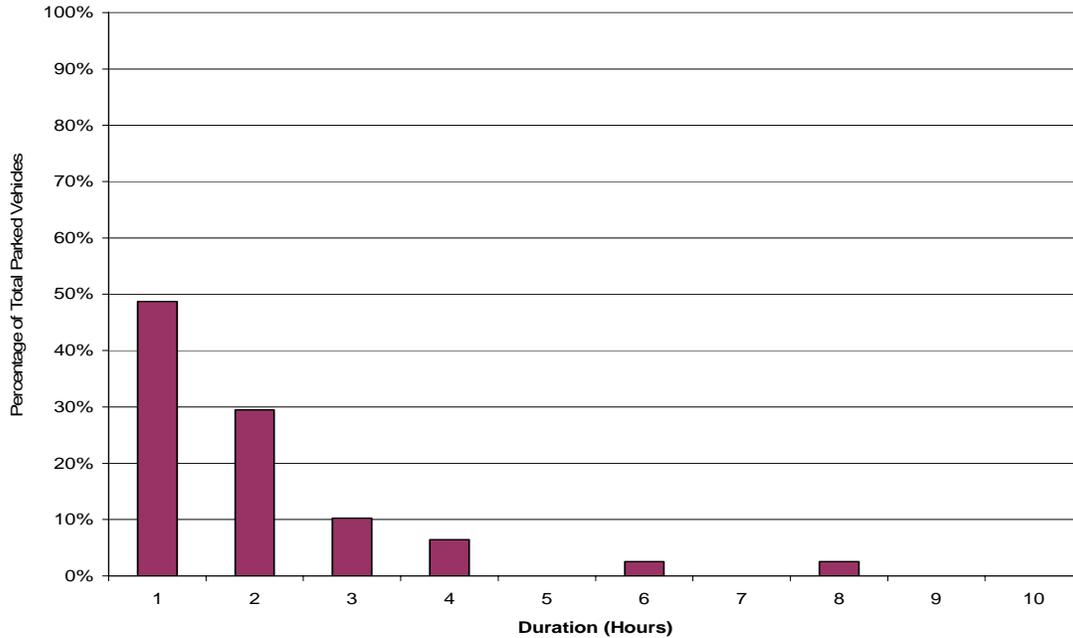


Figure 19. Parking Duration for One-Hour Spaces – Subarea C



Two-Hour Time-Limited Parking

There are **93 two-hour spaces** in Subarea C. Utilization, as shown in Figure 20, reaches 75% late morning for a couple of hours, then dips, and then reaches above 75% after 4:00 P.M. The duration data on Figure 21, shows that there are an equal number of vehicles that parked for one and two hours. Compliance was 67%.

Figure 20. Parking Utilization for Two-Hour Spaces – Subarea C

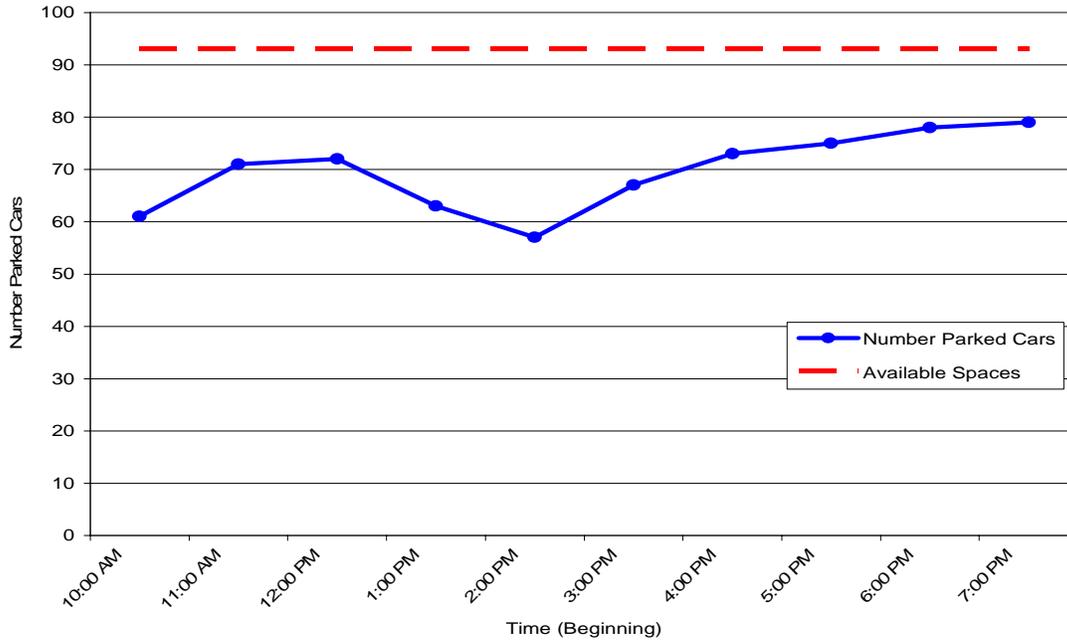
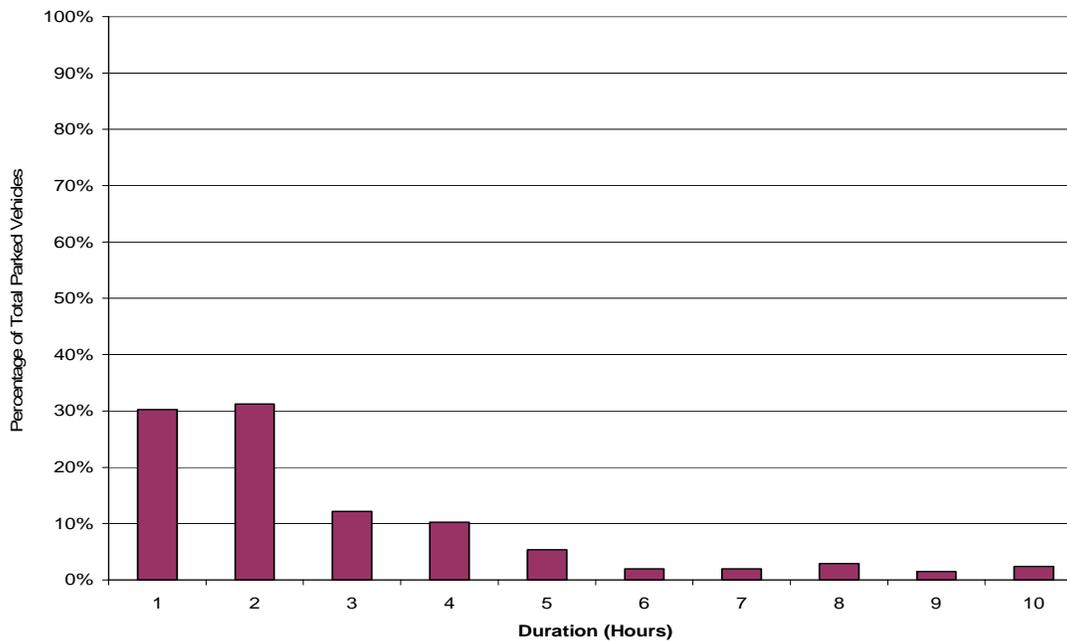


Figure 21. Parking Duration for Two-Hour Spaces – Subarea C



Unrestricted Parking

There are **83 unrestricted spaces** in Subarea C. The utilization as shown in Figure 22 is above 75% throughout the day. Seventy percent utilization is the threshold at which the City of Seattle considers the area a candidate for additional parking management measures. The parking duration data on

Figure 23, shows that there is a fairly even distribution of the hours parked by vehicles. Approximately 30% parked for three hours or less.

Figure 22. Parking Utilization for Unrestricted Spaces – Subarea C

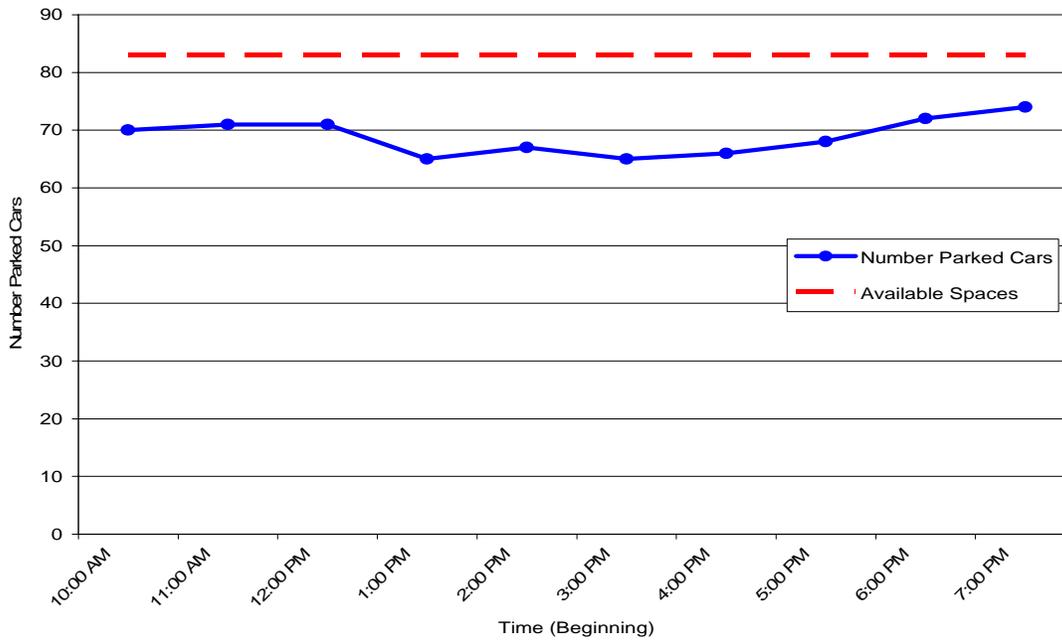
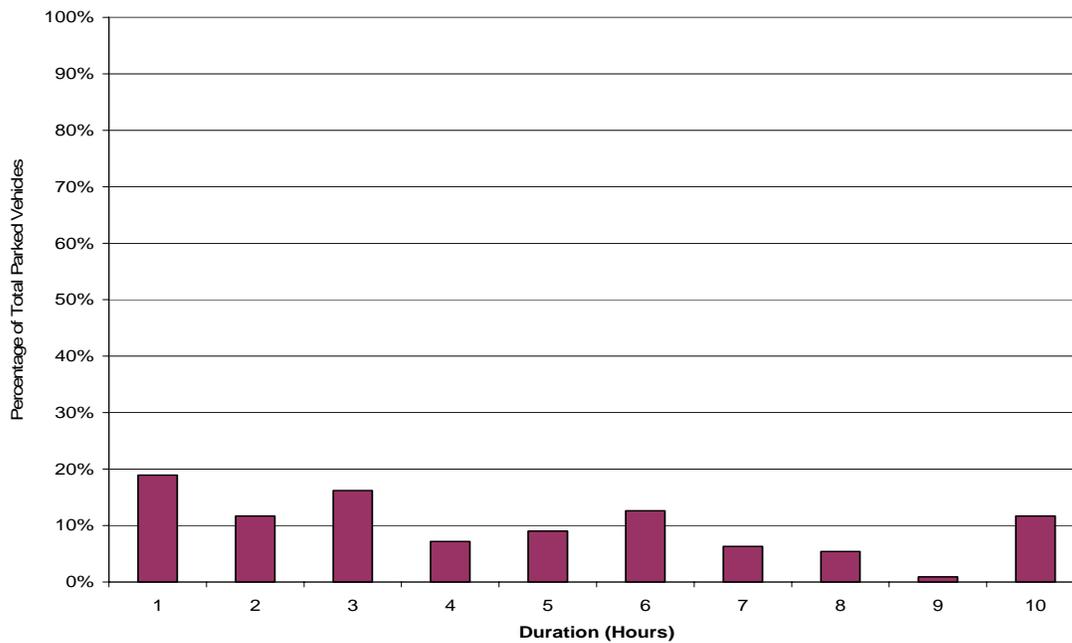


