



Central City Parking Occupancy and Turnover Analysis

October–November, 2014

***Areas Covered: Downtown, Old Town/
Chinatown, West End, Pearl District,
Goose Hollow, University District***

Report of Findings



Final Report | April 2, 2015

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Areas Covered:

- Downtown
- Old Town/Chinatown
- West End
- Pearl District
- Goose Hollow
- University District

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Part 1:
Project Overview

Executive Summary & Key Findings



1. A detailed analysis of parking occupancy and stay durations was conducted in Portland's Central City. The study area comprised 293 block faces divided into nine subareas representing potential routes that one might travel while looking for parking. Observations for each route were conducted on a Tuesday, Wednesday, or Thursday between 7:00 AM and 10:00 PM, with each block face along the route observed once per hour. Additionally, two routes in areas of the Central City known for numerous nightlife destinations were observed on a Friday night from 4:00 PM to 12:00 AM. The data collection began on October 22, 2014 and concluded on November 19, 2014.
2. Occupancy rates were generally observed to fluctuate between 60% and 90% for the bulk of the day, with two distinct 'peaks' observed: an afternoon peak occurring during the 12:00 or 1:00 PM hours, and an evening peak occurring during the 6:00 or 7:00 PM hours. While occupancy rates and patterns varied significantly between routes, the general pattern of an afternoon and evening peak was observed consistently throughout the study area.
3. The bulk of the study area was previously analyzed in a 2008 parking analysis. The 2014 analysis generally found higher overall occupancy; however occupancy was generally found to be lower in the early morning and late evening periods. The 2014 study area was slightly larger than the 2008 study area to capture the effects of new development in the Portland State University and northern Pearl District areas.
4. The likelihood that a vehicle would stay longer than the maximum permitted stay was greatest for stalls with the shortest maximum time stays. For stalls with a 1 hour maximum stay, the average estimated time stay was actually greater than one hour, with 18% of vehicles exceeding the maximum stay. Fewer vehicles were observed to be in violation of stay maximums in longer duration time stay slots, with only 3% of vehicles overstaying the maximum in 5 hour slots.
5. The usage of several special stall types was observed during the study. The peak loading/unloading activity for loading zones was found to occur during the 10:00 AM hour, and loading zone occupancy was generally light over the course of the day. Short stay stalls, allowing for maximum stays of 5 to 15 minutes, were generally observed to be at approximately 50% occupancy over the course of the day. Carpool slots were fairly heavily utilized. Disabled spaces, hotel zones, and other similar slots were utilized to various extents, but generally did not have significant numbers of unauthorized users.

Methodology & Study Area



The methodology employed for the data collection phase of this project consisted of two steps: An inventory of parking supply, including the number and types of stalls, followed by observations of demand.

To complete the first step, an inventory of the supply of parking stalls along each route was conducted, tracking the number and location of parking stalls, designated users, maximum time stay, and other pertinent information as needed. This initial inventory was conducted utilizing a tablet PC. The data collected in this step were utilized to set up route-specific spreadsheets to be used during the following step.

Following the inventory step, parking demand data is collected for each route. This data is collected by surveying each route once per hour from 7:00 AM to 10:00 PM on a Tuesday, Wednesday, or Thursday. The data was collected on tablet PCs utilizing the route-specific spreadsheets created in the previous step. During each hourly orbit of a given route, the first four digits of the license plate of each vehicle parked in a stall along the route are recorded. Additionally, user information is recorded for several types of special stalls including loading zones, disabled parking, and other stalls limited to certain types of users.

The study area was divided into nine routes of approximately 30 to 40 block faces each. The routes represent a potential circulation pattern for somebody looking to find an on-street parking space in a certain neighborhood within the Central City. Routes from the most recent previous analysis of parking in the Central City, conducted by Kittelson and Associates in 2008, were duplicated in the current survey wherever possible. To capture the effects of recent development, one new route was added in the vicinity of Portland State University, and one route in the northern Pearl District was significantly expanded. Other routes were only altered as necessary to account for street closures and other factors that would affect observations.



The nine routes and the date(s) during which they were observed are:

Entertainment District	Wednesday October 22, 2014, 7:00 AM–10:00 PM Friday October 24, 2014, 4:00 PM–12:00 AM
West End North	Tuesday October 28, 2014, 7:00 AM–10:00 PM
South Pearl	Wednesday October 29, 2014, 7:00 AM–10:00 PM
Goose Hollow	Thursday October 30, 2014, 7:00 AM–10:00 PM
West End South	Wednesday November 5, 2014, 7:00 AM–10:00 PM
PSU	Wednesday November 5, 2014, 7:00 AM–10:00 PM
Office District	Thursday November 6, 2014, 7:00 AM–10:00 PM
Old Town	Friday November 7, 2014, 4:00 PM–12:00 AM Wednesday November 12, 2014, 7:00 AM–10:00 PM
North Pearl	Wednesday November 19, 2014, 7:00 AM–10:00 PM

The routes are shown in Figure 1 on the following page. Detailed data on each route is included in Part 3 of this report.

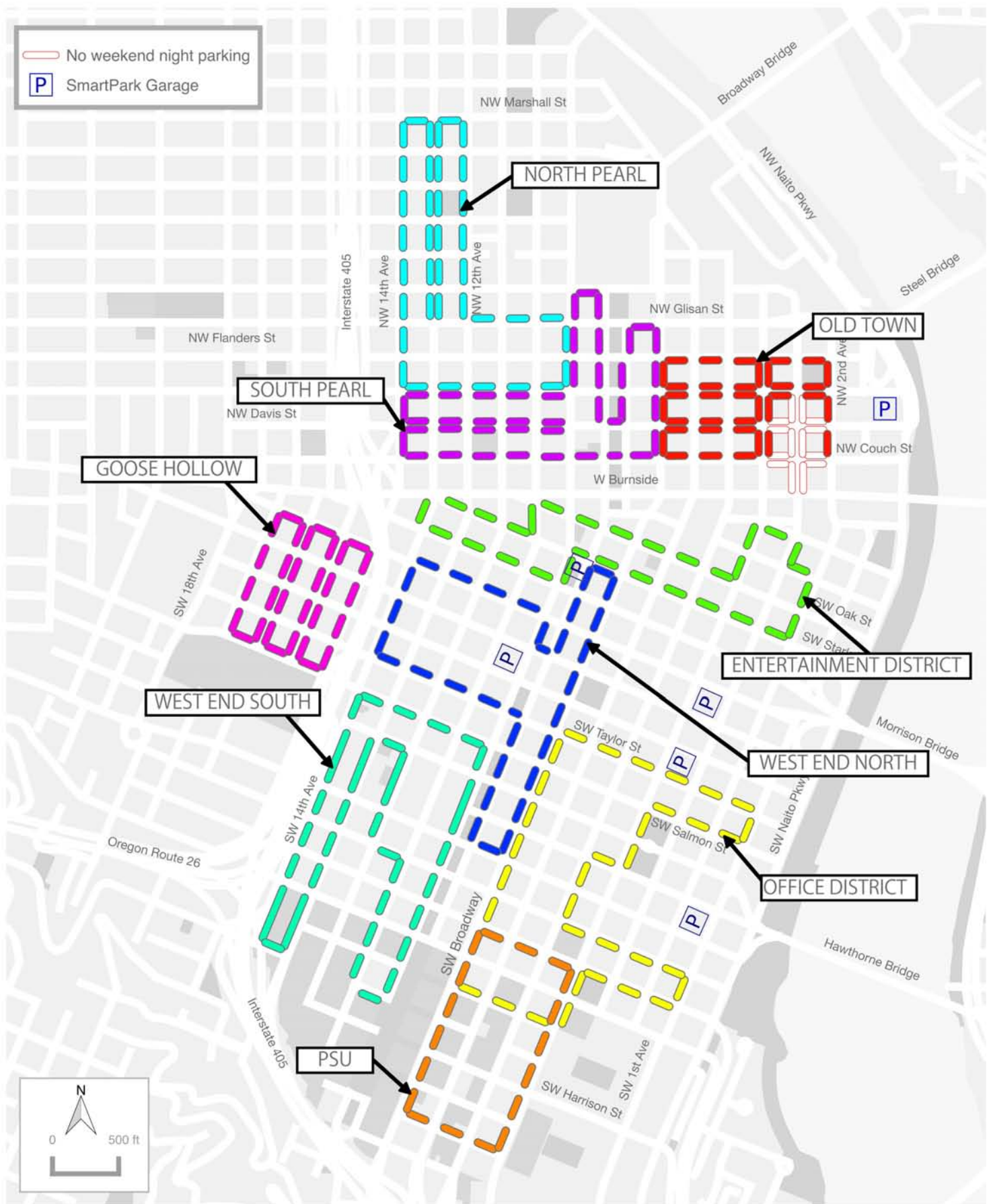


Figure 1: 2014 Study Area & Survey Routes

Stall Types and Quantities



The study area includes the following twelve types of parking stalls:

- **Standard metered:** These spaces comprise the bulk of on-street parking in the study area; Metered spaces have maximum stays of 1 hour, 90 minutes, 2 hours, 3 hours, or 5 hours.
- **Loading zones:** Spaces reserved for loading and unloading activities for some or all of the day. Typically, these stalls revert to standard metered spaces after 7:00 PM.
- **Disabled:** Spaces reserved for use by those with a disabled parking placard or licence plate.
- **Wheelchair:** Spaces reserved for use by wheelchair users displaying a placard.
- **Short stay:** Spaces with maximum time stays of 30 minutes or less. Most commonly, the maximum time stay is 5 minutes or 15 minutes.
- **Carpool:** Spaces reserved for use before 10:00 AM for those displaying a carpool placard. After 10:00 AM, these stalls revert to standard metered spaces; however time stay restrictions do not apply to vehicles displaying a placard .
- **Taxi:** Spaces reserved for use for taxis.
- **Hotel:** Spaces adjacent to hotels reserved for use for pick up & drop off of guests, valet parking, and other hotel-related activities.
- **Mail:** Spaces reserved for use for US Postal Service vehicles.
- **Carshare:** Spaces reserved for use for shared vehicles such as *Zipcar* vehicles.
- **Motorcycle:** Parking spaces sized and reserved to accommodate motorcycles.
- **Reserved Spaces:** Parking spaces that were reserved for construction, road/sewer maintenance, or another purpose during some or all of the period that they were observed.

The area studied consists of a total of **293 block faces** and includes **2,076 parking stalls**, **1,672 standard metered spaces**, and **141 loading zone slots**. Figure 2 summarizes the stalls surveyed during the study.

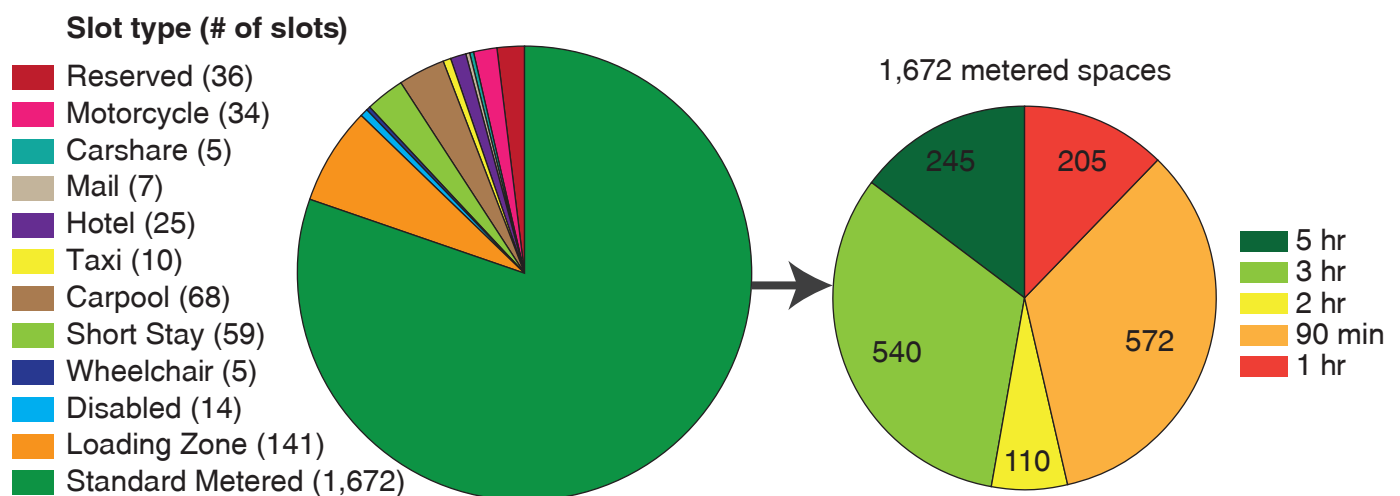


Figure 2: Quantities of parking stalls in the study area

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Part 2:
Area-Wide Findings

2014 Occupancy Rates & Maps



The weekday parking occupancy observed over the entire study area is summarized below in Figure 3. Demand was generally fairly low early in the morning before rising to above 70% by 10:00 AM. Two distinct peaks in parking occupancy were observed: an afternoon peak during the 1:00 PM hour and an evening peak during the 7:00 PM hour. A mid-afternoon lull is observed between the two peaks, with the lowest occupancy rates occurring during the 4:00 PM hour. Following the evening peak, demand was observed to wane slightly; however occupancy rates remained above 70% through the last observations during the 9:00 hour. While the sharpness of the peaks and lulls varies, this pattern is observed consistently across all routes.

The demand observed during the 2008 study conducted by Kittelson and Associates is also shown in Figure 3. Demand in 2014 was generally observed to be higher than in 2008 through most of the day, particularly during the early afternoon peak period; however, demand during the earliest and latest hours observed was greater in 2008. Though the same basic pattern—two peak periods with a mid-afternoon lull between them—was observed in 2008, the observed fluctuation in demand was greater in 2014.

Figures 4 and 5 on the following two pages show heat maps of parking occupancy during the 1:00 PM and 7:00 PM peak periods, respectively.

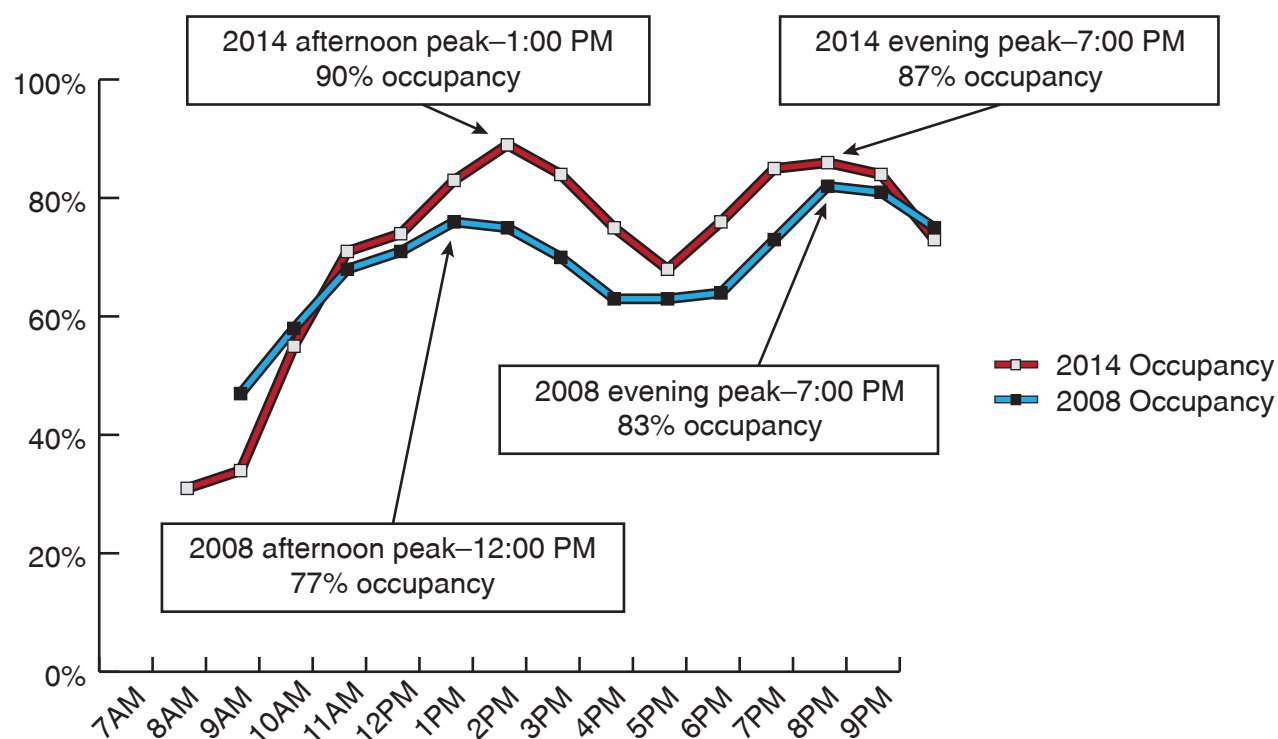


Figure 3: 2014 and 2008 occupancy by time of day for standard metered spaces

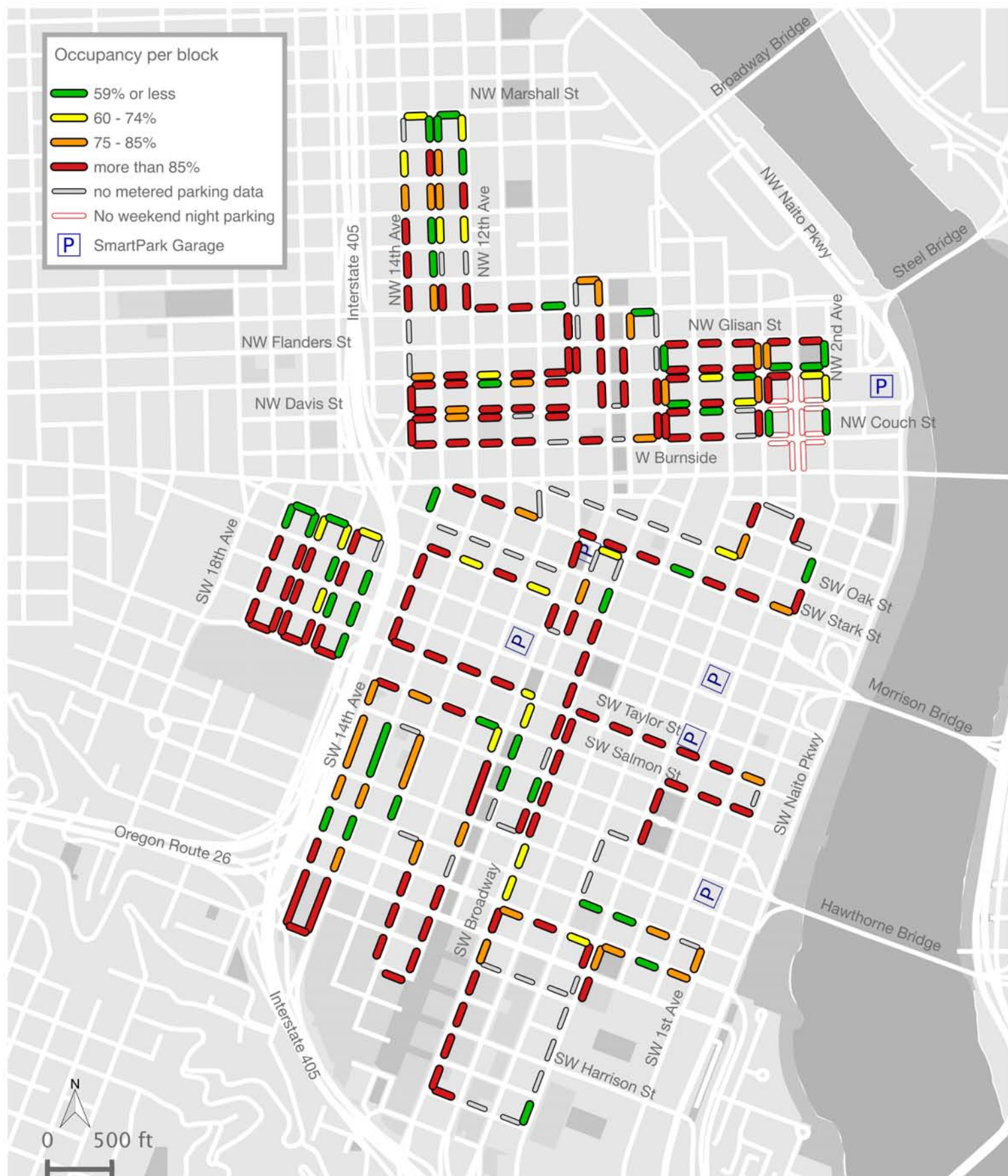


Figure 4: Occupancy during the 1:00 PM peak hour

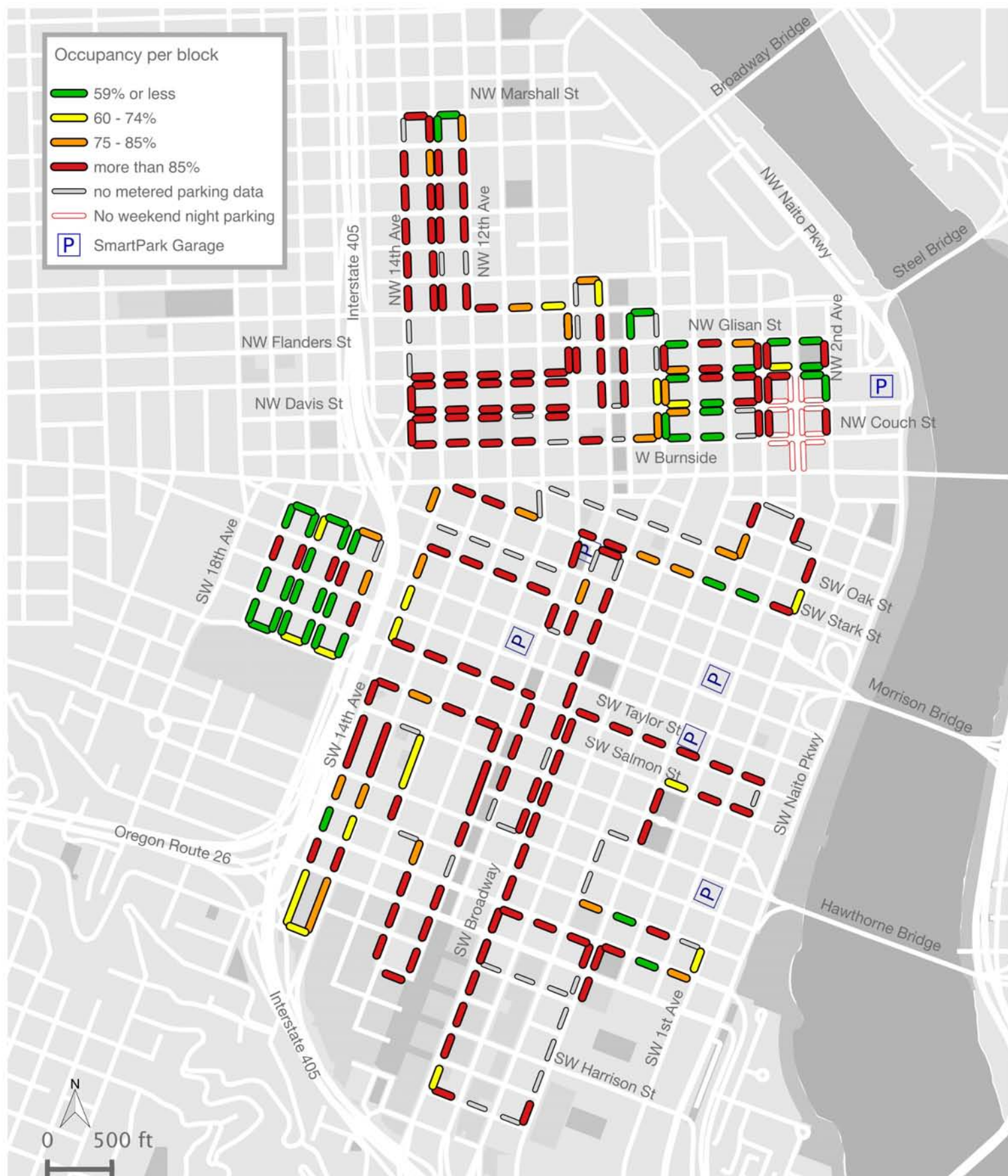


Figure 5: Occupancy during the 7:00 PM peak hour

Turnover & Stay Durations



Figure 6 summarizes this study's findings regarding the average duration of stays and percentage of vehicles observed to exceed the maximum legal stay.

