

TECHNICAL REPORT

**PIKE-PINE NEIGHBORHOOD  
ON-STREET PARKING STUDY**

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## Table of Contents

1. Introduction .....	1
2. Study Methodology .....	1
3. Parking Space Inventory and Average Utilization .....	3
4. Parking Utilization by Time of Day .....	6
5. Parking Duration .....	12
6. Findings.....	17

## Tables

Table 1. Pike-Pine Area Parking Inventory and Average Utilization .....	5
Table 2. Pike-Pine Area Time-Limited Parking Space Compliance Rates .....	12

## Figures

Figure 1. Study Area .....	2
Figure 2. Parking Inventory.....	4
Figure 3. Parking Utilization for Three-Minute Signed Time-Limited Spaces.....	6
Figure 4. Parking Utilization for 30-Minute Signed Time-Limited Spaces .....	7
Figure 5. Parking Utilization for One-hour Signed Time-Limited Spaces.....	8
Figure 6. Parking Utilization for Two-hour Signed Time-Limited Spaces .....	9
Figure 7. Parking Utilization for Two-Hour Pay Station Spaces .....	10
Figure 8. Parking Utilization for Unrestricted Spaces.....	11
Figure 9. Parking Duration for Unrestricted Spaces – Cars Parked at 5:00 A.M. ....	14
Figure 10. Parking Duration for Unrestricted Spaces – Cars Parked at 10:00 P.M. ....	15
Figure 11. Parking Duration for Unrestricted Spaces – Cars Parked Midday.....	16

## 1. Introduction

This technical report presents the findings of the July 2008 parking survey for the Pike/Pine area. The purpose of this study was to document how often and for how long parking spaces are used in the area on a typical afternoon and evening. 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 quantity, location, and utilization of unregulated spaces,
- the location and occupancy of parking spaces with time limits,
- parking utilization by time of day, and
- parking duration for two-hour and unrestricted spaces.

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.

The study was prepared for select block faces as shown in Figure 1. The area is relatively small with the study area block faces between Summit Avenue, E Union Street, E Madison Street, and E Pine Street. Land use activity in the area is a mix of restaurants, bars, specialty retail, and residential. The community requested that the study include parking activity during the evening and night hours to address the unique mix of restaurants and entertainment venues in the area. The smaller study area allowed for more detailed information to be collected for a longer span of time.