Figure 23. Parking Duration for Unrestricted Spaces – Subarea C



Load/Unload and Meter Parking

There are four types of load/unload zones in this subarea. A summary of load/unload parking space activity is presented in Table 5. The two 2-hour meter spaces are included in Table 5 for simplicity, rather than generate utilization and duration charts for two-hour spaces. There are also two 30-minute spaces (not metered) included in the table.

Table 5. Load/Unload and Short-Term Parking Activity – Subarea C

Parking Type	Number Spaces	Average Occupancy			Total number parked	Number parked over limit ²
		10:00 A.M. to 6:00 P.M.	6:00 P.M. to 8:00 P.M.	10:00 A.M. to 8:00 P.M.		
24 Hour Load/Unload	6			0.8	7	1
24 Hour Passenger Load/Unload	14			1.3	6	5
Load/Unload ¹	4	1.3	8.0		18	3
Passenger Load/unload ¹	3	0.1	0.0		1	0
30-minute spaces (unmetered)	2	0.3	2.0		3	1
2-hour meter spaces	2	1.5	2.0		8	0
TOTAL	29					

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Restriction ends at 6:00 P.M. Total number parked and over limit is from 10:00 A.M. to 6:00 P.M.
2. Over-limit is defined as more than one hour because data collection only occurred once per hour.

The 24-Hour Passenger Load/Unload spaces showed a high number of vehicles non-compliant, compared to subareas A, B, and E. The violations occurred both before and after 6:00 P.M. The load/unload spaces had a low occupancy until 6:00 P.M. The two 30-minute spaces appear to perform similarly to a load/unload space.

4.4. Subarea D (Business)

This subarea is the southwest of corner the study area. It is nominally referred to as the business subarea because of the prevalence of office uses. There are no metered spaces in this subarea.

One-Hour Time-Limited Parking

There are **33 one-hour spaces** in Subarea D for which the time limits are posted on signs. As shown on Figure 24, the utilization was 75% at 10:00 A.M. and then dropped continuously to 8:00 P.M. where it reached 48%. This type of parking activity reflects that in the late afternoon and evening hours there is less demand for parking by business/office use. The parking duration data on Figure 25, shows that 54% parked for one hour or less, and so 46% were non-compliant with the one-hour limit. There were 25% that parked for two-hours.

Figure 24. Parking Utilization for One-Hour Spaces – Subarea D

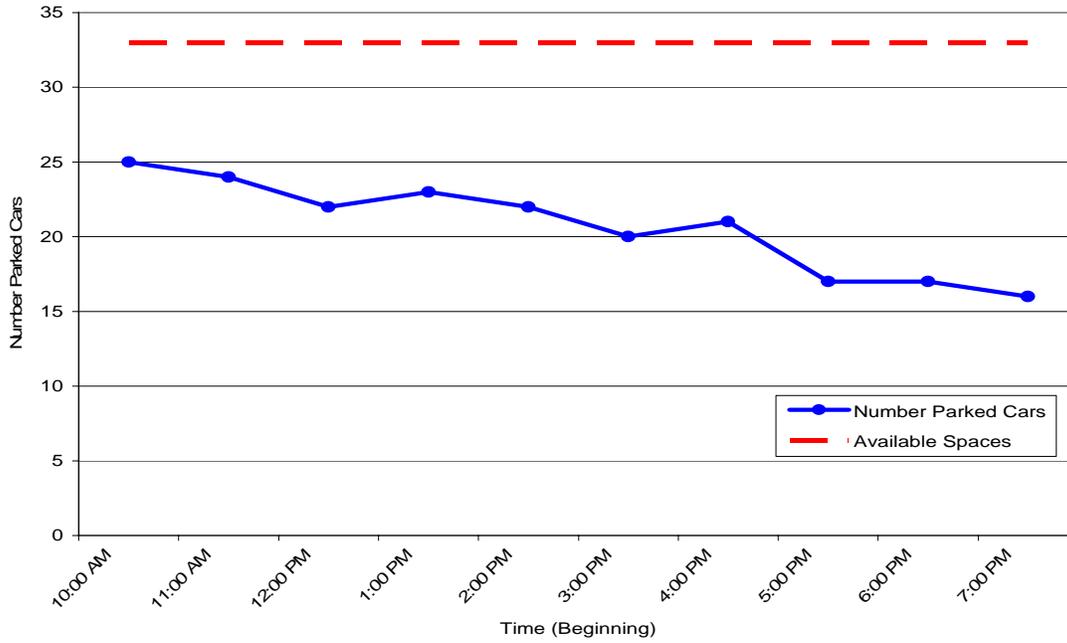
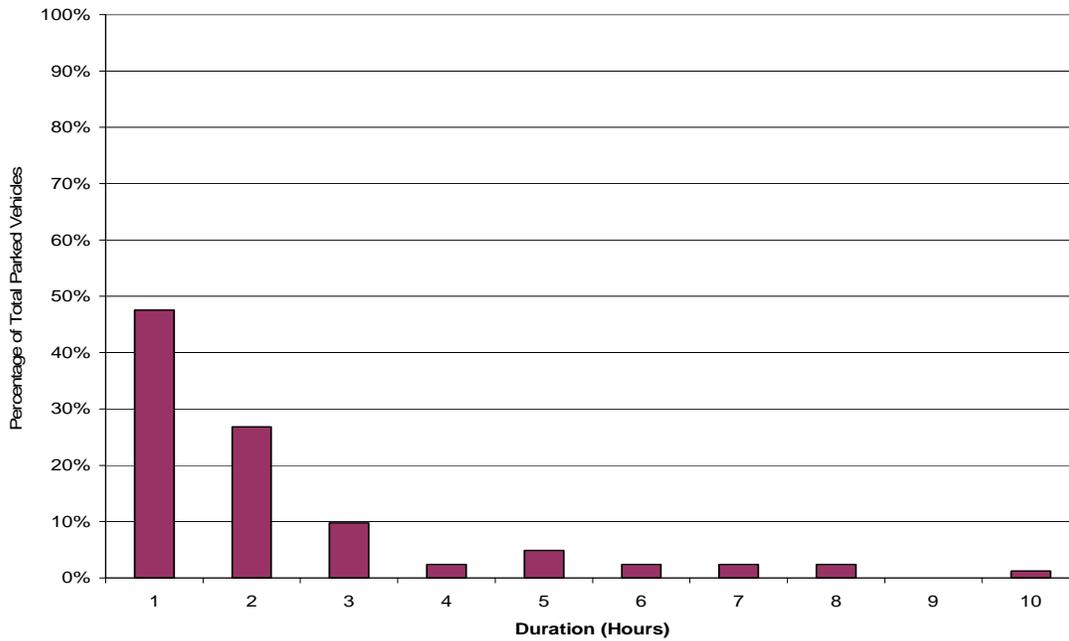


Figure 25. Parking Duration for One-Hour Spaces – Subarea D



Two-Hour Time-Limited Parking

There are **70 two-hour spaces** in subarea D. The utilization is just above 75% until approximately 1:00 P.M. as shown in Figure 26. The utilization drops somewhat after 1:00 P.M. The compliance rate is 71%, with 29% parking for two hours or less, as shown in Figure 27.