There are five time limits for metered spaces in the study area: 1 hour, 90 minutes, 2 hours, 3 hours, and 5 hours. The data collected show that the shorter the maximum permitted stay, the more frequent stays in excess of this maximum stay occur. Vehicles in parking spaces with a 1 hour limit were observed to stay in excess of the maximum time most frequently (18% of all vehicles observed), while vehicles in spaces with a 5 hour limit were observed to stay in excess of the maximum time least often (3% of all vehicles observed).

Similarly, the average time stay for vehicles in 1 hour spaces was observed to be nearly an hour and a half, while vehicles in 5 hour spaces only stayed an average of 2 hours 44 minutes. Interestingly, the average stay in 90 minute spaces was precisely 90 minutes, and the average stay in 2 hour spaces was 91 minutes.

It is noted that vehicles were sometimes observed to remain parked in a space for most or all of a day. While this was infrequent, it occurred in spaces of all maximum stays. These observations will most drastically affect the average stay length found for the shorter duration parking spaces. This likely contributes to the observed time stay well in excess of the limit for 1 hour slots.

Note that Figure 6 only includes data collected between the hours of 7:00 AM and 7:00 PM, which are the hours subject to enforcement.

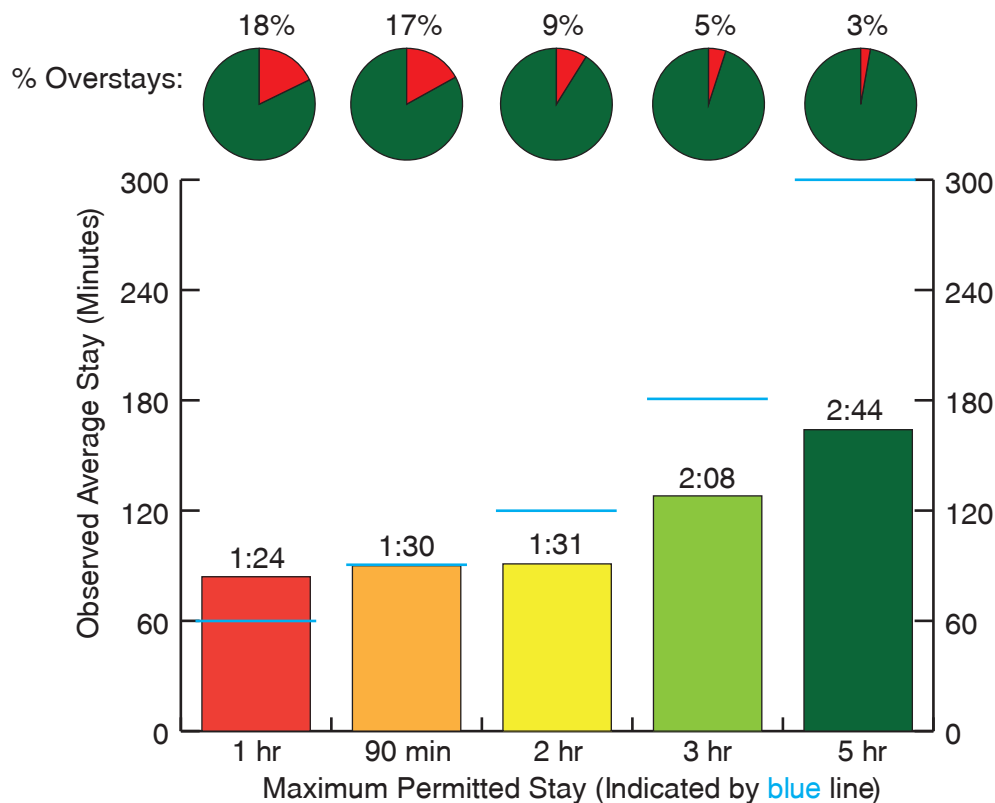


Figure 6: Average time stays and percentage of vehicles overstaying the time limit during metered hours

Friday Occupancy & Turnover



The weekday parking occupancy observed over the entire study area is summarized in Figure 7. Parking was observed along the Old Town and Entertainment District routes—routes through areas of town with a number of restaurants, bars, and similar attractions—on a Friday from 4:00 PM to 12:00 AM. Demand was found to be lowest at the beginning of the observation period, which corresponds to the midday “lull” observed during weekdays, and rises steadily until 7:00 to 8:00 PM, when parking is functionally full. After 8:00 PM, occupancy declines slightly, but was observed to remain in excess of 90% through the last observation during the 11:00 PM hour.

Echoing the patterns observed during weekdays, occupancy was found to be slightly lower than 2008 levels during the earliest and latest observation (during the 4:00 PM and 11:00 PM hours, respectively), and higher than 2008 levels during the middle of the study period.

Friday occupancy graphs for the two individual routes are provided in Part 3 of this report.

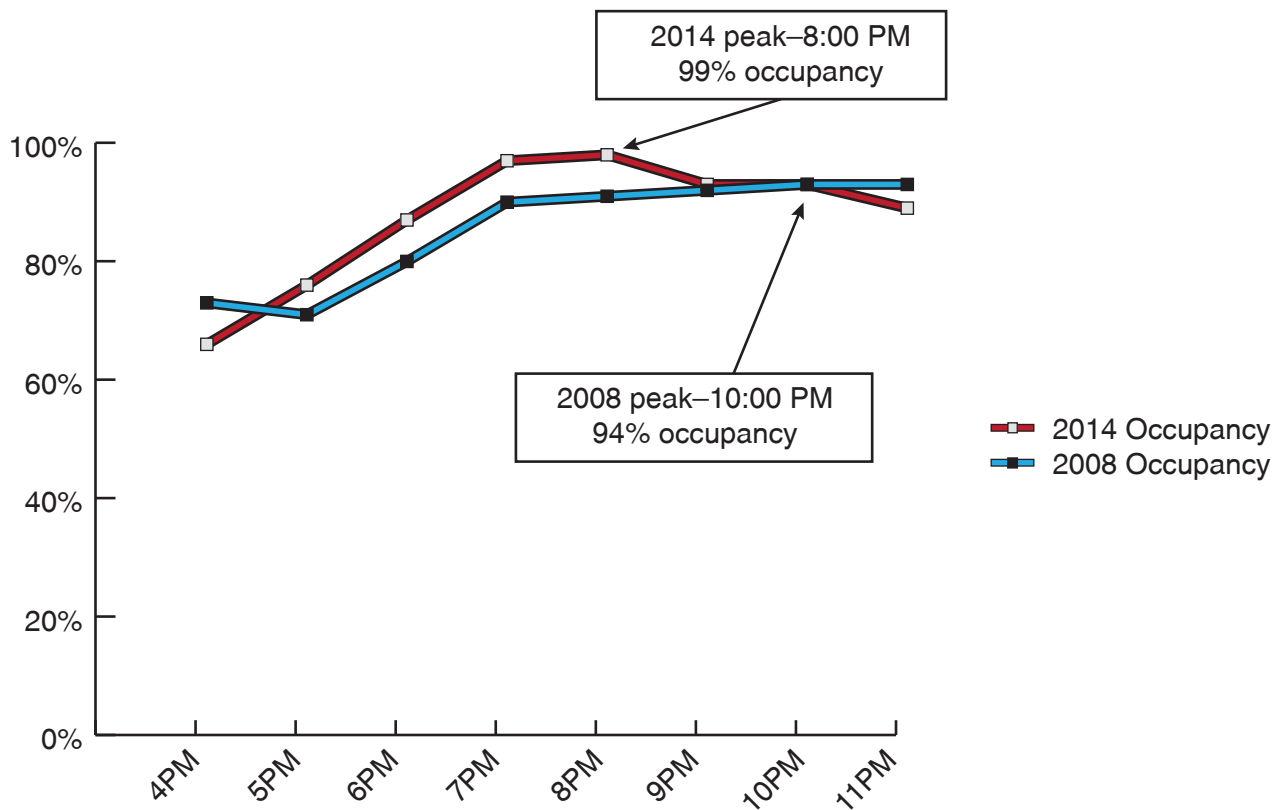


Figure 7: 2014 and 2008 Friday evening/night occupancy by time of day

Loading Zones

The observed occupancy for 141 designated loading zone stalls in the study area is shown in Figure 8. The peak time for loading activities was 11:00 AM, when approximately 28% of loading zone spaces were observed being utilized for loading & unloading activities. Approximately 5% to 10% of loading zone spaces were occupied by what appeared to be private cars (i.e., vehicles that were not apparently involved in loading activities) during metered hours. Loading zones generally revert to standard parking after enforcement ends at 7:00 PM; at this point, utilization of these spaces by private cars increases significantly, peaking at 8:00 PM with approximately 60% of spaces occupied.

It is noted that because loading zones vary significantly in size, these results should be interpreted as representing the percentage of loading zone frontage occupied rather than as a percentage of the number of designated loading zones occupied. For example, a loading zone large enough to accommodate a large truck would appear full if occupied by either a large truck or two smaller trucks/vans; it would only appear only half full if occupied by a single small truck or van.

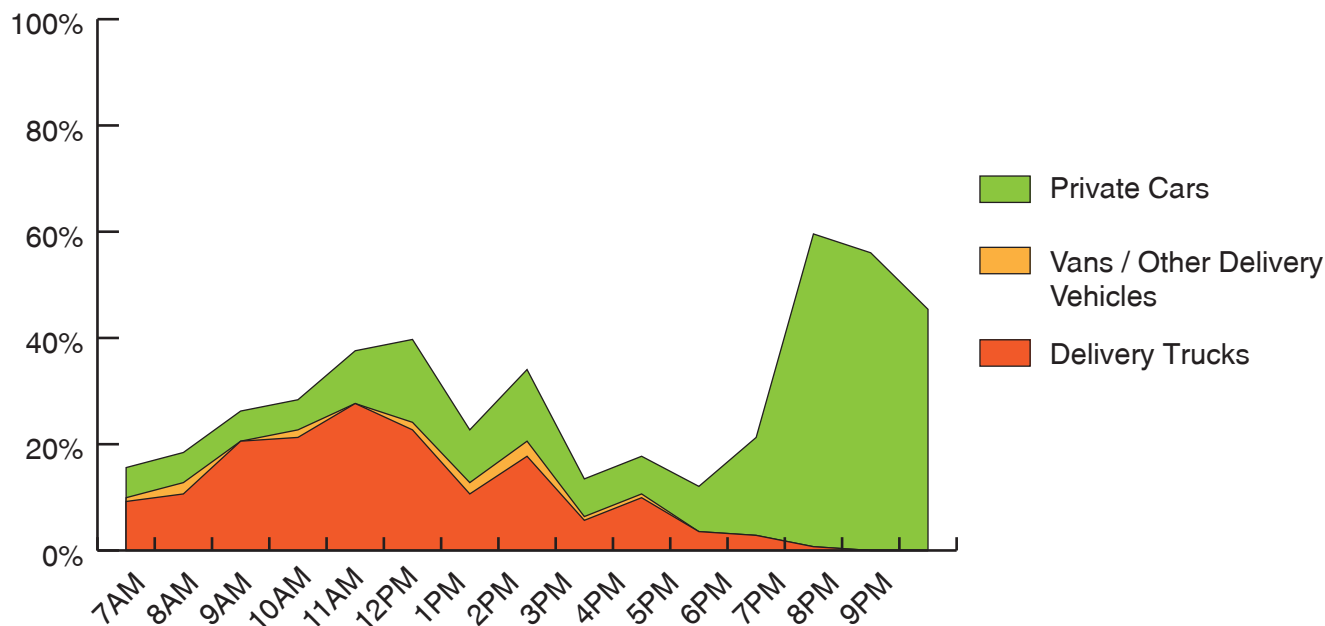


Figure 8: Loading zone occupancy and vehicle type by time of day

Disabled & Wheelchair Stalls

Figure 9 summarizes the occupancy of the 14 disabled spaces and 5 wheelchair-only spaces in the study area. The overall occupancy patterns were observed were similar to those observed in standard metered spaces, albeit with slightly lower occupancy rates. Generally, compliance with the applicable user restrictions was good; however a small number of vehicles that did not appear to be authorized to use disabled spaces were observed throughout the study period.

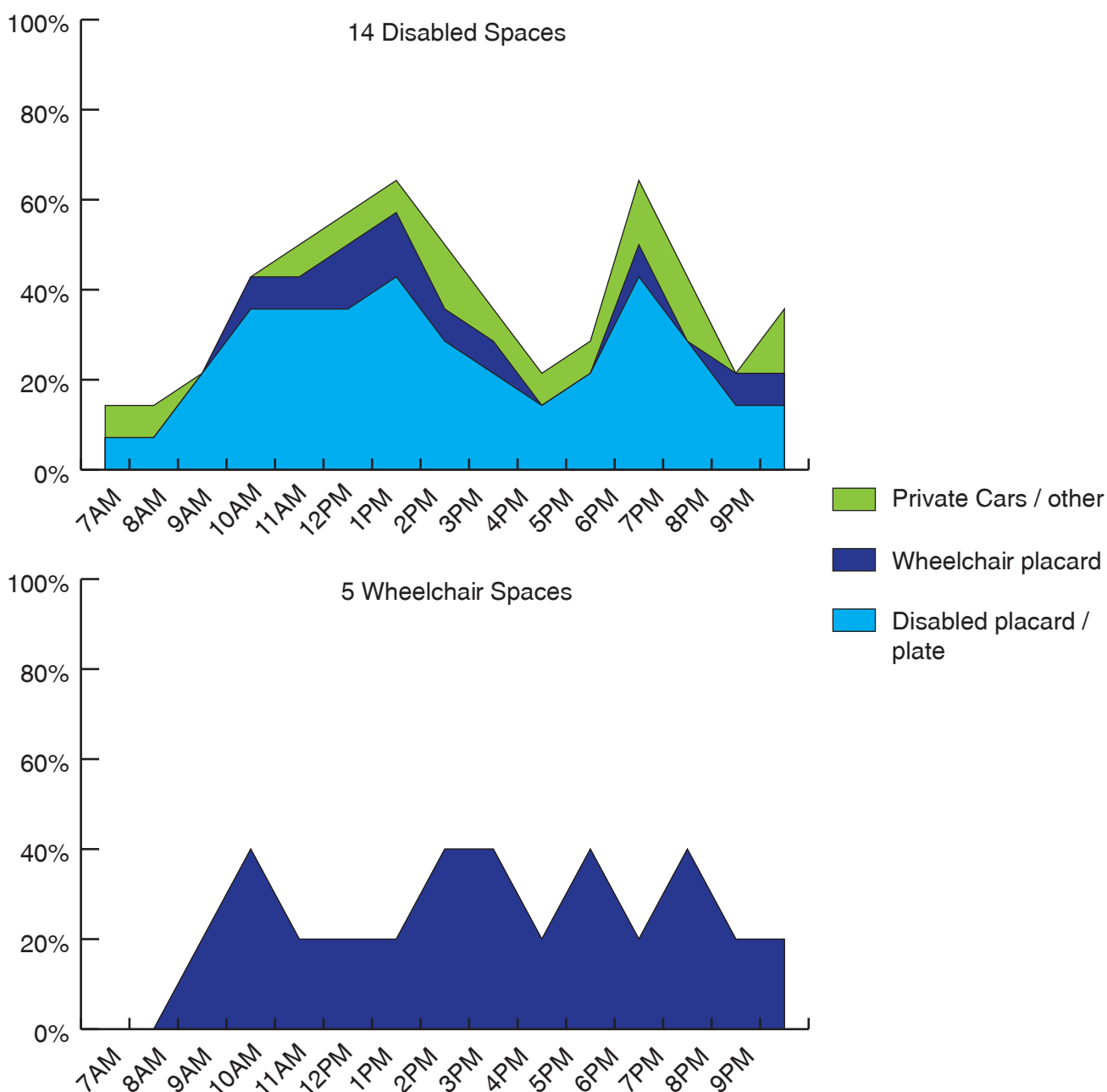


Figure 9: Disabled & wheelchar stall occupancy and user type by time of day

Other Special Stall Types

Figure 10 shows the occupancy rates observed for the 59 short stay slots, 68 carpool slots, 25 hotel slots, and 34 motorcycle slots in the study area.

Short stay slots allow maximum stays of 5 to 15 minutes. From 10:00 AM to 6:00 PM, occupancy is consistently around 50%. At the end of enforcement hours, occupancy was observed to increase to about 70% before again declining at the end of the day.

Carpool slots require users to have a placard if arriving before 10:00 AM, and time stay limits do not apply to vehicles with this placard. These slots were observed to be nearly full from 11:00 AM to 7:00 PM, with only a slight dip observed in the afternoon.

Hotel slots are sited adjacent to hotels for valet parking, pick-up & drop-off, and other similar activities. Occupancy rates were generally observed to be below 50% throughout the day, with noticeable peaks occurring during the late morning and early evening.

Carshare, taxi, and mail spaces did not account for a significant portion of the study area, and few unauthorized uses of these spaces occurred.

Figure 11 on the following page shows the locations of the most common types of special stalls: loading zones, disabled and wheelchair spaces, short stay stalls, hotel zones, and carpool stalls.

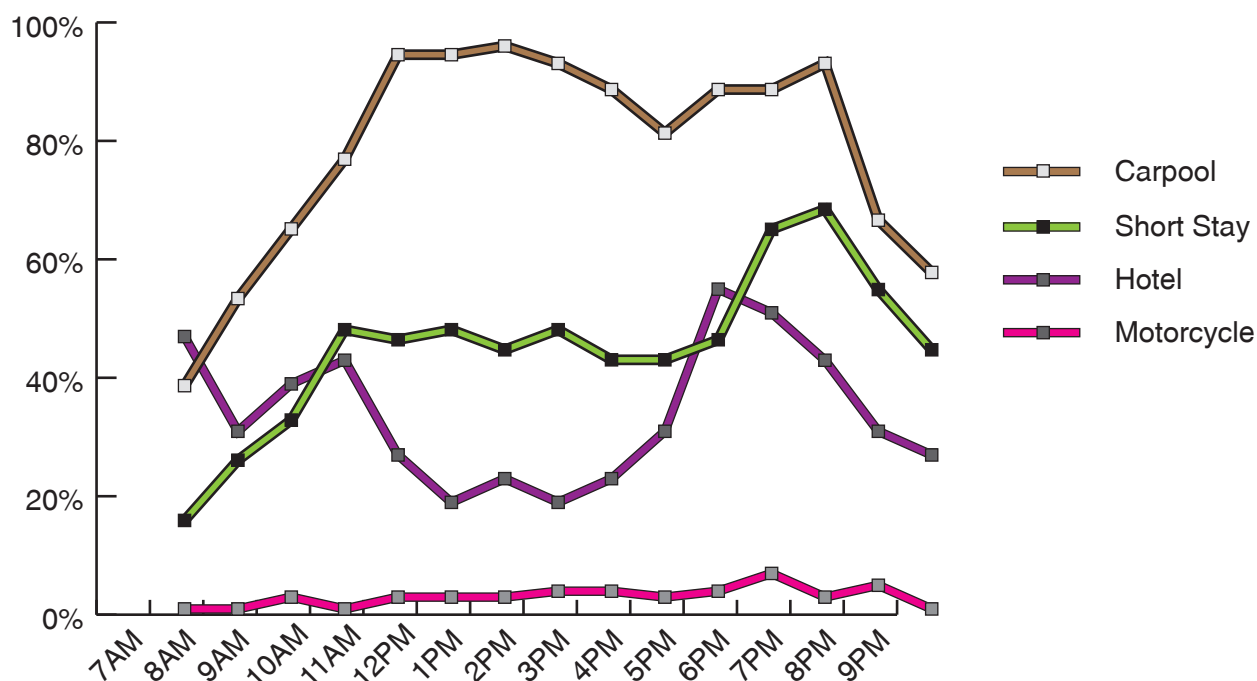


Figure 10: Short stay, carpool, hotel, and motorcycle occupancy by time of day

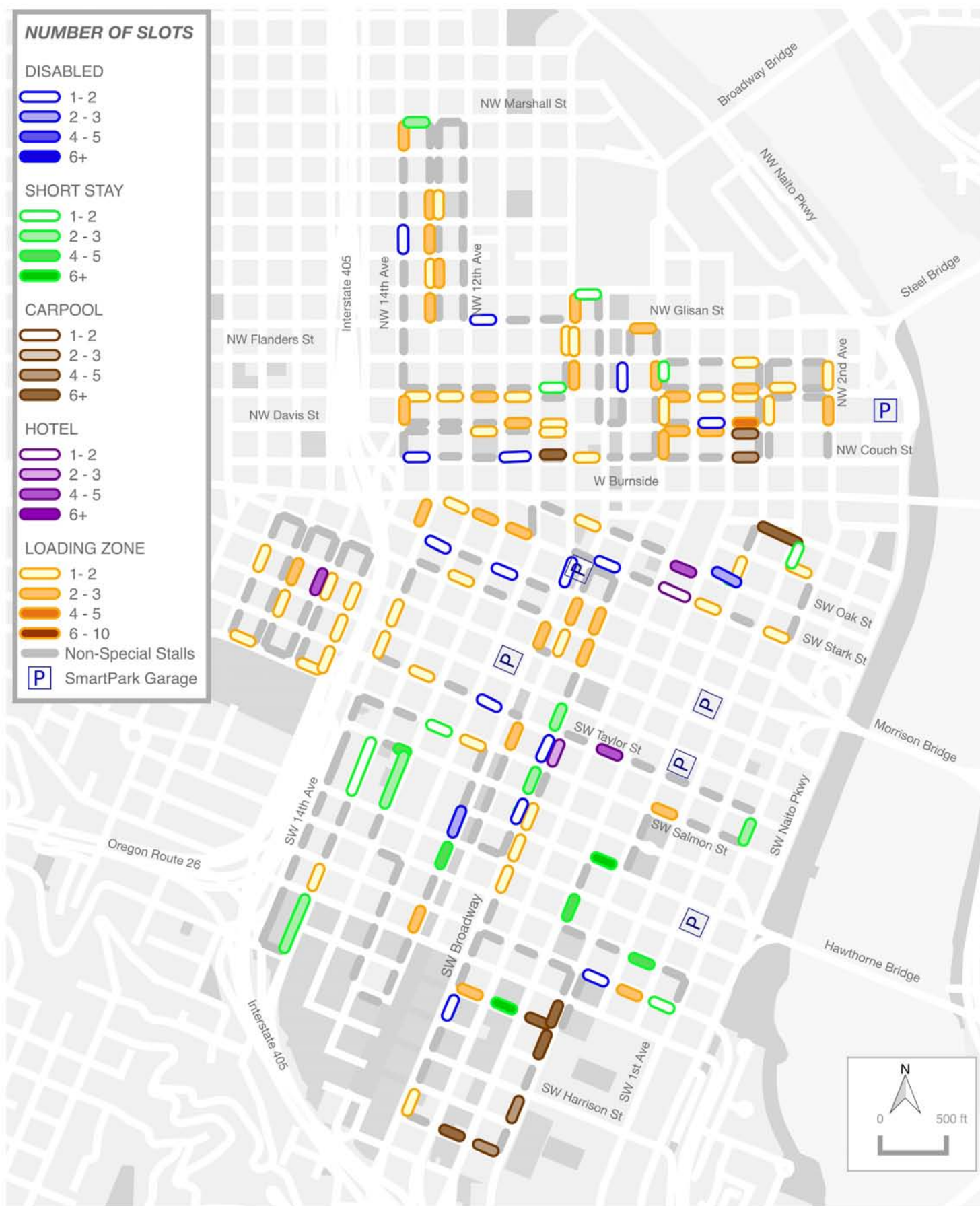


Figure 11: Locations of common types of special slots

Part 3:
Route Summaries

Old Town



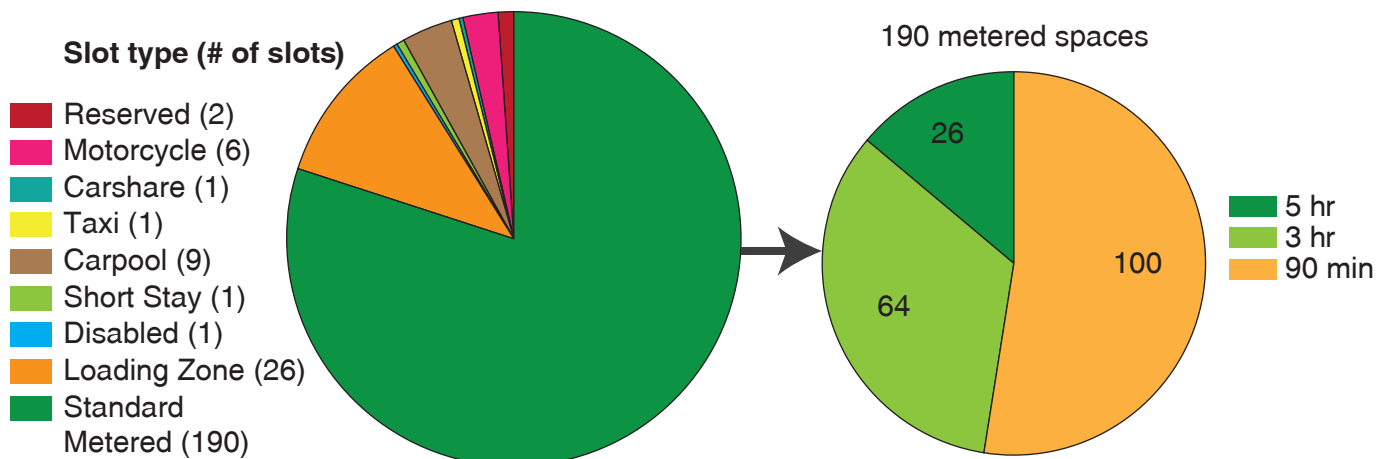
Route Map

The Old Town route was surveyed on Wednesday, November 12, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 36 block faces, is shown below, with block faces included in the previous (2008) survey but not the current survey highlighted in yellow.



