

TECHNICAL REPORT

**FIRST HILL NEIGHBORHOOD
ON-STREET PARKING STUDY**

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1. Introduction

A parking study was performed in Seattle's First Hill neighborhood in April 2009. There were two main purposes for this study. One purpose was to evaluate parking utilization, compliance, and parking duration for various areas of the First Hill neighborhood. Another purpose was to evaluate parking by cars using disabled parking permits in the vicinity of First Hill's three major hospitals: Virginia Mason, Swedish, and Harborview Medical Center. The data and analysis will help the Seattle Department of Transportation (SDOT) determine if changes in parking management techniques are needed. The study provided:

- the location, utilization, and compliance of parking spaces with time limits;
- parking quantity, location, utilization, and duration of unregulated spaces;
- parking utilization by time of day,
- the proportion of parked cars with disabled parking permits for areas near the three hospitals; and
- the proportion of cars with disabled parking permits that parked for more than four hours.

Detailed parking surveys were performed for 50 block faces in the First Hill neighborhood. Three distinct areas were surveyed and include:

- 18 block faces in the four square blocks east of Virginia Mason Hospital,
- 19 block faces west of Swedish Hospital,
- and 13 block faces in the vicinity of Harborview Medical Center.

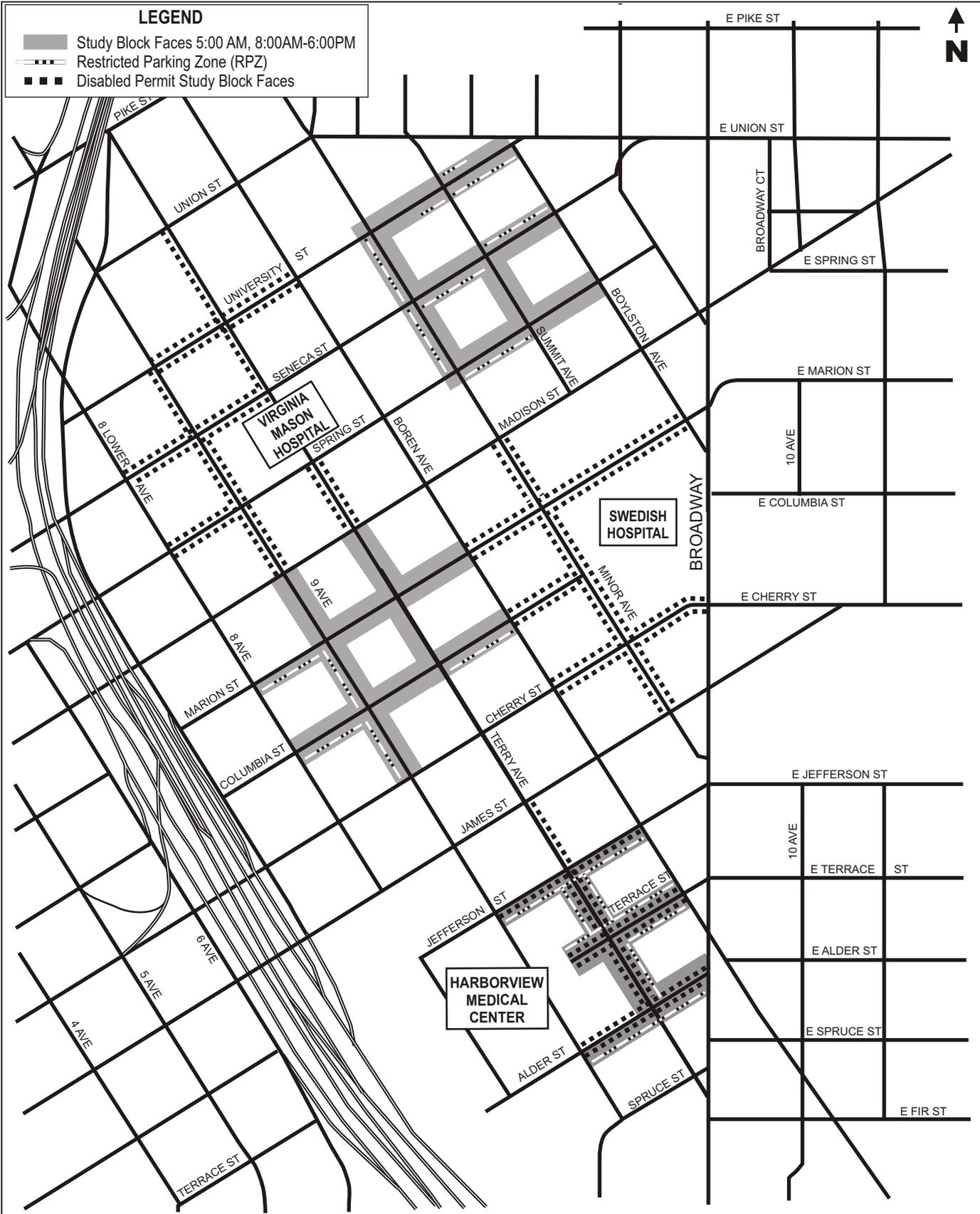
The streets surveyed and the time periods surveyed are shown in Figure 1. Some of the areas are within Zone 7 and Zone 21 of the City of Seattle's Restricted Parking Zone (RPZ) program. The study area inventory was provided by the Seattle Department of Transportation (SDOT) on maps prepared by the department's Geographic Information System (GIS) work team.

2. Study Methodology

Data Collection – Daytime Parking Activity

Parking demand data were collected over three days—Tuesday, April 21, Wednesday, April 22, and Thursday, April 23, 2009—to reflect typical weekday parking activity. The parking surveys were conducted by Operations Management Group (OMG), Inc. The first survey was conducted at 5:00 A.M. to determine the demand characteristics associated with area residents. The daytime surveys were conducted from 8:00 A.M. to 6:00 P.M. in one hour intervals.

OMG collected parking space occupancy data 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 data included “squeeze-in vehicles” on each street segment, which represent motorists who created their own space between other vehicles, at the end of the block, too close to a driveway or in “no-parking” zones. The presence of these vehicles reflects the demand for on-street parking.