Figure 26. Parking Utilization for Two-Hour Spaces – Subarea D

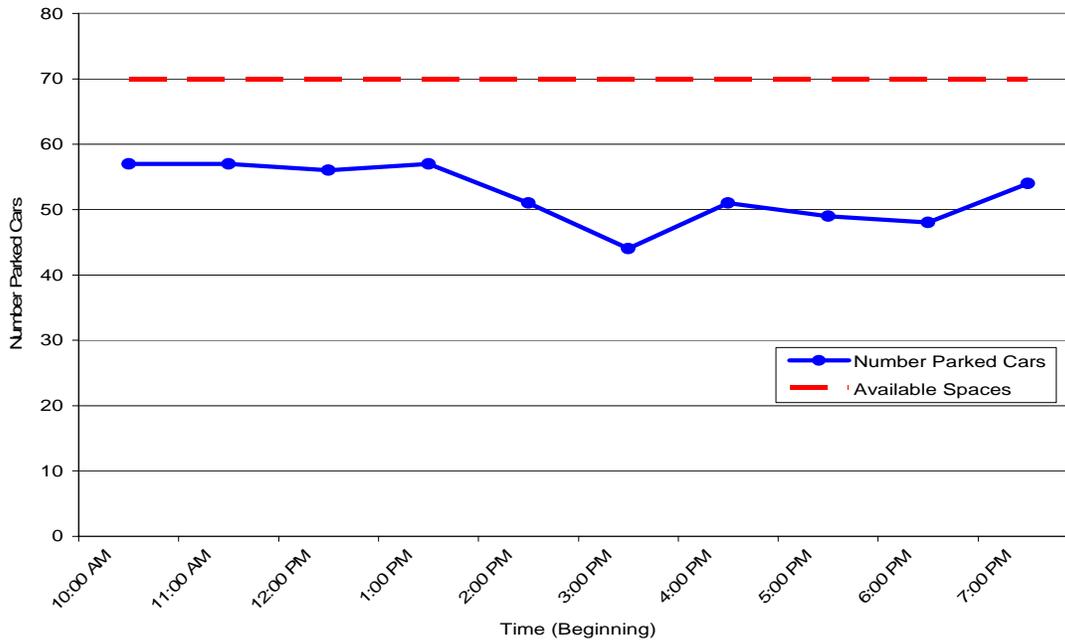
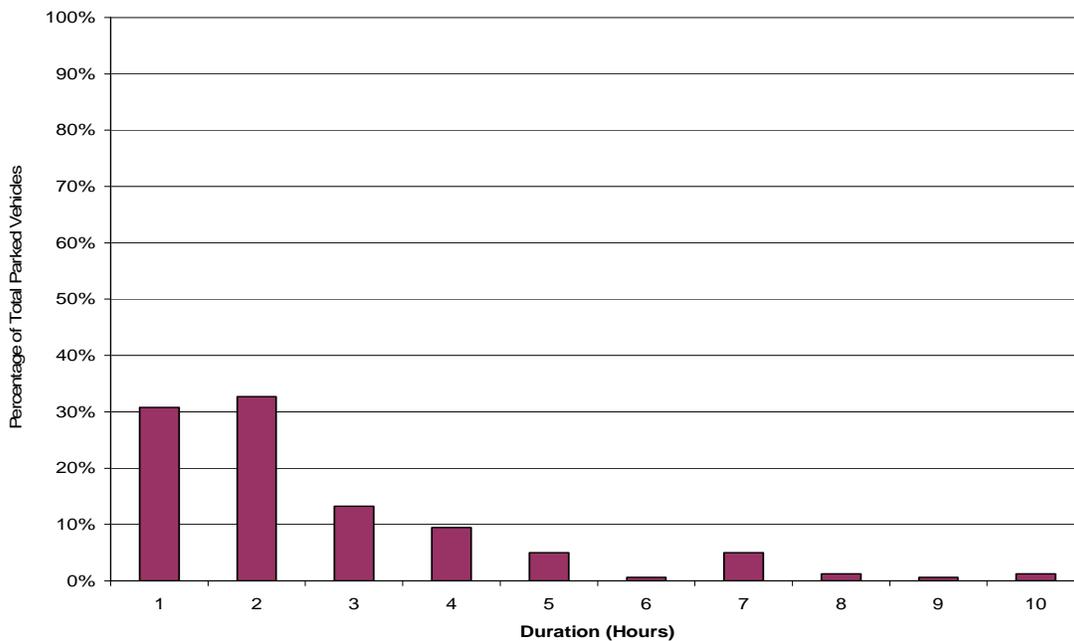


Figure 27. Parking Duration for Two-Hour Spaces – Subarea D



Unrestricted Parking

There are **92 unrestricted spaces** in Subarea D. The utilization, as shown in Figure 28, was 85% at 10:00 A.M. and remained at that level and above 75% up to 4:00 P.M. After 4:00 P.M. the utilization dropped below 75%. The duration data on Figure 29, shows that vehicles park for all lengths of time throughout the day. Twenty eight percent (28%) parked for two hours or less.

Figure 28. Parking Utilization for Unrestricted Spaces – Subarea E

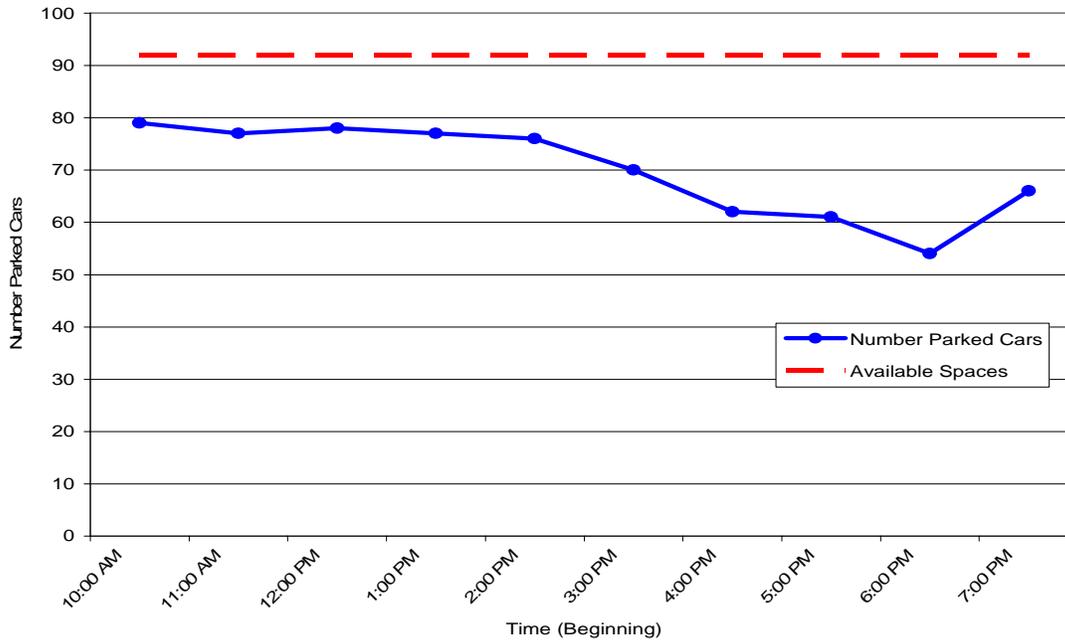
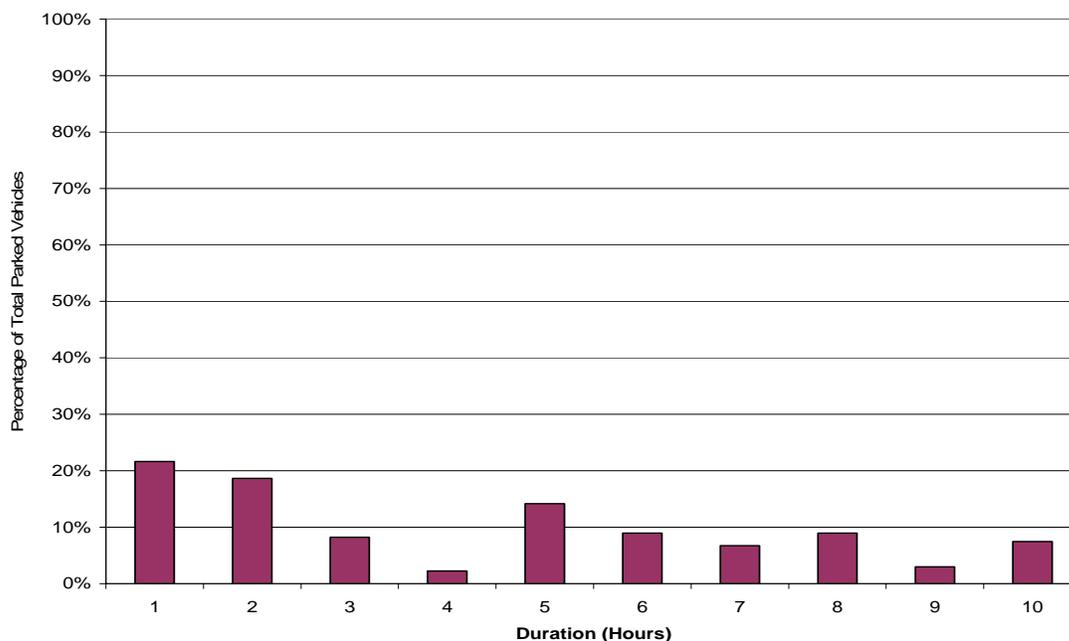


Figure 29. Parking Duration for Unrestricted Spaces – Subarea E



Load/Unload Parking

There are three types of load/unload zones in this subarea. A summary of load/unload parking activity is presented in Table 6.

Table 6. Load/Unload Parking Activity – Subarea D

Parking Type	Number Spaces	Average Occupancy			Total number parked	Number parked over limit ²
		10:00 A.M. to 6:00 P.M.	6:00 P.M. to 8:00 P.M.	10:00 A.M. to 8:00 P.M.		
24 Hour Load/Unload	11			1.1	7	3
24 Hour Passenger Load/Unload	29			1.8	4	3
Load/Unload ¹	8		6.4	10.1	45	12
TOTAL	48					

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Restriction ends at 6:00 P.M. Total number parked and over limit is from 10 A.M. to 6 P.M.
2. Over-limit is defined as more than one hour because data collection only occurred once per hour.

The 24 Hour Passenger Load/Unload spaces showed a high number of vehicles non-compliant, which is unusual compared to Subareas A, B, and E. The Load/Unload spaces were at 27% non-compliant, although three of these vehicles arrived between 5:00 and 6:00 P.M.

4.5. Subarea E: (West Seattle Center)

This subarea is directly to the west of Seattle Center. There are a large amount of unrestricted parking spaces and there are no metered spaces. There are public and private parking lots serving Seattle Center activities.

One-Hour Time-Limited Parking

There are **85 one-hour spaces** in Subarea E for which the time limit is posted on signs. The utilization was under 70% throughout the day as shown in Figure 30. The utilization reached approximately 75% after 7:00 P.M. The duration data in Figure 31 shows that 59% parked for one hour or less, and an additional 23% parked for two hours.