Route Overview

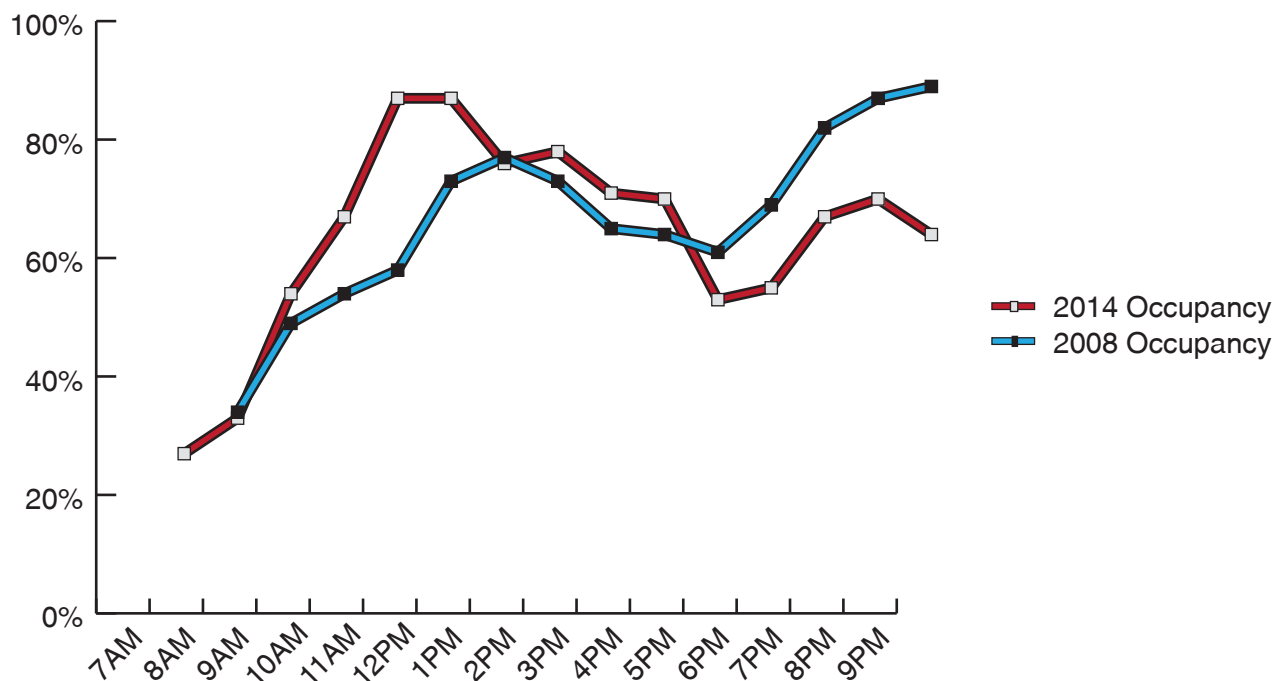
The Old Town route consists of a total of 237 slots, including 190 standard metered spaces, 26 loading zone slots, and 9 carpool slots.





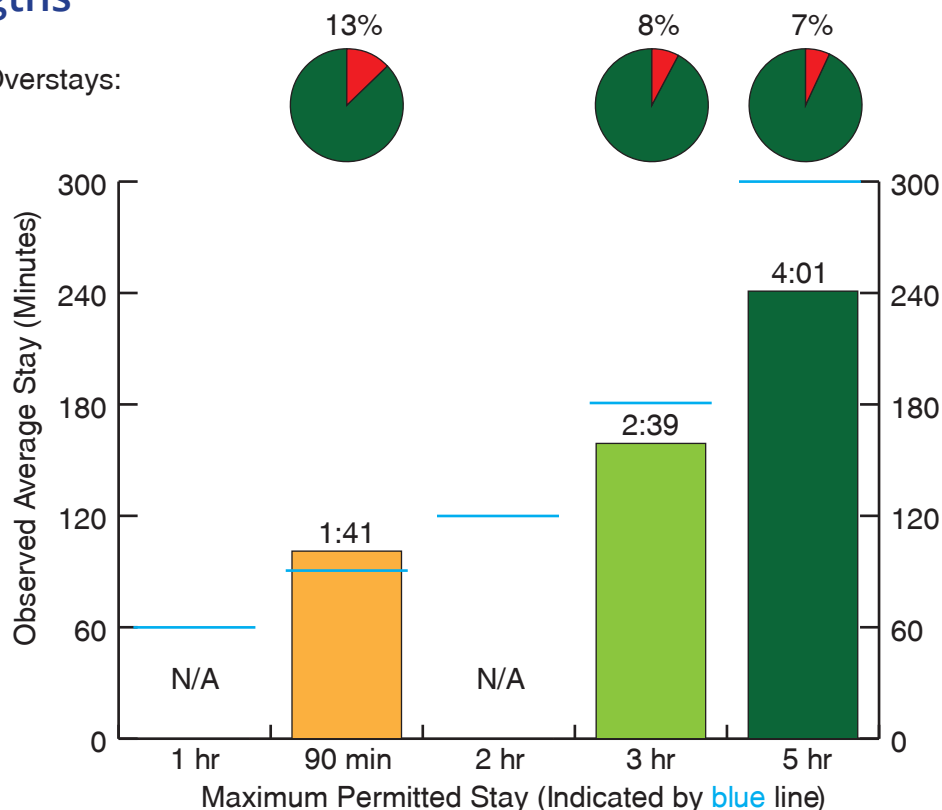
Occupancy – 2008 vs. 2014

Occupancy levels in Old Town were observed to be lower than 2008 levels in the early morning and late evening, and higher than 2008 levels at other times, particularly in during the early evening. The afternoon peak hour was 12:00 PM and the evening peak hour was 6:00 PM.



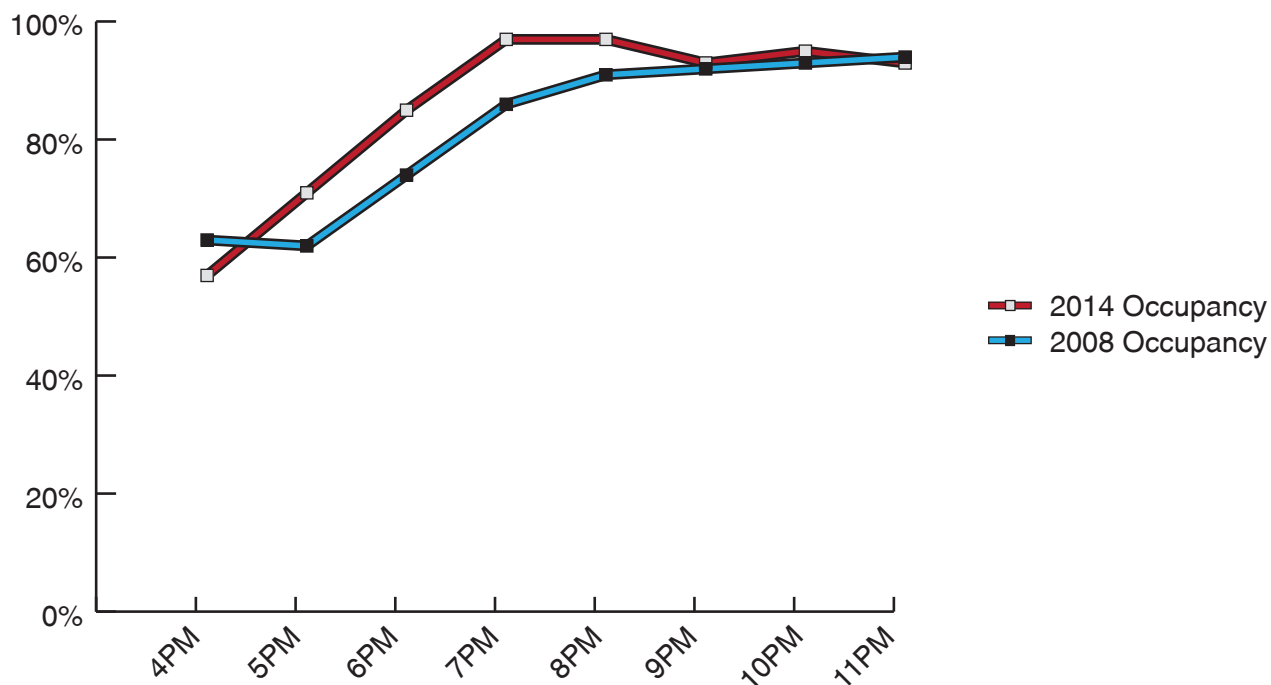
Stay Lengths

% Overstays:



Friday Occupancy – 2008 vs. 2014

Friday night occupancy and turnover data was collected along the Old Town route on November 7, 2014 from 4:00 PM to 12:00 AM. Occupancy levels before 9:00 PM were found to be slightly higher than in 2008, with parking occupancy above 90% from 7:00 PM until the end of the study period. After 9:00 PM, 2014 occupancy levels were similar to 2008 levels, with parking observed to be nearly full in both studies.



Entertainment District



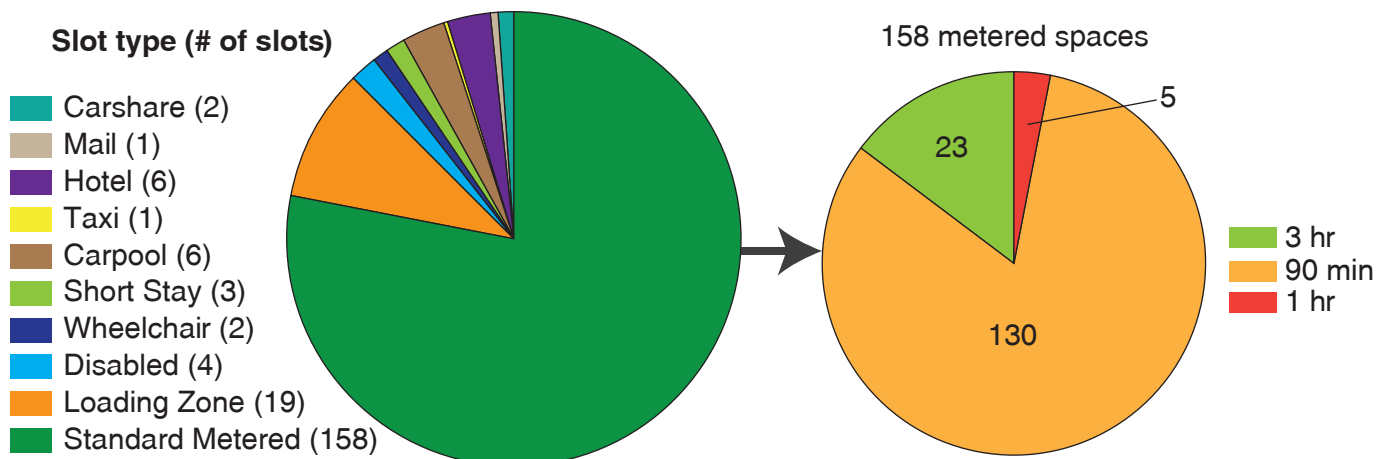
Route Map

The Entertainment District route was surveyed on Wednesday, October 22, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 30 block faces, is shown below, with block faces included in the previous (2008) survey but not the current survey highlighted in yellow.



Route Overview

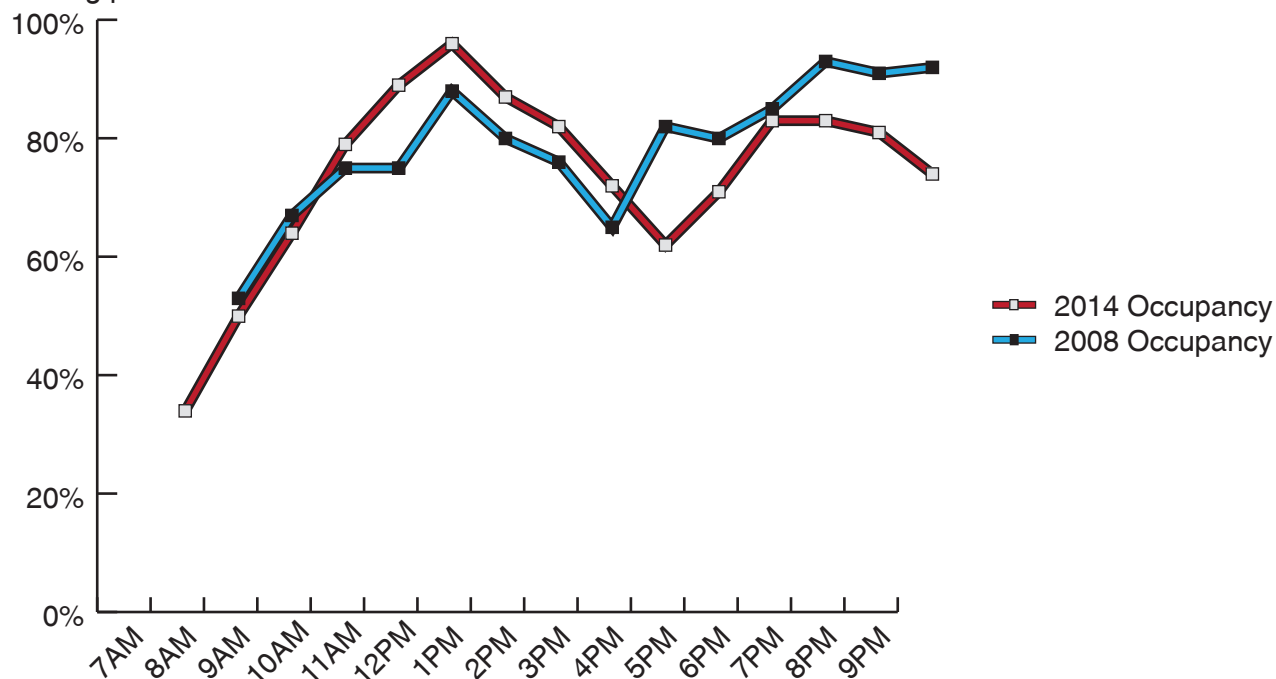
The Entertainment District route consists of a total of 202 slots, including 158 standard metered spaces, 19 loading zone slots, and 6 disabled slots.



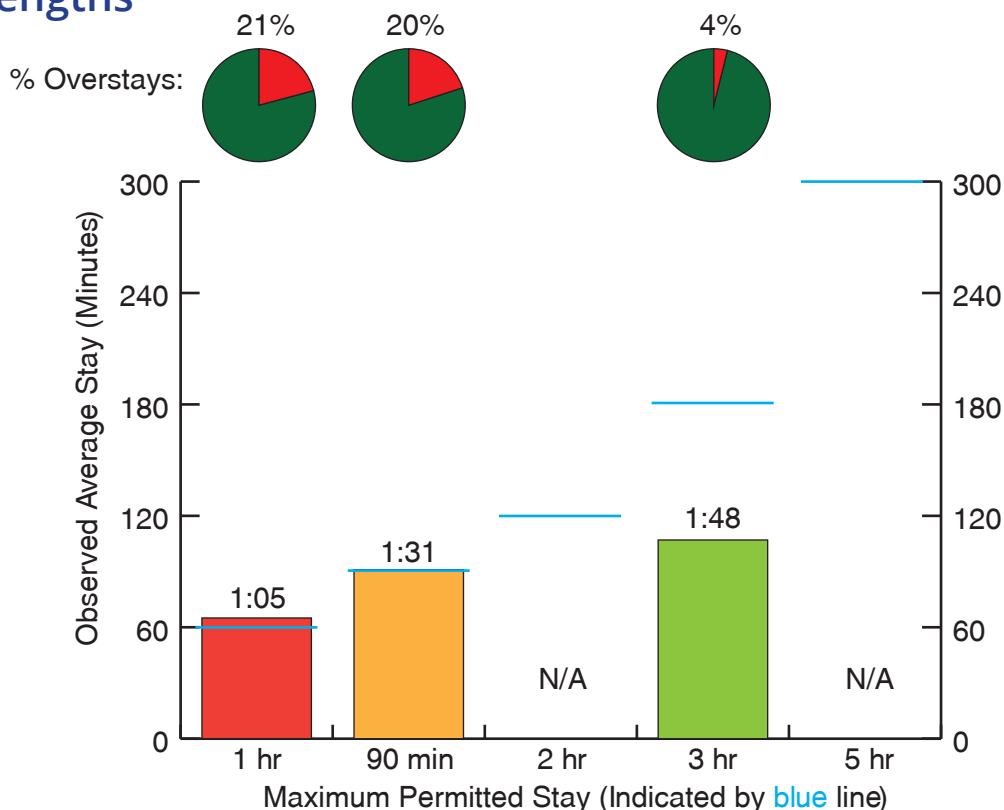


Occupancy – 2008 vs. 2014

Occupancy levels in the Entertainment District were observed to track fairly closely to 2008 levels, with slightly higher occupancy in the morning and early afternoon and slightly lower occupancy in the late afternoon and evening. The afternoon peak hour was 12:00 PM and the evening peak hour was 6:00 PM.



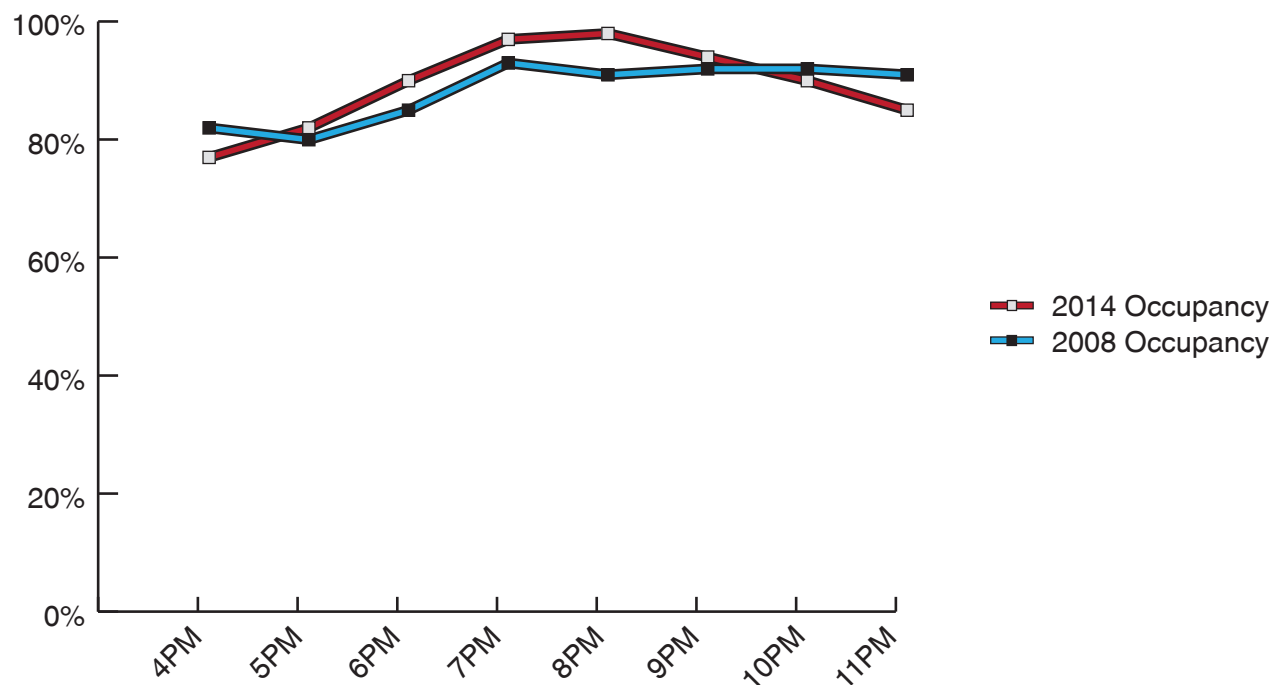
Stay Lengths





Friday Occupancy – 2008 vs. 2014

Friday night occupancy and turnover data was collected along the Entertainment District route on October 24, 2014 from 4:00 PM to 12:00 AM. Occupancy levels were observed to be largely similar to 2008 levels, with parking observed to be nearly full after about 6:00 PM in both studies.

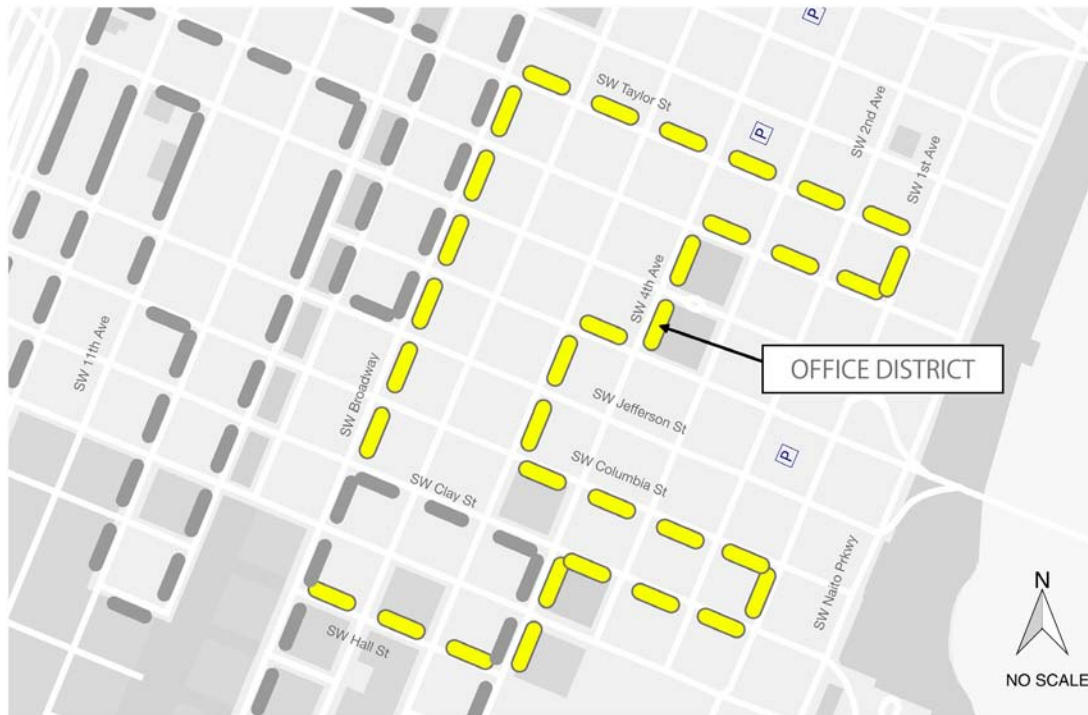


Office District



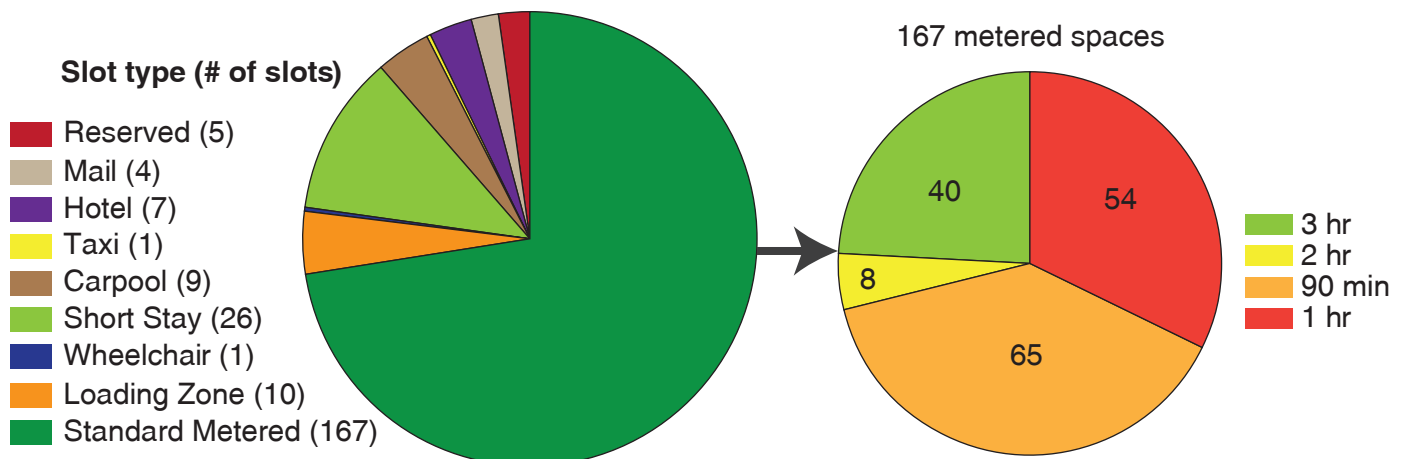
Route Map

The Office District route was surveyed on Thursday, November 6, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 36 block faces, is shown below. This route is identical to the route surveyed in 2008.