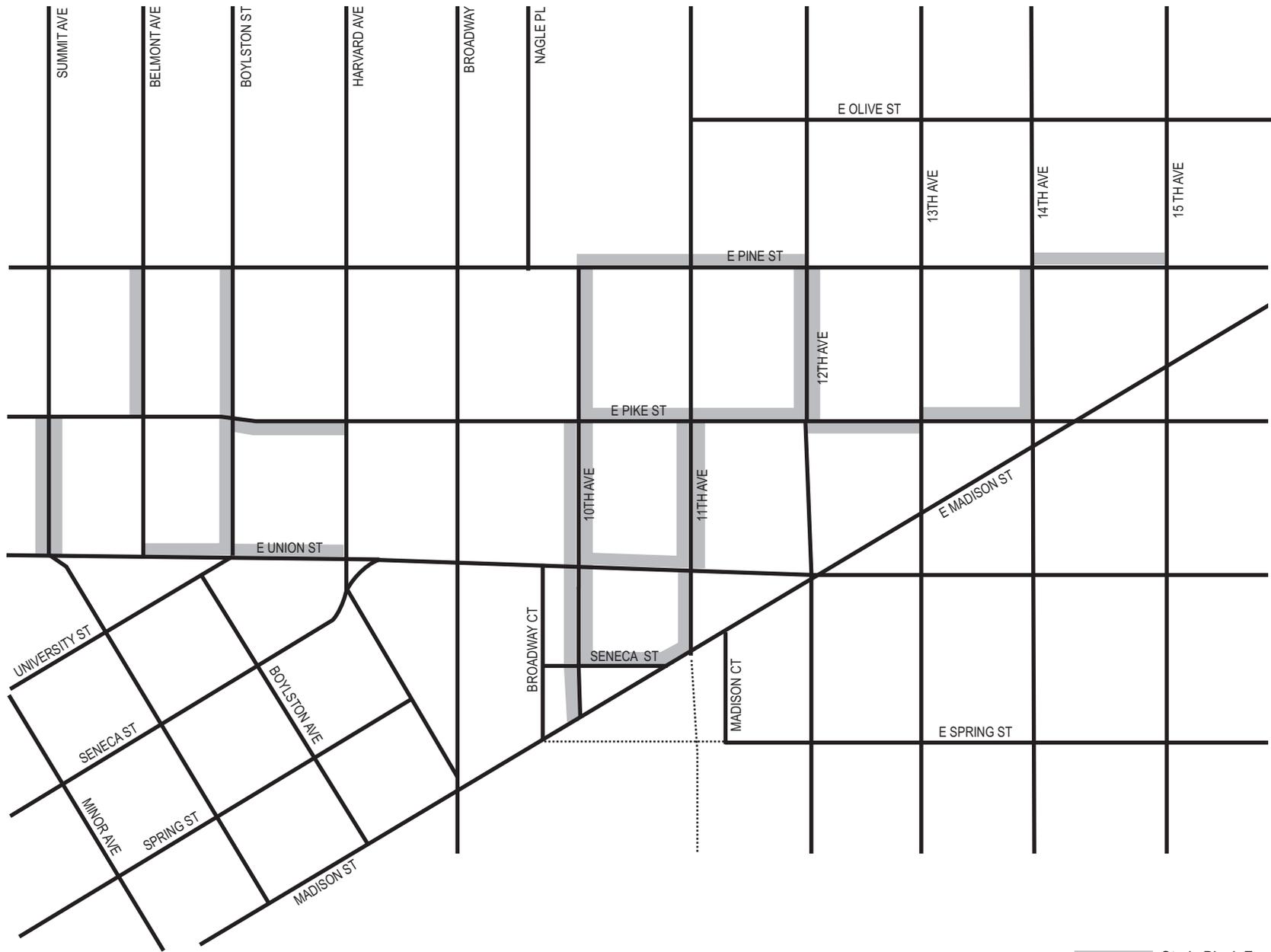
## 2. Study Methodology

### Data Collection

Parking demand data were collected on two days. The area west of Broadway was surveyed on Tuesday, July 15, 2008. The area east of Broadway was surveyed on Thursday, July 17, 2008. Operations Management Group (OMG), Inc. collected the parking data. The first survey was conducted at 5:00 A.M. to determine the demand characteristics associated with area residents. The next surveys were conducted from 11:00 A.M. to 6:00 P.M. in half hour intervals. The last survey occurred at 10:00 P.M. to assess the late night demand associated with the area's restaurants and clubs.

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, or in "no-parking" zones. The presence of these vehicles reflects the demand for on-street parking.

An average parking utilization and utilization by time of day was determined for each parking space type. Parking utilization equals the number of cars parked divided by the number of parking spaces.



Study Block Faces

**PIKE/PINE  
PARKING STUDY**

Figure 1  
Study Area



Parking duration was calculated by counting the 30-minute time periods occupied by the same vehicle. The first three letters or numbers of the vehicle license plate were recorded into the hand-held electronic device during each interval. Vacant spaces were noted in the manual count.

Parking compliance was evaluated for signed, 30-minute, one-hour, signed two-hour, and two-hour pay stations. For two-hour spaces, all vehicles parked for two hours or less were compliant and all vehicles parked longer than two hours were noncompliant.

## Parking Capacity

The practical capacity for parking is defined at 85% utilization. When occupancy exceeds the practical capacity, drivers will 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.

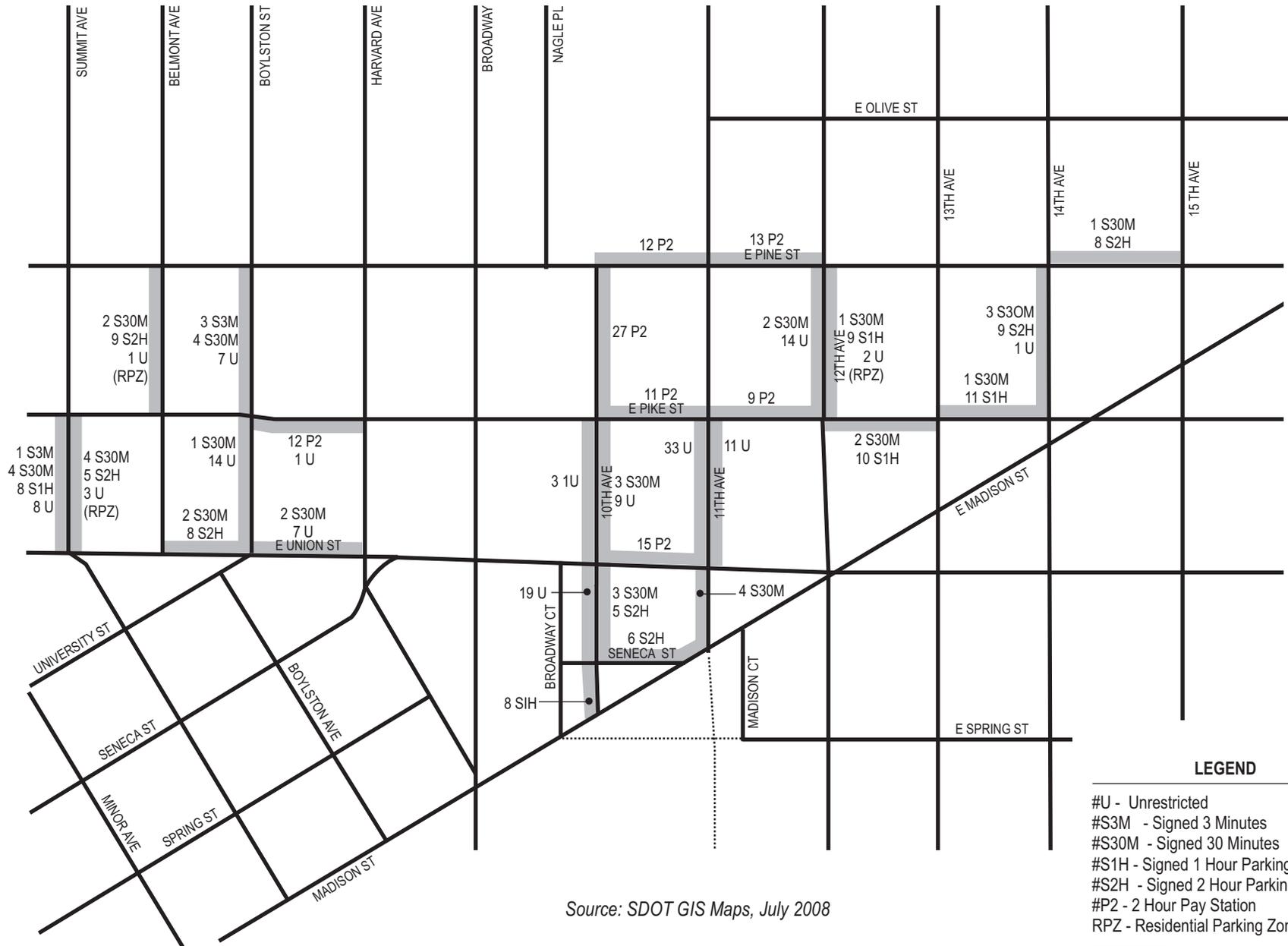
Practical capacity is used to determine the adequacy of a parking system. SDOT considers utilization rates above about 75% to be the threshold where additional parking management techniques should be explored through a comprehensive study. SDOT can then put measures in place before parking reaches capacity. 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 restaurant use are preferred to long-term parking that could be used by commuters.