FIRST HILL NEIGHBORHOOD Parking Study

Figure 1
Study Area Block Faces

Parking data were evaluated independently for each type of parking restriction and unrestricted parking. Three factors that rate the parking experience were evaluated:

Utilization – The percentage of the legal parking spaces that were occupied by a vehicle. Utilization rates above 100% can occur when vehicles park in illegal spaces or squeeze into marginal areas such as those near intersections, fire hydrants or driveways. The parking utilization for 3-minute, 15-minute, and 30 minute load/unload zones could reflect a lower than actual rate because the survey occurred once per hour. Some cars may have parked and left between each survey.

Compliance – The percentage of vehicles that parked within the established time limits. For example, the cars that parked for two hours or less in a signed two-hour zone. For the First Hill study areas, the compliance rates reflect only the cars that did **not** display an RPZ permit, because permitted vehicles are not subject to the time limits. Also, compliance rates are only measured for the period between 8:00 A.M. and 6:00 P.M. when time limits are in effect.

Parking duration – The length of time that a vehicle occupied a space. This factor was only evaluated for unrestricted spaces.

Parking Capacity

The practical capacity for parking is defined at 85% utilization. When utilization exceeds the practical capacity, drivers could experience delays and frustration while searching for a parking space. Circling the block in search of a parking space also contributes to area traffic congestion and increased vehicle emissions.

Practical capacity is used to determine the adequacy of a parking system. SDOT considers utilization rates above about 75% to be the threshold where additional parking management techniques should be explored through a comprehensive study. SDOT can then put measures in place before parking reaches capacity. SDOT also uses parking management measures to support the goal of reducing automobile trips, particularly for commuting. Short-term parking limits that encourage turnover for retail and businesses are preferred over long-term parking by commuters.

Data Collection – Disabled Parking Permits

Parking data for the disabled parking permit study were collected on Tuesday, April 21, 2009 and Tuesday, April 28, 2009. Surveys were performed at 10:00 A.M. and 2:00 P.M. The proportion of parked cars displaying either a disabled parking permit placard (hang-tag) or a disabled-persons license plate was calculated for each survey. In addition, by matching permit numbers, the number of cars using the disabled permit that parked for at least four hours was reported. There is no time limit on parking by cars displaying a disabled parking permit regardless of the signed parking restriction.

3. Parking Space Inventory and Average Utilization

The parking space inventory reflects parking regulations in effect midday. For the most part, time-limits begin at 8:00 A.M. and end at 6:00 P.M., when signed time restrictions and pay station spaces become unrestricted spaces. (Note: cars with an RPZ tag are exempt from parking time limits.) Table 1 summarizes parking space inventory and average daytime utilization for each parking restriction type within each of the three areas of study on First Hill. The survey included a total of 458 parking spaces on 51 block faces.

Table 1. First Hill Parking Inventory and Average Utilization

Parking Type for Each Survey Area	Number of Parking Spaces ¹	Average Utilization ²
East of Virginia Mason Hospital		
3-minute Signed Time-Limit	7	10% ³
30-minute Signed Time-Limit	11	36% ³
30-minute Pay Station	3	20% ³
1-hour Signed Time-Limit	9	66%
2-hour Signed Time-Limit	54	87%
2-hour Pay Station	64	46%
Unrestricted	<u>39</u>	<u>92%</u>
Total	187	66%
West of Swedish Hospital		
3-minute Signed Time-Limit	6	30%
15-minute Meter	1	0%
30-minute Signed Time-Limit	13	44%
30-minute Pay Station	1	20%
1-hour Signed Time-Limit	4	93%
2-hour Signed Time-Limit	25	83%
2-hour Meter	5	24%
2-hour Pay Station	39	62%
Unrestricted	<u>70</u>	<u>92%</u>
Total	164	74%
Vicinity of Harborview Medical Center		
3-minute Signed Time-Limit	2	60%
30-minute Signed Time-Limit	3	7%
2-hour Signed Time-Limit	89	90%
Unrestricted	<u>13</u>	<u>134%</u> ⁴
Total	107	93%

1. Source: SDOT GIS. Parking supply midday on a weekday when all parking restrictions are in effect.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc. Average utilization from 8:00 A.M. to 6:00 P.M.
3. Average utilization for load/unload zones reflects the percent of occupied spaces seen during a once-per-hour survey frequency. More usage could occur between surveys.
4. Average utilization above 100% means that cars squeezed in to spaces within gaps in the curb space, near corners, or other non-compliant curb space. Utilization is reported above 100% to reflect actual demand for parking.

Utilization of 3-minute signed time-limited spaces ranged from 10% in the area east of Virginia Mason Hospital, 30% west of Swedish Hospital, and 60% in the vicinity of Harborview Medical Center. A low utilization rate is reflective of short-duration parking that would often be empty when the data collector passed by, but may have been used between survey passes. Traditionally, the time limits have been in effect from 8:00 A.M. to 6:00 P.M.; however, some 3-minute passenger load zones are in effect 24 hours per day.

The 30-minute signed time-limited spaces were surveyed once per hour and also may have been utilized between survey passes. The average daytime utilization was 36% east of Virginia Mason Hospital and 44% west of Swedish Hospital, and 7% in the vicinity of Harborview Medical Center. The low utilization near Harborview is based on a small number of spaces.

The 2-hour signed time limited spaces show an average utilization of 87% east of Virginia Mason Hospital, 83% west of Swedish Hospital, and 90% in the vicinity of Harborview Medical Center. The 2-hour pay stations had lower utilization rates, 46% east of Virginia Mason Hospital and 62% west of Swedish Hospital. There were no 2-hour pay stations in the vicinity of Harborview Medical Center.

The unrestricted spaces had the highest utilization, at 92% in the vicinity of both Virginia Mason and Swedish Hospitals. The utilization of 13 unrestricted spaces in the vicinity of Harborview Medical Center was 134% meaning that cars were parked within available gaps along the curb and/or were parked at corners or other non-compliant spaces.