Route Overview

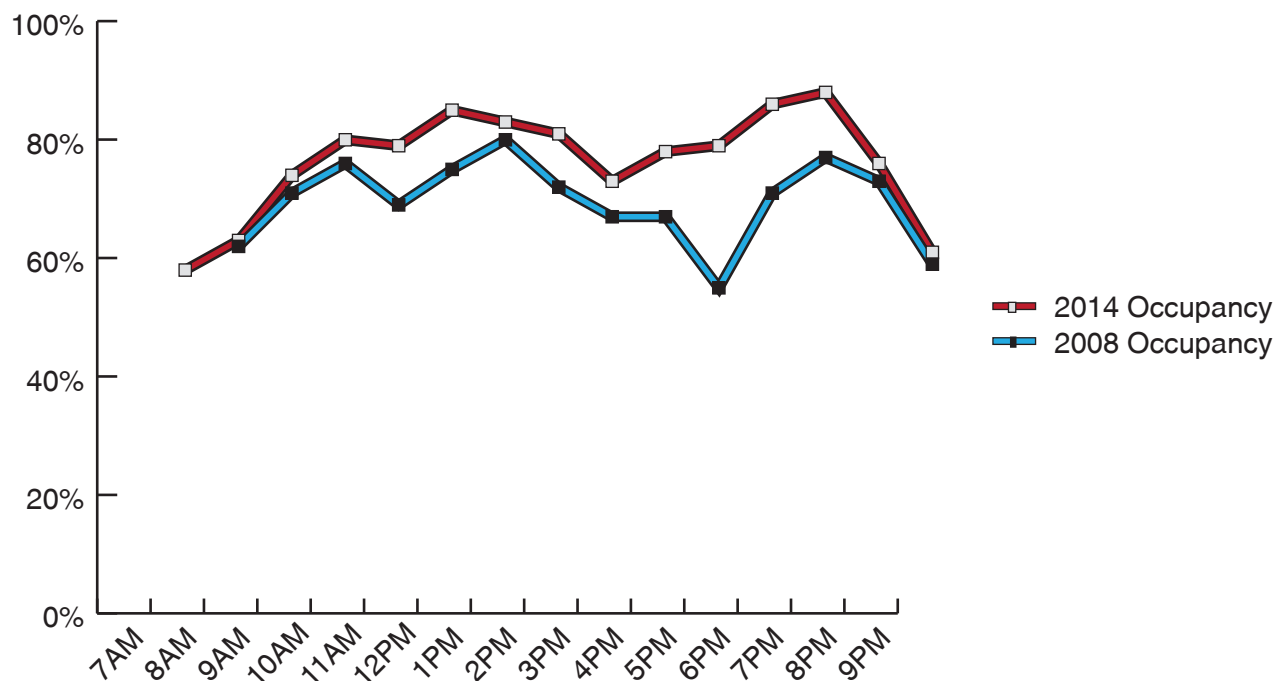
The Office District route consists of a total of 230 slots, including 167 standard metered spaces, 10 loading zone slots, and 26 short stay slots.



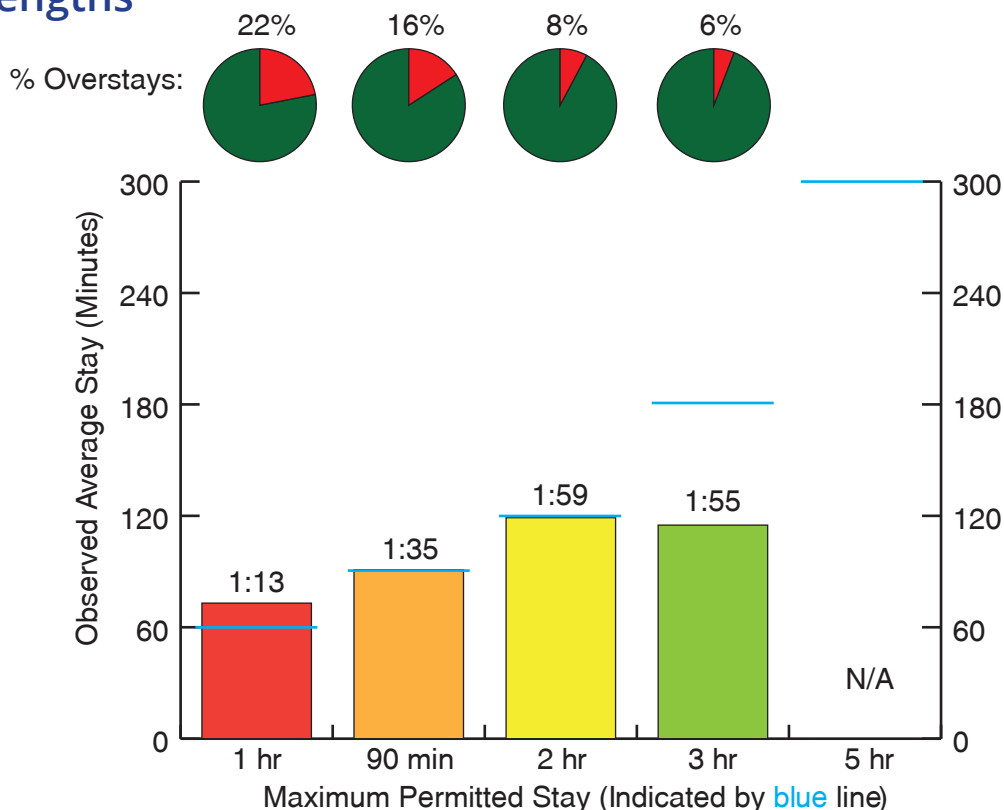


Occupancy – 2008 vs. 2014

Occupancy levels in the Office District were observed to be significantly lower than those in 2008 before 11:00 AM; similar to 2008 from 11:00 AM to 5:00 PM; and well above 2008 levels in the evening. The afternoon peak hour was 1:00 PM and the evening peak hour was 6:00 PM.



Stay Lengths

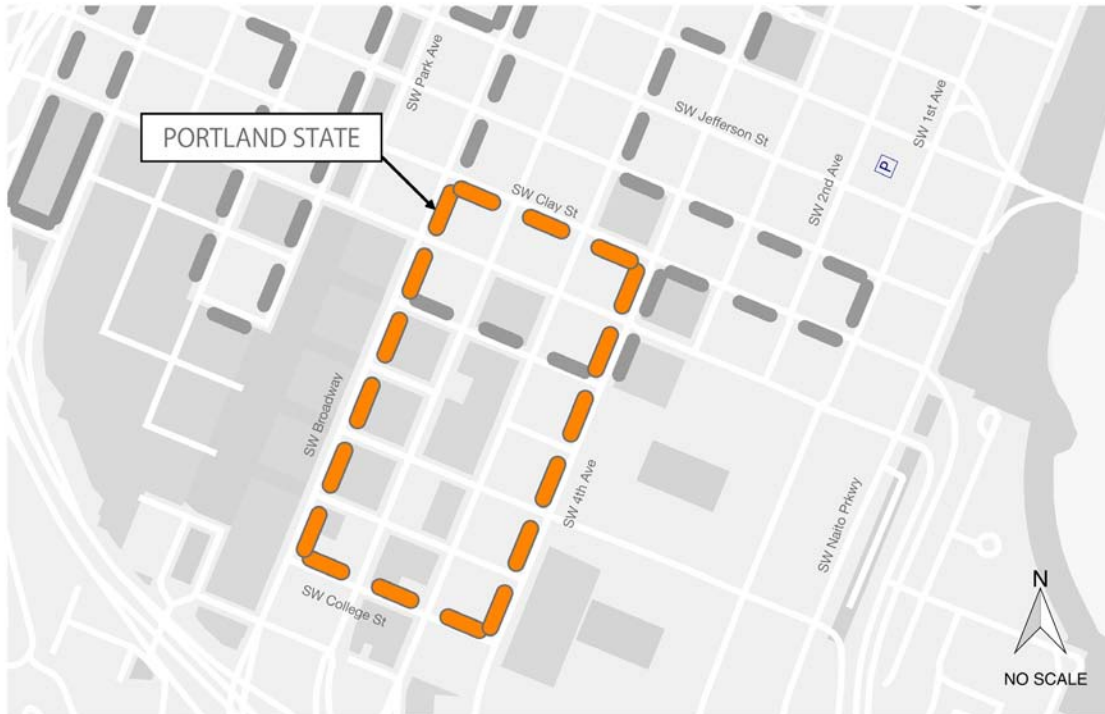


Portland State University District



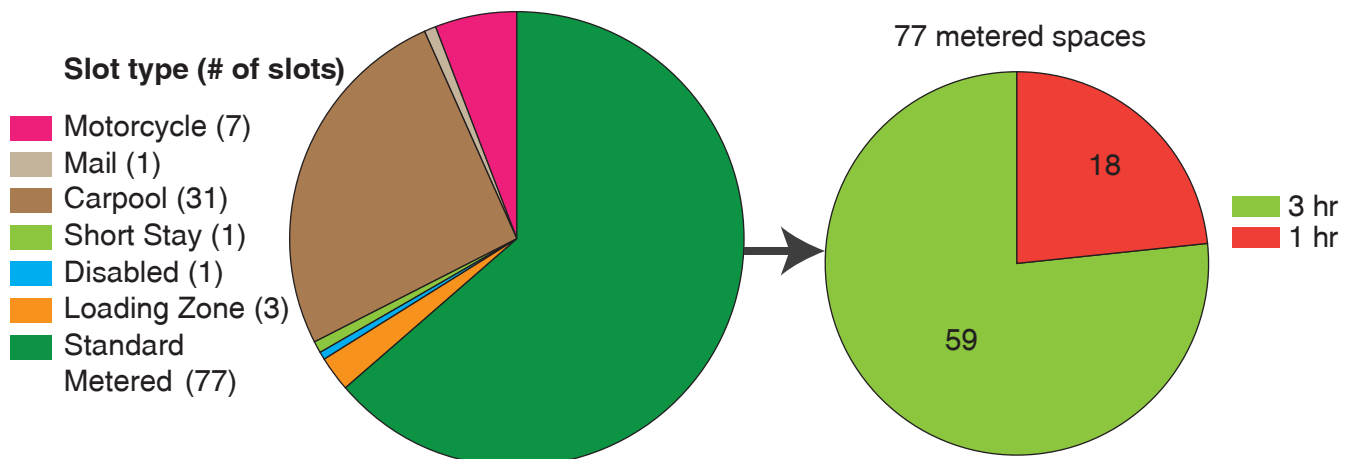
Route Map

The PSU route was surveyed on Wednesday, November 5, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 18 block faces, is shown below; This route is new to the 2014 study and was not surveyed in 2008.



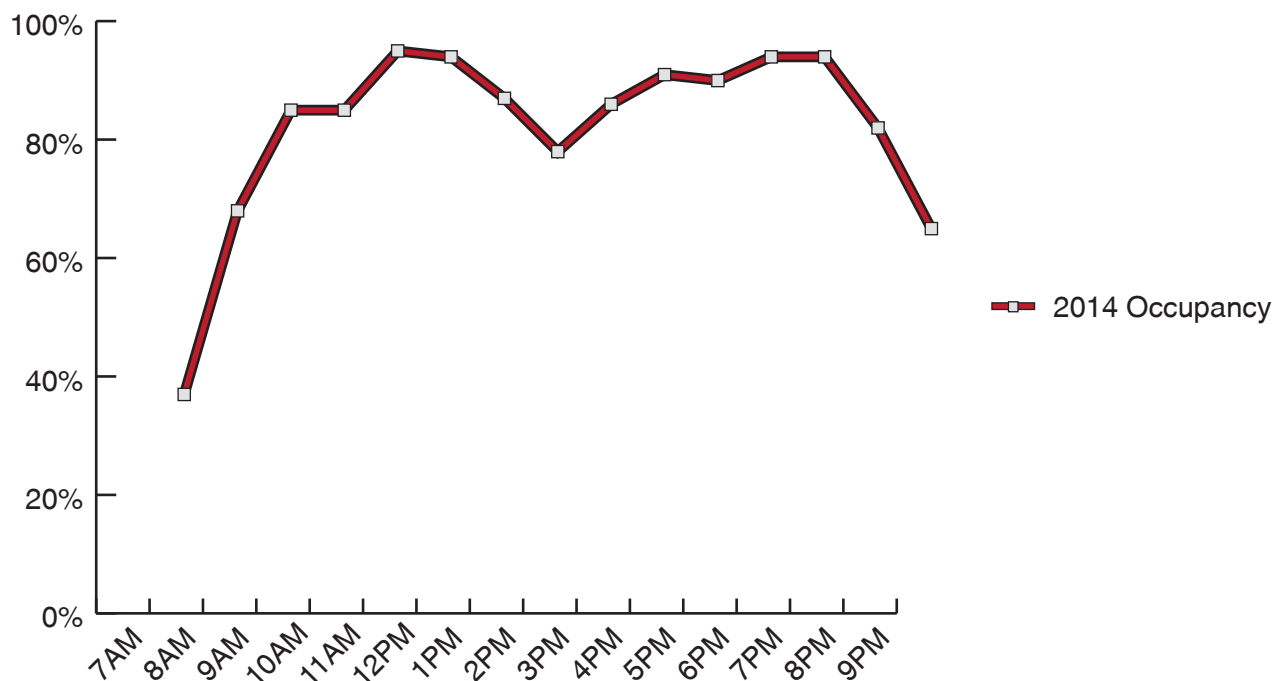
Route Overview

The PSU route consists of a total of 121 slots, including 77 standard metered spaces, 31 car-pool slots, and 7 motorcycle slots.

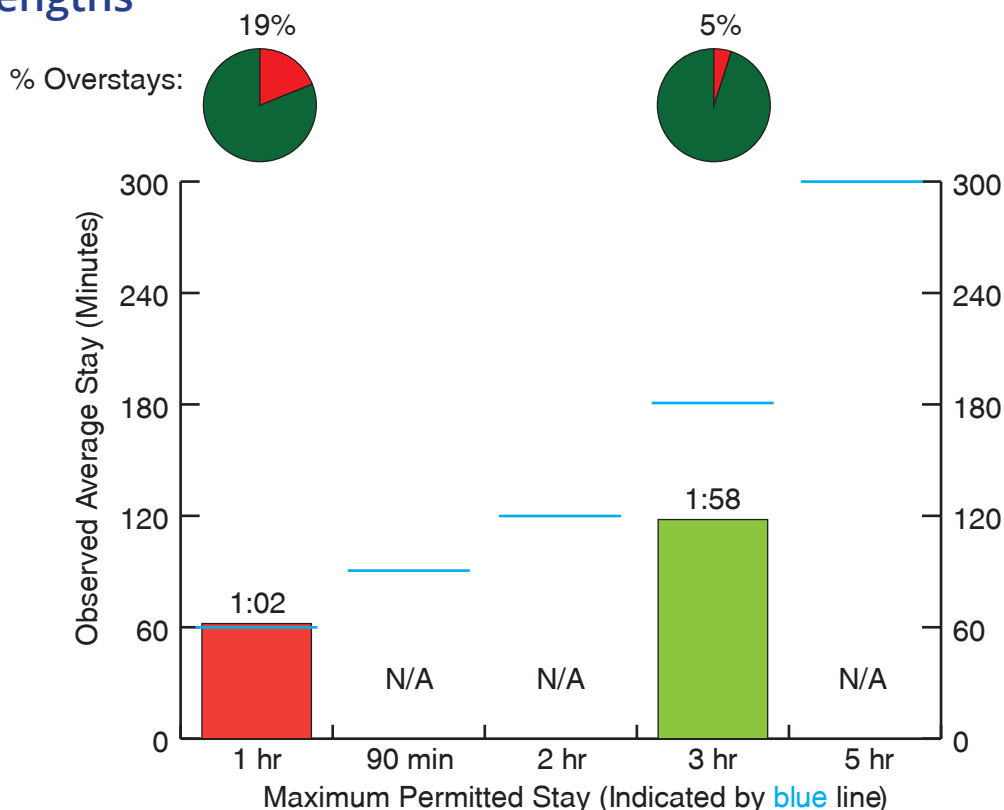


Occupancy - 2014

Occupancy levels in the PSU District were observed to be fairly high over the course of the day with a slight dip in the mid-afternoon. As indicated above, the route was not observed in 2008. The afternoon peak hour was 11:00 AM and the evening peak hour was 6:00 PM.



Stay Lengths



West End North



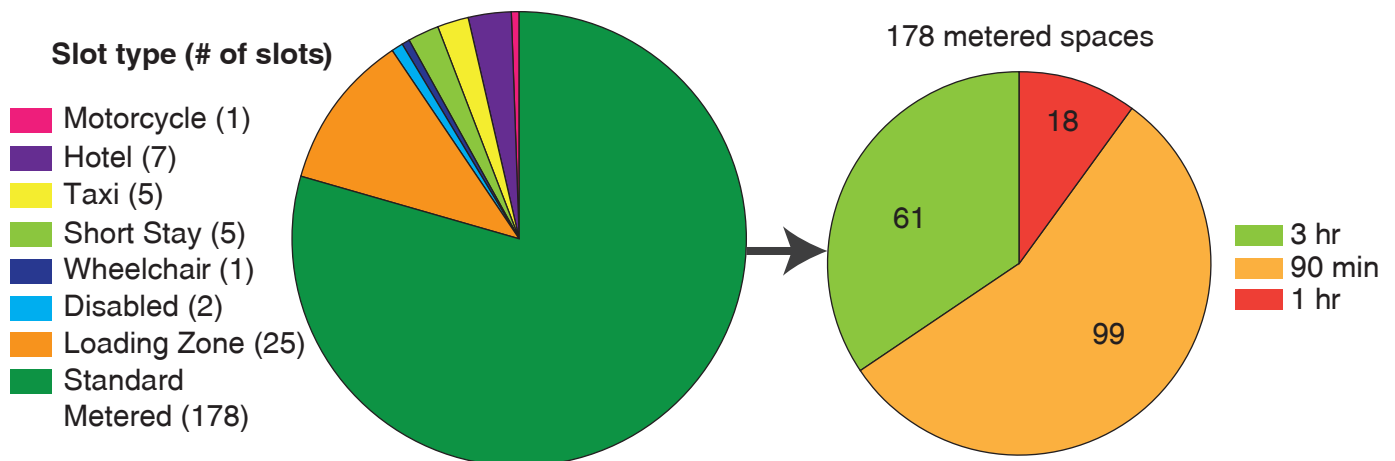
Route Map

The West End North route was surveyed on Tuesday, October 28, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 32 block faces, is shown below. This route is identical to the route surveyed in 2008.



Route Overview

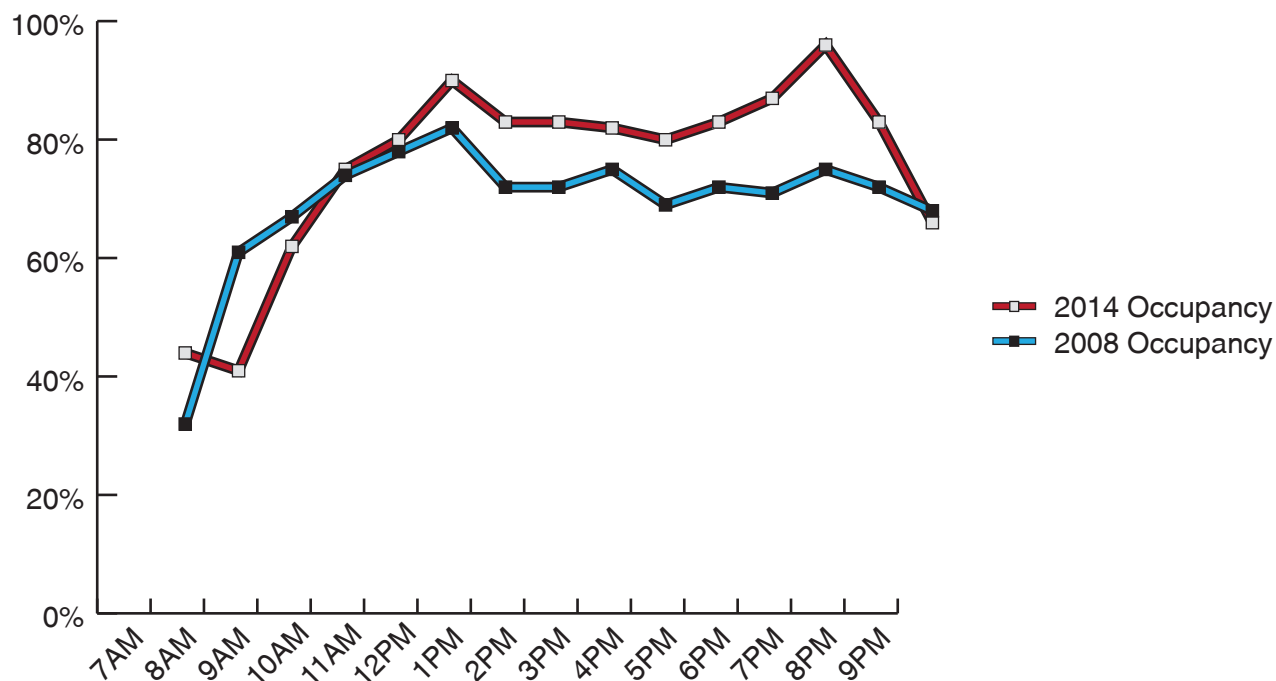
The West End North route consists of a total of 224 slots, including 178 standard metered spaces, 25 loading zone slots, and 7 hotel slots.



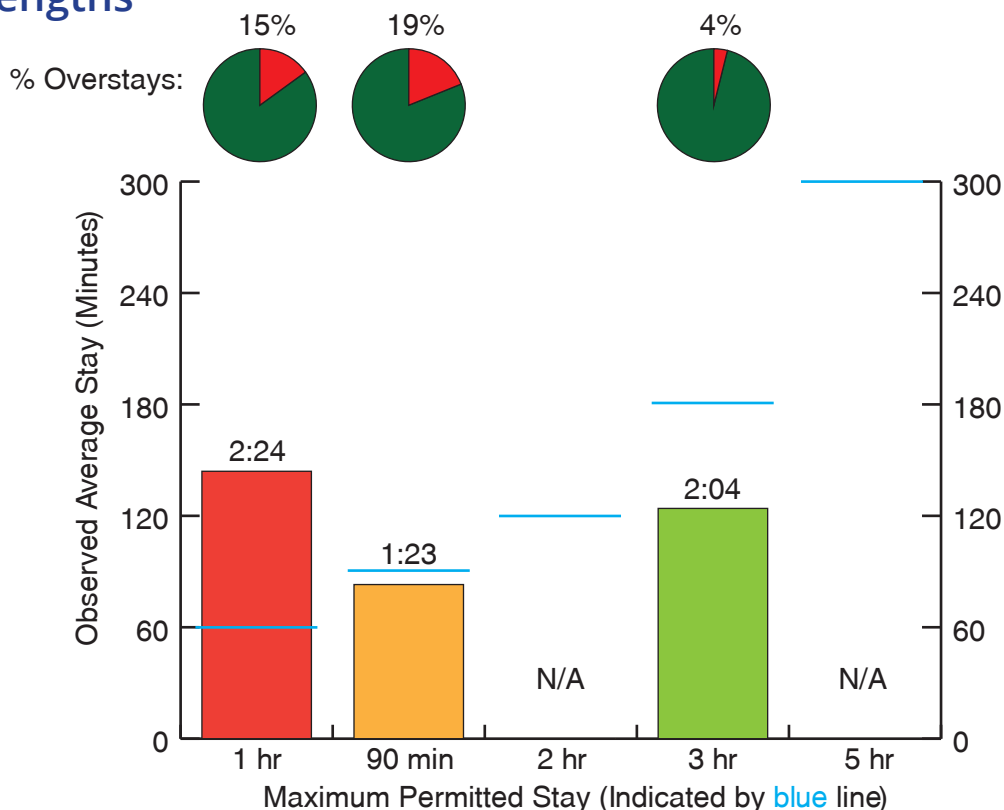


Occupancy – 2008 vs. 2014

Occupancy levels along the West End North route were generally observed to be slightly lower than those in 2008 before 11:00 AM, and a fair amount above 2008 levels through the remainder of the day. The afternoon peak hour was 12:00 PM and the evening peak hour was 7:00 PM.



