

TECHNICAL REPORT

**UPPER QUEEN ANNE
ON-STREET PARKING STUDY**

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1. Introduction

This technical report presents the findings of a parking study conducted in September 2008 in the Upper Queen Anne neighborhood. The study purpose was to evaluate parking characteristics on a typical day. Resulting data and analysis will help the Seattle Department of Transportation (SDOT) determine if changes in parking management are needed. The study included:

- utilization and parking compliance of parking spaces with signed time-limits,
- utilization and parking duration of unregulated spaces, and
- parking utilization by time of day.

2. Study Methodology

Data Collection

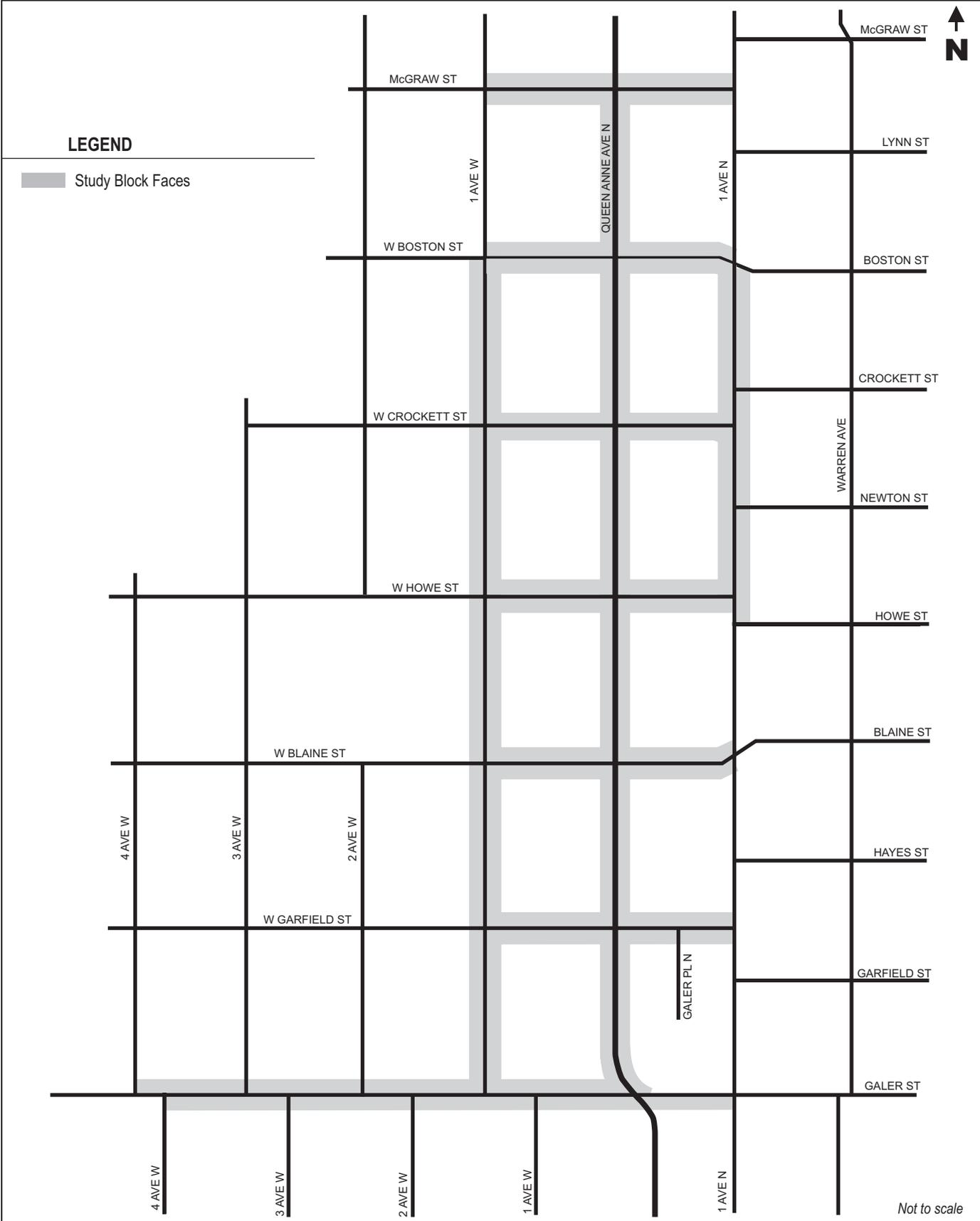
Parking data were collected on Tuesday, September 9, Thursday, September 11, and Tuesday, September 16, 2008. The streets surveyed are shown in Figure 1, and the block faces included in the study are shown with shading. The north area, including W Crockett Street to the north, and all of 1st Avenue N was surveyed on September 9, 2008. The southern area, south of W Garfield Street was surveyed on September 11, 2008. The middle of the study area was surveyed on September 16, 2008. The study area includes three north-south streets: 1st Avenue W, Queen Anne Avenue W, and 1st Avenue N; from Galer Street to McGraw Street. The study area also includes Galer Street from 1st Avenue N to 4th Avenue N, an area with relatively new commercial growth.

Parking space occupancy data were collected by Operations Management Group (OMG), Inc. using hand-held electronic data collection tools. Parking activity was recorded at 30-minute intervals from 8:00 A.M. to 6:00 P.M. A sequence number was assigned to every parking space within each map segment to ensure consistent data collection. The inventory and sequence numbers included all parking spaces by type, and other curb spaces such as bus zones, hydrants and driveways, where parking is not allowed. In addition to recording vehicles parked in legally-designated spaces, surveyors recorded “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. These vehicles reflect the demand for parking.

Parking utilization was determined from the number of vehicles parked divided by the parking supply. The data collection methodology enables the calculation of utilization by block face, by restriction type, by sub-area or street and for the entire study area.

Parking duration was calculated by counting the 30-minute time periods occupied by a vehicle. Duration was calculated by block face and restriction type. Then, the number of vehicles parked by duration was summarized in histograms. Duration data can reveal unusual activity, such as all-day parking in front of restaurants and retail uses.

The data also show the number of vehicles out of compliance with the restriction type. Parking restrictions are in place from 8:00 A.M. to 6:00 P.M.; vehicles were counted as out of compliance if they parked longer than the allowed time limit during the hours when the restrictions are in place. Parking compliance was evaluated for 30-minute, one-hour and two-hour time limit spaces. For two-hour spaces, all vehicles parked for less than two hours are compliant and all vehicles parked for two or more hours are noncompliant.