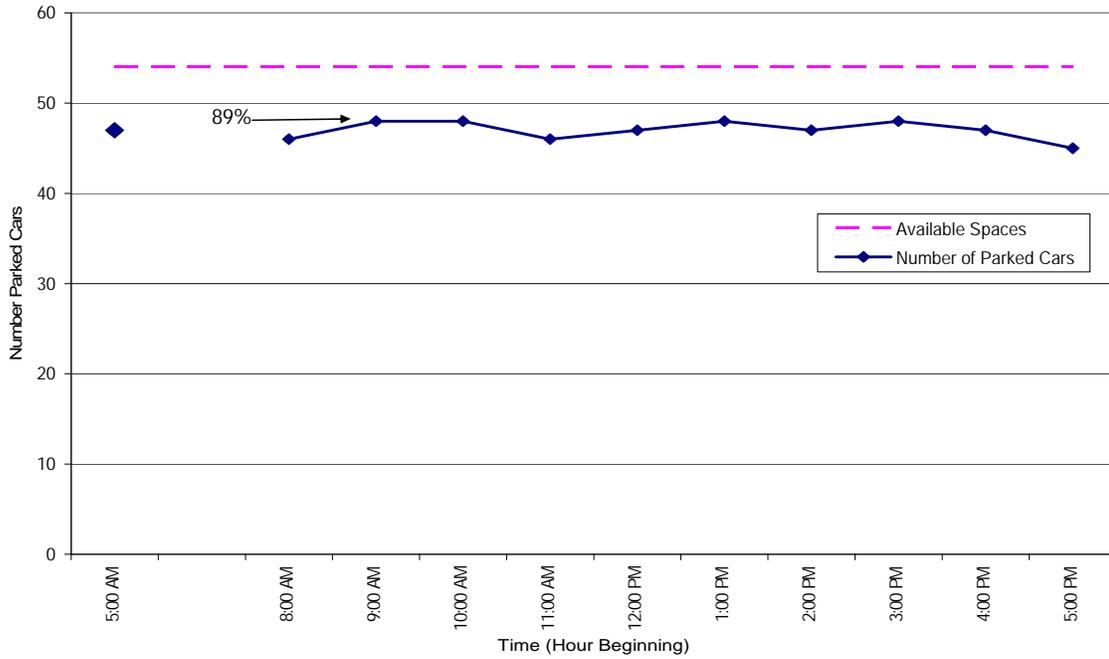
4. Parking Utilization by Time of Day

Parking utilization by time of day was calculated for 2-hour signed time-limited spaces, 2-hour pay station spaces, and unrestricted spaces. The utilization data are shown in three charts, one for each of the three areas. The utilization is shown at 5:00 A.M. and then continuously from 8:00 A.M. to 6:00 P.M.

Parking Utilization for Two-Hour Signed Time-Limited Spaces

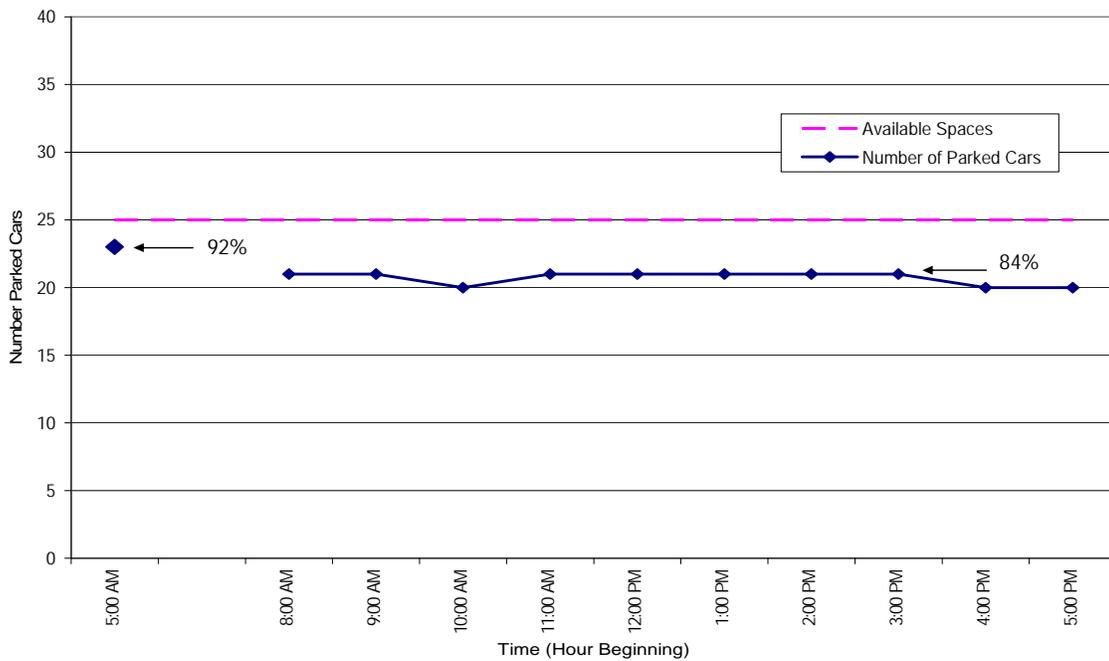
Figure 2, Figure 3, and Figure 4 present utilization by time of day for the areas east of Virginia Mason Hospital, west of Swedish Hospital, and in the vicinity of Harborview Medical Center, respectively. The utilization is above or near 85% throughout the day in all study areas. There was a slight dip in utilization over the noon hour in the vicinity of Harborview Medical Center.

Figure 2. Parking Utilization for Two-hour Signed Spaces - East of Virginia Mason Hospital



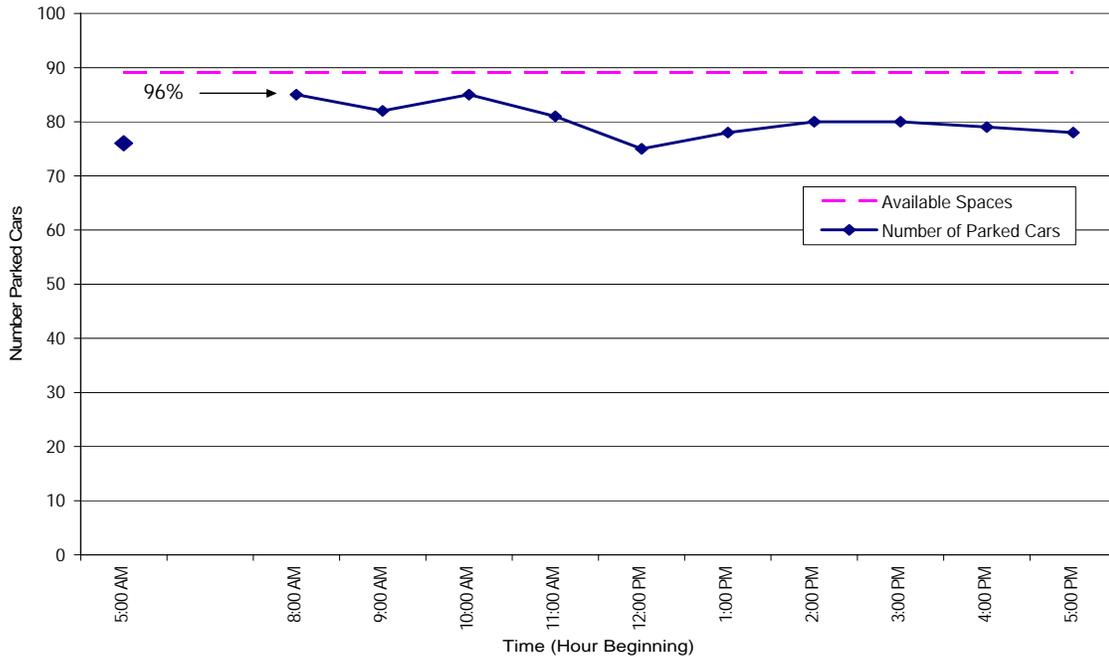
Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