Stay Lengths

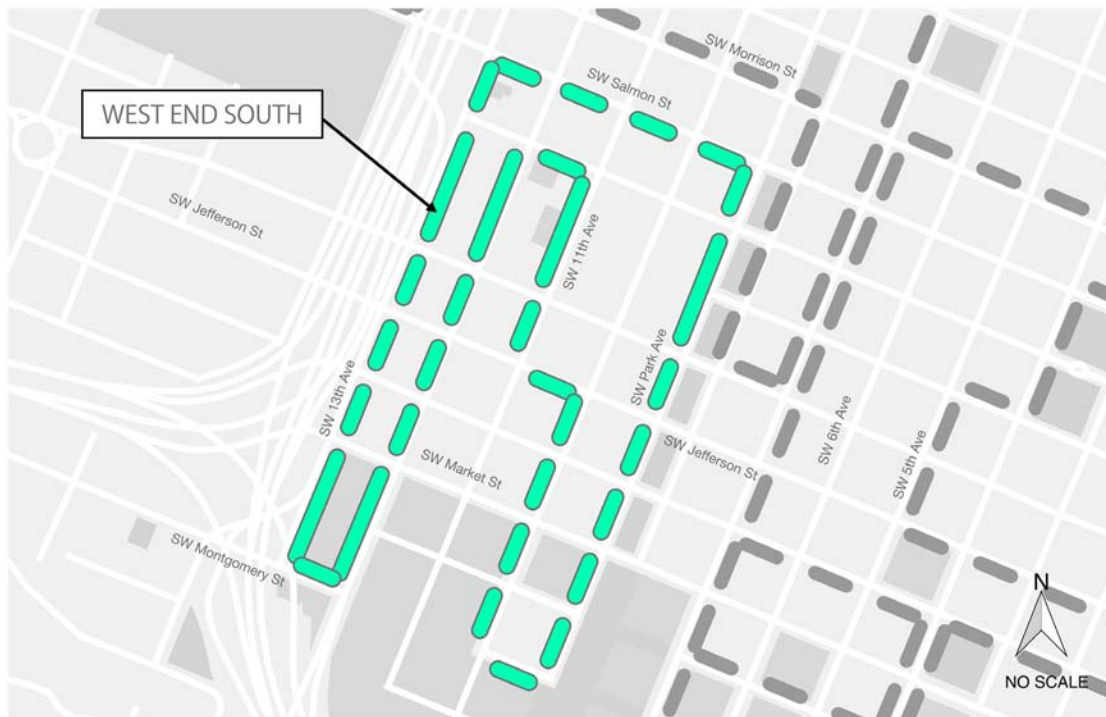


West End South



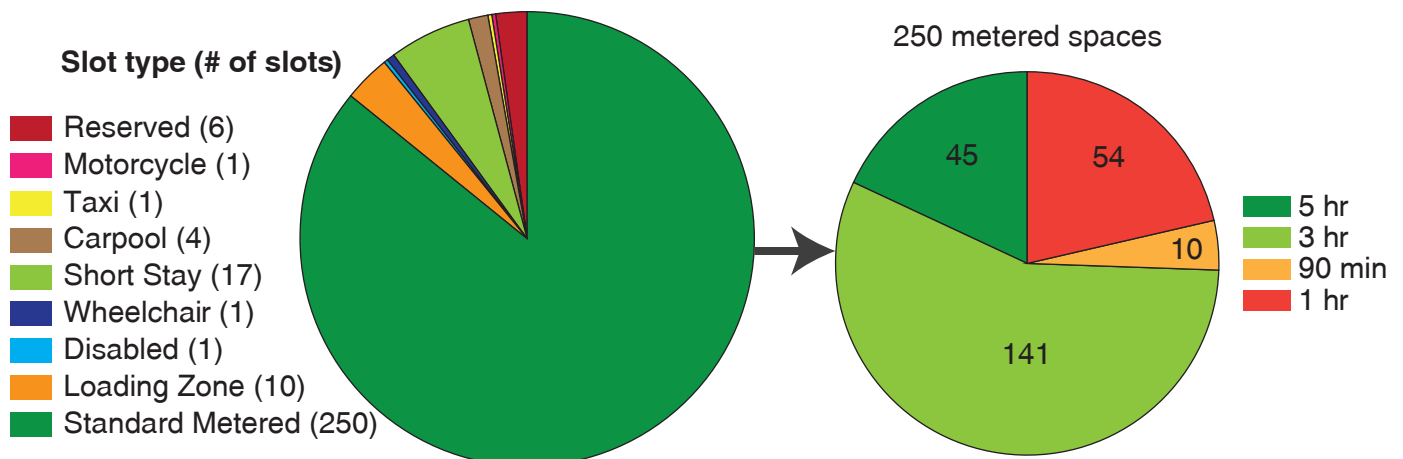
Route Map

The West End South route was surveyed on Wednesday, November 5, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 32 block faces, is shown below. This route is identical to the route surveyed in 2008.



Route Overview

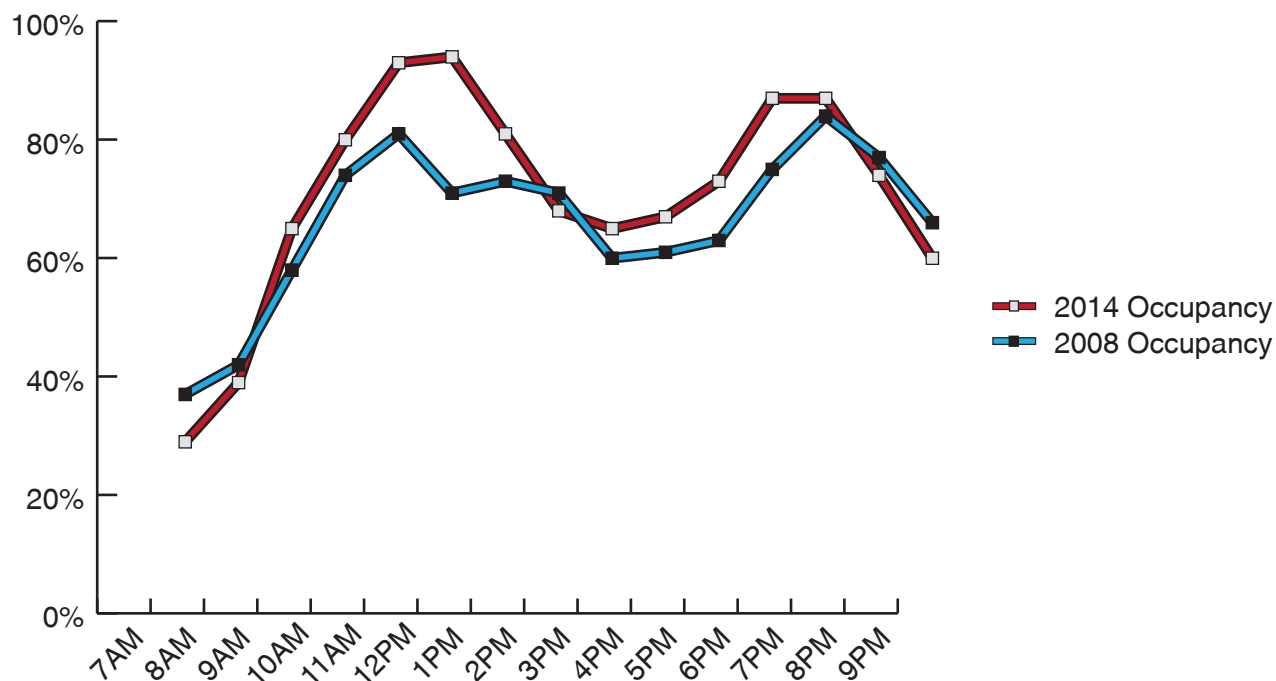
The West End South route consists of a total of 291 slots, including 250 standard metered spaces, 17 short stay slots, and 10 loading zone slots.



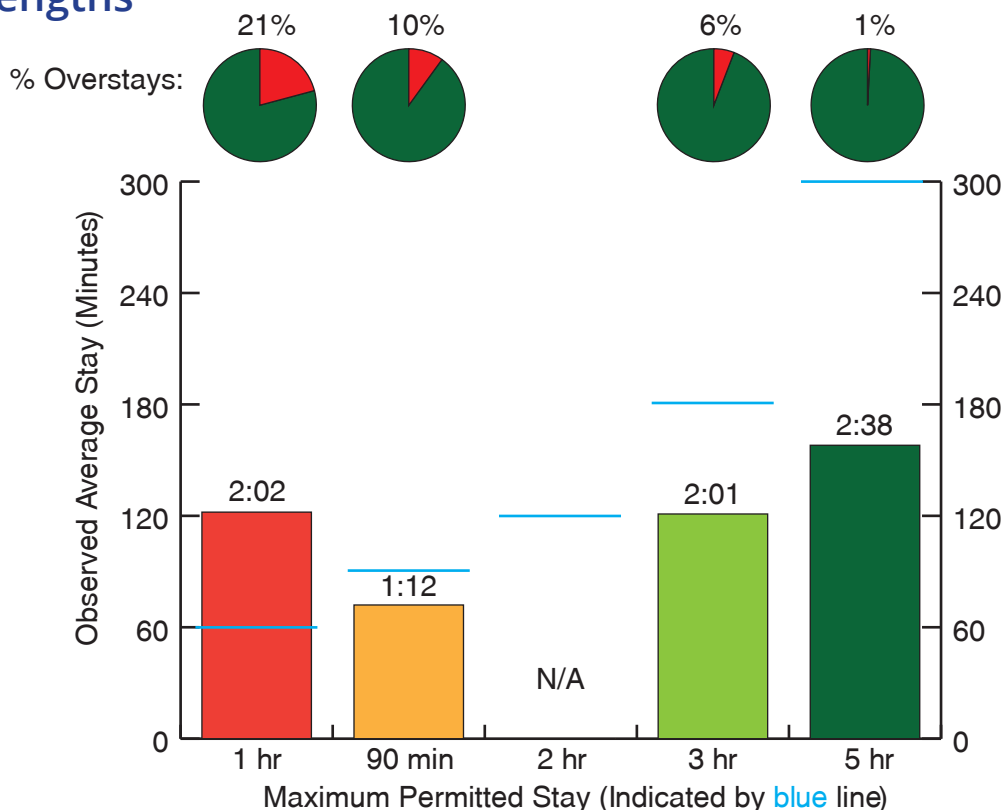


Occupancy – 2008 vs. 2014

Occupancy levels along the West End South route were observed to follow a similar pattern to 2008 levels, with higher occupancy rates during all but the early morning and late night periods. The afternoon peak hour was 12:00 PM and the evening peak hour was 7:00 PM.



Stay Lengths

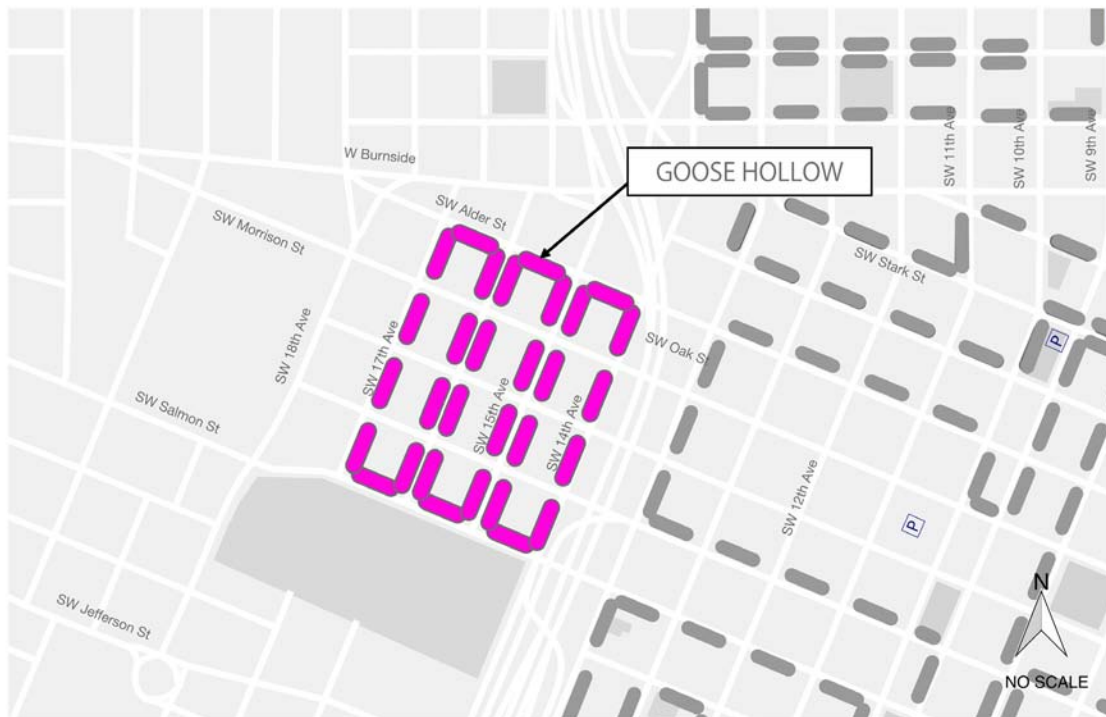


Goose Hollow



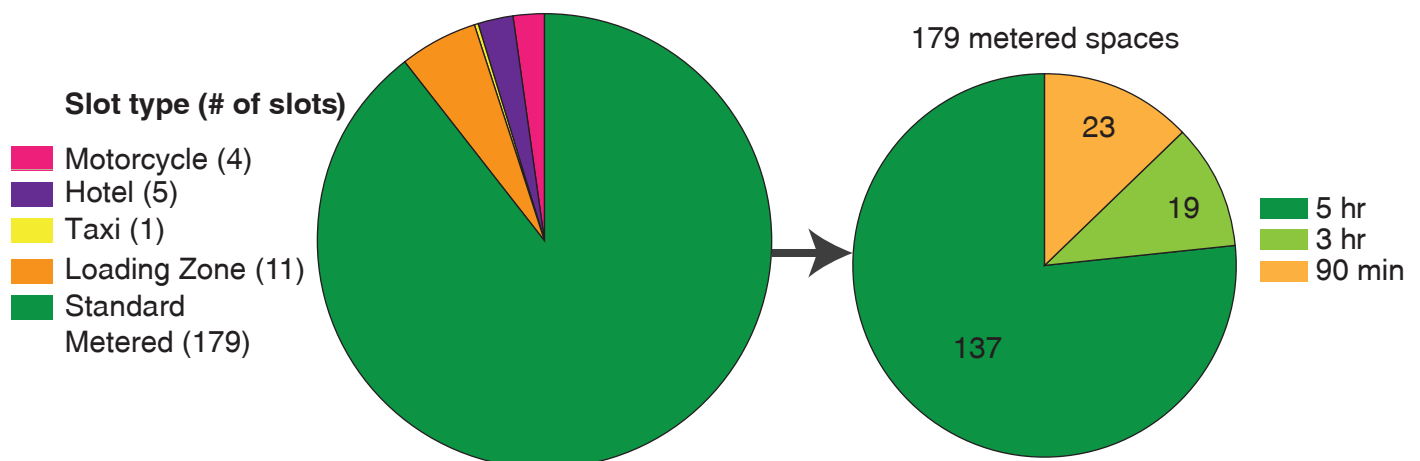
Route Map

The Goose Hollow route was surveyed on Thursday, October 30, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 30 block faces, is shown below. This route is identical to the route surveyed in 2008.



Route Overview

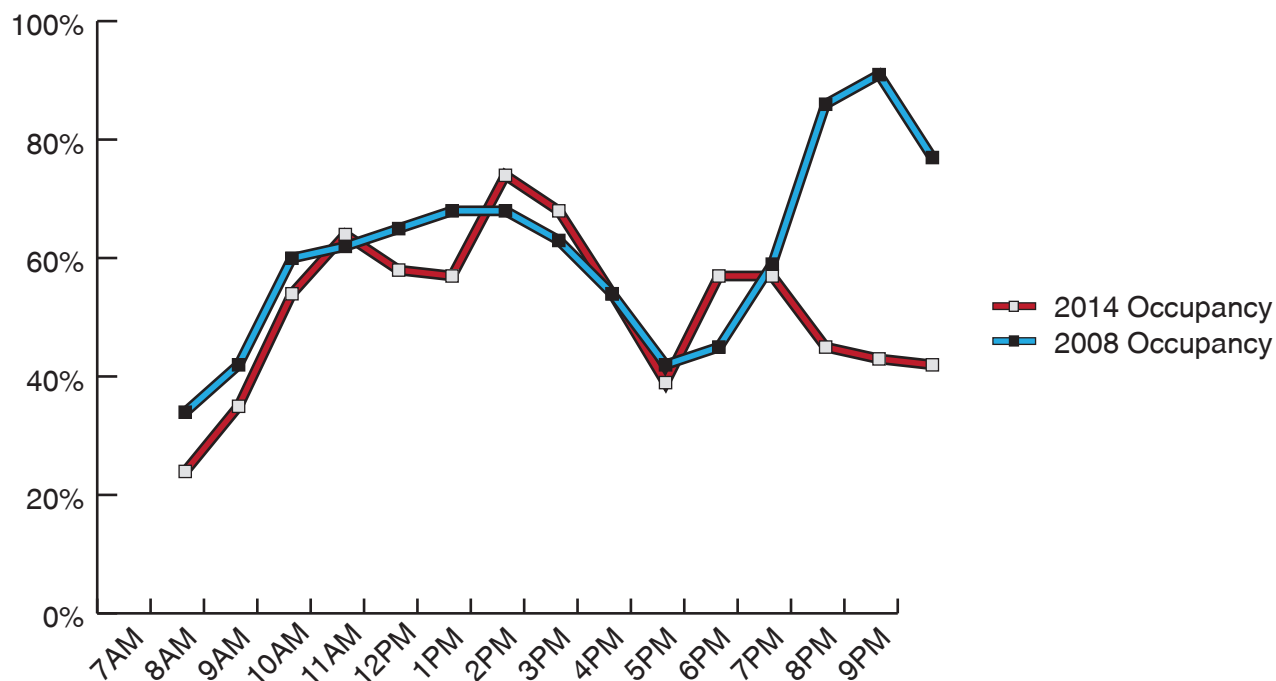
The Goose Hollow route consists of a total of 200 slots, including 179 standard metered spaces, 11 loading zone slots, and 5 hotel slots.



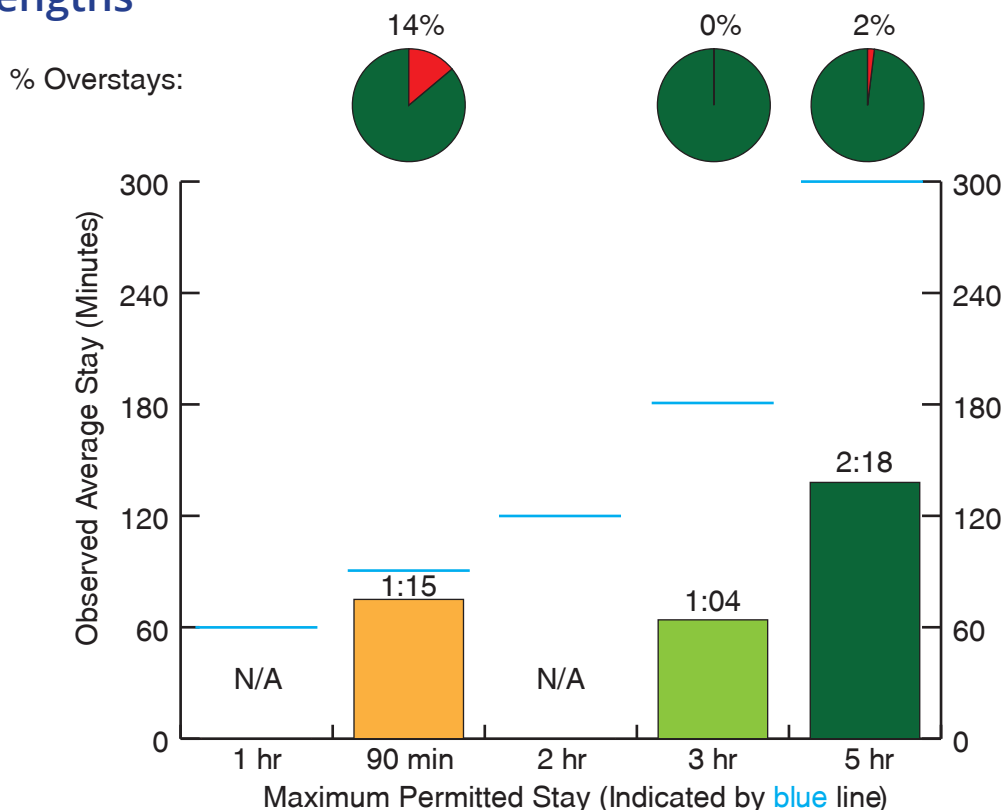


Occupancy – 2008 vs. 2014

Occupancy levels in Goose Hollow were observed to be slightly higher than in 2008 during the afternoon peak period but lower throughout the rest of the day, and significantly lower in the evening. The afternoon peak hour was 1:00 PM and the evening peak hour was 6:00 PM.



Stay Lengths

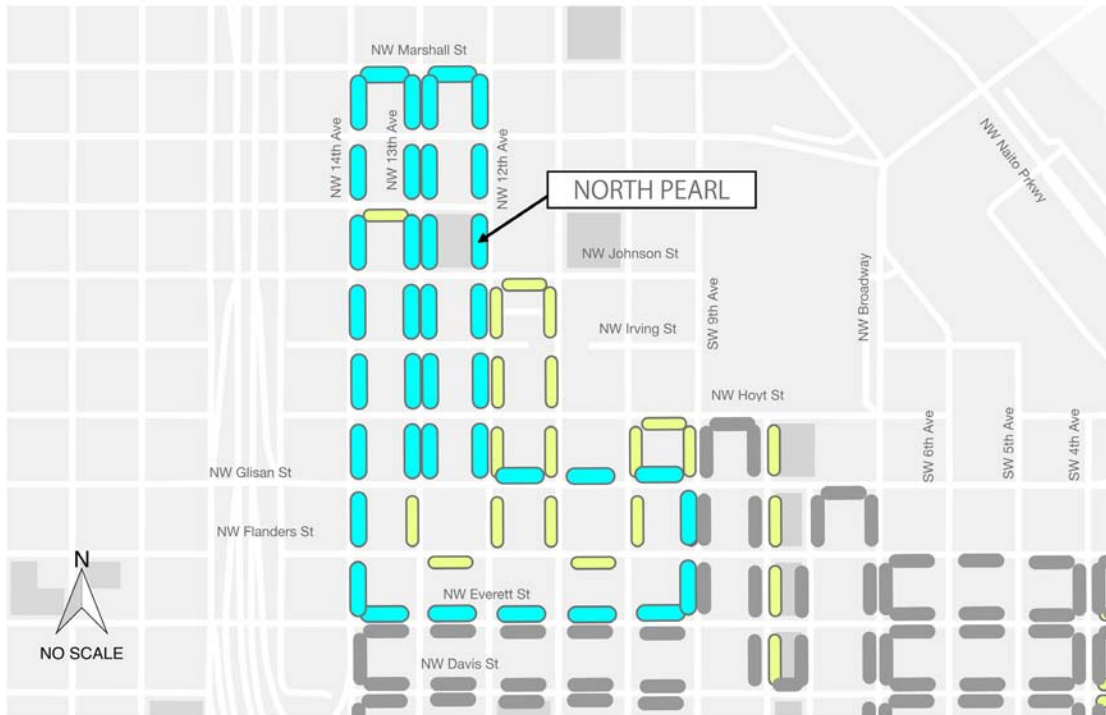


North Pearl



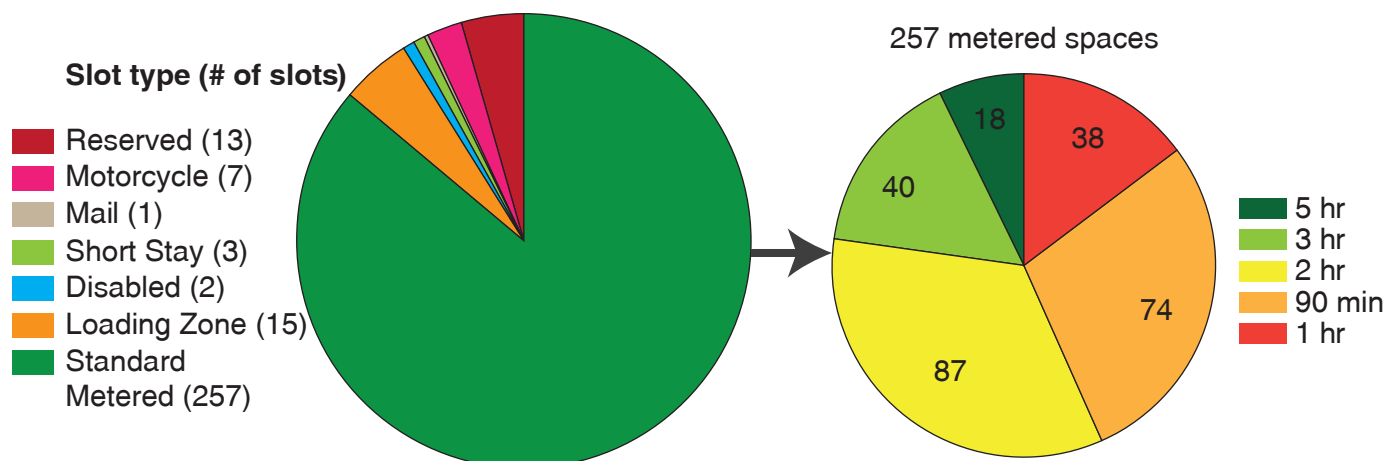
Route Map

The North Pearl route was surveyed on Wednesday, November 19, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 38 block faces, is shown below, with block faces included in the previous (2008) survey but not the current survey highlighted in yellow.