## 3. Parking Space Inventory and Average Utilization

The parking space inventory reflects parking regulations mid-day. 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. There are some late-night restrictions in this neighborhood such as taxi zones that go into effect near bar-closing times. However, these restrictions were not in effect during the survey time periods. Figure 2 represents the parking inventory by blockface.

Table 1 summarizes parking space inventory and average utilization. There are 406 parking spaces on the study area block faces available for public use. Of the 406 spaces, 168 are unrestricted. There are 50 or fewer spaces for each of the signed parking time-limits. The relatively large supply of unrestricted spaces means that few choose to park in time limited or paid spaces. There were ten dumpsters using curb space in the study area. Two were in a “gap,” a distance between parking spaces not long enough to park. Eight dumpsters were parked in unrestricted spaces, and six were grouped on the west side of 11<sup>th</sup> Avenue between E Union Street and E Pike Street. The number of vehicles with a disabled-persons license plate or hanging placard ranged from zero to five during the entire survey.

The average utilization of all spaces was 74%. The average utilization of the unrestricted spaces was 94%. The average utilization includes 16 survey points: at 5:00 A.M., the fourteen 30-minute periods between 11:00 A.M. and 6:00 P.M., and at 10:00 P.M.



Source: SDOT GIS Maps, July 2008

**LEGEND**

- #U - Unrestricted
- #S3M - Signed 3 Minutes
- #S30M - Signed 30 Minutes
- #S1H - Signed 1 Hour Parking
- #S2H - Signed 2 Hour Parking
- #P2 - 2 Hour Pay Station
- RPZ - Residential Parking Zone
- Study Block Faces

**PIKE/PINE  
PARKING STUDY**

Figure 2  
Parking Inventory



Table 1. Pike-Pine Area Parking Inventory and Average Utilization

Parking Type	Inventory <sup>1</sup>	Average Utilization <sup>2</sup>
<b>Pay Station Parking</b>		
2-hour	99	59%
<b>Signed Parking Time-Limits</b>		
3-minute Signed Time-Limit	5	51%
30-minute Signed Time-Limit	38	43%
1-hour Signed Time-Limit	46	63%
2-hour Signed Time-Limit	50	74%
<b>Unrestricted</b>	168	94% <sup>3</sup>
Occupied by dumpsters	(8)	
<b>Total Available for Public Use</b>	<b>406</b>	<b>74%</b>

1. Source: Heffron-conducted inventory. Parking Inventory at mid-day reflecting daytime hours. Parking restrictions are typically in effect from 8:00 A.M. to 6:00 P.M.
2. Operations Management Group, data collection on July 15 and 17, 2008. Compiled by Heffron Transportation, Inc.
3. Average utilization was 94% including cars parked in No Parking spaces and cars parked in small remainder curb space, reflecting the actual demand for parking. Utilization includes dumpsters parked in unrestricted spaces.

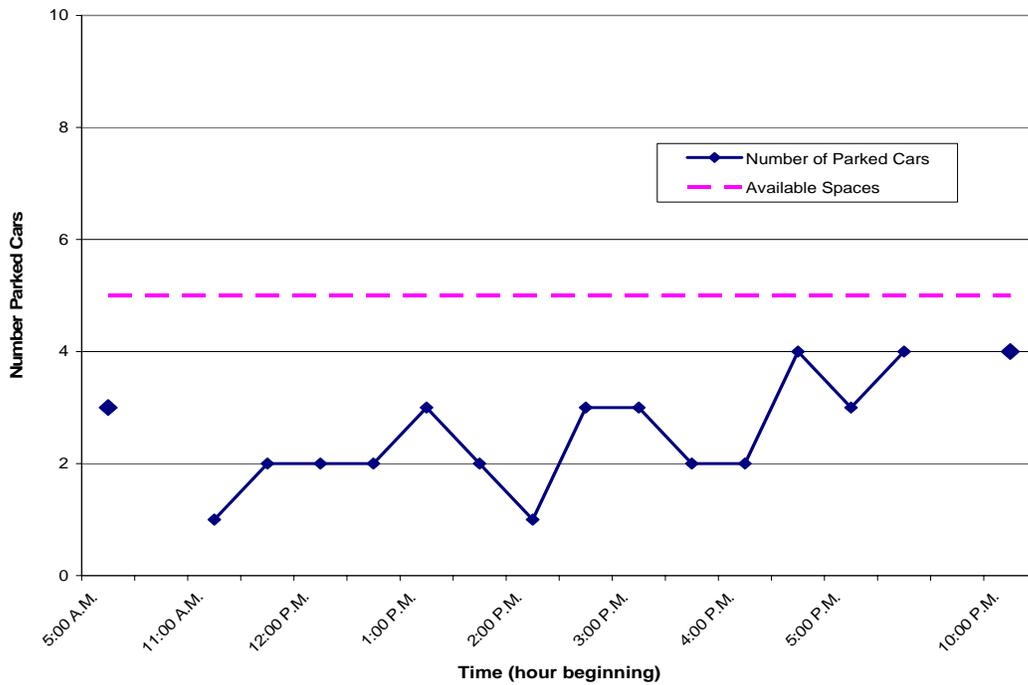
#### 4. Parking Utilization by Time of Day

Parking utilization by time of day was calculated for each parking restriction type. Data were collected with one survey at 5:00 A.M., in 30-minute intervals from 11:00 A.M. to 6:00 P.M., and at 10:00 P.M.

##### Parking Utilization for Three-Minute Passenger Load Zones

Parking utilization in three-minute passenger load zones is presented in Figure 3. The three-minute spaces were used throughout the day, from 5:00 A.M. to 10:00 P.M.