Figure 3. Parking Utilization for Two-hour Signed Spaces - West of Swedish Hospital



Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

Figure 4. Parking Utilization for Two-hour Signed Spaces
 Vicinity of Harborview Medical Center

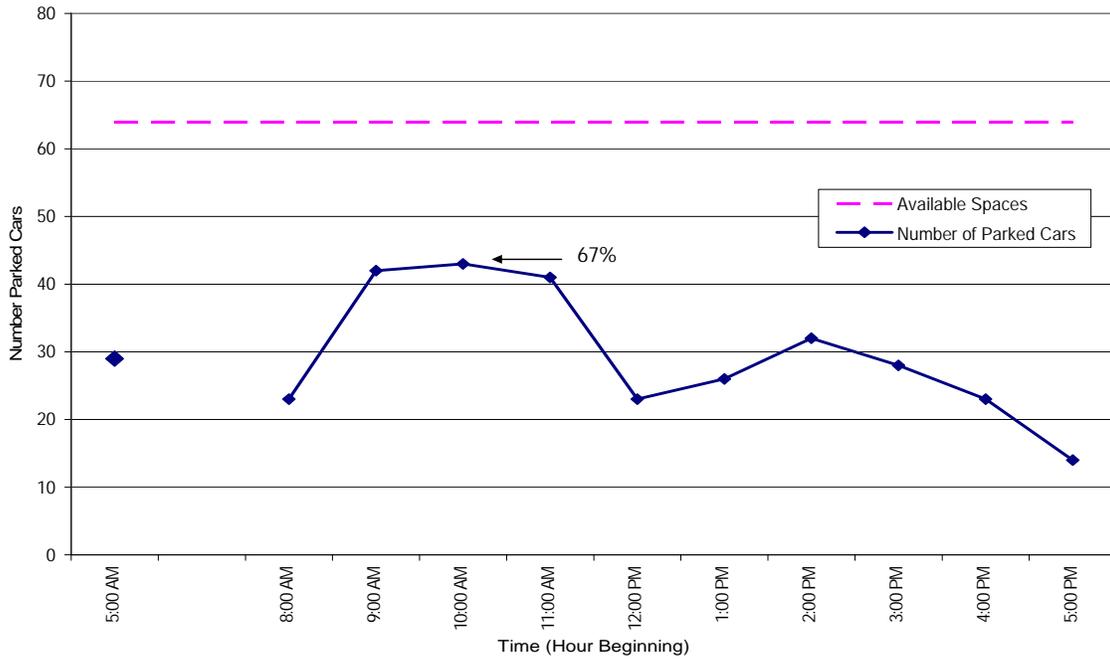


Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

Parking Utilization for Two-Hour Pay Station Spaces

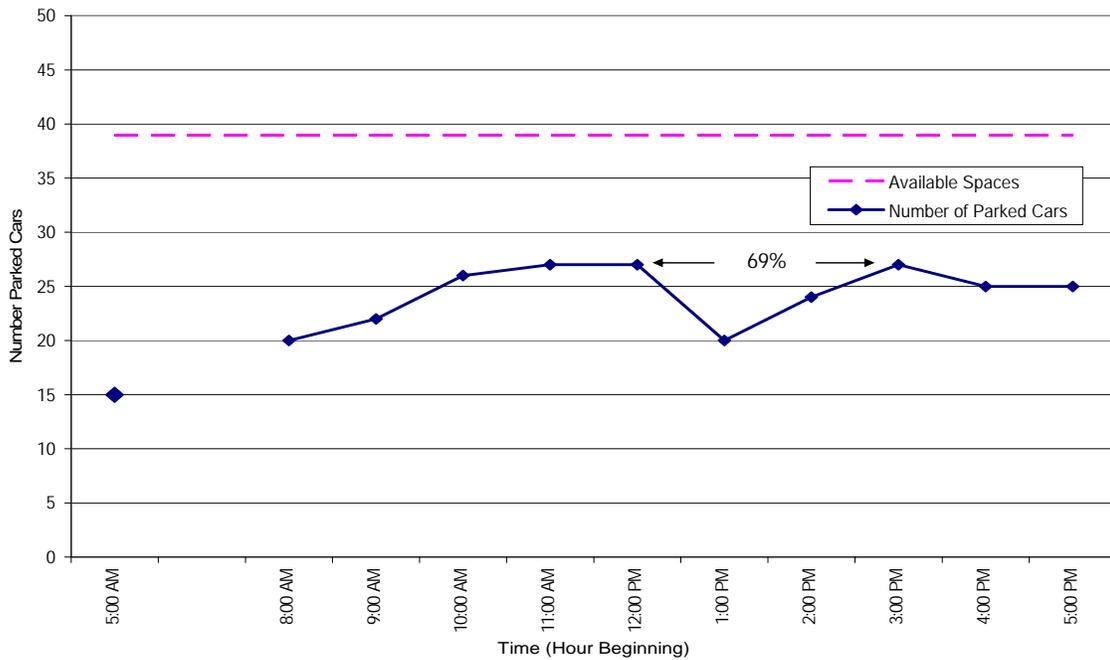
Figure 5 and Figure 6 present utilization by time of day for the areas east of Virginia Mason Hospital and west of Swedish Hospital. (There are no 2-hour pay stations in the vicinity of Harborview Medical Center.) The utilization is lower than for 2-hour signed time-limited spaces. Peak utilization east of Virginia Mason Hospital occurred at 10:00 A.M. with 67% utilization. Peak utilization west of Swedish Hospital occurred at 12:00 P.M. and 3:00 P.M. with 69% utilization.