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Figure 1
Study Area Block Faces

Parking turnover was calculated for vehicles parked in unrestricted spaces. Parking turnover is a measure of the number of vehicles that can park in a single parking space. It is a function of parking duration. High turnover rates occur when vehicles park for a short amount of time and many vehicles can be parked 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.

Parking Capacity

Practical capacity of on-street parking is typically defined at 85% utilization. At utilizations lower than 85%, the next arriving visitor is able to find a convenient parking space. When occupancy exceeds practical capacity, drivers 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 vehicle emissions. Practical capacity is used to determine the adequacy of a parking system. SDOT considers utilization rates of 75% to be the threshold where additional parking management techniques should be explored through a comprehensive parking assessment. That way measures can be put 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 favor retail and restaurant use are preferred to long-term parking that could be used by commuters.

3. Parking Space Inventory

The parking space inventory was updated during the on-street data collection effort. In total, there were 645 legal parking spaces in the study area. The allocation of these spaces by type and location are shown in Table 1. There were four block faces with parking removed or used by construction activities. These spaces were removed from the survey. Time-limited spaces are restricted by signage. There are no meters or pay stations within the study area.

Table 1. Parking Inventory ^a

| Street | 30-Minute | One-Hour | Two-Hour | Unrestricted | Other | Total | % of Total |
|--------------------------|-----------|-----------|-----------|------------------|----------------|------------|-------------|
| 1 st Avenue W | 2 | | | 161 ^b | | 163 | 25% |
| Queen Anne Ave N | 15 | 74 | 21 | 66 | 2 ^c | 178 | 27% |
| 1 st Avenue N | | | | 60 | 1 ^d | 61 | 10% |
| Galer Street | 7 | 4 | | 49 | 1 ^d | 61 | 10% |
| Garfield Street | | | 10 | 26 | | 36 | 6% |
| Blaine Street | | | | 24 | | 24 | 4% |
| Howe Street | | | | 39 | | 39 | 6% |
| Crockett Street | | | | 22 | | 22 | 3% |
| Boston Street | | 21 | 3 | 3 | | 27 | 4% |
| McGraw Street | 3 | | | 31 | | 34 | 5% |
| Study Area Total | 27 | 99 | 34 | 481 | 4 | 645 | 100% |
| Percent of Total | 4% | 15% | 5% | 75% | 1% | 100% | |

Source: Seattle Department of Transportation and Parking Data Collection, September 2008 by Operations Management Group.

- a. Reflects the inventory when restrictions were in effect, typically 8:00 A.M. to 6:00 P.M. on weekdays.
- b. There are 15 spaces between W Howe and Crockett Streets that become school-bus only spaces from 8:00 A.M. to 9:00 A.M. and from 1:00 P.M. to 5:00 P.M.
- c. Signed 3-minute time-limit space.
- d. Signed Disabled Parking Only.

The parking space inventory reflects midday parking regulations. Changes in restriction type typically occur at 6:00 P.M. when restricted spaces become unrestricted spaces. There was little change in restriction type during the day and so the midday was used in the daytime analysis.

4. Parking Utilization, Duration, and Compliance

30-Minute Load Zones

Figure 2 presents parking utilization and compliance rates for 30-minute load zones. The average weekday utilization was 56%. The average compliance rate for all 30-minute signed spaces was 65%, meaning that 35% of users stayed for longer than 30 minutes. This was a relatively high compliance rate, with four block faces at 80% or higher compliance and one block face at 0% (meaning that none of the vehicles observed stayed for less than the time limit allowed). This occurred on the south side of Galer Street between 3rd Avenue W and 4th Avenue W where there were two 30-minute spaces where the average utilization was 138%. It is possible that there was little to no enforcement of these spaces.

One-Hour Time-Limited Spaces

Figure 3 presents parking utilization and compliance rates for one-hour spaces in the study area. There were 55 one-hour spaces at the north end of the study area and 44 at the south end. Average utilization at the north end was 87% and 52% at the south end. Average compliance at the north end was 77% and 82% at the south end.

Figure 4 presents utilization of one-hour time-limited spaces throughout the day at the north end of the study. Parking utilization increased steadily from 8:00 A.M., peaked at noon, held steady until 1:30 P.M. and then decreased slightly in the afternoon. Utilization was above 75% from 9:30 A.M. to 6:00 P.M.

Figure 5 presents parking utilization of one-hour time-limited spaces throughout the day at the south end of the study area. Parking utilization increased steadily from 8:00 A.M., peaked at noon, held steady until 1:30 P.M. and then decreased slightly in the afternoon. Utilization was above 75% from 11:00 A.M. to 1:00 P.M. Utilization decreased significantly at 1:30 P.M. and increased steadily to 75% at 5:30 P.M. just prior to the end signed time restrictions at 6:00 P.M. Utilization was lowest on the north side of W Galer Street, between 1st Avenue W and 2nd Avenue W at 31%.