Figure 3. Parking Utilization for Three-Minute Passenger Load Zones

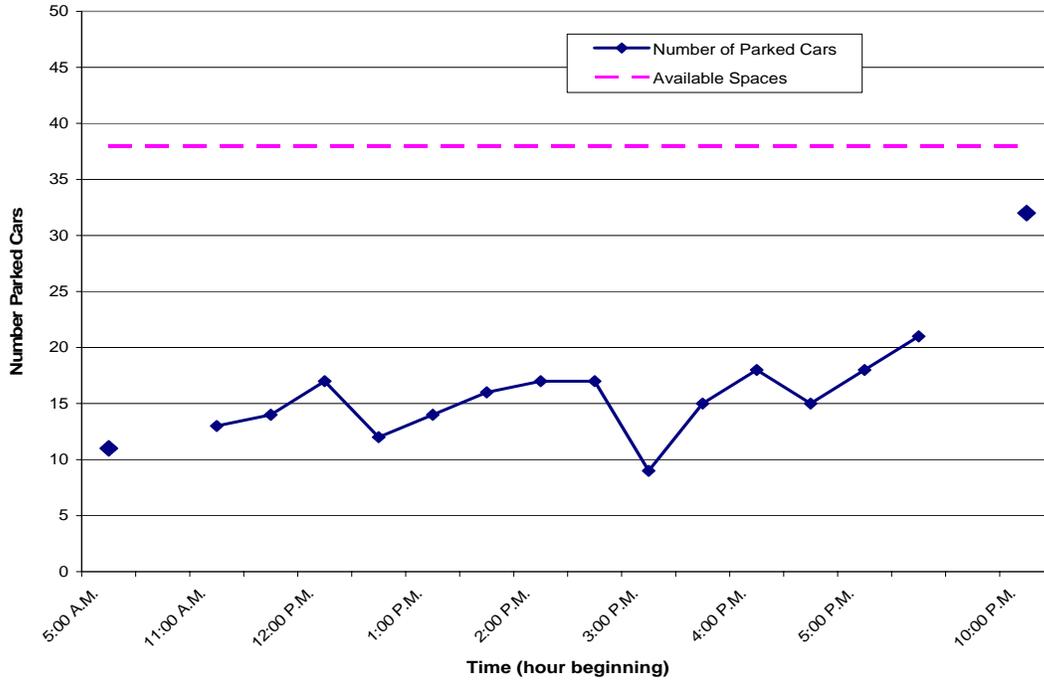


Source: Parking data collected on July 15 and July 17, 2008.

### Parking Utilization for 30-Minute Signed Time-Limited Spaces

Figure 4 represents parking utilization in 30-minute spaces. Utilization ranged from 24% to 55% throughout the day until 6:00 P.M. Utilization increased to 85% at 10:00 P.M. when the time limit is no longer in effect. There are 36 signed Load/Unload spaces and six that are restricted to commercial vehicle use.

Figure 4. Parking Utilization for 30-Minute Signed Time-Limited Spaces

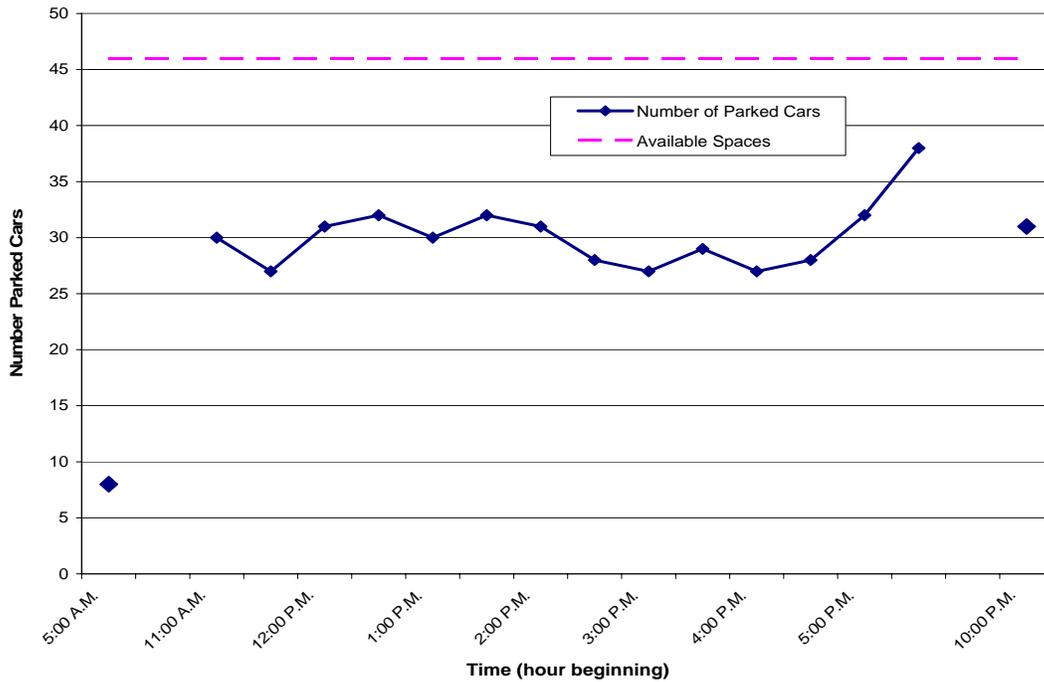


Source: Parking data collected on July 15 and July 17, 2008.

### Parking Utilization for One-Hour Signed Time-Limited Spaces

Figure 5 represents parking utilization of one-hour signed time-limited spaces. Utilization rates ranged from 59% to 70% between 11:00 A.M. and 5:30 P.M., and reached 83% at 6:00 P.M. when the signed time-limited parking restriction ends. Of the study area west of Broadway, there is one block face with one-hour time limited spaces located on the west side of Summit Avenue between E Union Street and E Pike Street. This block face also includes eight unrestricted spaces, four 30-minute spaces and one three-minute space. East of Broadway, there are four block faces with one-hour time limited spaces. Three of the block faces are in the vicinity of E Pike Street and 13<sup>th</sup> Avenue (refer to Figure 2).