Figure 5. Parking Utilization for Two-Hour Pay Station Spaces East of Virginia Mason Hospital



Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

Figure 6. Parking Utilization for Two-Hour Pay Station Spaces - West of Swedish Hospital

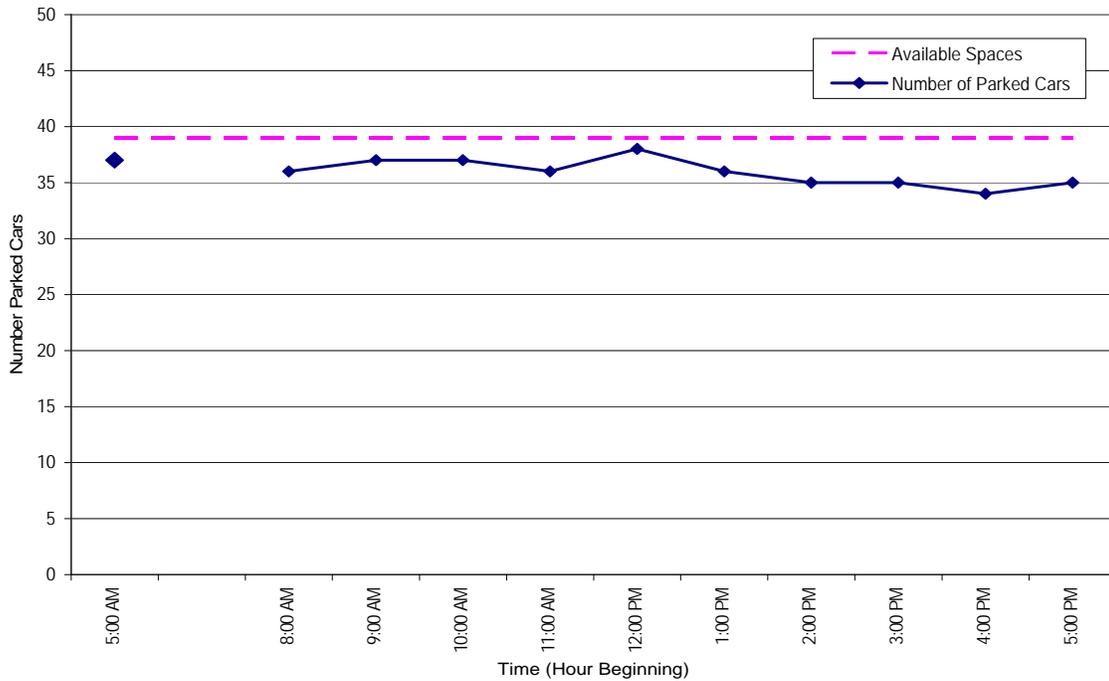


Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

Parking Utilization for Unrestricted Spaces

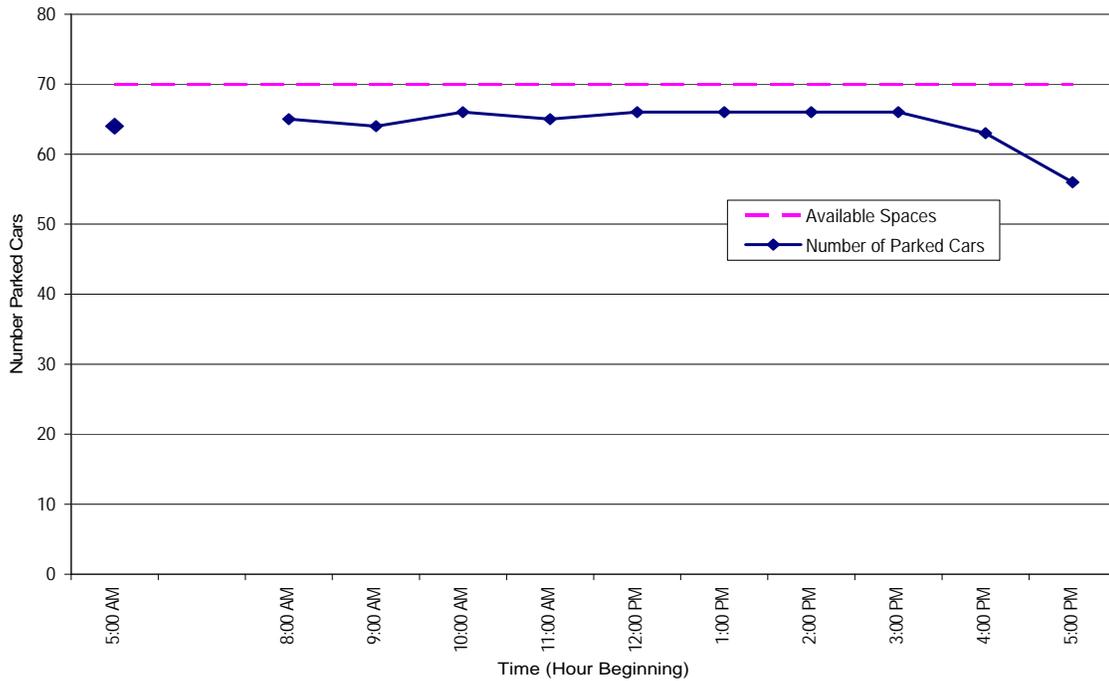
Figure 7, Figure 8, and Figure 9 show parking utilization by time of day, for unrestricted spaces, in each of the areas. Utilization was 90% or higher for most hours of the day in each area. West of Swedish hospital, utilization drops off at 5:00 P.M.