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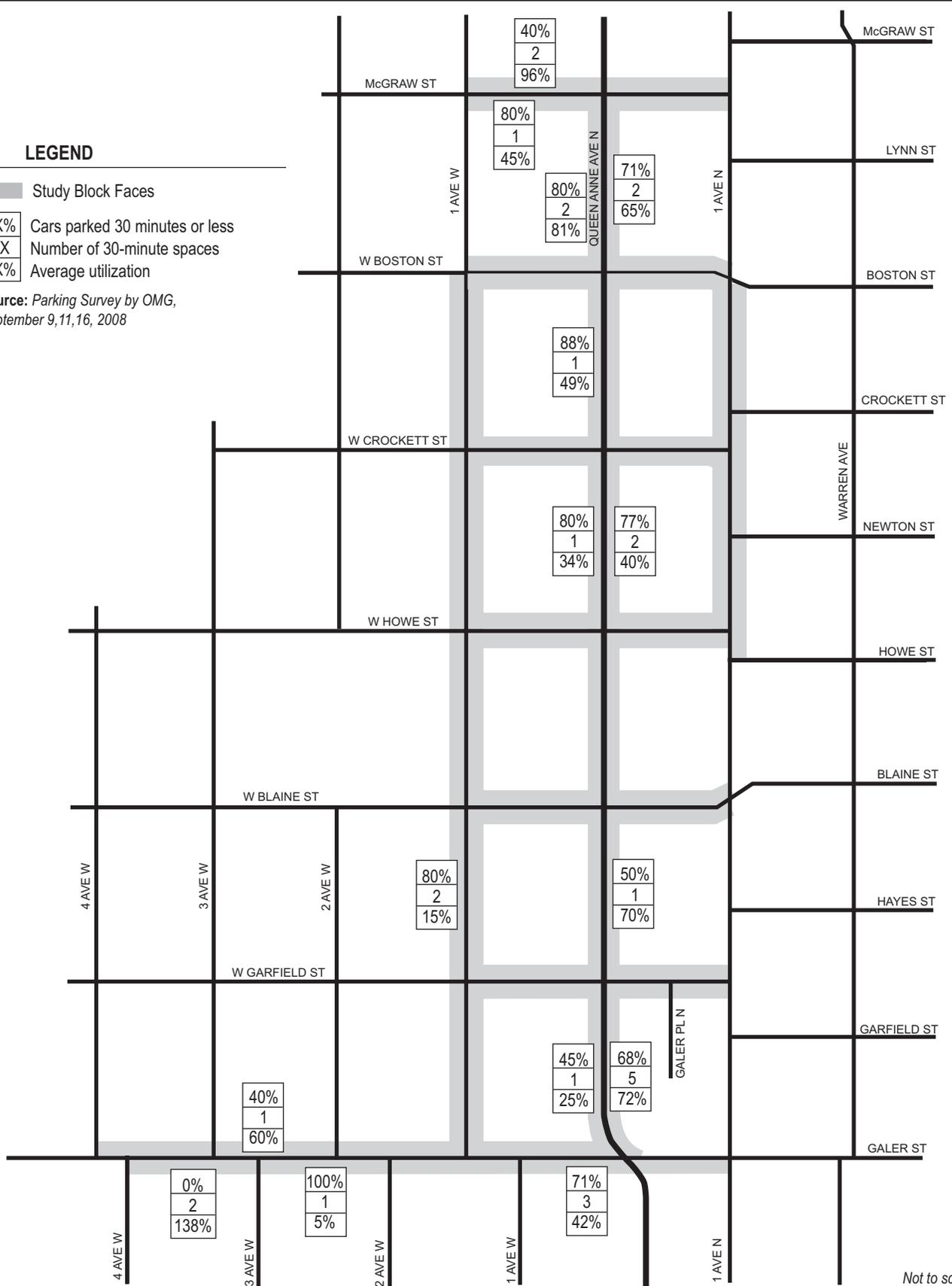
- Study Block Faces
- | |
|-----|
| XX% |
|-----|

 Cars parked 30 minutes or less
- | |
|----|
| XX |
|----|

 Number of 30-minute spaces
- | |
|-----|
| XX% |
|-----|

 Average utilization

Source: Parking Survey by OMG,
September 9, 11, 16, 2008



Not to scale

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Figure 2
30-Minute Signed Time-Limited Parking Spaces
Utilization and Compliance
Weekdays 8 AM- 6 PM



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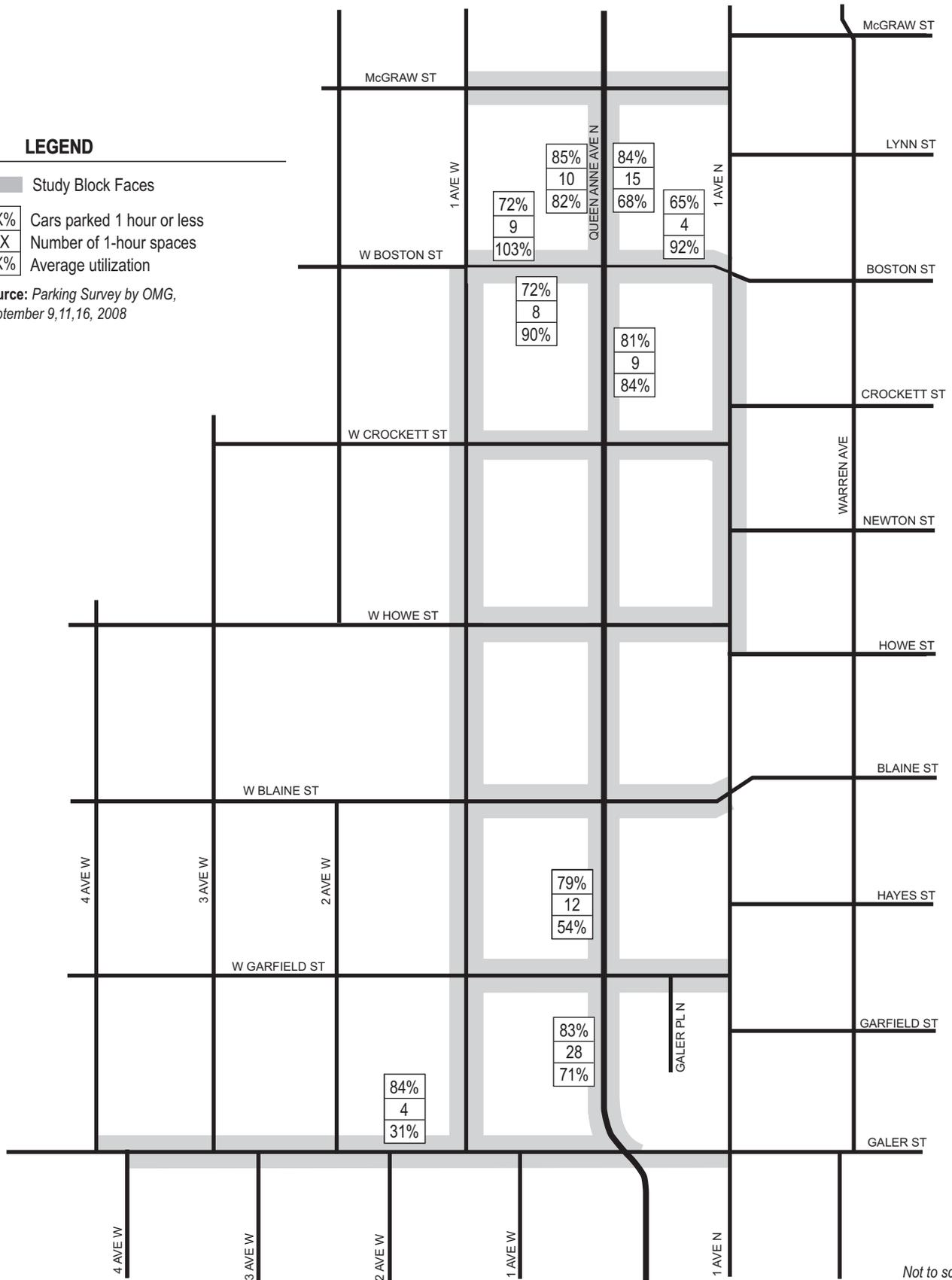
- Study Block Faces
- | |
|-----|
| XX% |
|-----|