Figure 5. Parking Utilization for One-hour Signed Time-Limited Spaces

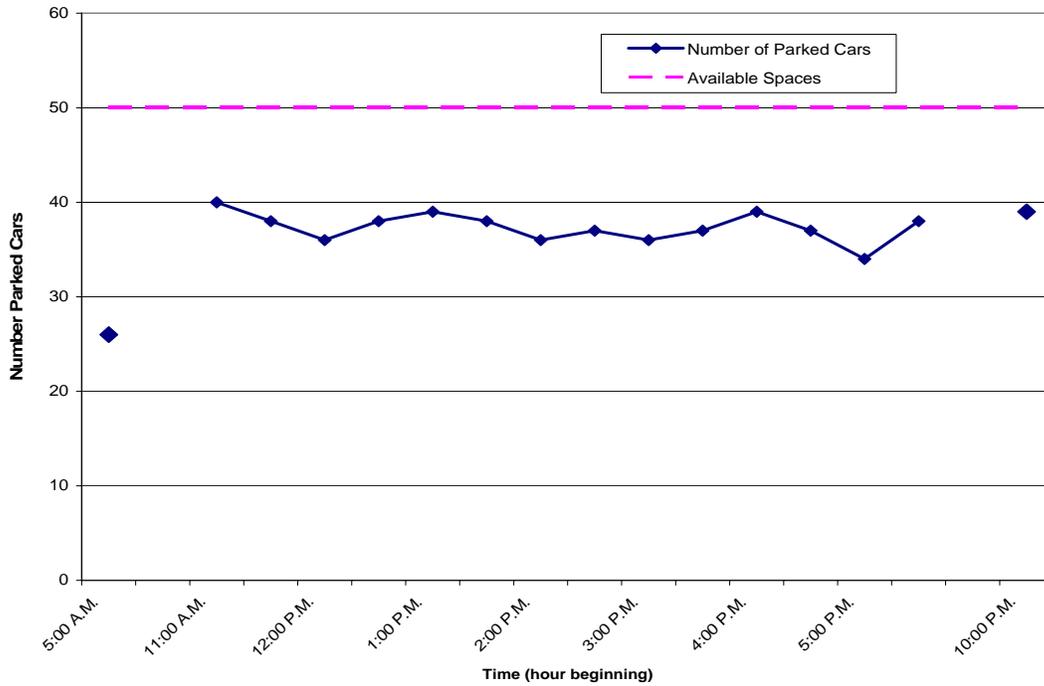


Source: Parking data collected on July 15 and July 17, 2008.

## Parking Utilization for Two-Hour Signed Time-Limited Spaces

Figure 6 represents parking utilization for two-hour signed time-limited spaces. Utilization was fairly constant between 11:00 A.M. through 10:00 P.M. Utilization rates ranged from 68% to 80%, averaging 74%. Daytime utilization of one-hour and two-hour signed time-limited spaces show similar characteristics.

Figure 6. Parking Utilization for Two-hour Signed Time-Limited Spaces

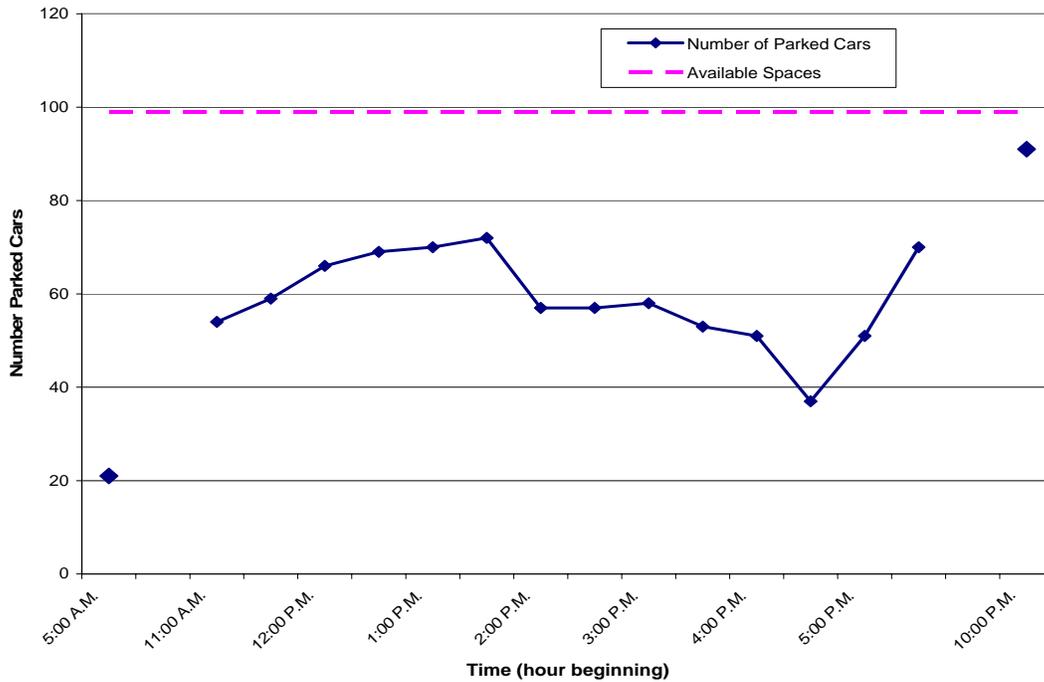


Source: Parking data collected on July 15 and July 17, 2008.