Route Overview

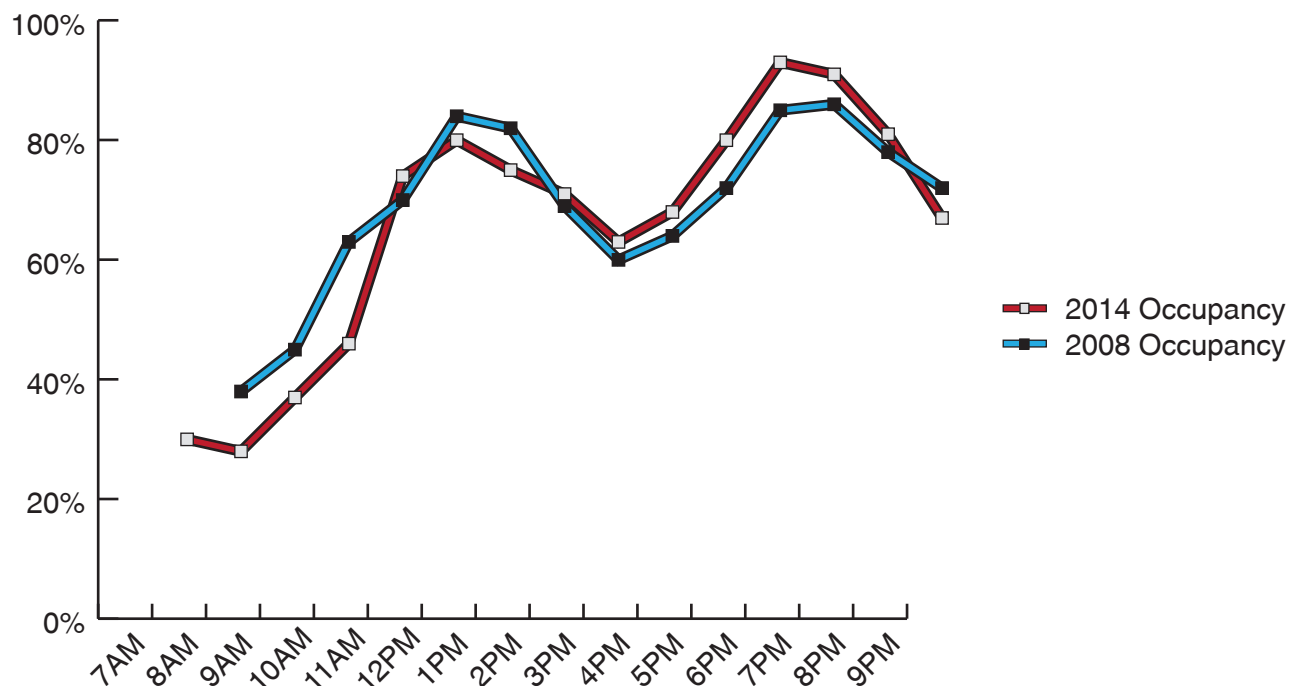
The North Pearl route consists of a total of 298 slots, including 257 standard metered spaces, 15 loading zone slots, and 7 motorcycle spaces.



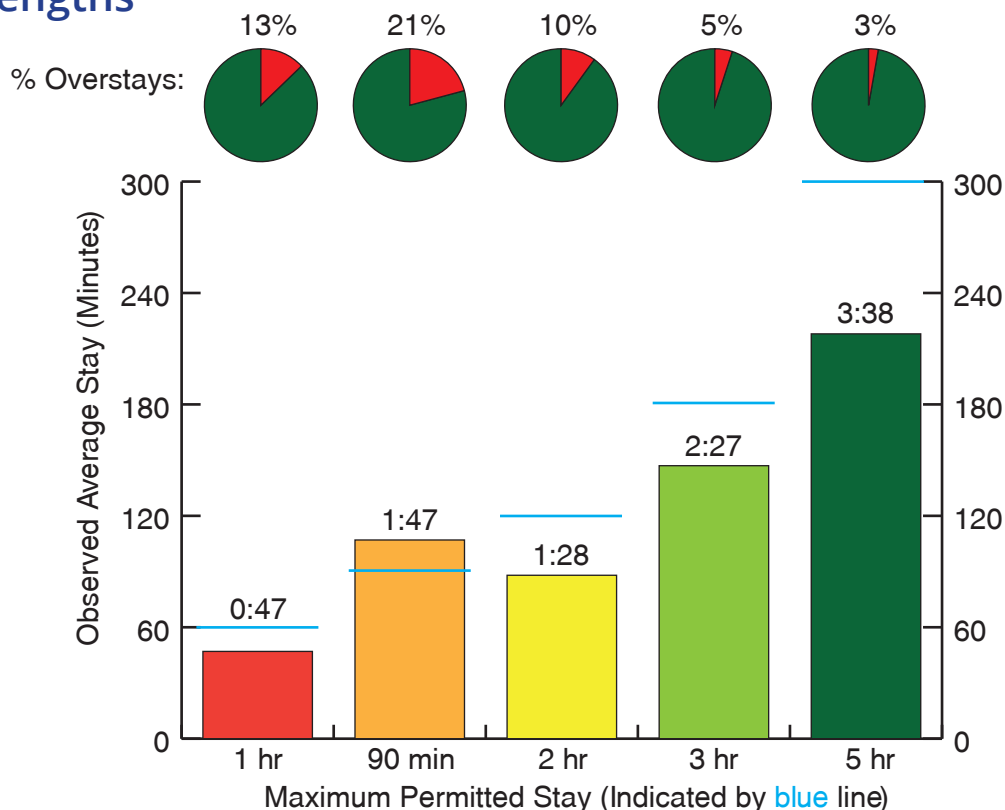


Occupancy – 2008 vs. 2014

Occupancy levels in the North Pearl followed the same overall pattern as 2008 levels, with 2014 occupancy slightly lower in before about 2:00 PM, and slightly higher afterward. The afternoon peak hour was 12:00 PM and the evening peak hour was 6:00 PM.



Stay Lengths

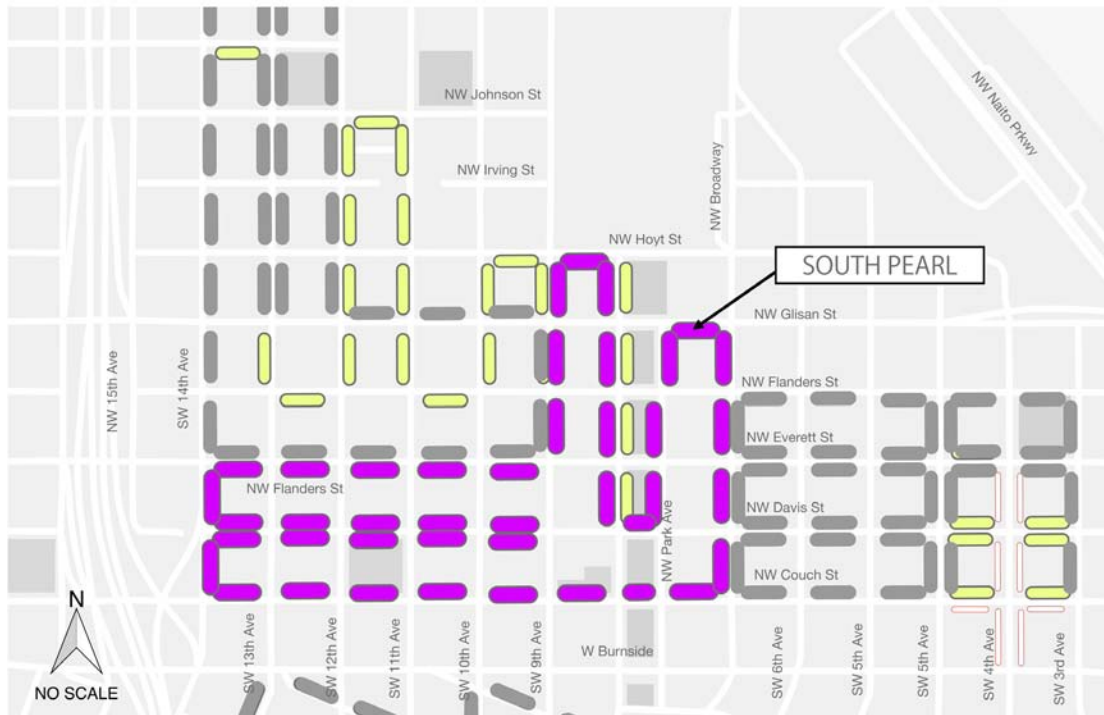


South Pearl



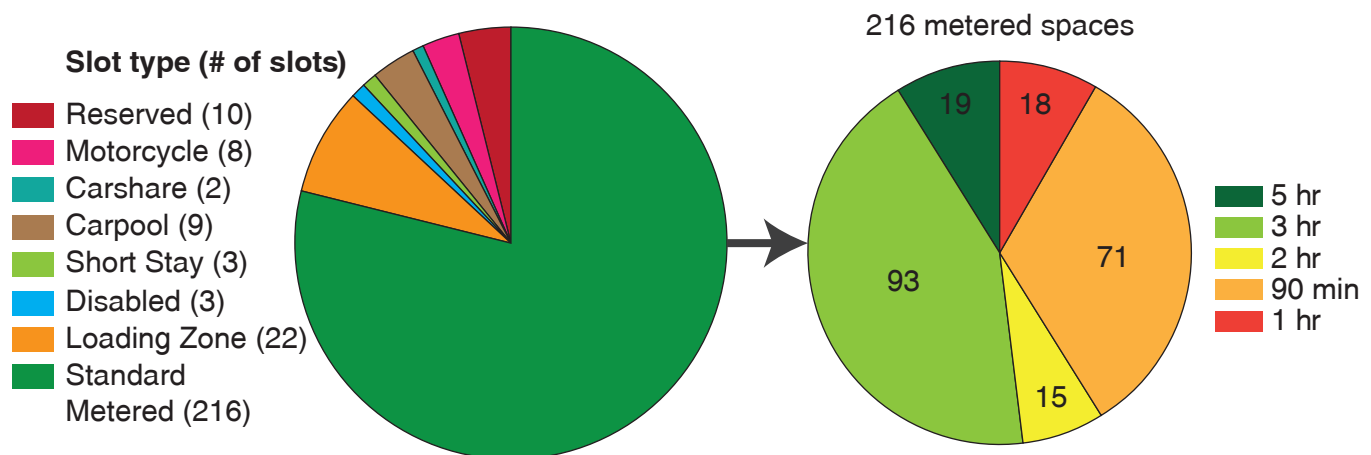
Route Map

The South Pearl route was surveyed on Wednesday, October 29, 2014 from 7:00 AM to 10:00 PM. The route, consisting of 41 block faces, is shown below, with block faces not included in the previous (2008) survey highlighted in yellow.



Route Overview

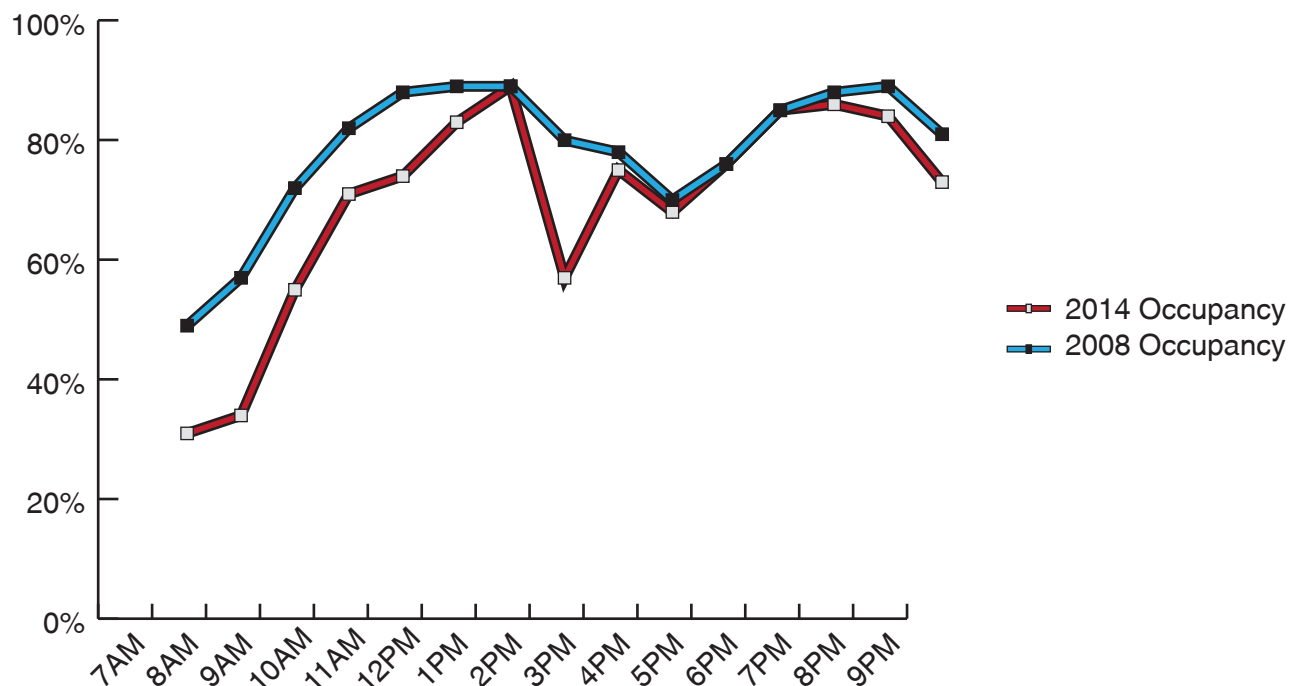
The South Pearl route consists of a total of 273 slots, including 216 standard metered spaces, 22 loading zone slots, and 3 disabled spaces.



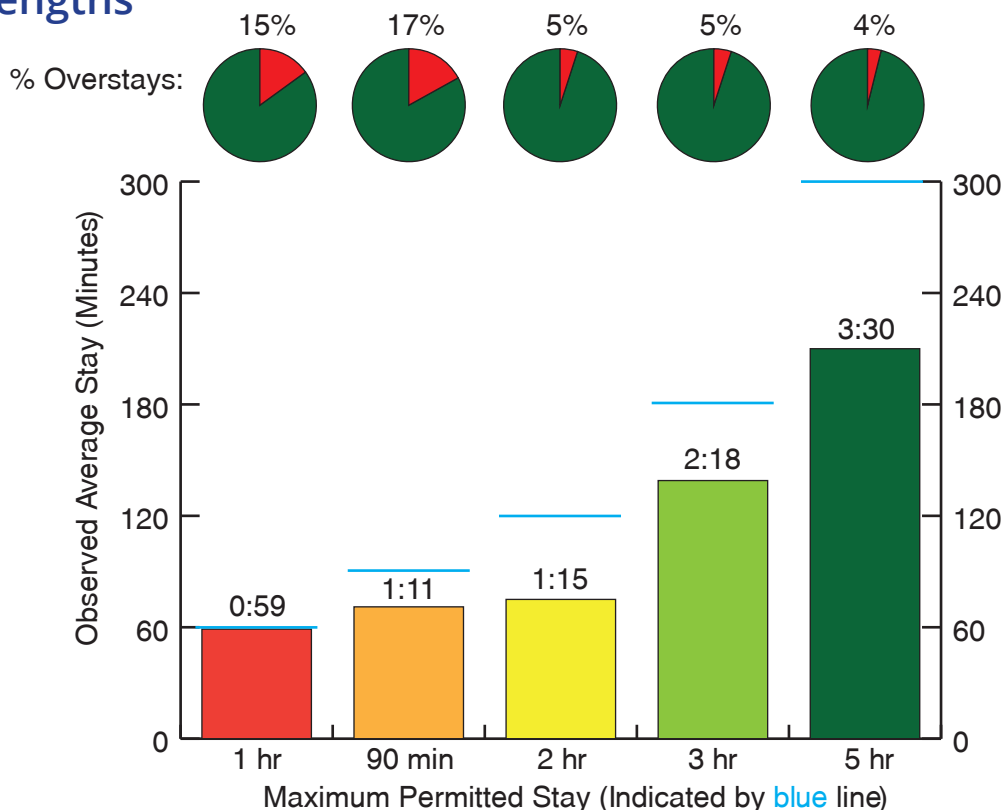


Occupancy – 2008 vs. 2014

Occupancy levels in the South Pearl were observed to be slightly lower than those in 2008, particularly early in the morning and late in the evening. The afternoon peak hour was 1:00 PM and the evening peak hour was 7:00 PM.