 Cars parked 1 hour or less
- | |
|----|
| XX |
|----|

 Number of 1-hour spaces
- | |
|-----|
| XX% |
|-----|

 Average utilization

Source: Parking Survey by OMG,
September 9, 11, 16, 2008

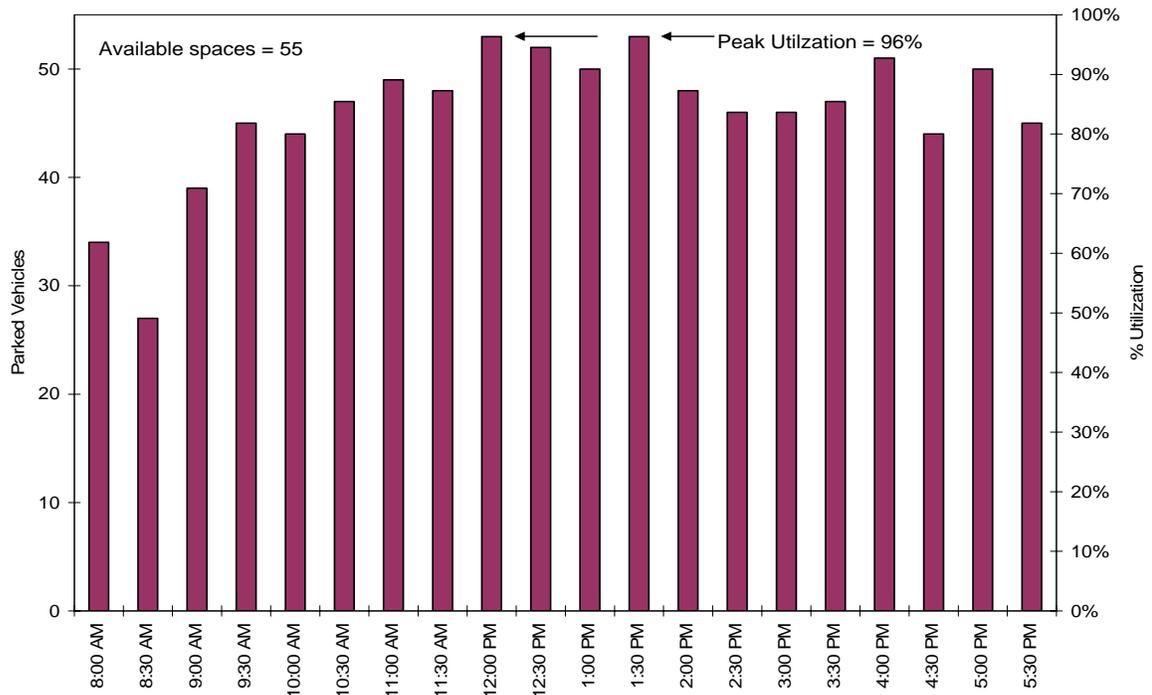


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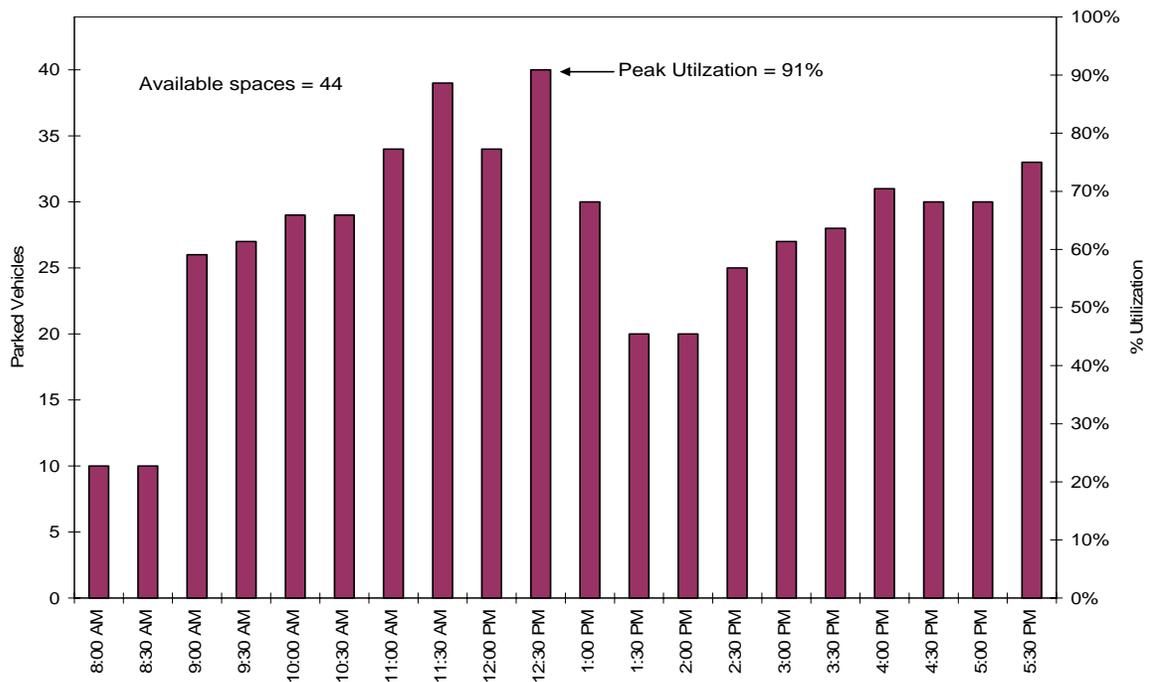
Figure 3
1- Hour Signed Time-Limited Spaces
Utilization and Compliance
Weekdays 8 AM - 6 PM

Figure 4. Utilization of One-Hour Parking Spaces – North end



Source: Parking survey on September 9, 11, 16, 2008. Compiled by Heffron Transportation, Inc...