Figure 30. Parking Utilization for One-Hour Spaces – Subarea E

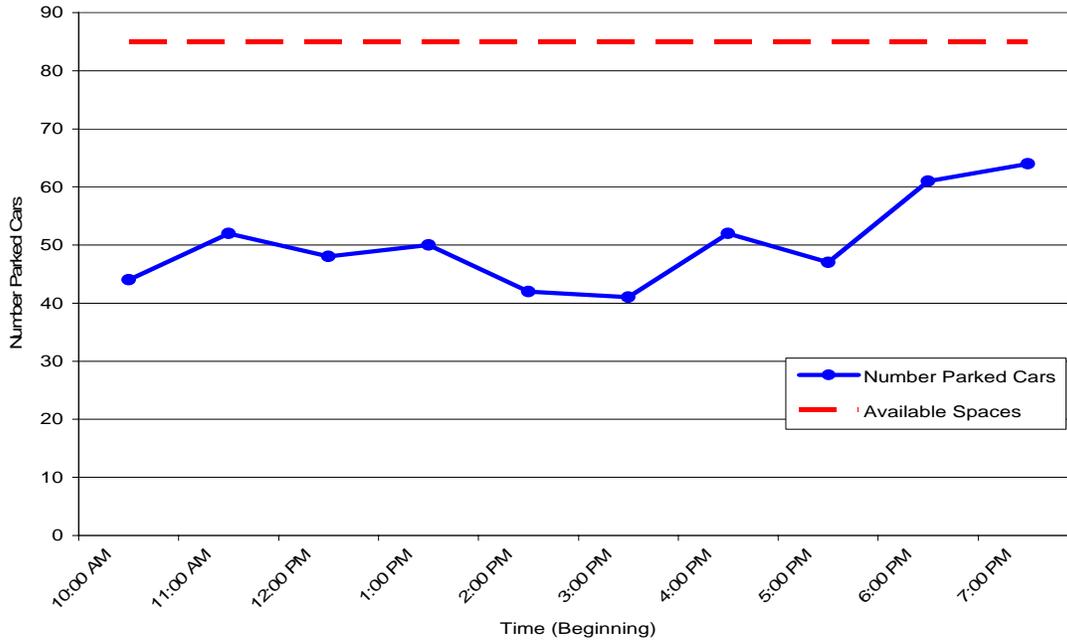
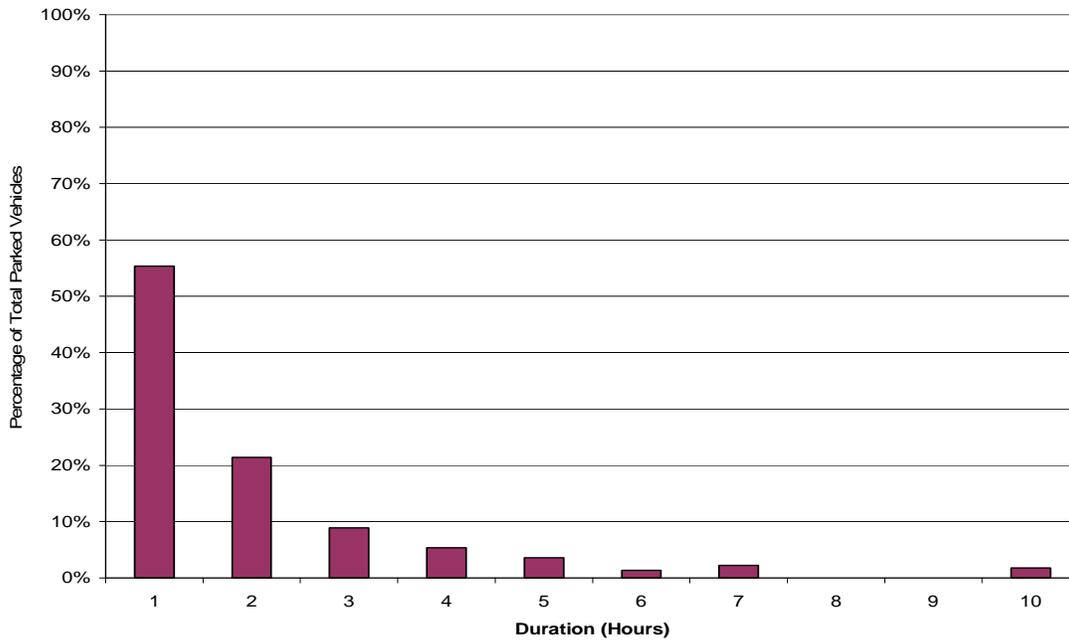


Figure 31. Parking Duration for One-Hour Spaces – Subarea E



Two-Hour Time-Limited Parking

There are **132 two-hour spaces** in Subarea E that are marked with signs. Utilization is at approximately 75% until 1:00 P.M. and then drops slightly as shown in Figure 32. Seventy percent (70%) parked for two hours or less and 30 percent were non-compliant as shown in Figure 33.

Figure 32 . Parking Utilization for Two-Hour Spaces – Subarea E

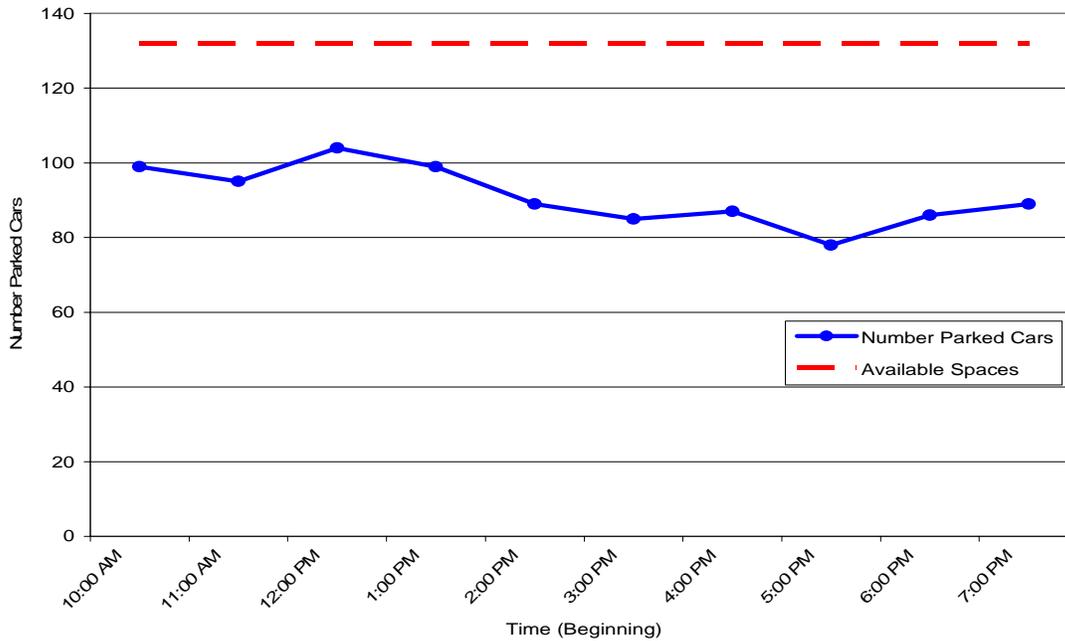
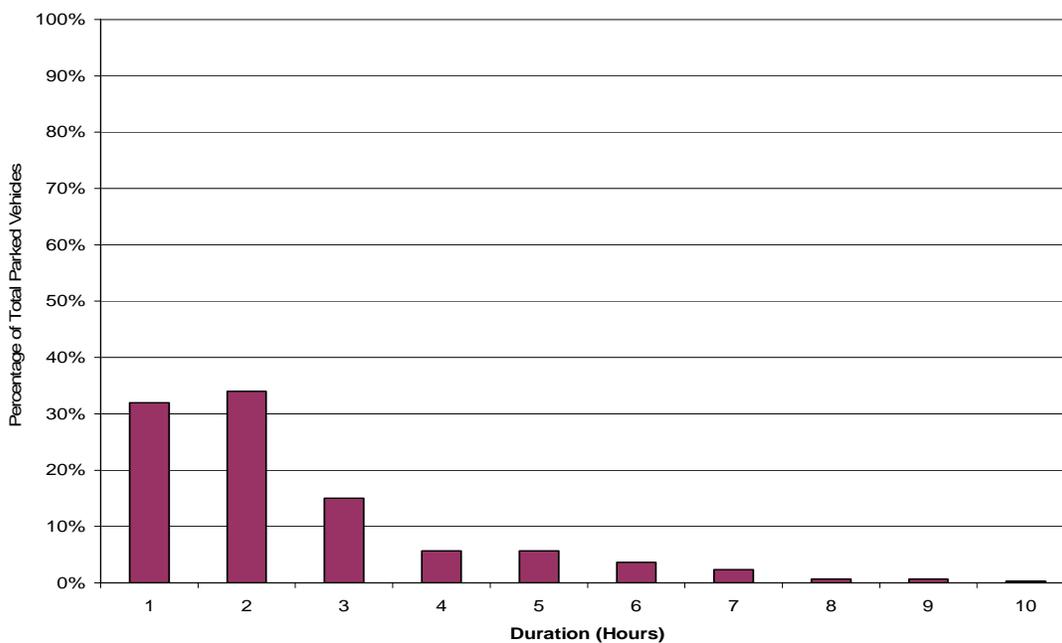


Figure 33 Parking Duration for Two-Hour Spaces – Subarea E



Three-Hour Time-Limited Parking

There are **30 three-hour spaces** in Subarea E that are marked by signs. The utilization shown in Figure 34 is at or just above 75% throughout the day. The duration data in Figure 34 shows that 27% parked for three hours, 43% parked for two hours or less, and 30% were non-compliant.