## Parking Utilization for Two-Hour Pay Station Spaces

Pay station spaces are located in the center of the study area on the study block faces along E Pine Street, 10<sup>th</sup> Avenue, E Pike Street, and E Union Street east of 10<sup>th</sup> Avenue. Figure 7 represents parking utilization for the two-hour pay stations. Parking utilization was lower than for signed two-hour time-limited parking due to the availability of nearby free parking spaces. Midday utilization peaked at 2:00 P.M. with 72% of the spaces occupied. At 10:00 P.M., when the pay stations are unrestricted spaces, the utilization reached 92%.

Figure 7. Parking Utilization for Two-Hour Pay Station Spaces

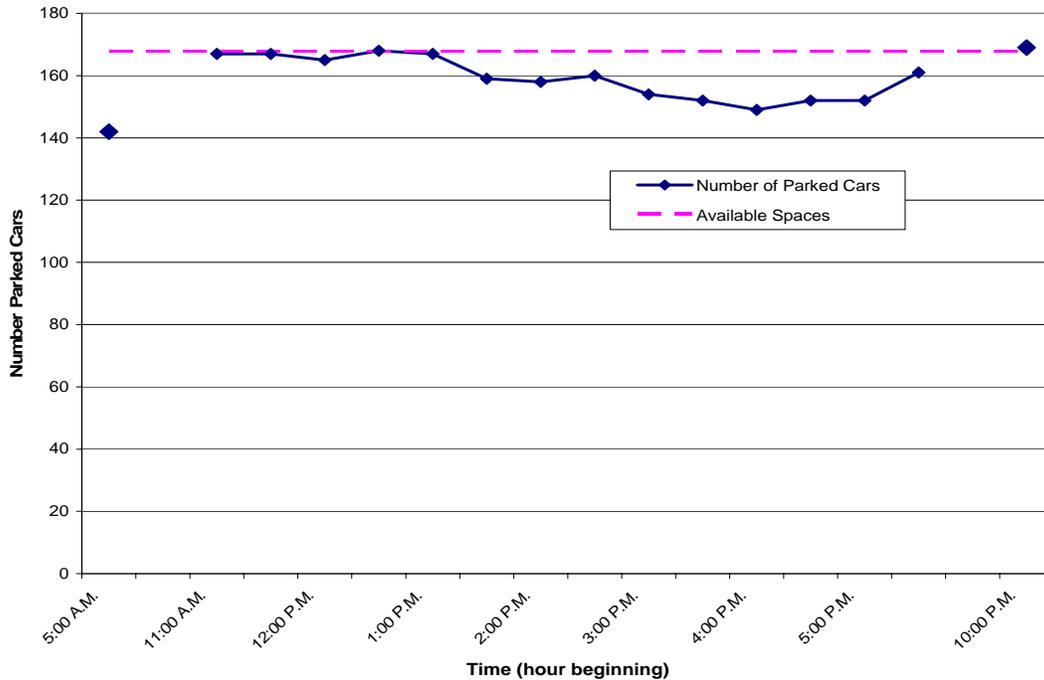


Source: Parking data collected on July 15 and July 17, 2008.

### Parking Utilization for Unrestricted Spaces

Figure 8 represents parking utilization by time of day for unrestricted spaces. Utilization of the 168 unrestricted spaces in the study area was 100% at 11:00 A.M. Utilization was 89% or higher for the remainder of the day, reaching 101% at 10:00 P.M. Utilization exceeded capacity due to the number of cars squeezing into available curb space.

Figure 8. Parking Utilization for Unrestricted Spaces



Source: Parking data collected on July 15 and July 17, 2008.

## 5. Parking Duration

Parking duration and the resulting compliance rates were calculated for the signed time-limited spaces and the pay stations. Table 2 summarizes the parking compliance rates for restricted parking. Because the midday parking surveys began at 11:00 A.M., the compliance rate calculation could not determine if vehicles in the first few survey intervals had parked over the time limit (for example, a vehicle that had arrived at 9:00 A.M. would have been overtime at a pay station by 11:30 A.M.). To be conservative, it was assumed that all vehicles parked at 11:00 A.M. had just arrived at the space. It is likely that some of those vehicles had been parked for longer, in which case, the compliance rates would be lower than reported.

Table 2. Pike-Pine Area Time-Limited Parking Space Compliance Rates

			Compliance Rate <sup>2</sup>	
Parking Type	Inventory <sup>1</sup>	Average Utilization <sup>2</sup>	West of Broadway	East of Broadway
<b>Pay Station Parking</b>				
2-hour	99	59%	92%	80%
<b>Signed Parking time-limited</b>				
3-minute Signed Time-Limit	5	51%	n/a <sup>3</sup>	n/a
30-minute Signed Time-Limit	38	43%	73%	45%
1-hour Signed Time-Limit	46	63%	61%	55% <sup>4</sup>
2-hour Signed Time-Limit	50	74%	25% <sup>5</sup> /24% <sup>6</sup>	79%

1. Source: SDOT GIS maps. Parking inventory at mid-day reflecting daytime hours.
2. Operations Management Group, data collection on July 15 and 17, 2008. Compiled by Heffron Transportation, Inc. The compliance rates assume that vehicles parked at 11:00 A.M. had just arrived to provide a conservative estimate.
3. Survey was conducted in ½ hour intervals; therefore, data cannot indicate compliance with a 3-minute time limit.
4. RPZ on 12<sup>th</sup> Avenue between E Pike Street and E Pine Street. Compliance rate excludes number parked with RPZ or RPZ Guest pass displayed.
5. North side of E Union between Belmont Street and Boylston Street (not an RPZ).
6. Compliance rate excludes number parked with RPZ or RPZ Guest pass displayed.

The 30-minute signed time-limited spaces had a compliance rate of 73% west of Broadway and 45% east of Broadway. As previously discussed, the survey began at 11:00 A.M., and it is unknown if the car was parked prior to 11:00 A.M. and out of compliance by 11:30 A.M. For 30-minute spaces there were 5 of 48 cars parked at 11:00 A.M west of Broadway and 7 of 38 cars parked at 11:00 A.M east of Broadway. Therefore, the low rate of compliance may have been even lower. Combined with the low utilization rates, it appears that there is limited need or function for the 30-minute spaces, particularly east of Broadway.