Figure 5. Utilization of One-Hour Parking Spaces – South end



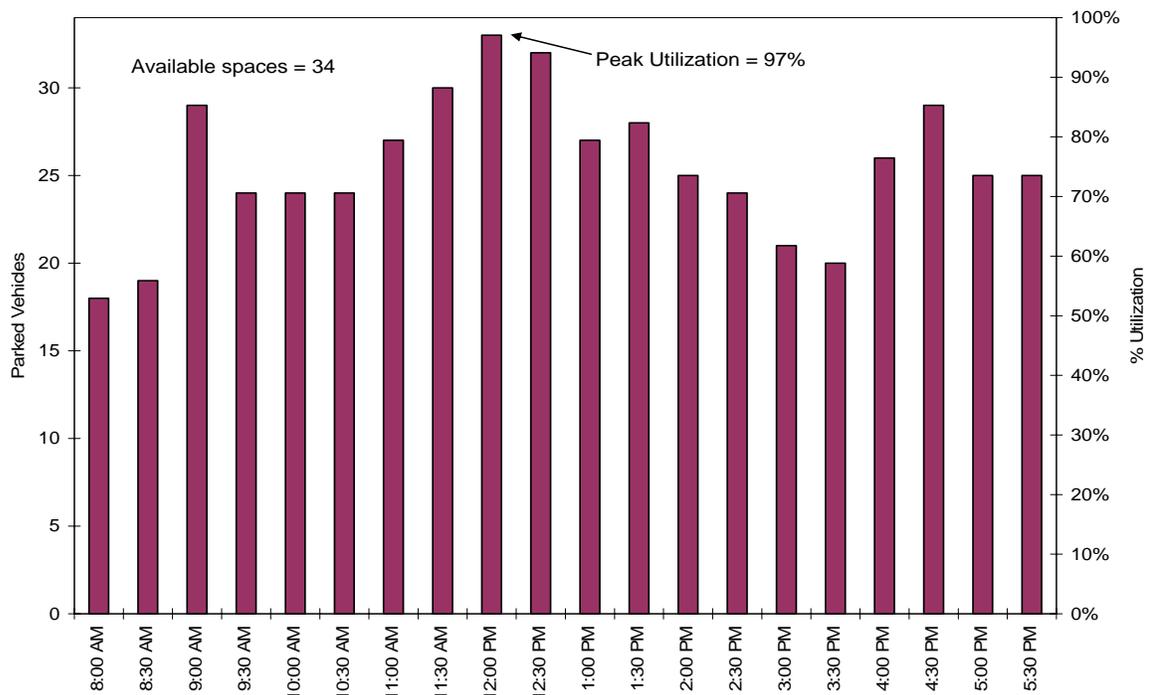
Source: Parking survey on September 9, 11, 16, 2008. Compiled by Heffron Transportation, Inc.

Two-Hour Time-Limited Spaces

Figure 6 presents weekday parking utilization and compliance rates for two-hour spaces. There were 34 two-hour time-limited spaces in the study area. Three block faces with two-hour time-limited spaces were near the north end, and one block face was on Garfield Street east of Queen Anne Avenue N. Average utilization was 63% and average compliance was 92%.

Figure 7 presents parking utilization of two-hour time-limited spaces throughout the day. Parking utilization increased steadily from 8:00 A.M. with a mid-morning peak of 85% at 9:00 A.M. and a daytime peak of 97% utilization at noon. Utilization was above 75% for four hours of the day.

Figure 6. Utilization of Two-Hour Parking Spaces



Source: Parking survey on September 9, 11, 16, 2008. Compiled by Heffron Transportation, Inc.

Unrestricted Parking Spaces

Figure 8 presents weekday parking utilization and short term duration rates for unrestricted parking spaces by block face. There were 481 unrestricted spaces within the study area. Utilization by block face showed a range from 28% to 115% with an average of 77%. Figure 9 presents parking utilization of unrestricted spaces throughout the day. Parking utilization increased steadily from 8:00 A.M. and reached a peak of 86% at noon. Utilization was above 75% from 9:00 A.M. to 3:00 P.M. At this rate, motorists likely have difficulty finding an available parking space causing additional circulation through the neighborhood.



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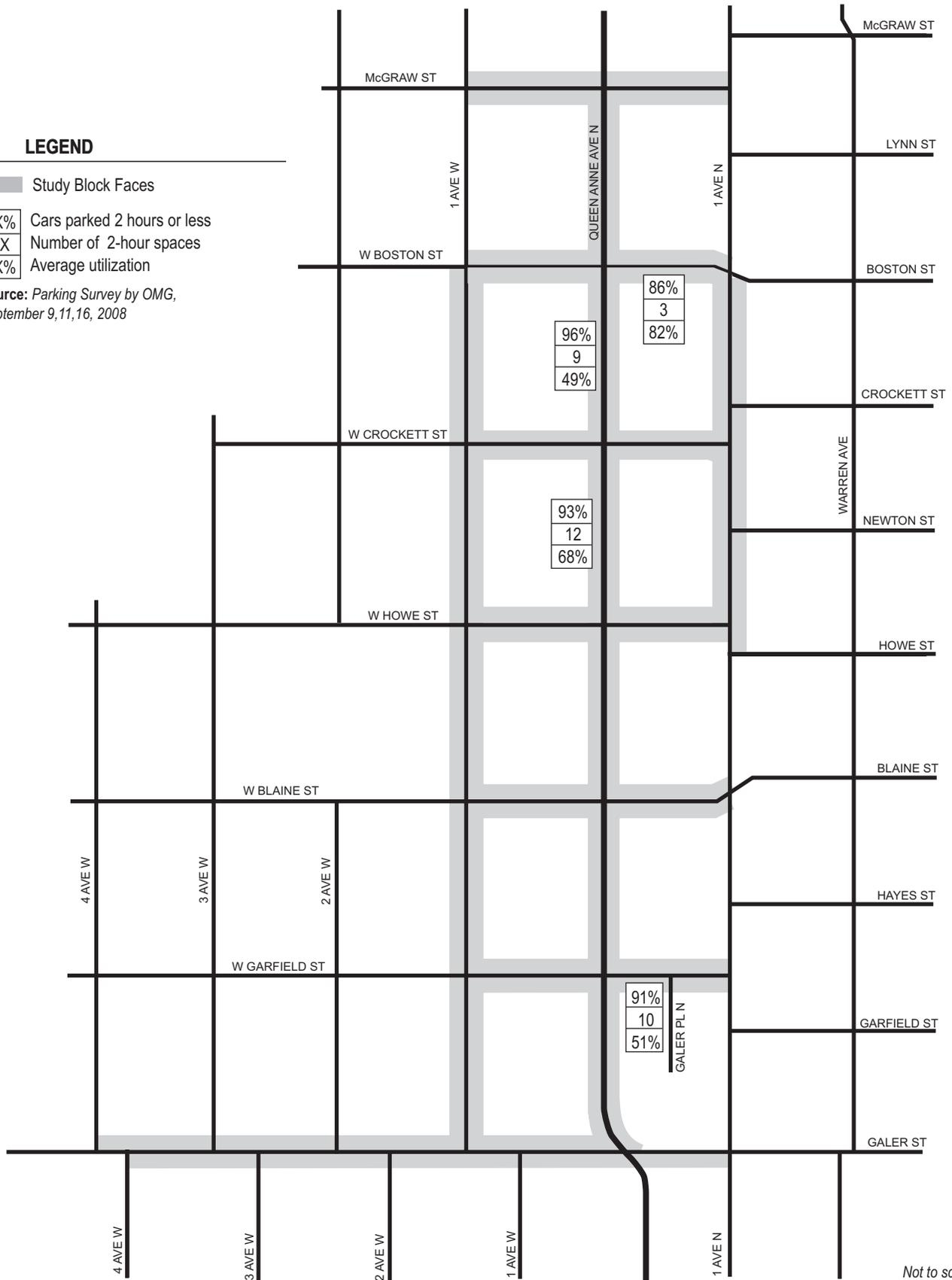
- Study Block Faces
- | |
|-----|
| XX% |
|-----|