Figure 34. Parking Utilization for Three-Hour Spaces – Subarea E

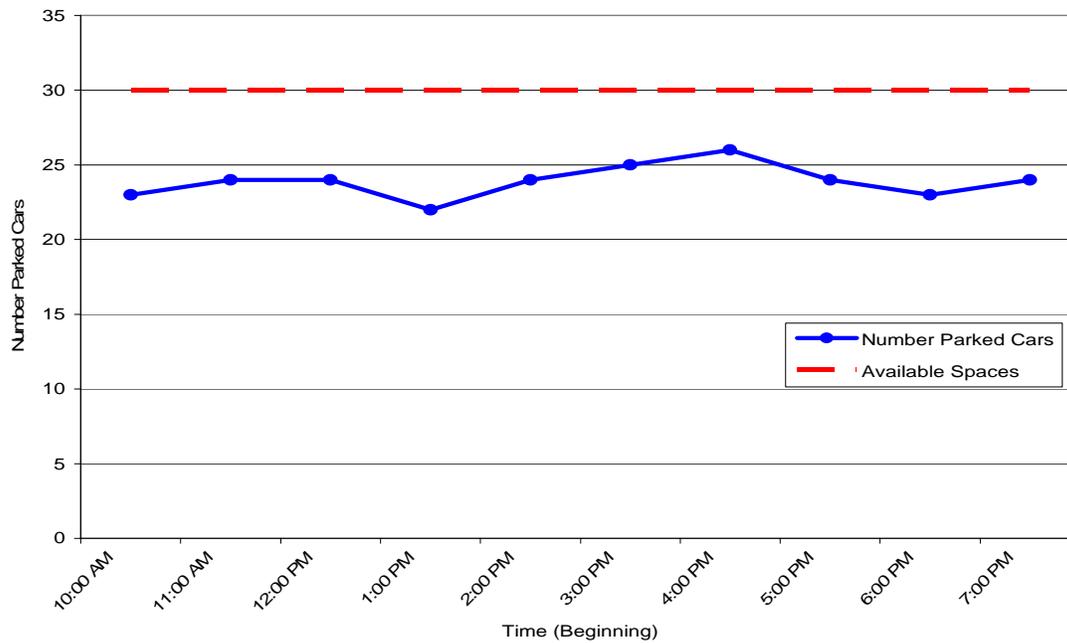
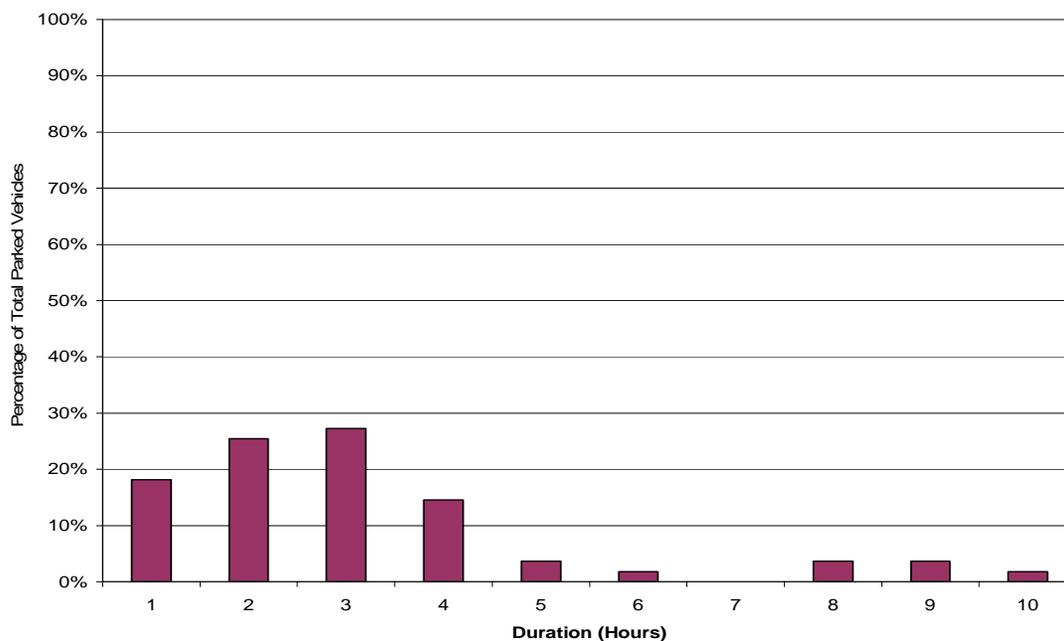


Figure 35. Parking Duration for Three-Hour Spaces – Subarea E



Unrestricted Parking

There are **200 unrestricted spaces** in Subarea E. The utilization was at or above 75% throughout the day as shown in Figure 36. The duration data on Figure 37 shows that 37% parked for two hours or less. Nineteen percent parked for 10 hours. These are vehicles that were parked at 10:00 A.M. to 8:00 P.M. the day of the survey.

Figure 36. Parking Utilization for Unrestricted Spaces – Subarea E

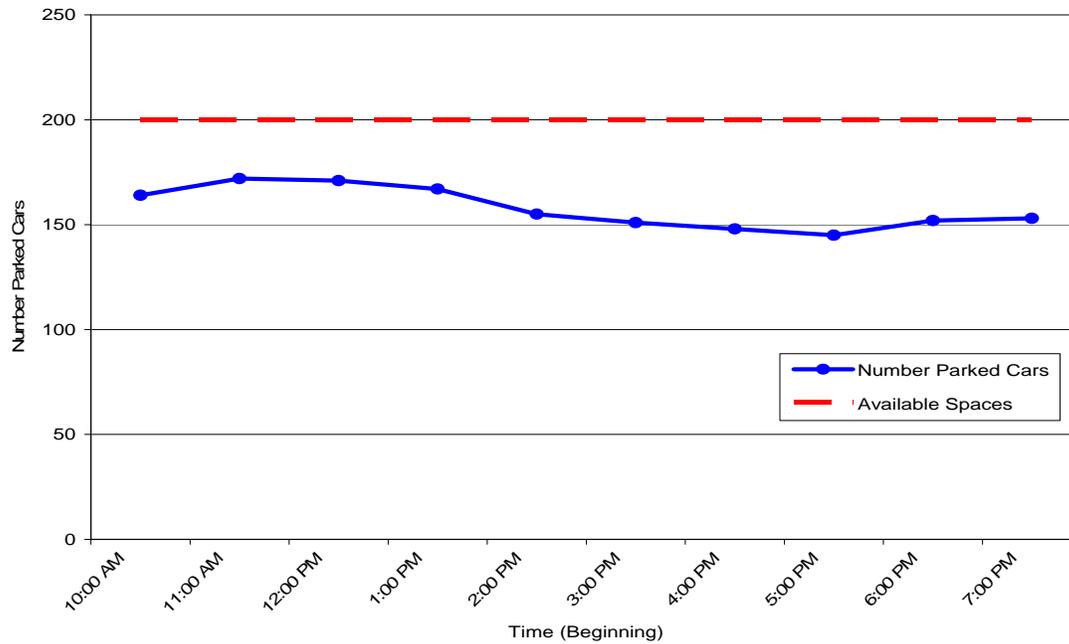
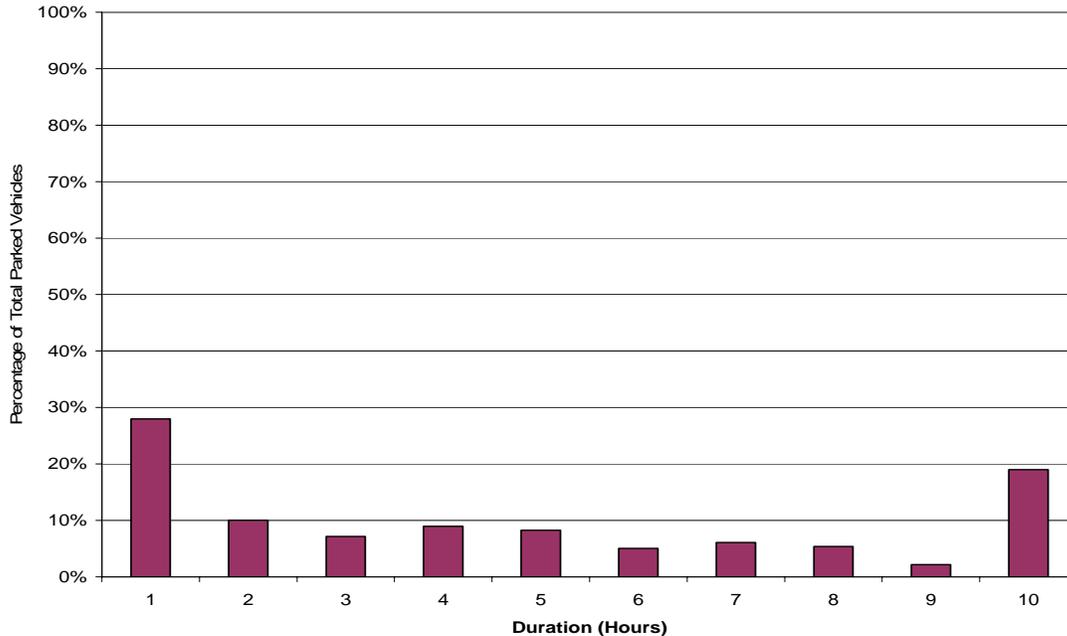


Figure 37. Parking Duration for Unrestricted Spaces – Subarea E



Load/Unload Parking

There are four types of load/unload zones in this subarea. A summary of load/unload parking space activity is presented in Table 7.

Table 7. Load/Unload Parking Activity – Subarea E

Parking Type	Number Spaces	Average Occupancy			Total number parked	Number parked over limit ²
		10:00 A.M. to 6:00 P.M.	6:00 P.M. to 8:00 P.M.	10:00 A.M. to 8:00 P.M.		
24 Hour Load/Unload	46			2.6	23	5
24 Hour Passenger Load/Unload	9			1.4	4	2
Load/Unload ¹	47	7.5	15.0		47	14
Passenger Load/Unload	2	0.0	0.5		1	0
TOTAL	104					

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. May 2005

1. Parking Restriction ends at 6:00 P.M. Total number parked and over limit is from 10 A.M. to 6 P.M.

2. Over-limit is defined as more than one hour because data collection only occurred once per hour.

The Load/Unload spaces showed 30% non-compliant including one car that parked for 10 hours. A field review the need for load/unload spaces in this subarea could reduce the number of unused load/unload spaces.