The one-hour signed time-limited spaces had compliance rates of 61% west of Broadway and 55% east of Broadway. These are also relatively low compliance rates showing that at least 39% of the vehicles had parked for longer than the signed time limit. The compliance rate could be lower than the calculated rate if the duration of cars parked at 11:00 A.M was known.

Three block faces west of Broadway have two-hour signed time-limited spaces. Two of these blocks include an RPZ; the block face without an RPZ had a compliance rate of 25%. The two block faces with RPZ were analyzed for compliance without the parked cars that displayed an RPZ or Guest RPZ permit. The compliance rate was 24% for those parked cars. The two-hour signed time-limited parking compliance was 79% east of Broadway.

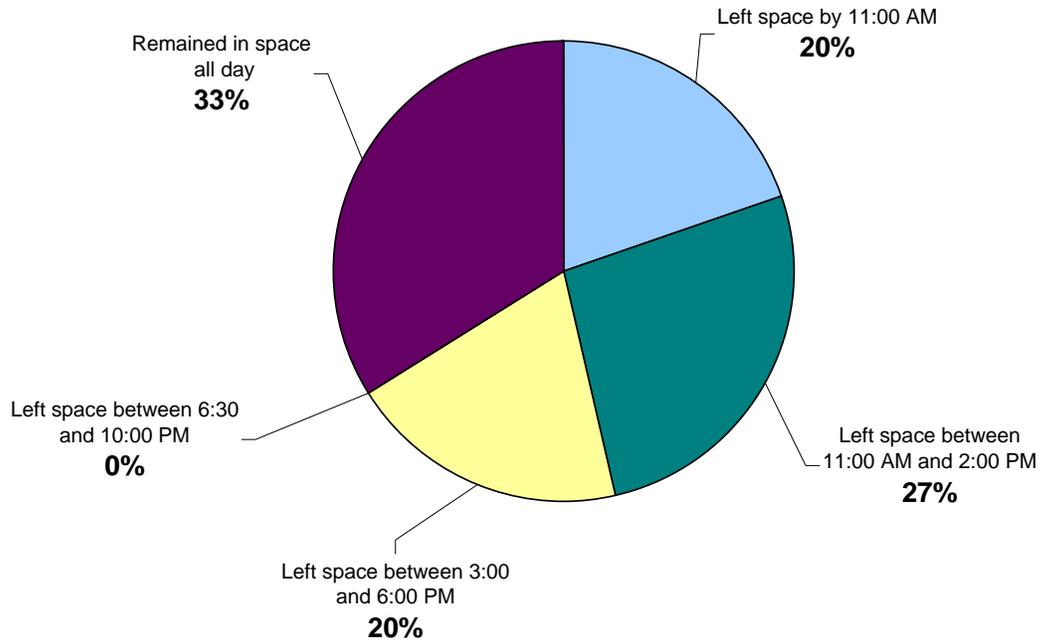
Finally, the two-hour pay station compliance rate was 92% west of Broadway and 80% east of Broadway. The compliance rate for pay stations was the highest of all parking restriction types.

## Unrestricted Parking Spaces

The parking survey began at 5:00 A.M. for the purpose of assessing the residential parking characteristics. License plate data were collected by space, which made it possible to determine how long a vehicle remained parked in that space. It was assumed that the vast majority of vehicles parked at 5:00 A.M. were related to residents or their guests. Only the unrestricted spaces were evaluated because they are not affected by midday time limits.

There were 142 vehicles parked in the study area's unrestricted spaces at 5:00 A.M. Of these, 28 vehicles (20%) left the space by 11:00 A.M. This reflects residents who are likely using a vehicle for a morning commute. Forty eight vehicles (34%) remained in the space for the entire day through 10:00 P.M. This reflects residents who likely commute by other modes of transportation and own a vehicle for occasional use. The other vehicles left the space between 11:00 A.M. and 6:00 P.M., which could reflect the diverse population in this neighborhood that have non-traditional work or school schedules. Figure 9 shows the percentage of vehicles parked at 5:00 A.M. and what time they left the space.

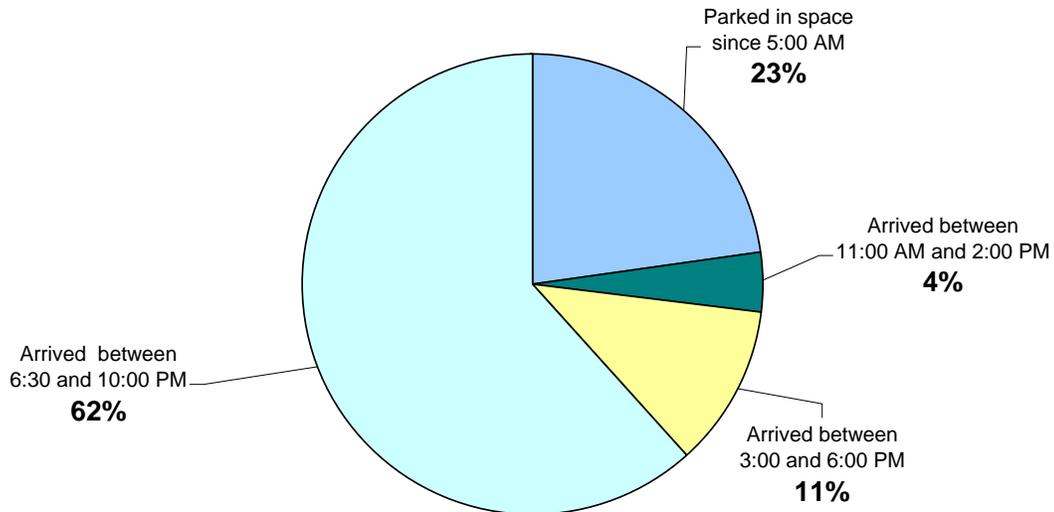
Figure 9. Parking Duration for Unrestricted Spaces – Cars Parked at 5:00 A.M.