 Cars parked 2 hours or less
- | |
|----|
| XX |
|----|

 Number of 2-hour spaces
- | |
|-----|
| XX% |
|-----|

 Average utilization

Source: Parking Survey by OMG,
September 9, 11, 16, 2008



Not to scale

UPPER QUEEN ANNE PARKING STUDY

Figure 7
2-Hour Signed Time-Limited Parking Spaces
Utilization and Compliance
Weekdays 8 AM - 6 PM

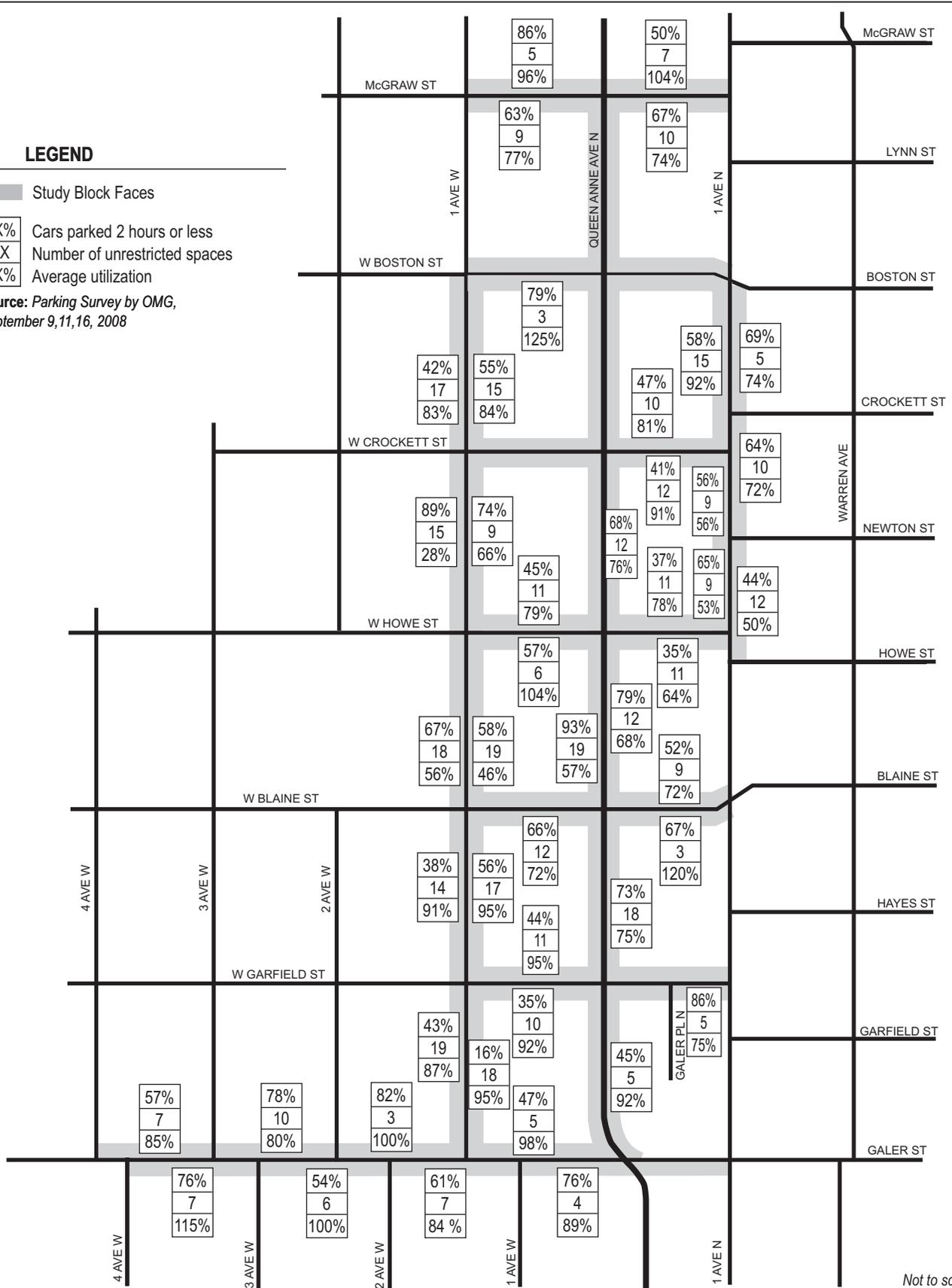


LEGEND

Study Block Faces

- XX% Cars parked 2 hours or less
- XX Number of unrestricted spaces
- XX% Average utilization