Stay Lengths



Appendix A:
Hourly Occupancy Maps

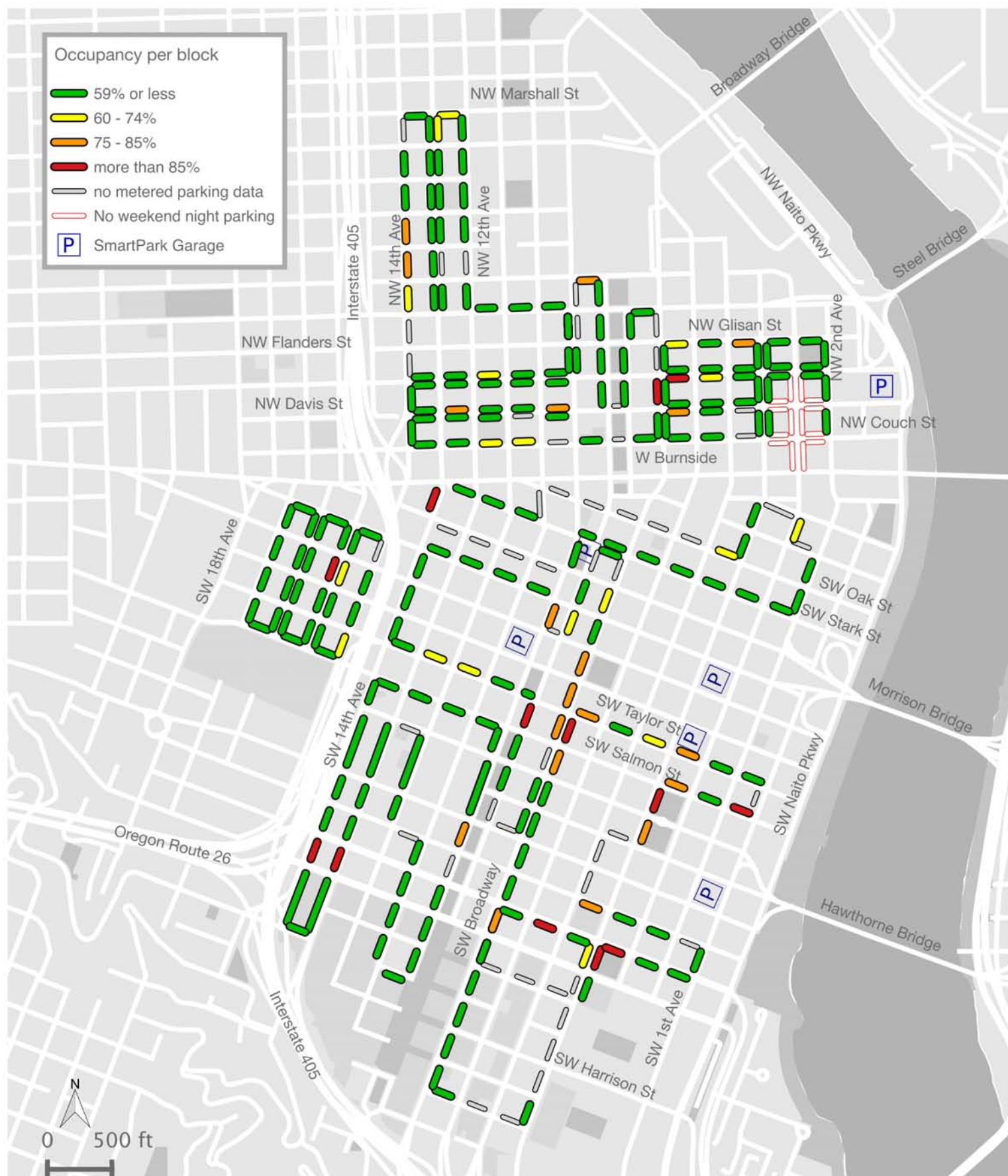


Figure A1: Occupancy during the 7:00 AM hour

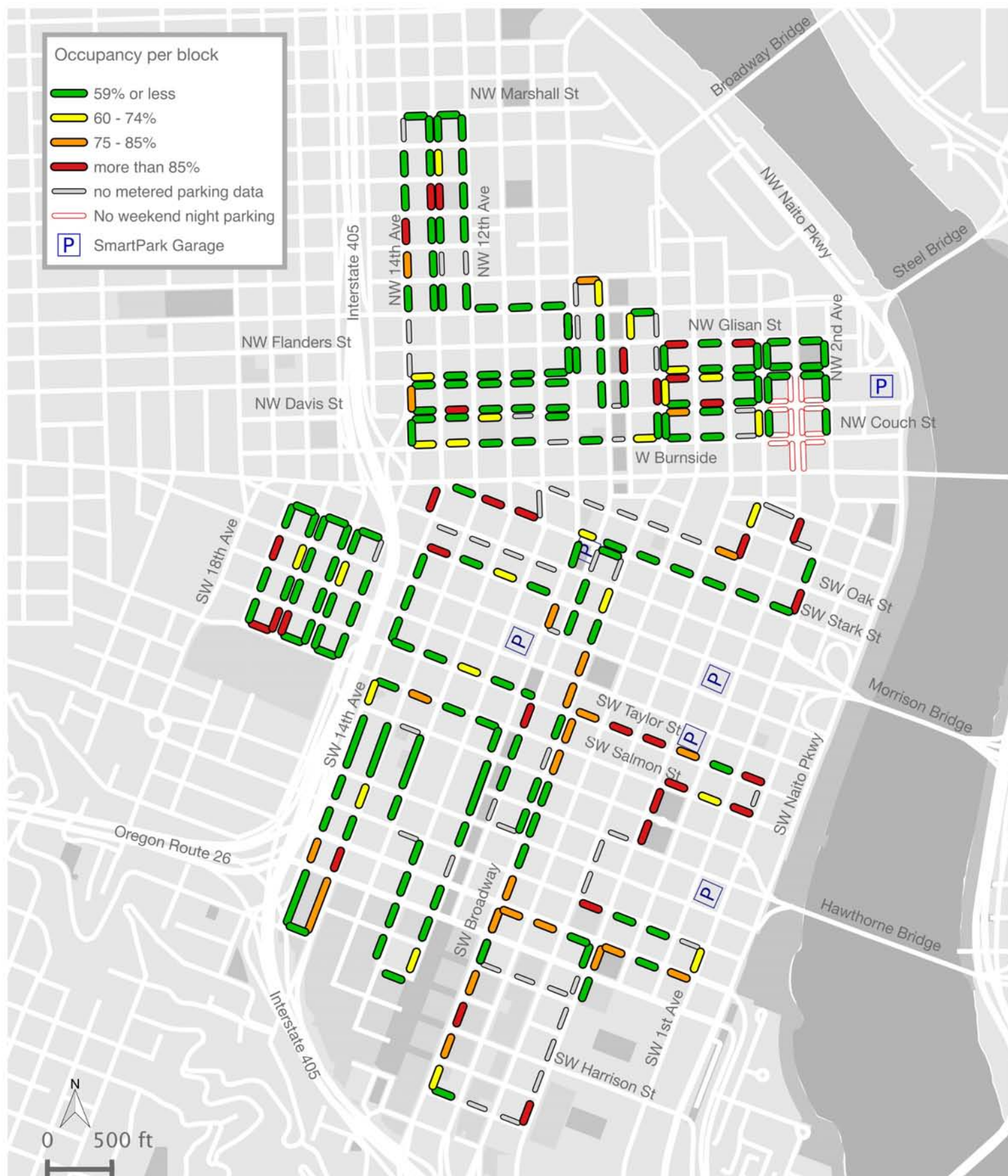


Figure A2: Occupancy during the 8:00 AM hour

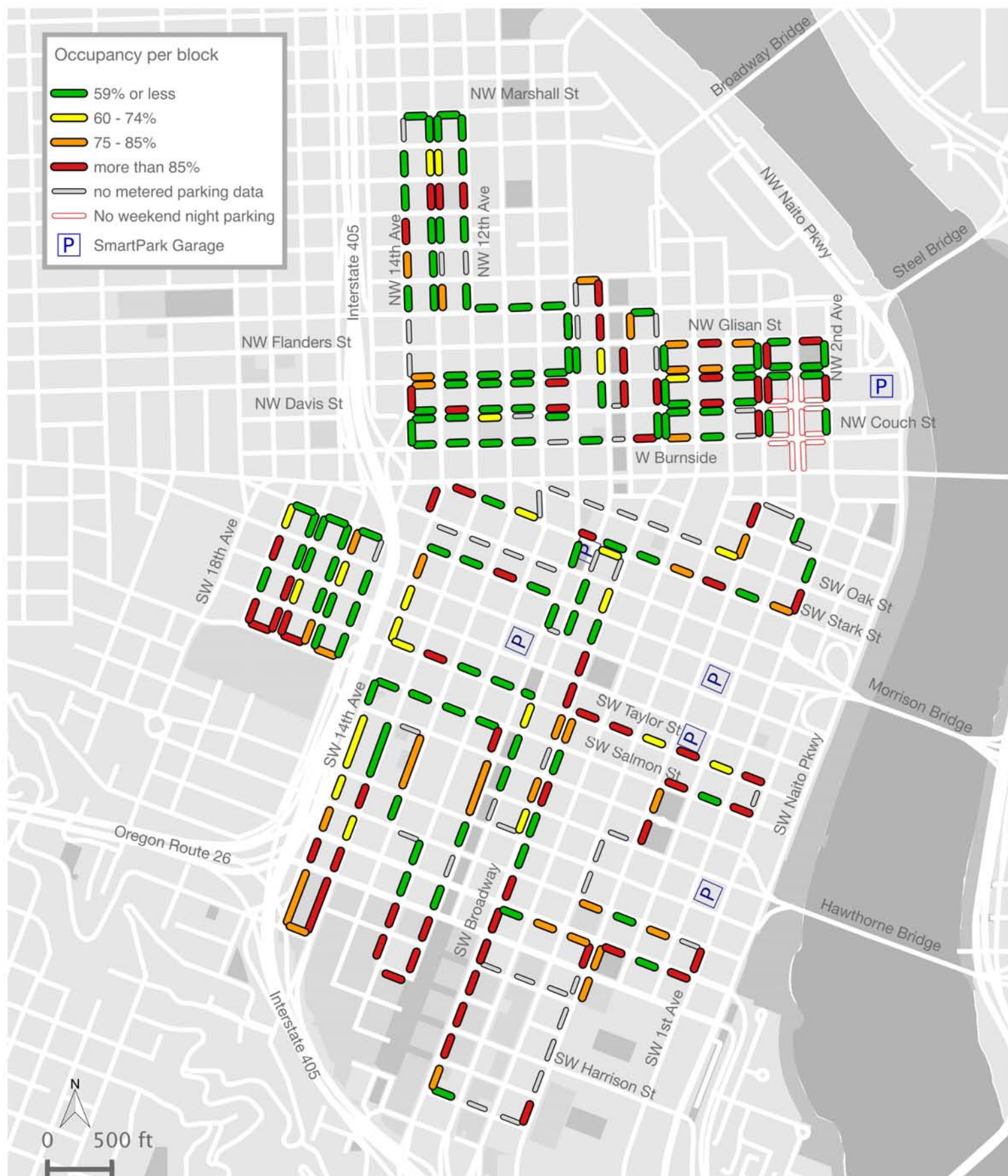


Figure A3: Occupancy during the 9:00 AM hour

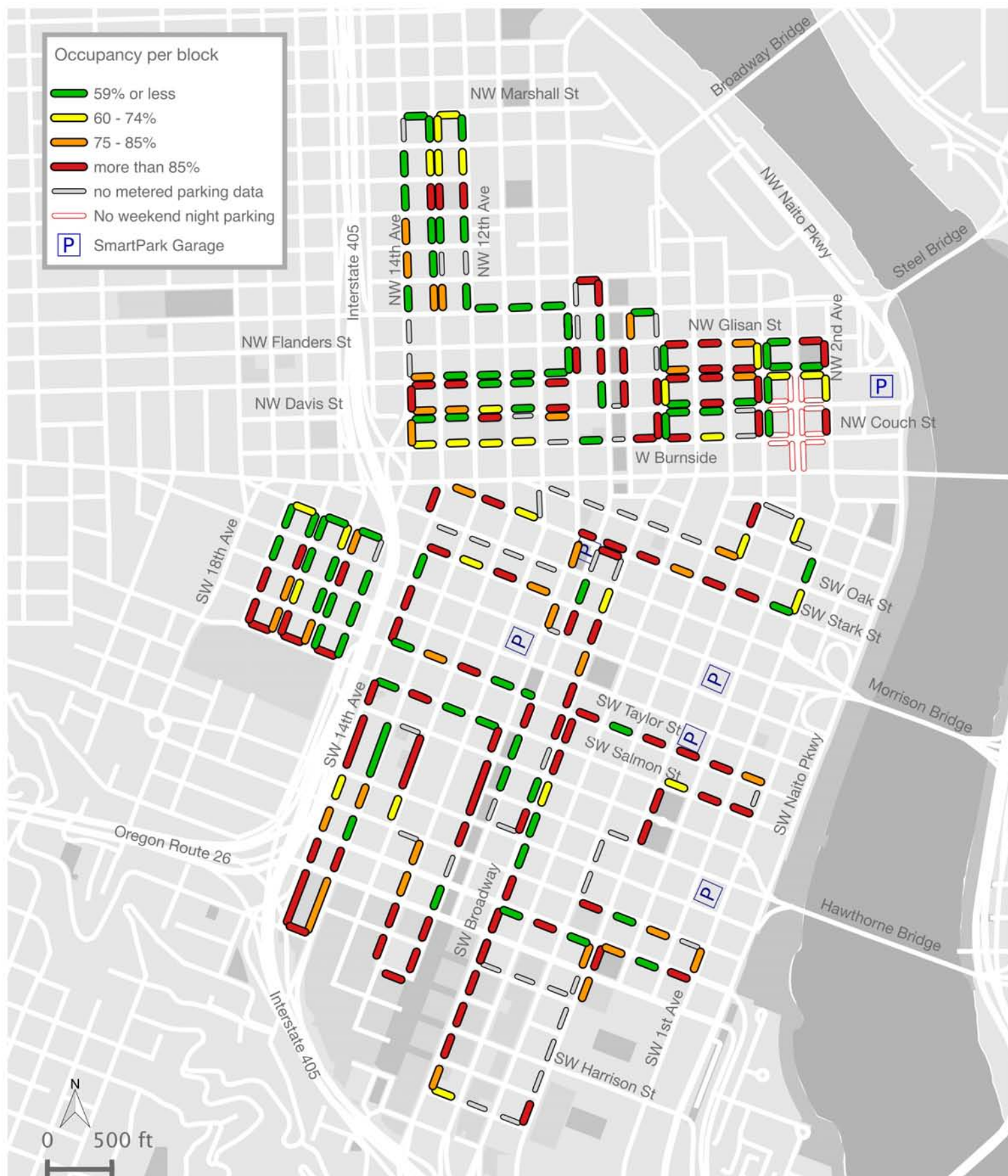


Figure A4: Occupancy during the 10:00 AM hour

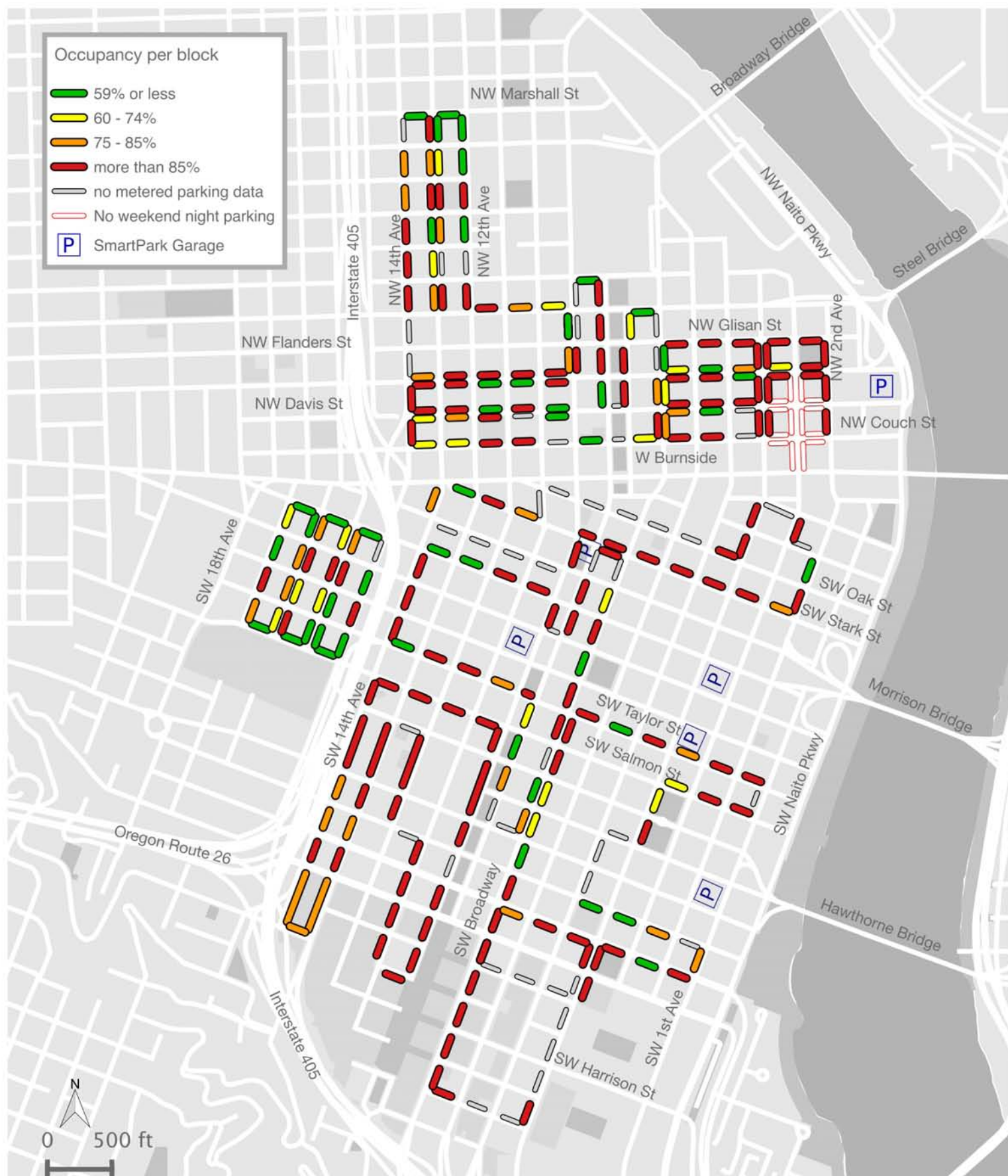


Figure A5: Occupancy during the 11:00 AM hour

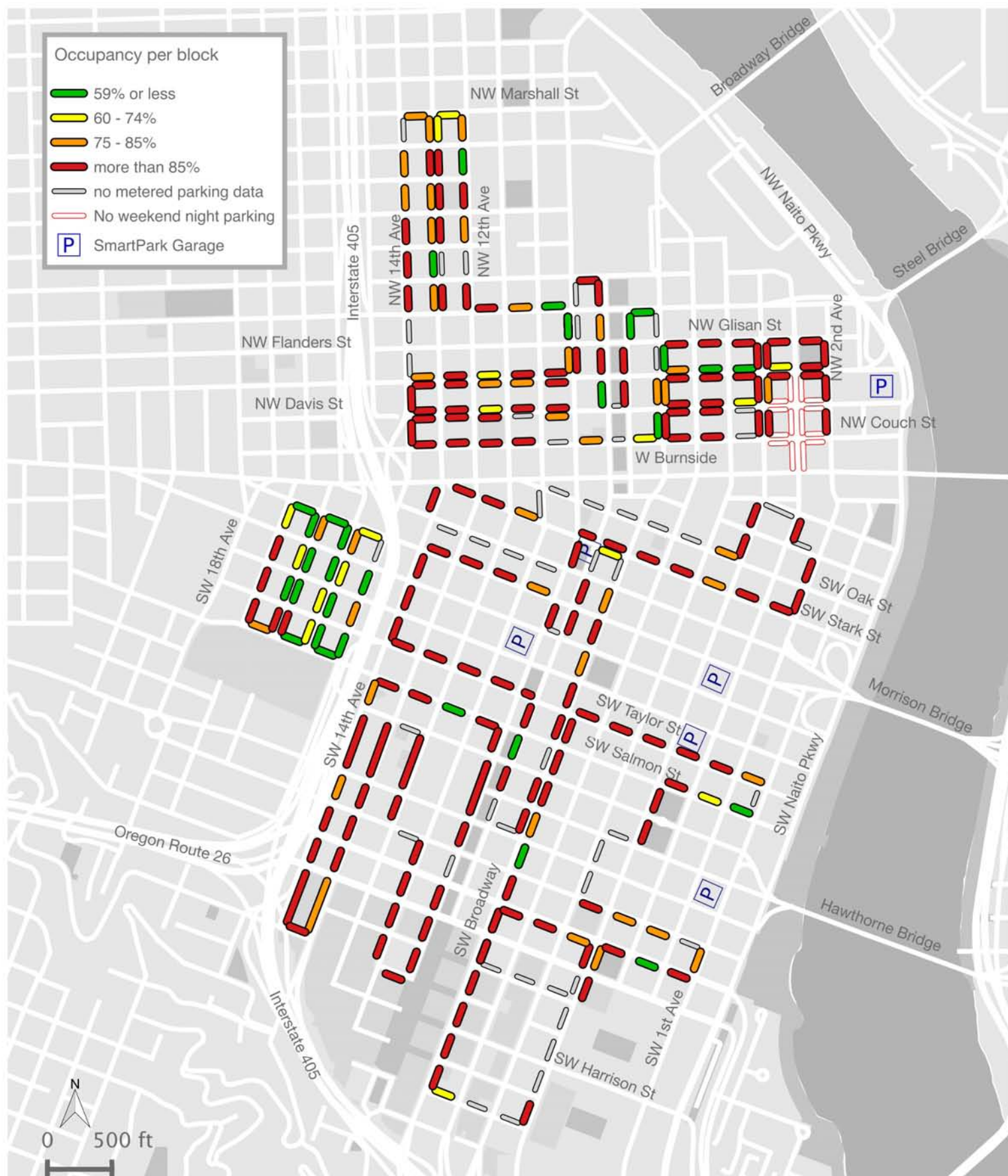


Figure A6: Occupancy during the 12:00 PM hour

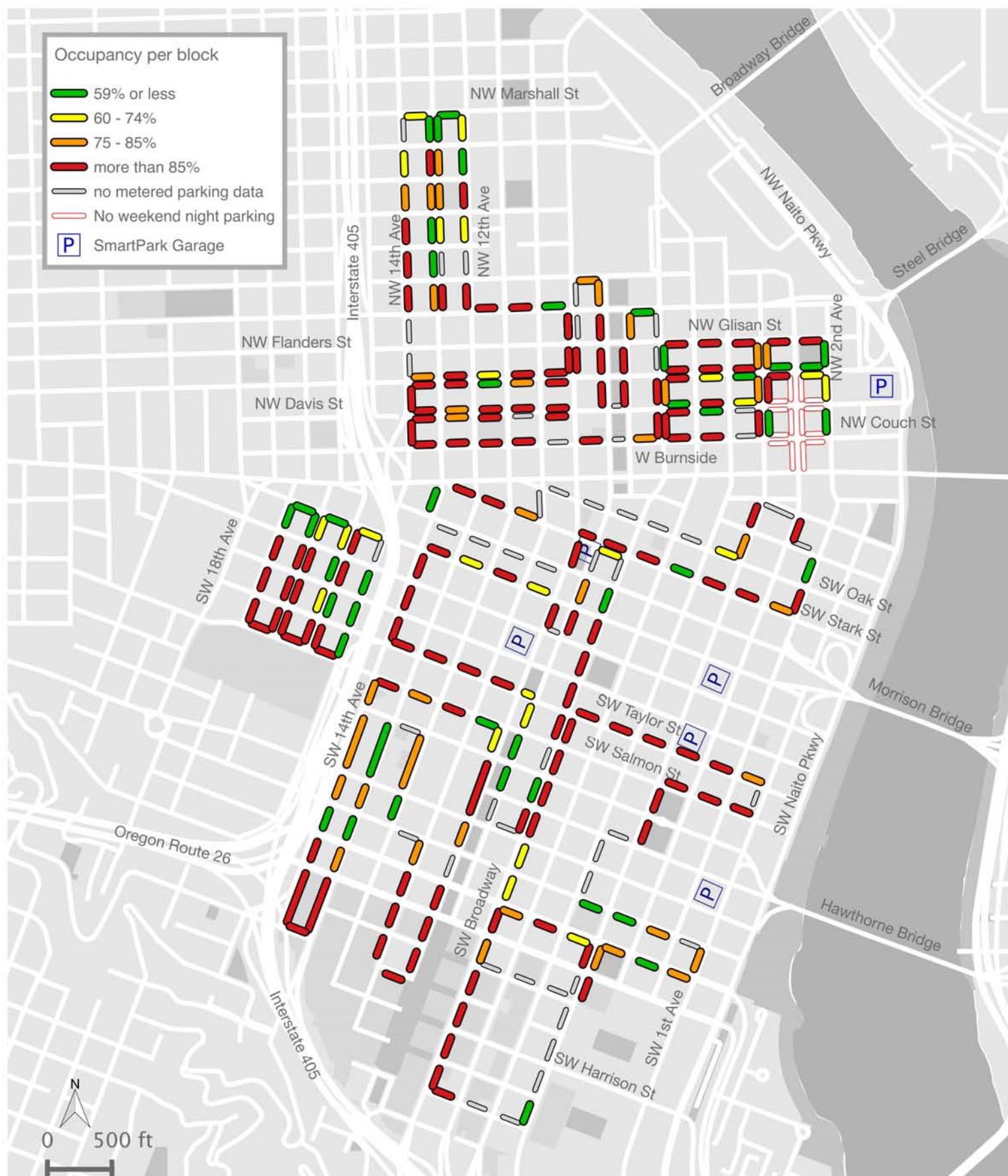


Figure A7: Occupancy during the 1:00 PM hour