Source: Parking data collected on July 15 and July 17, 2008.

At the other end of the spectrum are the vehicles that were parked at 10:00 P.M. These vehicles include a mix of users including residents who have returned home, employees of the areas restaurants and clubs, and customers of those businesses. For this group, the data were compiled to show when the vehicle arrived in a space. Figure 10 represents the arrival times of vehicles parked at 10:00 P.M.. This shows that the majority of the vehicles (62%) arrived after 6:00 P.M. Only 15% arrived between 11:00 A.M. and 6:00 P.M.

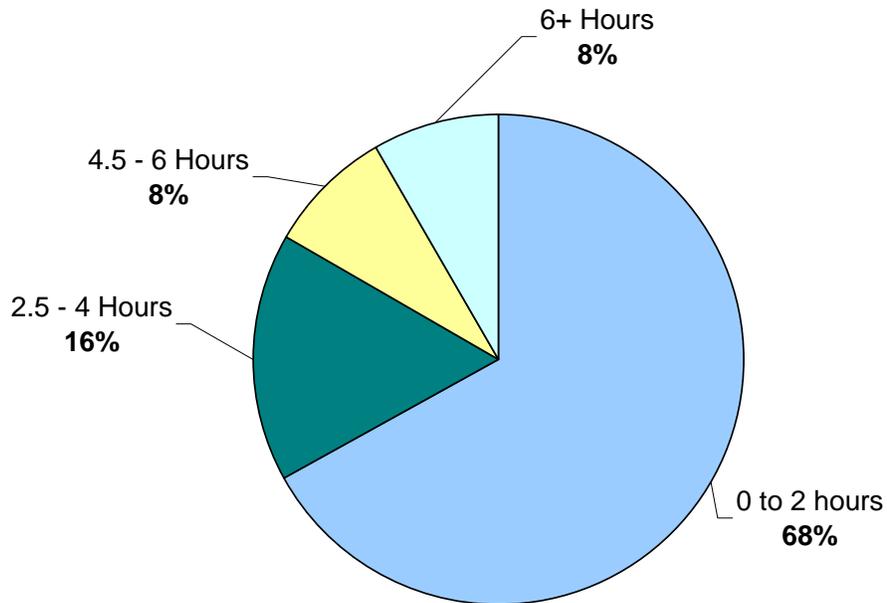
Figure 10. Parking Duration for Unrestricted Spaces – Cars Parked at 10:00 P.M.



Source: Parking data collected on July 15 and July 17, 2008.

There were 251 cars parked between the hours of 11:00 A.M. and 6:00 P.M. that arrived in the area after the 5:00 A.M. survey. These were compiled to show the midday parking duration that is likely related to the area's businesses. Figure 11 shows parking duration. Of these parked cars, 168 (68%) parked for two hours or less. West of Broadway, 70% parked for two hours or less; east of Broadway, 66% parked for two hours or less. This shows that there was a high demand for short-term parking (less than two hours) in the middle of the day.

Figure 11. Parking Duration for Unrestricted Spaces  
– Cars Parked between 11:00 A.M. and 6:00 P.M.



Source: Parking data collected on July 15 and July 17, 2008. Excludes cars parked at 5:00 A.M. and at 10:00 P.M. that were also parked during daytime hours. There were 60 cars parked at 11:00 A.M. included in the duration data. Actual duration of cars parked at 11:00 A.M. is longer than calculated for all cars arriving after 5:00 A.M. up to the first survey pass at 11:00 A.M.

## 6. Findings

There is a wide variety of signed time-limited parking on study area block faces. Unrestricted parking accounts for 41% of the 406 parking spaces surveyed. There is a wide variety of parking needs in the study area including commercial, residential, and night-time entertainment.

- Overall parking utilization was 74% for all spaces and including all survey periods, indicating that parking was well utilized from early morning to late at night.
- At 10:00 P.M. parking utilization was 90% for all spaces.
- Parking utilization for unrestricted spaces was 80% at 5:00 A.M., 100% at 11:00 A.M., and then at 89% or higher for the remainder of the day, reaching 101% at 10:00 P.M.
- The 30-minute spaces had a low utilization rate and a low compliance rate for that time limit, particularly in the area east of Broadway. This suggests that there is limited need for this type of parking restriction in the neighborhood.
- The compliance rate for one-hour signed time limited spaces was also low with nearly the same rate west and east of Broadway.
- The compliance rate for two-hour signed time-limited spaces east of Broadway and two-hour pay station spaces was approximately the same, and shows the highest compliance rate of all parking restriction types at 80%. (The compliance rate of two-hour spaces west of Broadway was low due to the overlap with RPZs.)
- One-third of the vehicles parked in unrestricted spaces at 5:00 A.M. stayed in those spaces through the 10:00 P.M. survey interval. These reflect the demand for long-term residential parking.
- The highest utilization of the unrestricted spaces occurs at night. The majority of vehicles (62%) that were parked at 10:00 P.M. had arrived in those spaces after 6:00 P.M. These vehicles could be residents who have returned to the neighborhood in the evening, or employees and customers of the area's restaurants and clubs.
- Of the cars parked between 11:00 A.M. and 6:00 P.M., 68% were parked for two hours or less, reflecting the commercial activity in the area. About 24% of the vehicles parked for between two and six hours.

Based on the survey findings, the Pike/Pine area could benefit from implementation of parking management measures. The wide variety of existing parking restrictions and relatively low utilization of time-limited spaces is an opportunity to increase efficiency of curb space.