5. SURVEY RESULTS- SONICS GAME NIGHT

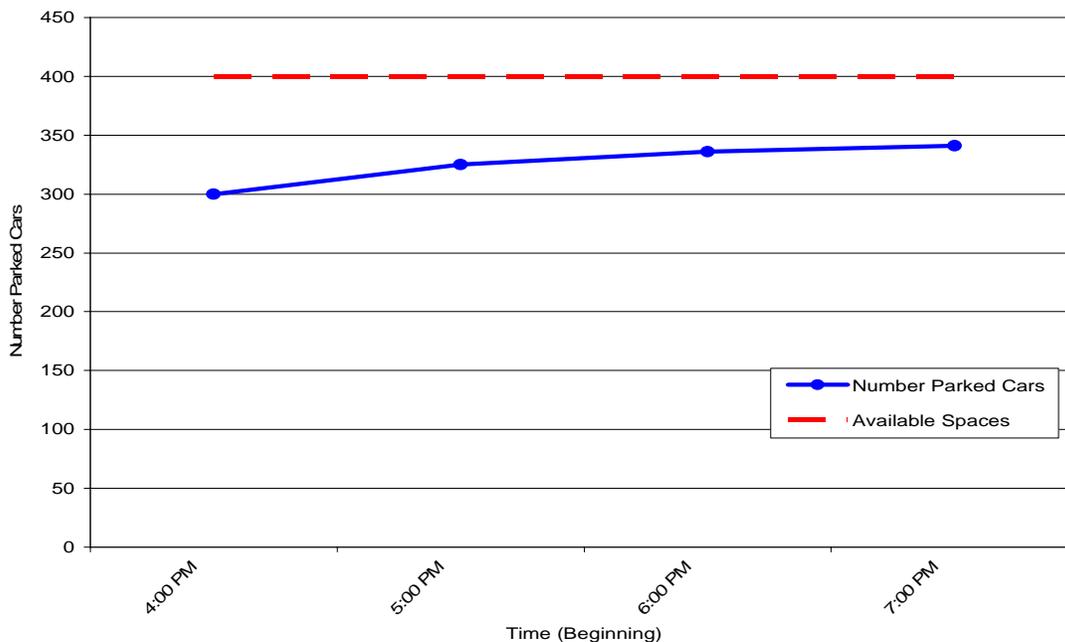
Parking demand data were collected on an evening with a Sonics game. The game night survey was December 6, 2005 when the Sonics were playing the New York Knicks. The game started at 7:00 P.M. This night was selected because there were no other major events (such as the Nutcracker) occurring at the Seattle Center.

It was observed in the field that arrivals began about 5:00 P.M. for the game. Data collection occurred between 4:00 and 8:00 P.M. with one pass-by each space per hour. Parking restrictions are lifted at 6:00 P.M. for all but the 24-hour load/unload. Parking spaces where the restriction was lifted were treated as unrestricted. If the spaces were restricted to one-hour or two-hour spaces before 6:00 P.M. then those that parked at 5:00 P.M. were able to remain in the space after the restriction was lifted at 6:00 P.M.

5.1. Subarea A (Residential)

Subarea A contains **400 unrestricted spaces** after 6:00 P.M. The utilization is presented in Figure 38. The utilization was 75% at 4:00 P.M. and reached 85% by 8:00 P.M. This subarea is the furthest from the Seattle Center and Key Arena.

Figure 38. Parking Utilization on Sonics Game Night – Subarea A



5.2. Subarea B (Shopping)

In Subarea B there are both metered and signed (regulated for duration, but without a meter) parking spaces. The metered spaces also became unrestricted at 6:00 P.M. However, because of the propensity for meters to encourage self enforcement, two utilization charts were prepared, one for metered spaces and one for signed spaces to check for any differences.

In Subarea B there are a total of **361 unrestricted spaces in this subarea after 6:00 P.M.** Of these, 173 are metered and 188 have signed parking restrictions prior to 6:00 P.M. Figure 39 shows that the 173 metered spaces were 65% utilized from 4:00 to 5:00 P.M. and then 96% utilized by 8:00 P.M. The 188 signed, then unrestricted, spaces were 64% utilized from 4:00 to 5:00 P.M. and then reached 85% utilization between 7:00 and 8:00 P.M. as shown in Figure 40. There was little difference in evening parking activity for metered versus signed parking limits that were in place before 6:00 P.M.

Figure 39. Parking Utilization for Unrestricted (meter) Spaces on Sonics Game Night - Subarea B

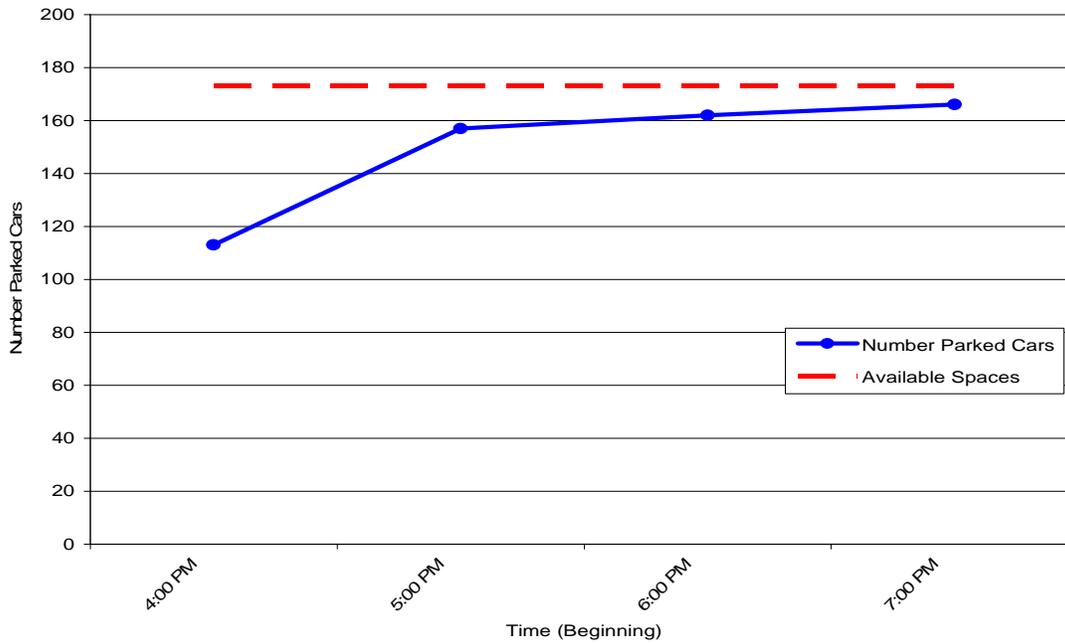
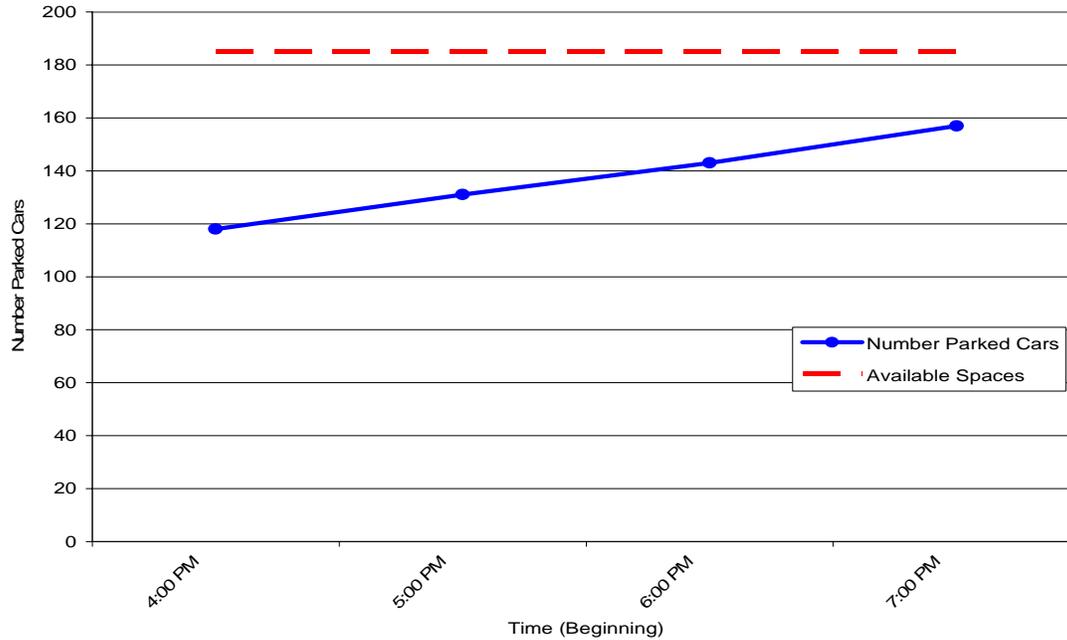


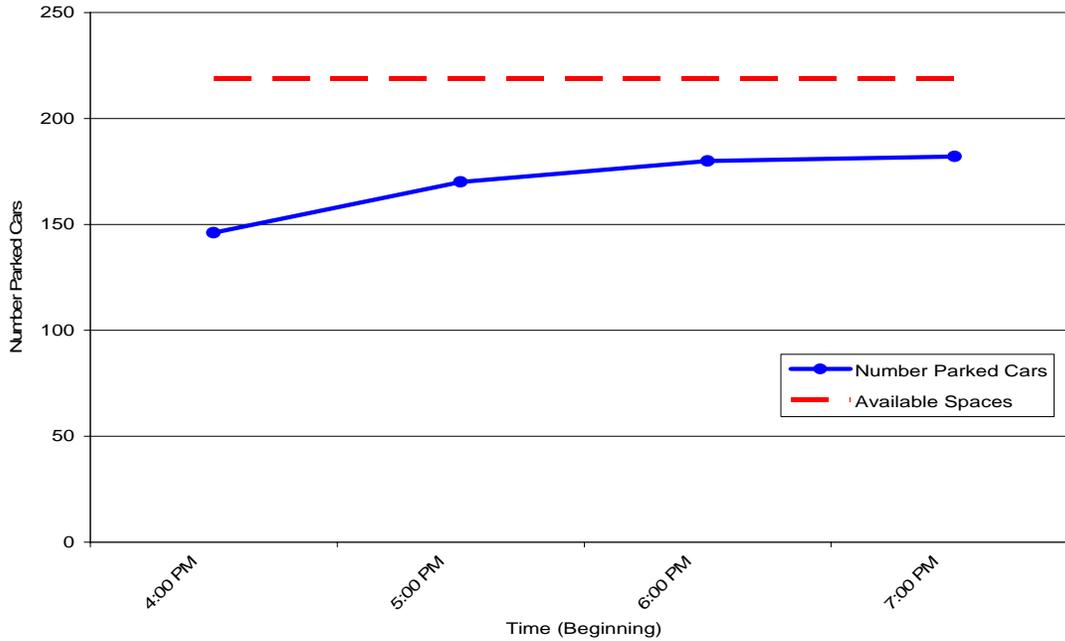
Figure 40. Parking Utilization for Unrestricted (signed) Spaces on Sonics Game Night – Subarea B



5.3. Subarea C (North Seattle Center)

In Subarea C there are **219 unrestricted spaces at 6:00 P.M.** There are only two metered spaces which were 100% occupied at 5:00 P.M. Figure 42 shows that the utilization was 67% between 4:00 and 5:00 P.M. and reached 85% between 7:00 and 8:00 P.M.