Figure 7. Parking Utilization for Unrestricted Spaces
East of Virginia Mason Hospital



Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

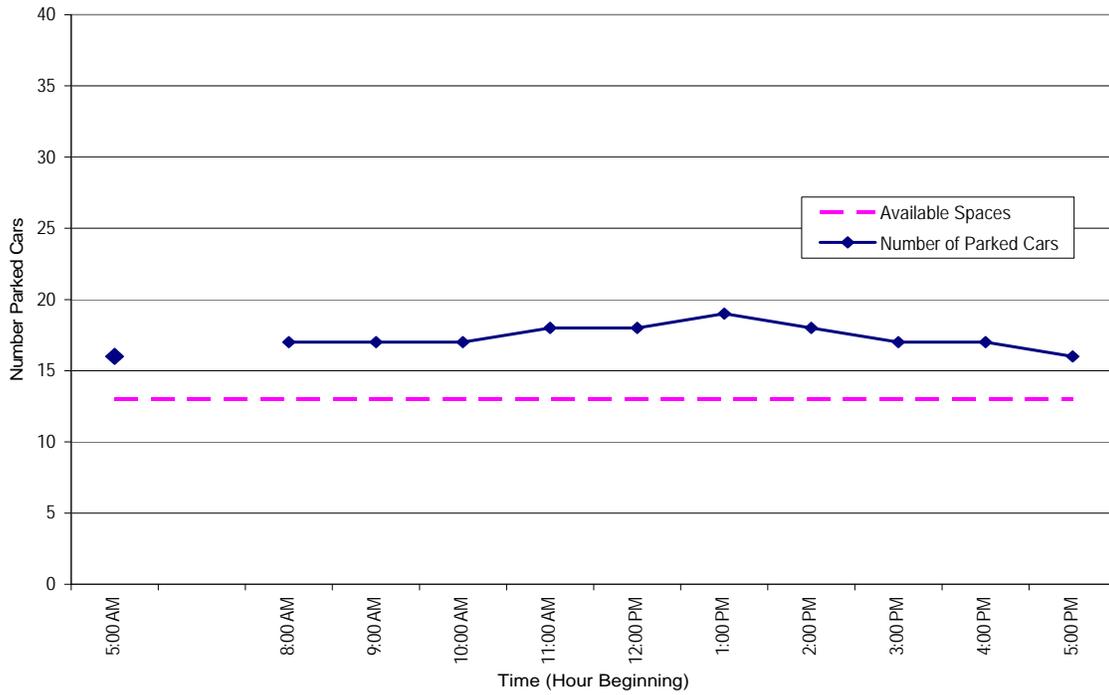
Figure 8. Parking Utilization for Unrestricted Spaces
West of Swedish Hospital



Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

The utilization of unrestricted spaces in the vicinity of Harborview Medical Center was over 100% throughout the day. The data show a large number “squeeze-ins” on block faces with unrestricted parking. This means that cars are using small gaps in curb space, parking at corners, or other non-compliant parking spaces. It is also possible that more vehicles can park between driveways by using the driveway area for maneuvering space.

Figure 9. Parking Utilization for Unrestricted Spaces
Vicinity of Harborview Medical Center



Source: Operations Management Group, data collection April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

5. Parking Compliance

Parking compliance rates were calculated for time-limited and pay stations spaces. The compliance rate is the percentage of vehicles that parked within the established time limits. For example, the cars that parked for two hours or less in a signed two-hour zone. For the First Hill study areas, the compliance rates reflect only the cars that did **not** display an RPZ permit since permitted vehicles are not subject to the time limits.

For cars parked at 5:00 A.M. the compliance rates were calculated for vehicles that were parked at 8:00 A.M. or later. Cars that parked for one-hour or less were considered to be compliant for 30-minute, 30-minute and 1-hour time-limited spaces, including cars that were parked at 5:00 A.M. but had left the area by 9:00 A.M.

Compliance rates were also calculated for vehicles that arrived after 8:00 A.M. and left the space before 6:00 P.M. Cars that parked after 6:00 P.M. were excluded since the time limits no longer apply. Table 2 and Table 3 present parking compliance rates for 30-minute, and 1-hour signed time-limited parking spaces.

Table 2. First Hill 30-Minute Signed Time-Limited Parking Space Compliance Rates

Parking Area	Number of Spaces ¹	Parked at 5:00 A.M. ²			Parked between 8:00 A.M. and 6:00 P.M. ²		
		Number Parked	Number RPZ tags	Rate ³	Number Parked	Number RPZ tags	Rate ⁴
East of Virginia Mason Hospital	11	9	1	67%	26	1	73%
West of Swedish Hospital	13	6	2	75%	35	0	100%
Harborview Medical Center	3	0	0	n/a	2	0	100%

1. Source: SDOT GIS maps. Parking inventory at mid-day reflects daytime hours.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.
3. The compliance rates are based on the number of vehicles still parked after 9:00 A.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.
4. The compliance rates reflect cars arriving after 8:00 A.M. and leaving before 6:00 P.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.

Table 3. First Hill 1-Hour Time-Limited Parking Space Compliance Rates

Parking Area	Number of Spaces ¹	Parked at 5:00 A.M. ²			Parked between 8:00 A.M. and 6:00 P.M. ²		
		Number Parked	Number RPZ tags	Rate ³	Number Parked	Number RPZ tags	Rate ⁴
East of Virginia Mason Hospital	9	12	0	100%	34	0	85%
West of Swedish Hospital	4	1	0	100%	13	0	31%
Harborview Medical Center	0	0	0	n/a	0	0	n/a

1. Source: SDOT GIS maps. Parking inventory at mid-day reflects daytime hours.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.
3. The compliance rates are based on the number of vehicles still parked after 9:00 A.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.
4. The compliance rates reflect cars arriving after 8:00 A.M. and leaving before 6:00 P.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.

Table 4 and Table 5 present compliance rates for 2-hour time-limit and 2-hour pay station spaces. Cars parked at 5:00 A.M. that left their space after 10:00 A.M. were considered compliant. Cars parked beyond 10:00 A.M. are non-compliant. Cars displaying an RPZ permit were not included in the calculation.

Table 4. First Hill Two-Hour Time-Limited Parking Space Compliance Rates

Parking Area	Number of Spaces ¹	Parked at 5:00 A.M. ²			Parked between 8:00 A.M. and 6:00 P.M. ²		
		Number Parked	Number RPZ tags	Rate ³	Number Parked	Number RPZ tags	Rate ⁴
East of Virginia Mason Hospital	54	48	23	76%	66	5	56%
West of Swedish Hospital	25	22	11	88%	28	1	44%
Harborview Medical Center	89	76	32	85%	190	6	59%

1. Source: SDOT GIS maps. Parking inventory at mid-day reflects daytime hours.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.
3. The compliance rates are based on the number of vehicles still parked after 10:00 A.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.
4. The compliance rates reflect cars arriving after 8:00 A.M. and leaving before 6:00 P.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.