Source: Parking Survey by OMG,
September 9, 11, 16, 2008

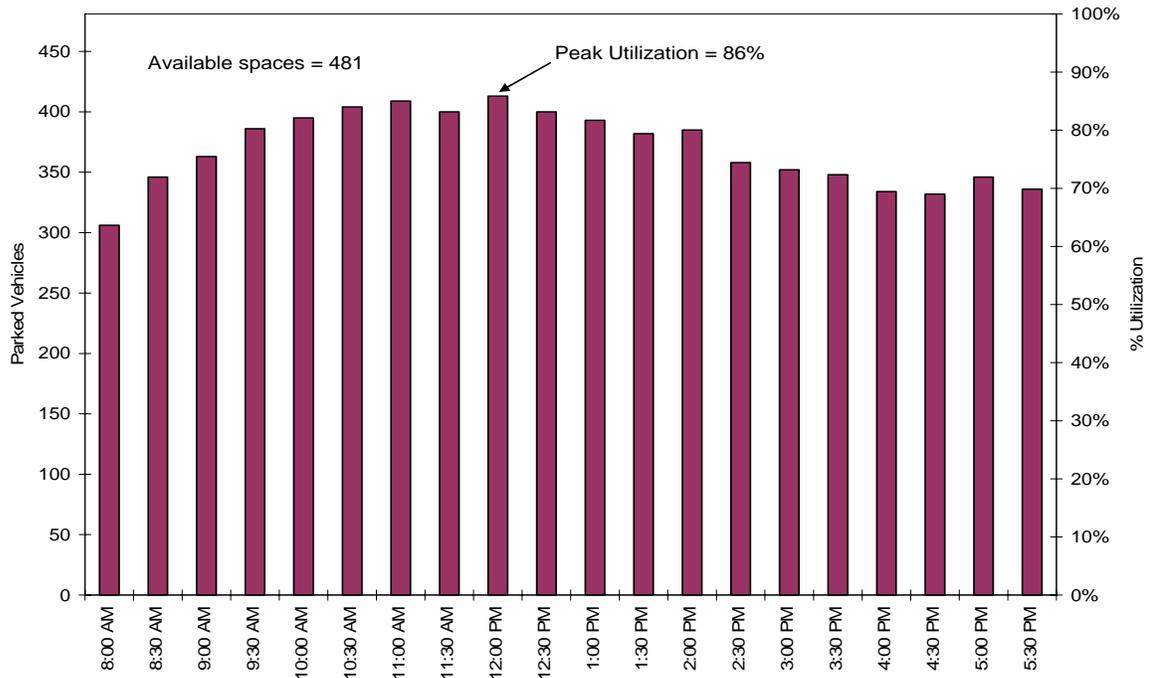


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Figure 8
Unrestricted Parking Spaces
Utilization and Duration
Weekdays 8 AM - 6 PM

Figure 9. Utilization of Unrestricted Spaces by Time of Day



Source: Parking survey on September 9, 11, 16, 2008. Compiled by Heffron Transportation, Inc.
 The number of spaces reflect those available during the peak noon hour. There are 15 unrestricted spaces on 1st Avenue W that are reserved for school buses only at certain times of the day.

Parking duration data for unrestricted spaces was analyzed by block face for the number of cars parked for two hours or less as an indication of turnover (see definition in Section 2). On a weekday, the average number of cars parked for two hours or less in unrestricted parking spaces was 63%. Figure 8 shows that the range was from 35% to 93%. These data show relatively high two-hour parking durations within the unrestricted parking spaces.

Parking duration of unrestricted spaces was evaluated. The parking duration in three areas are presented in the figures below. Figure 10 presents parking duration north of Howe Street, including the north side of Howe Street. In this area 60% of vehicles parked for two hours or less, followed by 16% from 6 to 10 hours, and 12 % from 2 to 4 hours.

Similar characteristics exist south of Howe Street as shown in Figure 11. This includes the south side of Howe Street to Galer Street from 1st Avenue W to 1st Avenue N. The remaining spaces are on W Galer Street from 1st Avenue W to 4th Avenue W. This area showed similar characteristics, but with cars parked for two hours or less reaching 70%.