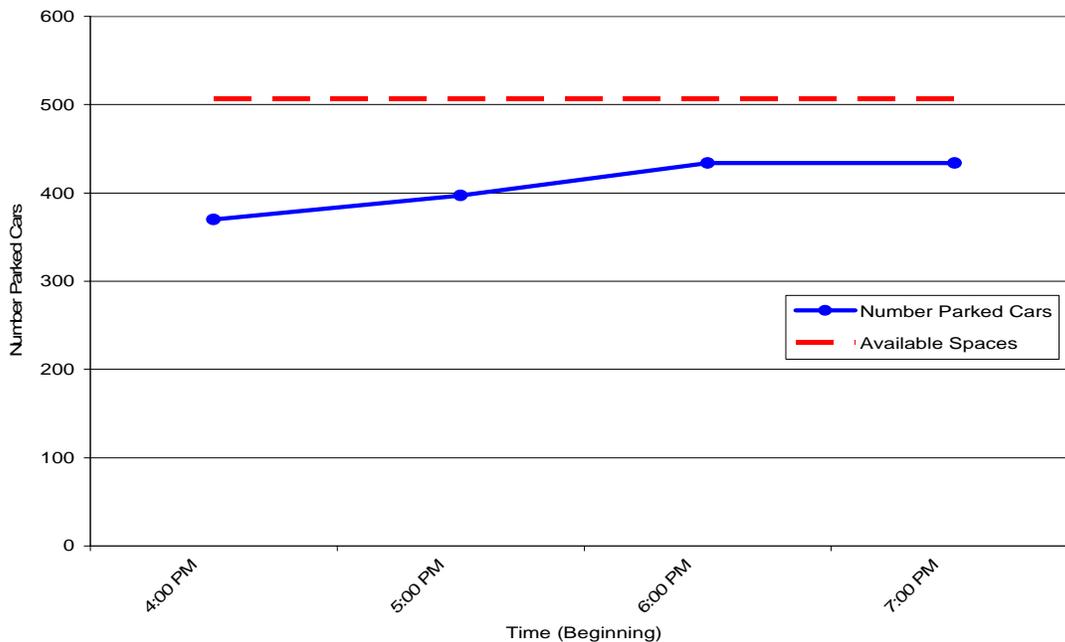
Figure 41. Parking Utilization on Sonics Game Night – Subarea C



5.4. Subarea D (Business)

In Subarea D there are **224 unrestricted spaces after 6:00 P.M.** The utilization was 63% from 4:00 to 5:00 P.M. and 78% for 7:00 to 8:00 P.M. as shown in Figure 42. This area is further west of Subarea E, the West Seattle Center subarea.

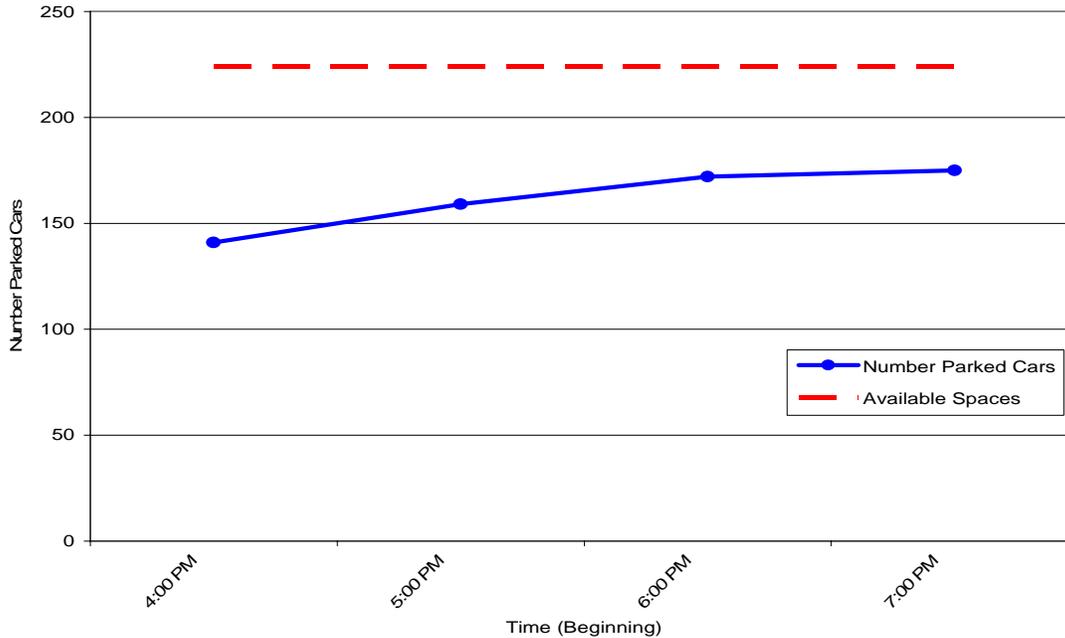
Figure 42. Parking Utilization on Sonics Game Night – Subarea D



5.5. Subarea E (West Seattle Center)

In subarea E there are **507 unrestricted parking spaces**. The utilization was 73% from 4:00 to 5:00 P.M. and reached 86% from 7:00 to 8:00 P.M. as shown in Figure 43.

Figure 43. Parking Utilization on Sonics Game Night – Subarea E



5.6. Summary of Sonics Game Night Data

There was little variation in parking utilization across subareas on a Sonics game night. The utilization between 4:00 and 5:00 P.M. averaged 68%. The utilization was the highest from 7:00 to 8:00 P.M. and averaged 86%.

By contrast, the daytime data collection, that occurred without a Sonics game night and without any other major event at the Seattle Center, averaged 67% utilization from 4:00 to 5:00 P.M. and 78% utilization from 7:00 to 8:00 P.M. There was no difference on average from 4:00 to 5:00 P.M. for a normal afternoon and Sonics game night. The night of the Sonics game was 86% utilized compared to a non-event night at 78%. Eighty five percent (85%) is defined as the practical capacity over which drivers will experience delays and get frustration while searching for a parking space. On a Sonics game night the Uptown neighborhood parking is filled to this practical capacity threshold, and on a non-event night there was some parking available.

6. FINDINGS

Full-day data collection occurred on Wednesday, December 7 and Thursday, December 8, 2005 from 10:00 A.M. to 8:00 P.M. Data were also collected on Tuesday, December 6, 2005 from 4:00 to 8:00 P.M. to determine the parking conditions during a Sonics game. There was no Nutcracker performance or other major events at the Seattle Center on the evening of the Sonics game.

Parking activity was surveyed by recording license plate numbers by stall at 60-minute intervals from 10:00 A.M. to 8:00 P.M. and from 4:00 P.M. to 8:00 P.M. on the Sonics game night. The data collection provided information on utilization by parking restriction type for designated subareas, compliance by parking restriction type, and the number of vehicles by length of time parked.

Figure 1 is a map of the study area with subareas labeled. The study area included all on-street parking. The parking daytime parking inventory is summarized in Table 1 and the evening parking inventory in Table 2. Utilization and duration charts were prepared for each subarea, and each parking restriction type, in the body of the report. In addition, Appendix A includes two maps with the average occupancy by block face. These two maps are: 1) On-street parking average occupancy for one- and two-hour signs and parking meters, and 2) on-street parking average occupancy for unrestricted parking. The major findings resulting from this analysis are highlighted below.

6.1. Major Findings

- There are 1,846 parking spaces in the Uptown neighborhood that were surveyed for this project.
- A total of 697 or 38% of all spaces are unrestricted. About 40% of all of the unrestricted spaces (278) are located in Subarea A, the residential area in the northwest corner of the study area.
- There are 175 metered spaces in the study area. All but two of these are located in Subarea B, which is the primary shopping area.
- The metered spaces work well for turnover, with 76% of vehicles that parked in one-hour meter spaces and 86% of the vehicles that parked in two-hour meter spaces in compliance with the time limit.
- There are 671 parking spaces with signed time limits in the study area. These include four 30-minute spaces, 224 one-hour spaces, 413 two-hour spaces, and 30 three-hour spaces.
- The one-hour signed spaces are not working well, with an average of only 48% of the vehicles that parked in them compliant with the time limit. However, 71% of the vehicles that parked in the one-hour spaces parked for less than two hours.
- The two-hour spaces have low compliance rates, ranging from 40% to 66%. The two-hour meter spaces had a high compliance at 85%.
- Unrestricted parking spaces accommodate a wide range of parking durations. This suggests that these spaces are being used for a variety of purposes and no single time limit or parking management solution might work for these spaces.

- All subareas have parking utilization rates of 70% or greater, indicating candidate locations for implementing parking management measures.

6.2. Parking Utilization Summary

A summary of parking utilization by subarea is presented in Table 8. Shaded cells indicate parking spaces at or above the practical capacity, defined as 85% utilization.

Table 8. Parking Utilization Summary

Subarea	Parking Restriction	Average Utilization %		
		10 A.M. to 2 P.M.	2 P.M. to 5 P.M.	5 P.M. to 8 P.M.
A (Residential) ^a	One-hour space	75	59	93 ^b
	Two-hour space	78	75	69
	Unrestricted Space	86	84	81
	Sub-total	80	73	81
B (Shopping)	One-hour meter	60	54	87
	Two-Hour meter	60	51	91
	One-hour space	48	50	74
	Two-hour space	68	58	77
	Unrestricted Space	78	75	80
	Sub-total	64	58	81
C (North Seattle Center)	One-hour space	50	49	90
	Two-hour space	72	71	83
	Unrestricted Space	83	80	86
	Sub-total	68	66	86
D (Business)	One-hour space	71	64	51
	Two-hour space	81	70	72
	Unrestricted Space	85	75	66
	Sub-total	79	70	63
E (West Seattle Center)	One-hour space	57	53	67
	Two-hour space	75	66	64
	Three-hour space	78	83	79
	Unrestricted Space	84	76	75
	Sub-total	73	69	71
Average for Study Area		73	67	78

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. December 2005

a) Nomenclature is general land use, but in each subarea there is a mix of land uses.

b) Shaded cells indicated parking spaces at or above the practical capacity, defined as 85% utilization

- The charts presented in the prior sections show that parking utilization was higher between 10:00 A.M. and 2:00 P.M. than 2:00 P.M. to 5:00 P.M. After 4:00 P.M. the parking utilization increased up until the end of the data collection period at 8:00 P.M. This afternoon dip is also revealed in the summary data.
- One or more parking space types in each subarea are a candidate for improving parking management. Locations with parking utilization rates above 70% are considered candidates for parking management measures so that such measures can be implemented before utilization reaches the practical capacity.
- Parking utilization is the highest overall for Subarea A, which also has the greatest proportion of unrestricted spaces.
- Utilization from 4:00 P.M. to 5:00 P.M. was 68% on both a non-event night and a Sonics game night. Utilization from 7:00 to 8:00 P.M. was 80% on a non-event night and 86% on a Sonics game night. Utilization of 85% is considered the practical capacity.