Table 5. First Hill Two-Hour Pay Station Time-Limited Parking Space Compliance Rates

Parking Area	Number of Spaces ¹	Parked at 5:00 A.M. ²			Parked between 8:00 A.M. and 6:00 P.M. ²		
		Number Parked	Number RPZ tags	Rate ³	Number Parked	Number RPZ tags	Rate ⁴
East of Virginia Mason Hospital	64	33	0	56%	191	0	86%
West of Swedish Hospital	39	13	0	67%	122	6	75%
Harborview Medical Center	0	0	0	n/a	0	0	n/a

1. Source: SDOT GIS maps. Parking inventory at mid-day reflects daytime hours.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.
3. The compliance rates are based on the number of vehicles still parked after 10:00 A.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.
4. The compliance rates reflect cars arriving after 8:00 A.M. and leaving before 6:00 P.M. Vehicles with an RPZ tag parked on block faces signed as a restricted parking zones were excluded from the compliance rate.

6. Parking Duration for Unrestricted Parking Spaces

Table 6 presents a summary of parking duration for unrestricted spaces. Cars parked at 5:00 A.M. are likely reflective of cars parked overnight for residential use. Table 6 includes the total number of cars parked at 5:00 A.M. and then the number of the same cars if seen parked in the same stall at 5:00 A.M. and at 6:00 P.M. Some of these cars were parked in the same stall at 5:00 A.M. and 6:00 P.M. but were gone during the day. The number of unique parked cars were summed to identify the cars that arrived after 8:00 A.M. and before 6:00 P.M. to calculate the average parking duration in an unrestricted space. Cars that parked at 6:00 P.M. were excluded because their duration is unknown. The result was 2.7 hours parked in the area east of Virginia Mason Hospital, 3.1 hours west of Swedish Hospital, and 3.2 hours in the vicinity of Harborview Medical Center. Table 6 also shows that at 5:00 A.M. 110 of the 122 spaces were occupied, resulting in a utilization rate of 90%.

Table 6. First Hill Parking Duration in Unrestricted Parking Spaces

Parking Area	Number of Spaces ¹	Number of Cars Parked		Number Unique Parked Cars ²		Average Hours Parked ³
		At 5:00 AM ²	Same Car At 5:00 A.M. and 6:00 P.M. ²	8:00 A.M. to 6:00 P.M.	At 6:00 P.M.	
East of Virginia Mason Hospital	39	31	24	15	9	2.7
West of Swedish Hospital	70	65	25	50	29	3.1
Harborview Medical Center	13	14	2	11	10	3.2
Total	122	110	51	76	48	

1. Source: SDOT GIS maps, number unrestricted parking spaces.

2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.

3. Based on the number of cars arriving after 8:00 A.M. and leaving before 6:00 P.M.

7. Disabled Permit Parking

Parking by cars using a disabled parking permit was surveyed in the vicinity of First Hill's three major hospitals: Virginia Mason, Swedish, and Harborview Medical Center. The survey areas for this part of the study were shown on Figure 1. The total number of vehicles on each survey block face was recorded at 10:00 A.M. and 2:00 P.M. Vehicles displaying a disabled parking placard or having a license plate were recorded. In addition, by matching permit numbers, the number of cars using the disabled permit that parked for at least four hours was reported. The results are presented in Table 7. It is noted that the survey did not determine the legitimacy of these permits or the drivers who used them. Further analysis will be performed by the City of Seattle using the surveyed permit numbers.

Special parking privileges for disabled persons are mandated by state law. Washington State law (RCW 46.61.582) requires that on-parking for disabled persons be free. State law also notes that 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 for the use of these parking spaces. In the City of Seattle no such restrictions have been imposed by ordinance.

Table 7. Disabled Permit Parking Use

Parking Area	Parked Cars at 10:00 A.M.			Parked Cars at 2:00 P.M.			Cars with Permit that Parked over 4 Hours ²
	Without Permit	With Permit ¹	Percent with Permit	Without Permit	With Permit ¹	Percent with Permit	
Virginia Mason Hospital	68	47	41%	80	47	37%	54%
Swedish Hospital	70	54	44%	79	52	40%	37%
Harborview Medical Center	104	4	4%	103	9	8%	36%
Total	244	105	30%	262	108	29%	44%

Source: Operations Management Group, data collection on April 21 and April 28, 2009. Compiled by Heffron Transportation, Inc.

1. Vehicles displaying a disabled-persons placard (mirror hangtag) or having a disabled persons license plate.

2. Vehicles displaying a disabled-persons placard (mirror hangtag) that parked in the same space for both survey passes.

8. Key Findings

Key findings for weekday parking are presented in Table 8 below, followed by a descriptive summary for the various types of parking restrictions: 30-minute time limits; 1-hour time limits; 2-hour time limits; 2-hour pay stations; and unrestricted parking.

Table 8. First Hill Parking Activity Summary

Parking Type for Each Survey Area	Number of Parking Spaces ¹	Utilization ²			Compliance Rate ⁶	Average Duration ⁹
		Average ³	Peak	Time of Peak		
East of Virginia Mason Hospital						
3-minute Signed Time-Limit	7	10% ⁴	50%	1:00 P.M.	90%	2.7 Hours
30-minute Signed Time-Limit	11	36% ⁴	73%	8:00 A.M.	73%	
30-minute Pay Station	3	20% ⁴	n/a ⁷		n/a	
1-hour Signed Time-Limit	9	66%	100%	2:00 P.M.	85%	
2-hour Signed Time-Limit	54	87%	89%	9:00 A.M.	56%	
2-hour Pay Station	64	46%	67%	10:00 A.M.	86%	
Unrestricted	<u>39</u>	92%	97%	12:00 P.M.	n/a ⁸	
Total	187	66%				
West of Swedish Hospital						
3-minute Signed Time-Limit	6	30%	75%	5:00 A.M.	88%	3.1 Hours
15-minute Meter	1	0%	n/a		n/a	
30-minute Signed Time-Limit	13	44%	62%	Multiple	100%	
30-minute Pay Station	1	20%	n/a		n/a	
1-hour Signed Time-Limit	4	93%	125%	9:00 A.M.	31%	
2-hour Signed Time-Limit	25	83%	92%	5:00 A.M.	44%	
2-hour Meter	5	24%	80%	5:00 P.M.	64%	
2-hour Pay Station	39	62%	69%	Multiple	75%	
Unrestricted	<u>70</u>	92%	94%	Multiple	n/a	
Total	164	74%				
Vicinity of Harborview Medical Ctr						
3-minute Signed Time-Limit	2	60%	100%	Multiple	83%	3.2 Hours
30-minute Signed Time-Limit	3	7%	33%	Multiple	100%	
2-hour Signed Time-Limit	89	90%	96%	Multiple	59%	
Unrestricted	<u>13</u>	134% ⁵	146%	1:00 P.M.	n/a	
Total	107	93%				