Figure 10. Unrestricted Parking Duration north of Howe Street

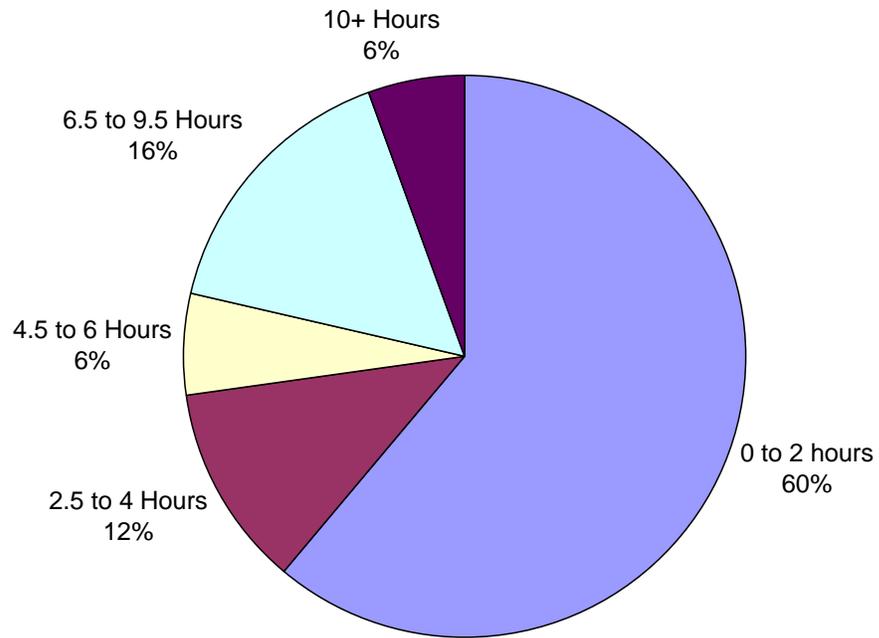
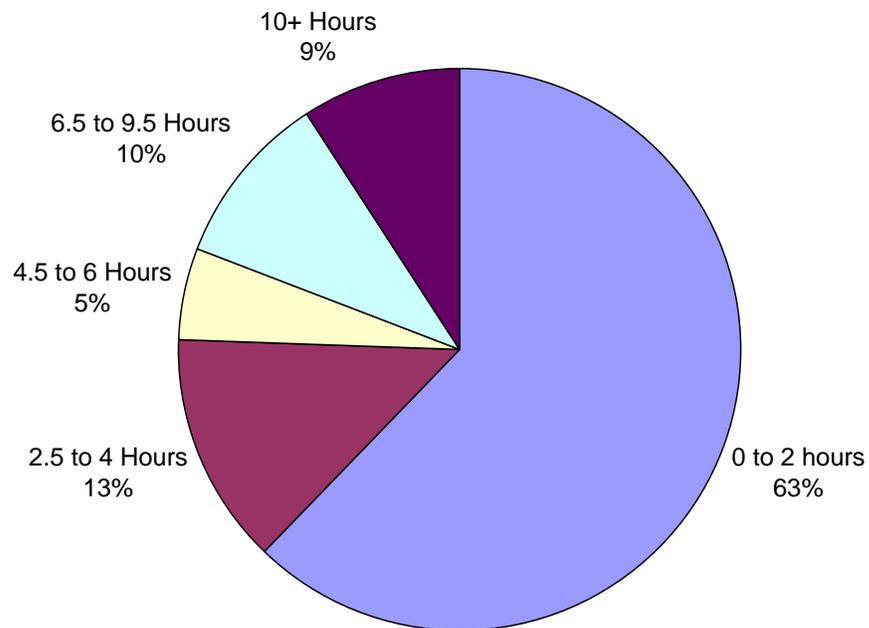
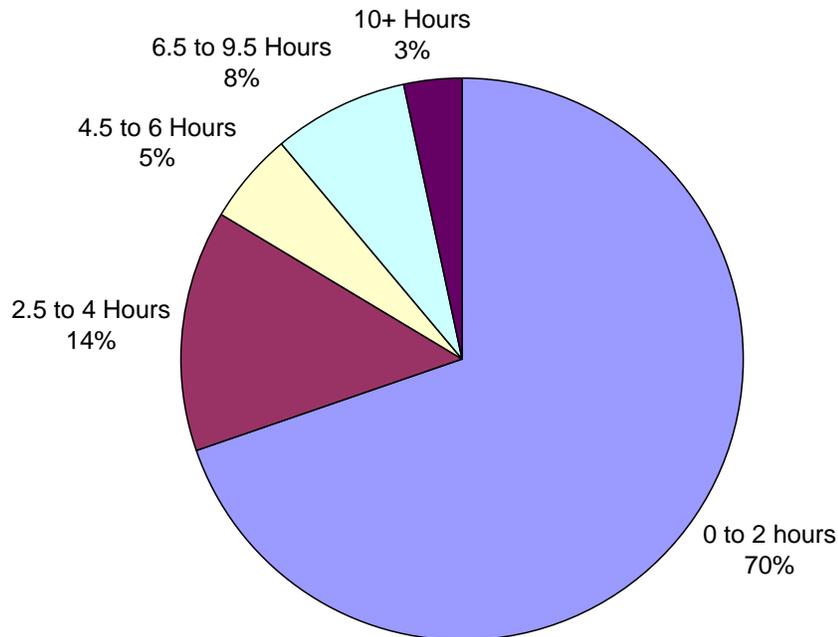


Figure 11. Unrestricted Parking Duration south of Howe Street



Source: Parking survey on September 9, 11, 16, 2008. Compiled by Heffron Transportation, Inc.

Figure 12. Unrestricted Parking Duration on Galer Street west of 1st Avenue West



Source: Parking demand counts performed on September 11, 2008. Compiled by Heffron Transportation, Inc.

In summary, unrestricted parking spaces have utilization rates reaching or slightly above capacity mid-day. Turnover data indicated that 60% to 70% of cars in the unrestricted spaces parked for two hours or less. This reflects a high level of use of the unrestricted spaces for short-term trips such as those to nearby retail businesses, restaurants, or schools.

Other Types of Parking

There were two marked “Disabled Parking” stalls in the study area that are summarized below.

- South side of Galer Street between 4th Avenue W and 3rd Avenue W. This space was occupied during 78% of the survey passes, which occurred in ½ hour frequency. Two vehicles were parked ½ hour or less, and one vehicle parked five hours.
- East side of 1st Avenue W between Howe Street and Crockett Street. This space was not occupied during any of the survey passes.

There were three signed 3-Minute Passenger Load Zones that are summarized below.

- Two spaces on the east side of Queen Anne Avenue N between W Crockett Street and W Boston Street. These spaces had an average occupancy of 62% during surveys that were performed in 30-minute intervals. Sixty percent parked for less than 30 minutes (seen on the first survey and not on the second).

5. Summary of Findings

The Upper Queen Anne parking study data collection occurred in September 2008. Data collection provided information on utilization, duration, and compliance by parking restriction type. There is currently no on-street paid parking in this area. Key findings are presented below for each of four types of parking restrictions: 30-minute parking, one-hour parking, two-hour parking, and unrestricted parking. Unrestricted parking spaces made up 75% of the inventory. Peak utilization occurred at the noon hour for all parking restriction types.

30-Minute Loading Zones

- 27 parking spaces with signed 30-minute time-limit on 15 of the 60 study area blockfaces.
- Average utilization of 30-minute spaces was 56%, with a low of 5% and a high of 138%.
- Average compliance rate was 65%, meaning that 35% of users stayed for longer than 30 minutes.

One-Hour Parking Restrictions

- 99 parking spaces with signed with one-hour time-limit
- 55 one-hour parking spaces concentrated on 6 blockfaces in the vicinity of W Boston Street and Queen Anne Avenue N.
- 28 one-hour angle parking spaces on one block face (west side of Queen Anne Avenue N between Galer Street and Garfield Street).
- Average utilization was 87%.
- Average compliance rate was 80%.

Two-Hour Parking Restrictions

- 34 parking spaces with signed two-hour time limit.
- Average utilization was 63%.
- Average compliance was 92%.

Unrestricted Parking

- 481 unrestricted parking spaces in the study area.
- Average utilization was 77%. Utilization peaked at 12:30 p.m. with a utilization of 86%.
- 63% of cars parked for two hours or less. This indicates that parking turnover in the unrestricted spaces was relatively high.