6.3. Parking Duration Summary

The duration data were compiled to show turnover characteristics by subarea as shown in Table 9.

Table 9. Parking Duration Summary

Subarea	Parking Restriction	% of Vehicles Parked				
		<1 Hour	<2 Hours	3 Hours	4-8 Hours	> 8 Hours
A (Residential) ¹	One-hour space	33	56	15	23	6
	Two-hour space		40	10	42	8
	Unrestricted Space		38	8	33	21
B (Shopping)	One-hour meter	76	92	7	1	0
	Two-Hour meter		86	6	8	0
	One-hour space	55	78	6	14	2
	Two-hour space		66	7	23	4
	Unrestricted Space		28	13	36	23
C (North Seattle Center)	One-hour space	49	68	10	12	0
	Two-hour space		62	12	23	3
	Unrestricted Space		31	16	40	13
D (Business)	One-hour space	48	75	10	14	1
	Two-hour space		64	13	21	2
	Unrestricted Space		41	8	41	10
E (West Seattle Center)	One-hour space	55	76	9	13	2
	Two-hour space		66	15	18	1
	Three-hour space		43	27	24	6
	Unrestricted Space		38	7	34	21

Source: Heffron Transportation, Inc., and Operations Management Group, Inc. December 2005

1. Subarea titles reflect the prevalent land use in each area. However, in each subarea there is a mix of land uses.

- The one-hour parking spaces had compliance rates of 33 to 55%. The data show a relatively high compliance rate could be realized if these spaces were two-hour spaces. In Subarea A, which has more residential use than other subareas, 23% of vehicles in the one-hour spaces parked for between four and eight hours.
- All one-hour meter spaces are in Subarea B. These spaces function well as a one-hour spaces
- The two-hour parking spaces in Subareas B, C, D, and E have similar turnover characteristics with an average of 65% parking for two hours or less. This is below the compliance rates found in other neighborhood parking studies —Two-hour com-

pliance rates along the Westlake Avenue corridor adjacent to Lake Union were about 70%, and compliance for two-hour parking in Fremont was 79%.

- The two-hour spaces in Subarea A showed the lowest compliance, with only 40% parking for two hours or less, and 42% parking for four to eight hours.
- The two-hour meter spaces in Subarea B work very well with 85% parking for two hours or less.
- Subareas A and B had the highest amount of long-term parking where vehicles parked for eight to ten hours.
- There is a large number of load/unload parking spaces, and four different load/unload restriction types in the study area. In addition there are 15-minute and 30-minute meters, as well as 30-minute signed time limited spaces. Some restriction types showed a high number of non-compliant vehicles indicating that either the restriction type was confusing or drivers knew there was limited enforcement.

7. RECOMMENDED PARKING MANAGEMENT MEASURES

Based on the findings from the parking surveys, the Uptown neighborhood would benefit from implementation of additional parking management measures. The wide variety of existing parking restrictions will require that the City carefully consider changes based on the wide variety of land uses in the neighborhood, residents, senior housing, office development. The various land uses will require a mix of restriction type and/or time limits. Changes that the City could consider include the following:

1. One-hour signed time limits could be converted to two-hour limits with either signs or meters to increase compliance. An increase in compliance would mean better turnover of parking spaces for adjacent businesses.
2. In areas where the utilization has exceeded 70% or compliance with the time limit is low, two-hour signed time limited parking could be converted to metered parking. The two-hour signed spaces have higher compliance rates than one-hour spaces in all subareas. Compliance rates of two-hour spaces are 40% to 66%. If the two-hour spaces were metered, and the vehicles that parked in the third hour were brought into compliance, the compliance rate could reach 50% to 81%.
3. For simplicity and efficiency of sign production and enforcement, three-hour spaces should be converted to another restriction type depending on nearby needs. Three-hour spaces are located in Subarea E, West Seattle Center.
4. Consider converting a portion of the unrestricted spaces to two-hour pay stations (meters) where data show that two-hour parking is occurring in unrestricted spaces. Review adjacent land use to determine local parking needs and identify businesses that may benefit from turnover. Work with area businesses to determine areas that would benefit from two-hour parking limits to serve customer needs throughout the study area.
5. Consider installing long-term pay-by-space meters in areas where unrestricted parking now exists, but a mix of parking durations is desired. Parking time limits ranging

from one hour to all day could be provided. The pay-by-space technology allows these longer limits only for the area served, and would not create enforcement issues associated with transferring longer-time permits to other areas of the City.

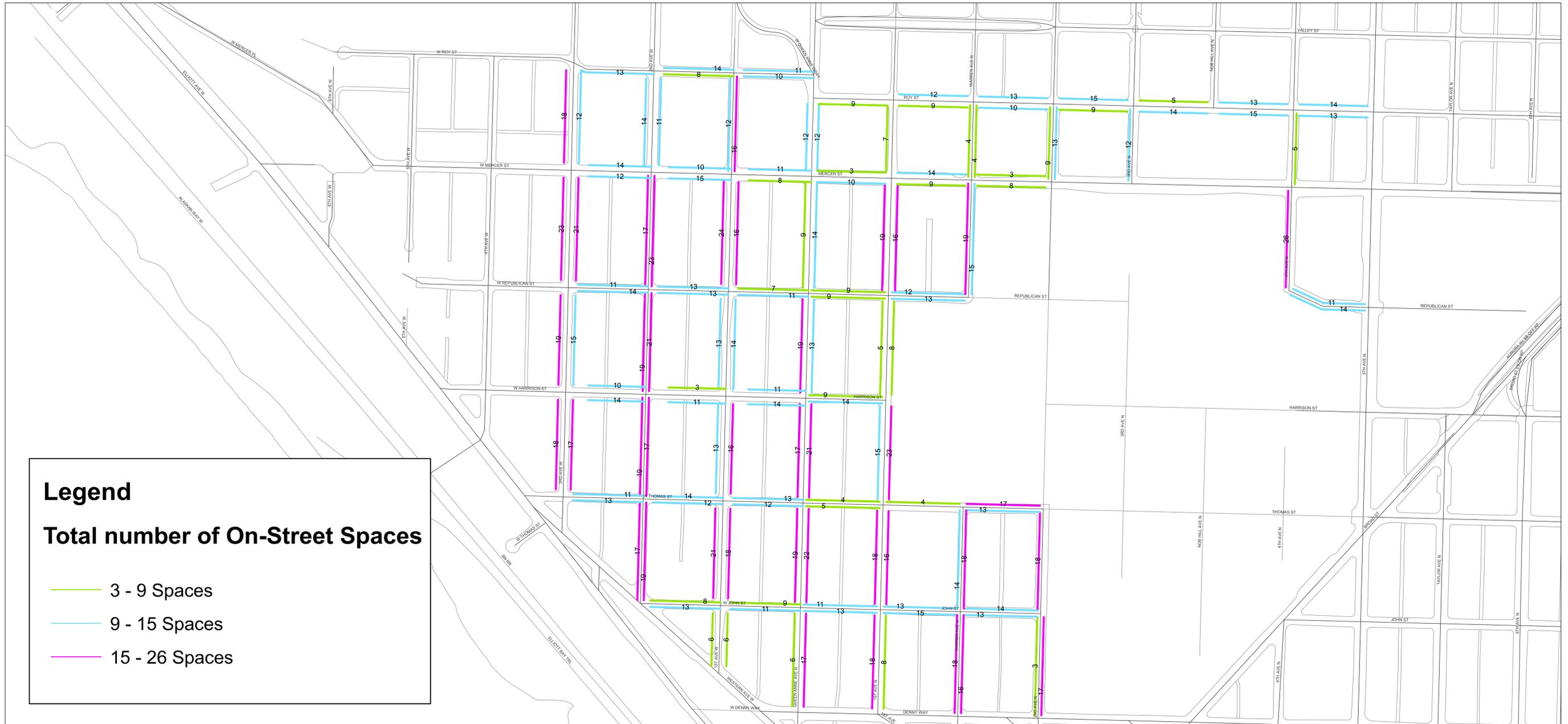
6. Consider residential parking zone permits. Most of the residential needs are in Subarea A, where over 60 vehicles were parked at 7:00 P.M. and over 60 vehicles were parked at the beginning of data collection at 10:00 A.M. Candidate streets should not have ground-floor commercial uses that would need short-term parking.
7. Excess load/unload spaces could be converted to signed or metered spaces to improve the supply. Review locations of load/unload spaces for needs of adjacent land use. Consolidate load/unload spaces and move to ends of blocks to facilitate ease of access to load/unload spaces. In particular, Subarea B should be reviewed to determine if the existing 64 load/unload spaces are needed.
8. Eliminate 15-minute and 30-minute meter or signed parking restrictions. There are very few, adding to complexity in enforcement and signage. Thirty minute parking spaces are in areas with a quantity of load/unload spaces and may be eliminated without impact. The location of these spaces should be reviewed for load/unload needs on that block face.
9. Explore the possibility of evening meters to provide turnover for local businesses during events at the Seattle Center.
10. Replace existing meters with parking pay stations. The technology should be the pay-and-display type system used elsewhere in the city.
11. Retain designated spaces for vehicles with disabled parking permits in their current locations.
12. Increase Parking Enforcement Officers resources (PEOs) to enforce new parking management controls along the corridor.

APPENDIX



Seattle Department of Transportation

On-Street Parking Supply in Uptown Neighborhood



This map reflects only data collected by consultants on blockfaces specific to the parking study results.

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Seattle Department of Transportation

On - Street Parking Average Occupancy - 1 and 2 hour Signs and Parking Meters



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Seattle Department of Transportation

On-Street Parking Average Occupancy - Unrestricted Parking



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