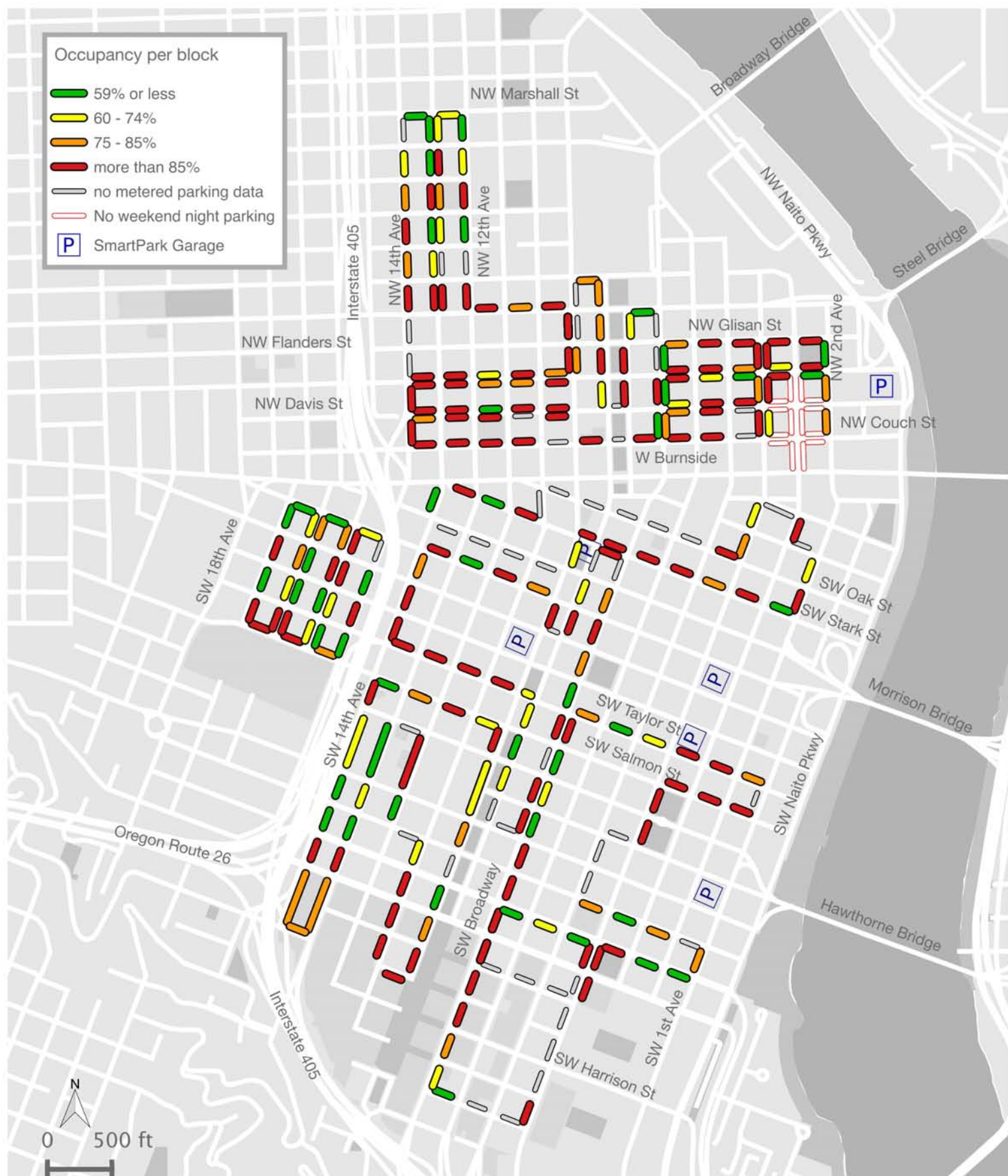


Figure A8: Occupancy during the 2:00 PM hour

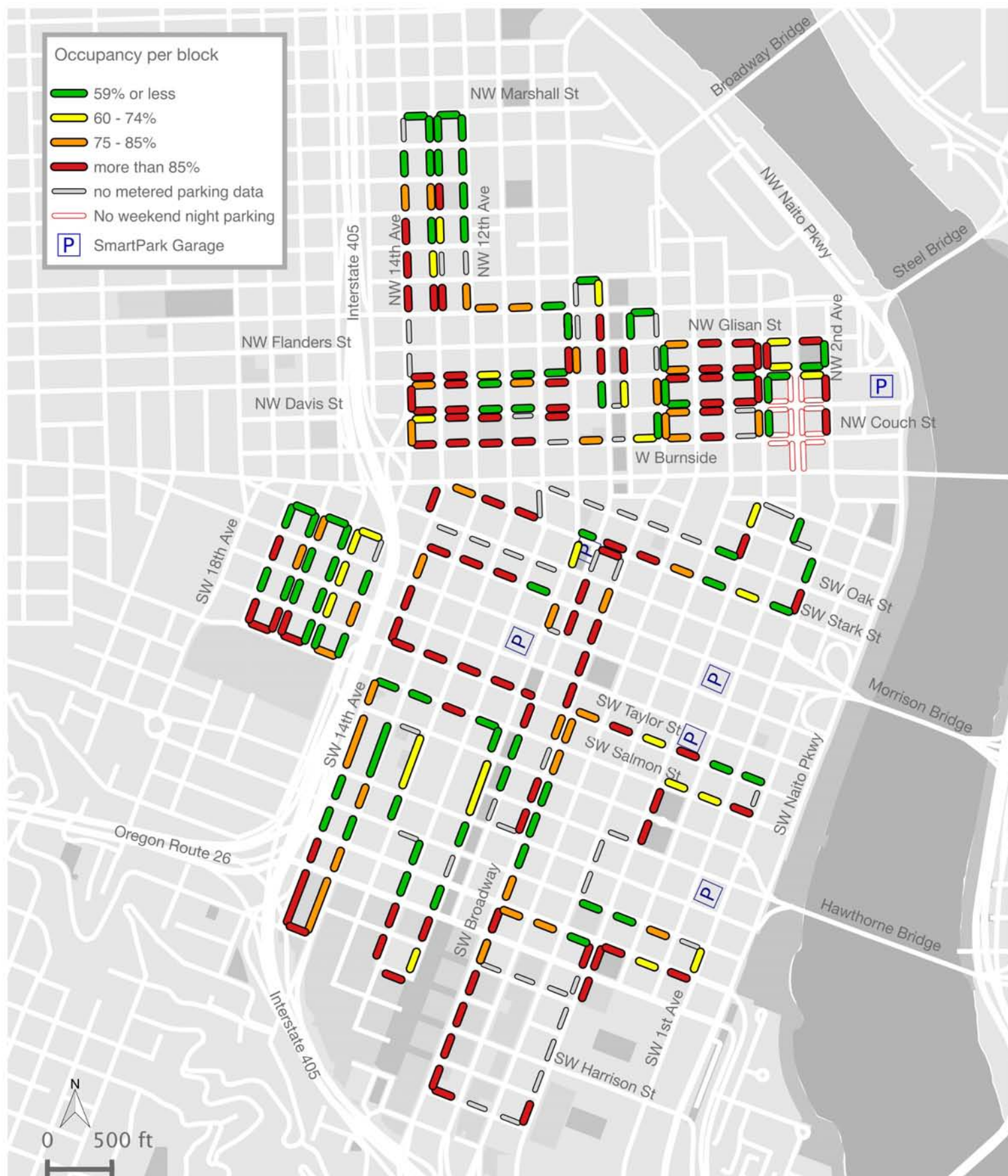


Figure A9: Occupancy during the 3:00 PM hour

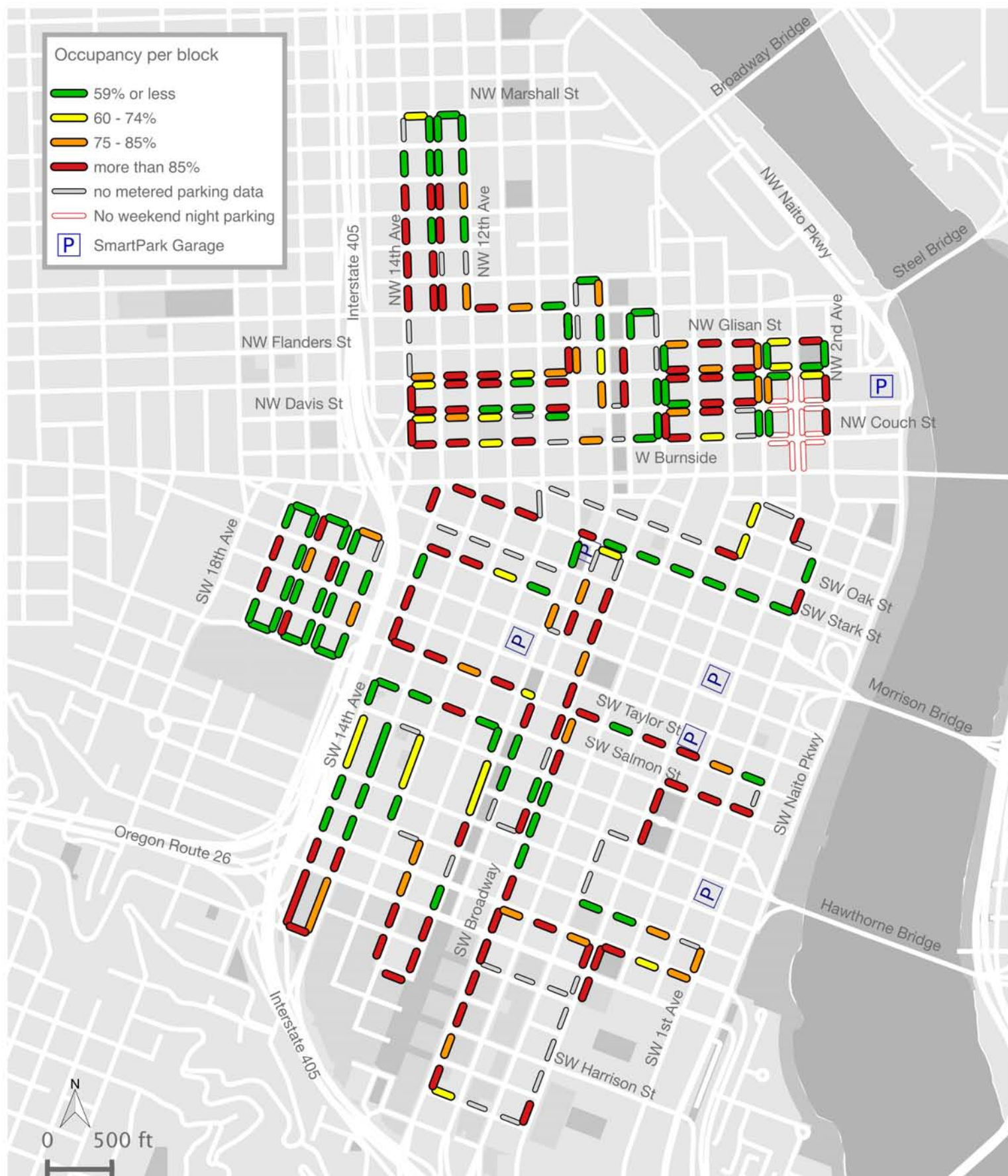


Figure A10: Occupancy during the 4:00 PM hour

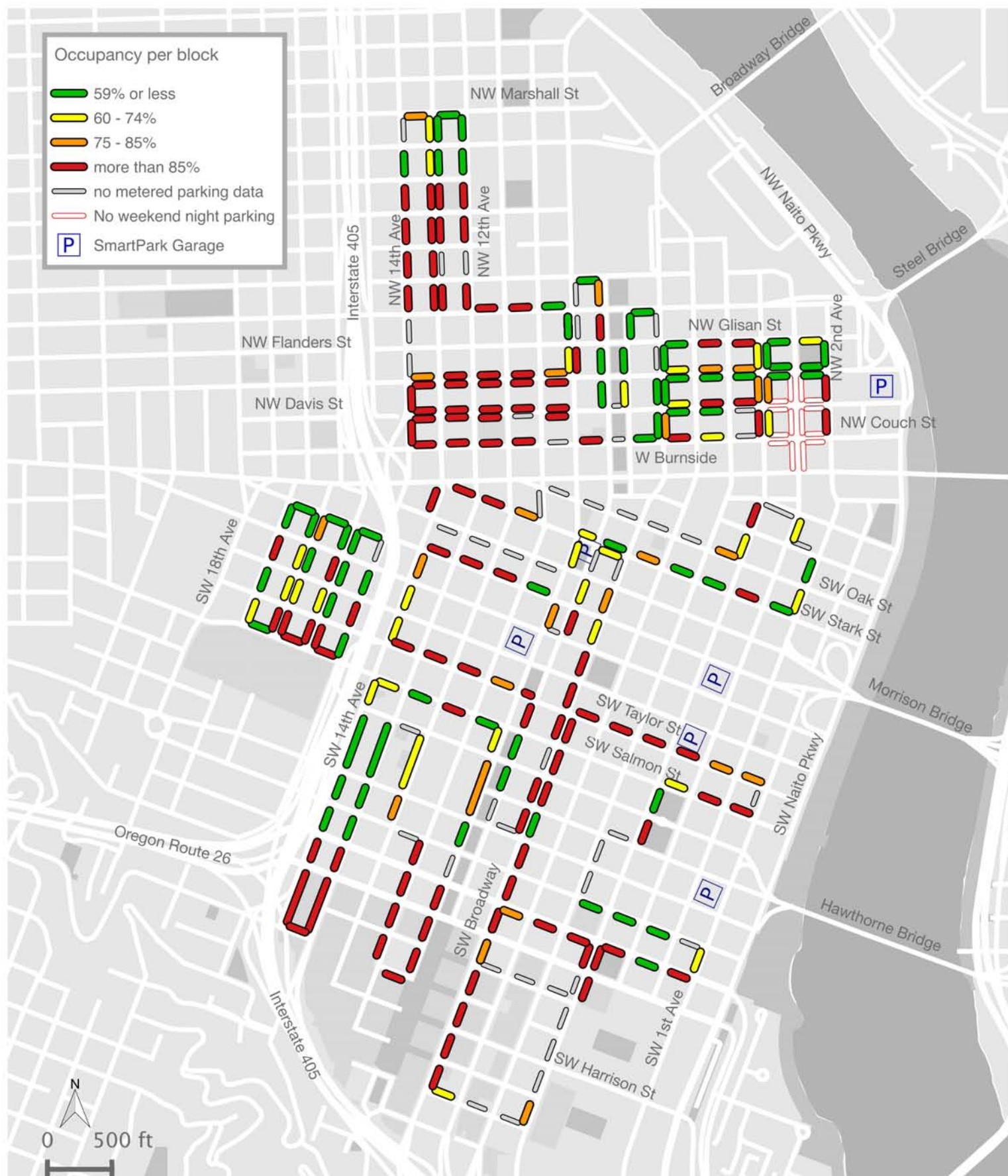


Figure A11: Occupancy during the 5:00 PM hour

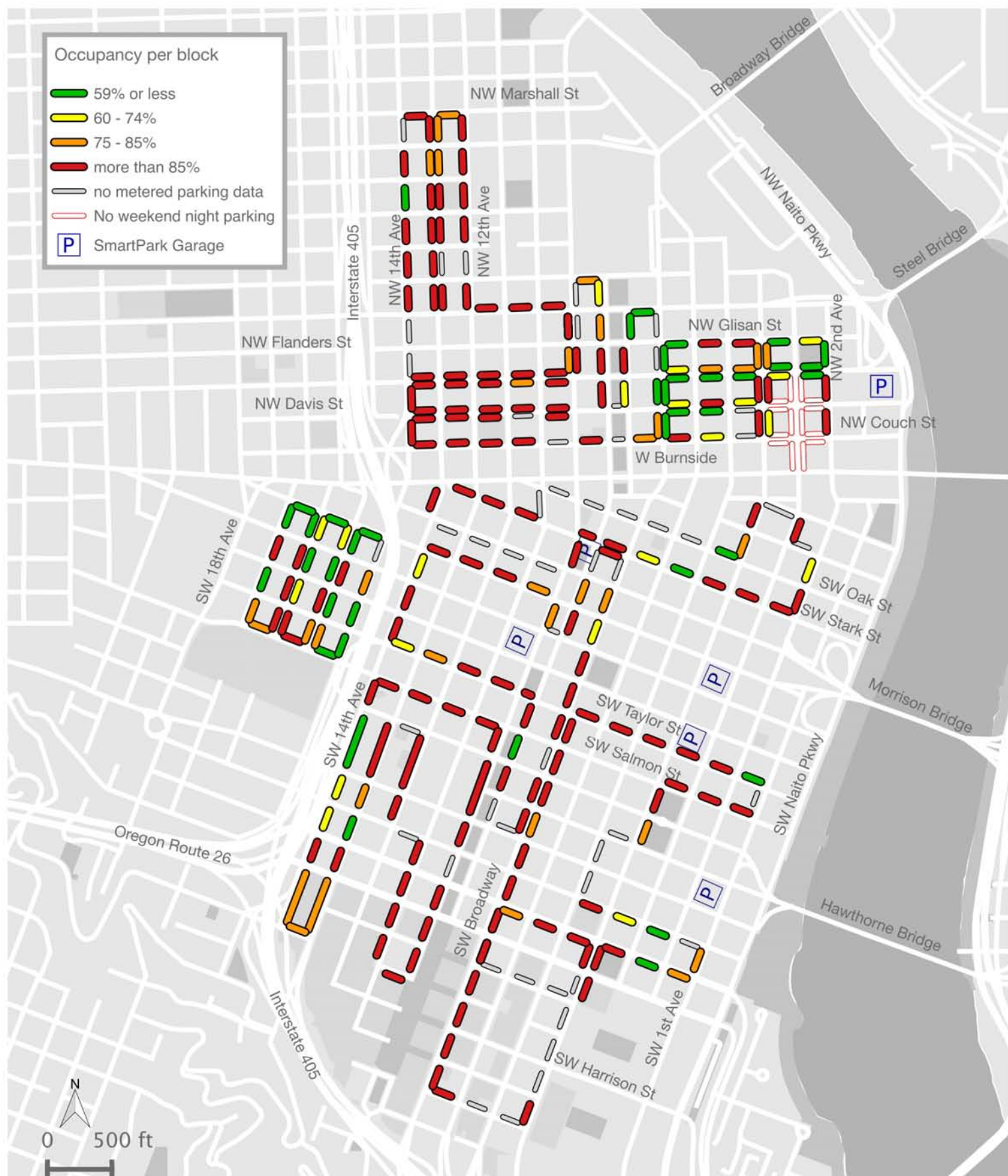


Figure A12: Occupancy during the 6:00 PM hour

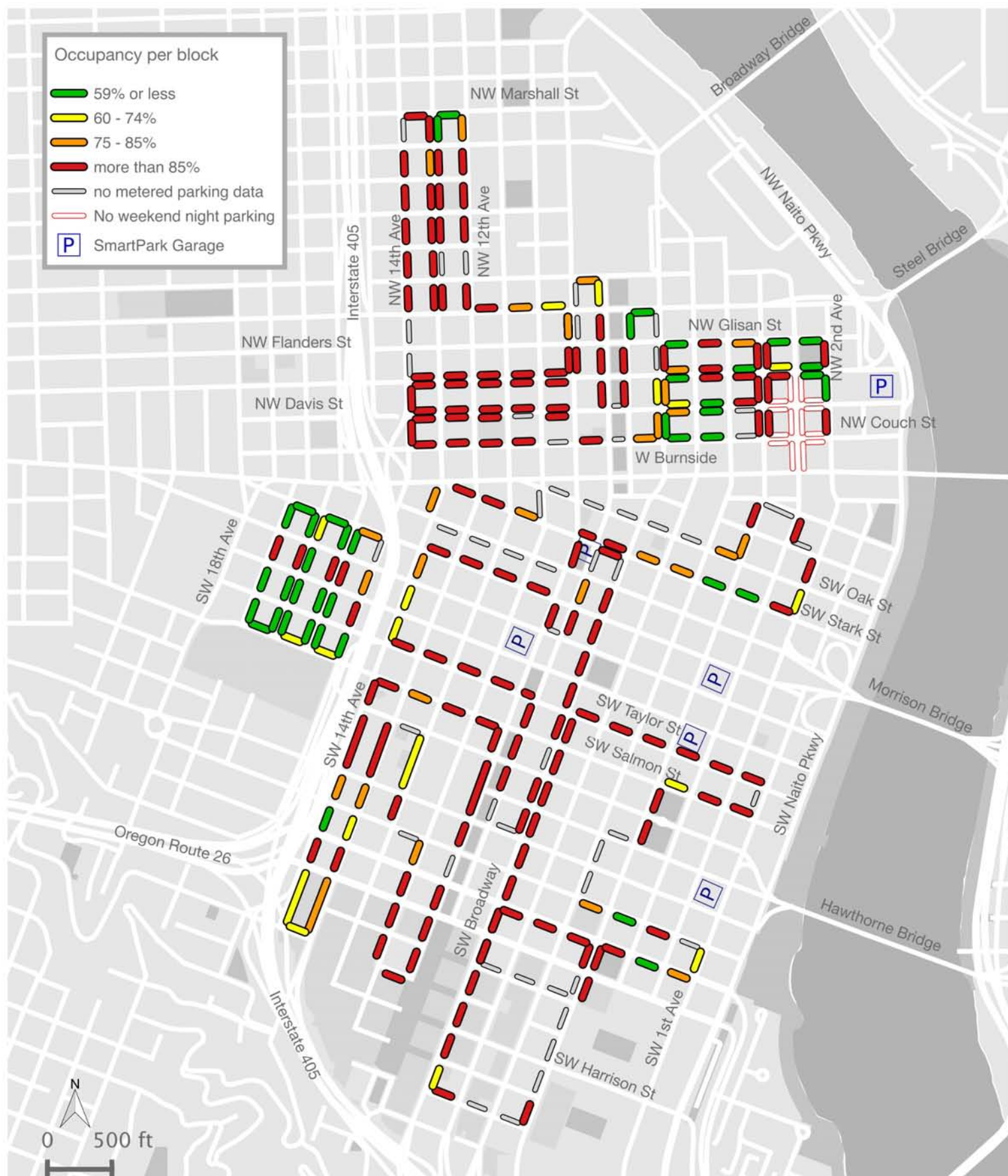
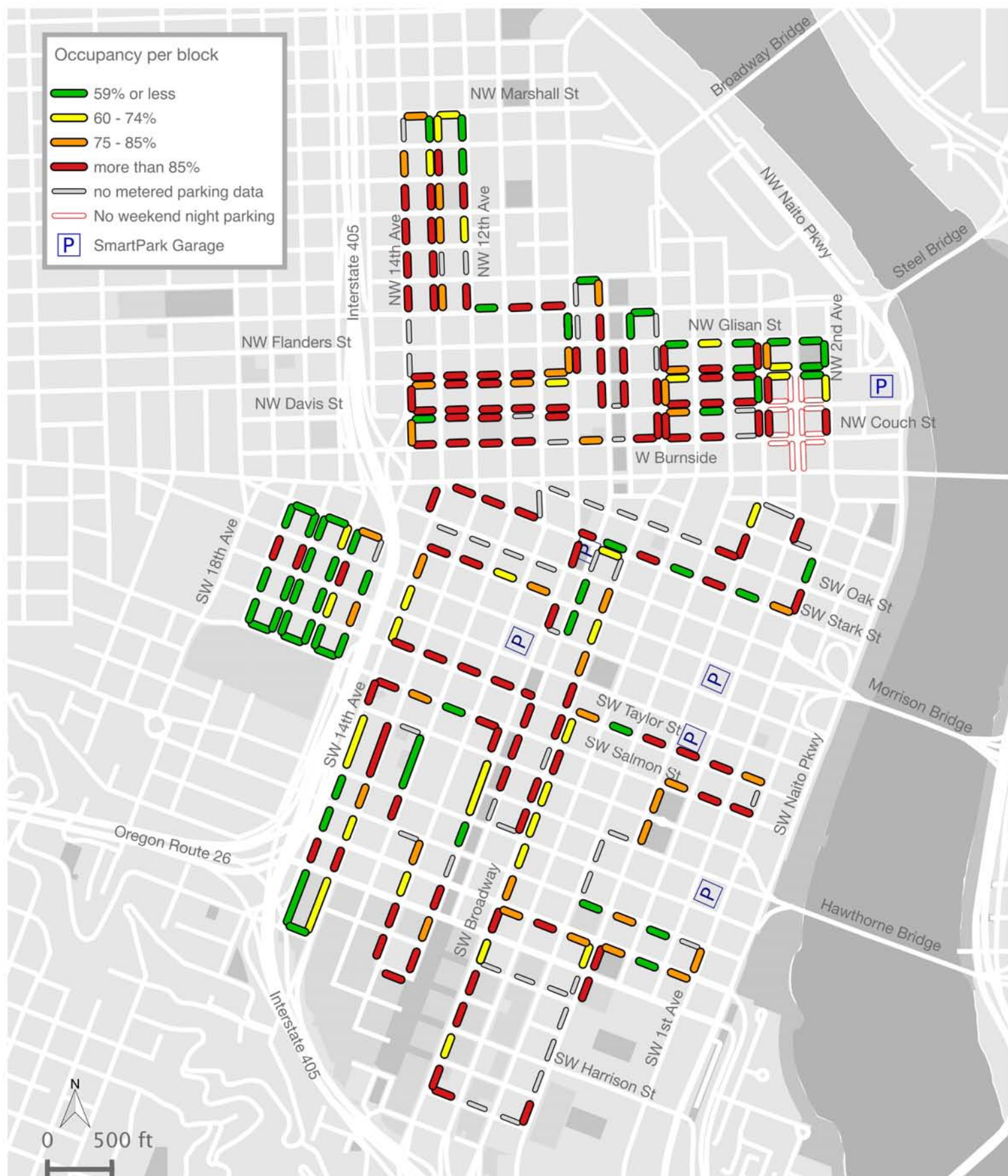


Figure A13: Occupancy during the 7:00 PM hour



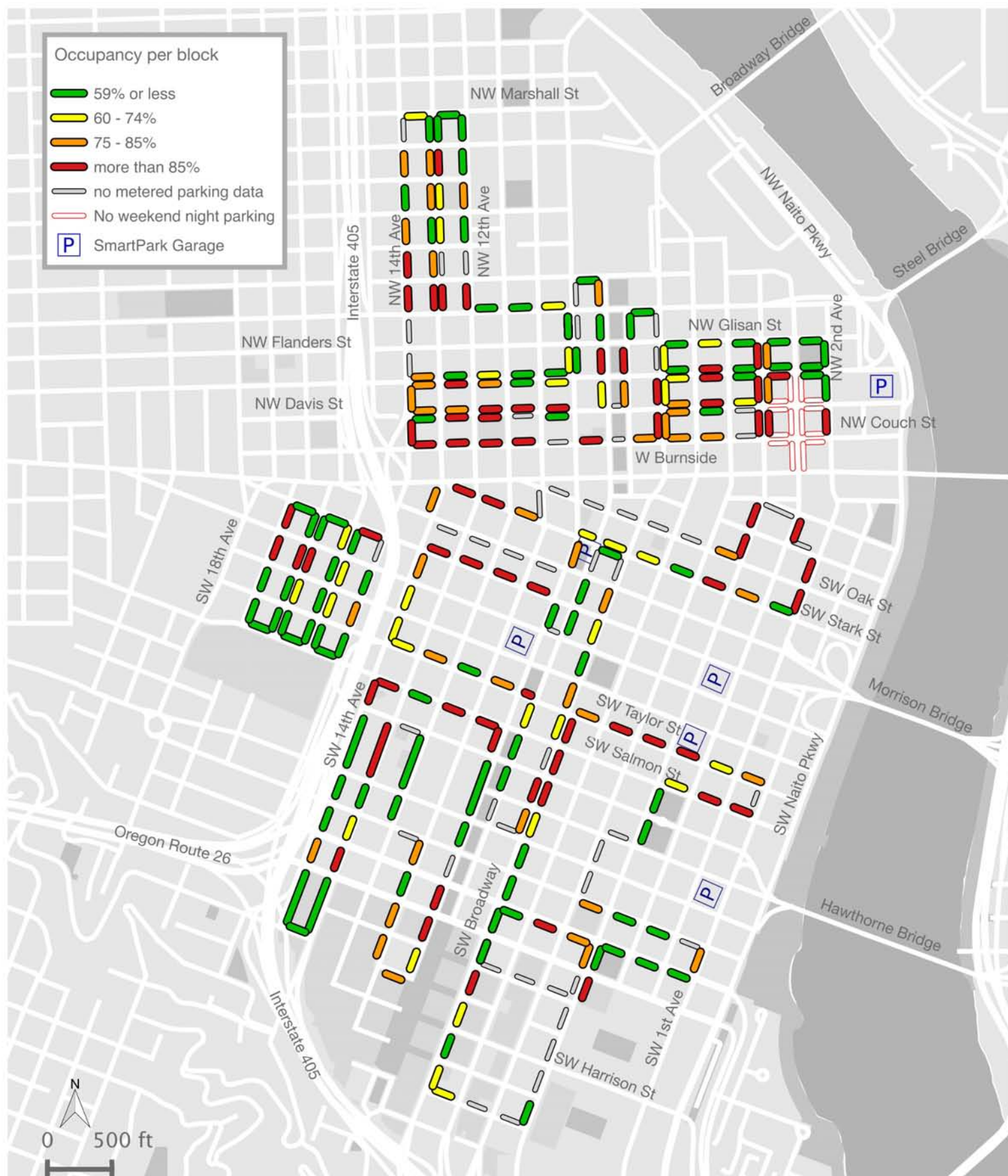


Figure A15: Occupancy during the 9:00 PM hour