1. Source: SDOT GIS. Parking supply midday on a weekday when all parking restrictions are in effect.
2. Operations Management Group, data collection on April 21, 22, and 23, 2009. Compiled by Heffron Transportation, Inc.
3. Average utilization from 8:00 A.M. to 6:00 P.M.
4. Average utilization for load/unload zones reflects the percent of occupied spaces seen during a once-per-hour survey frequency. More usage could occur between surveys.
5. Average utilization above 100% means that cars squeezed in to spaces within gaps in the curb space, near corners, or other non-compliant curb space. Utilization is reported above 100% to reflect actual demand for parking.
6. Compliance rate calculated for cars parked between 8:00 A.M. and 6:00 P.M., excluding cars with RPZ tags.
7. Not applicable due to very small number of spaces.
8. Compliance rate not applicable for unrestricted spaces.
9. Average duration calculated for the number of cars arriving after 8:00 A.M. and leaving before 6:00 P.M. (Excludes cars parked at 5:00 A.M. and 6:00 P.M. because the total parking duration is unknown.)

30-Minute Parking Restrictions

- There are a total of 27 thirty-minute time limit spaces on study blocks: 11 east of Virginia Mason Hospital, 13 west of Swedish Hospital, and 3 near Harborview Medical Center.
- The average daytime utilization was 36% east of Virginia Mason Hospital and 44% west of Swedish Hospital, and 7% in the vicinity of Harborview Medical Center.
- The compliance rates were high, with 73% east of Virginia Mason Hospital and 100% west of Swedish Hospital and 100% in the vicinity of Harborview Medical Center.

One-Hour Parking Restrictions

- There are thirteen 1-hour time limit spaces on study block faces with nine in the area east of Virginia Mason Hospital and four west of Swedish Hospital.
- The average utilization was 66% in the area east of Virginia Mason and 93% west of Swedish Hospital.
- The compliance rate was 85% east of Virginia Mason Hospital and 31% west of Swedish Hospital. There were 12 cars parked in 1-hour spaces at 5:00 A.M. all of which left prior to 9:00 A.M. in the area east of Virginia Mason Hospital.

Two-Hour Parking Restrictions –Time Limits

- There are a total of 168 signed 2-hour time-limited parking spaces on study block faces: 54 east of Virginia Mason Hospital, 25 west of Swedish Hospital, and 89 in the vicinity of Harborview Medical Center.
 - The average utilization of these 2-hour spaces was 87% east of Virginia Mason Hospital, 83% west of Swedish Hospital, and 90% in the vicinity of Harborview Medical Center.
 - The compliance rates were 56% east of Virginia Mason Hospital, 44% west of Swedish Hospital, and 59% in the vicinity of Harborview Medical Center.
 - There were 146 cars parked in the 168 signed 2-hour spaces at 5:00 A.M. Of these early-morning parked cars, 48% displayed RPZ tags in the area east of Virginia Mason Hospital, 50% west of Swedish Hospital, and 42% in the vicinity of Harborview Medical Center.
 - The compliance rate, the number of cars that left before 10:00 A.M. was 76% east of Virginia Mason Hospital, 89% west of Swedish Hospital, and 85% in the vicinity of Harborview Medical Center. These parked cars were in compliance with the signed time limit.
- ### Two-Hour Parking Restrictions – Pay Stations
- There are a total of 103 signed 2-hour pay station parking spaces on study block faces. There are 64 east of Virginia Mason Hospital, 39 west of Swedish Hospital, and zero in the vicinity of Harborview Medical Center.
 - The average utilization of these 2-hour pay station spaces was 46% east of Virginia Mason Hospital and 62% west of Swedish Hospital. The utilization of pay station spaces is less than 2-hour time limit spaces.

- The average compliance rates were 86% east of Virginia Mason Hospital and 75% west of Swedish Hospital. The compliance rate is higher than 2-hour time limit spaces.
- There were 46 cars parked in the 103 two-hour pay station parking spaces at 5:00 A.M. Thirty one of these parked cars left by 8:00 A.M. when the pay stations go into effect. An additional 11 cars left before 10:00 A.M. when the 2-hour time limit is reached. None of the parked cars after 8:00 A.M. displayed on RPZ tag.

Unrestricted Parking

- There are 122 unrestricted parking spaces on study block faces: 39 in the area east of Virginia Mason, 76 west of Swedish Hospital, and 13 in the vicinity of Harborview Medical Center.
- The average daytime utilization was 92% in the area east of Virginia Mason, 92% west of Swedish Hospital, and 134% in the vicinity of Harborview Medical Center. Utilization above 100% occurs when cars park by squeezing in to gaps in the curb, park at corners, or other non-compliant spaces.
- There were 110 cars parked at 5:00 A.M. utilizing 92% of the spaces.
- The average duration of cars arriving after 8:00 A.M. and leaving before 6:00 P.M. was 2.7 hours in the area east of Virginia Mason, 3.1 west of Swedish Hospital, and 3.2 in the vicinity of Harborview Medical Center.

Other Parking Spaces

- There is one 15-minute meter parking spaces, one in the area west of Swedish Hospital. This space was not occupied during any hour of the survey.
- There are three 30-minute pay stations east of Virginia Mason Hospital.
- There are five 2-hour old-style meter parking spaces in the area west of Swedish Hospital. The compliance rate was 64%.
- There is one on-street disabled parking space in the area of Harborview Medical Center, southeast side of Alder Street, between 9th Avenue and Terry Avenue.

Disabled Parking Permit Use

The study showed relatively high use of on-street parking by vehicles displaying a disabled parking permit. Near Virginia Mason and Swedish Hospitals, 37% to 44% of the vehicles parked displayed such a permit. Of these, the number of vehicles that parked for four hours or more was 54% and 37% for the respective hospitals. There was a low use of disabled parking permits near Harborview with only 4% of the vehicles displaying a permit. These permit numbers were submitted to the City of Seattle for further review to determine the legitimacy of the permit.