City of Carlsbad

Parking Data Collection Comparison Memorandum (May 2018)

FINAL

Glossary of Terms

The following terms and concepts are used throughout this Comparison Memorandum to describe the performance of the parking system or individual components of the parking system.

Effective Capacity

Effective capacity is an industry-accepted occupancy threshold for parking facilities that indicates the efficiency of the facility or system. Based on industry standards, the primary threshold is 85 percent of the total capacity of the parking system and/or certain areas within the system. This is the threshold that indicates whether the parking system is operating effectively. For example, when observed or projected occupancies are under this threshold, users can typically locate spaces easily. When observed or projected occupancies are at or above this threshold, users cannot typically find available parking easily.[1]

In-lieu Fee

In-lieu fee, as provided for in the existing Village and Barrio Master Plan (effective outside the Coastal Zone) and Village Master Plan and Design Manual (effective inside the Coastal Zone), is a cash payment made by a developer to the city instead of providing the total number of minimum parking space or spaces required by the code. These payments are typically calculated on a per space basis to reduce a portion or all a development's parking requirement. Fees are collected and used in a defined area to provide additional parking supply, or parking-related infrastructure and services. Under the existing program, the in-lieu fee program is available only to non-residential projects.

License Plate Recognition Technology (LPR)

License plate recognition technology is a computer-based optical system that can sense the presence of a license plate from its reflective material. Once a license plate is detected, the plate number may be recorded in addition to state of origin. This technology can be used for data collection to better understand parking behaviors and/or perform parking enforcement activities.

Parking Demand

Parking demand is the metric representing the projected quantity of parking generated by employees, patrons, residents, visitors, and others associated with a business or land use within the parking system. Each business or land use generates a certain quantity of demand for

[1] "Parking 101: A parking Primer: A Publication of the International Parking Institute", International Parking Institute, 2015; "Shared Parking, Second Edition", Urban Land Institute

parking spaces to accommodate their users. The total number of spaces generated by business or land use patrons at a given time is the parking demand for that business or land use. This demand is based on the land use intensity (building square footage or number of units) and the land use type (restaurant, office space, retail, single and multi-family residential, etc.). Parking demand may differ from the actual parking supply or standard parking requirements.

Parking Duration

Parking duration is a measure of how long vehicles are parked in a parking space. This metric is analyzed through data collection efforts and is used to help define policies such as parking time limits.

Parking Facility

A parking facility refers to any on- or off-street location designated for parking.

Parking Occupancy

Parking occupancy is the percentage of occupied spaces in a parking facility at a given time. Parking occupancy is calculated by dividing the number of observed or projected vehicles parked in a facility by the number of total spaces in the facility.

Parking System

Parking system refers to the entire collection of parking spaces, parking facilities, technologies, equipment, policies, regulations, and personnel that work together to provide the parking needs of employees, patrons, residents, visitors, and other users in a study area.

Introduction

In 2016, Kimley-Horn developed a Parking Management Plan (PMP) for the City of Carlsbad that contained an analysis of the parking behaviors unique to the Village, Barrio, and Beach study area, a comprehensive data collection process, including field observations for occupancy and duration in each of the three areas within the study, and robust community outreach to document perception related to parking behaviors. The result of the analysis and community outreach was a set of parking management strategies compiled in the PMP that are intended to balance parking demands among the different neighborhoods in the study area, accommodate the various users in the study area (visitors, residents, business owners, etc.), while creating a system that is sustainable.

Since the completion of the PMP in 2016, the City has proactively started looking at the implementation of various components of the PMP recommendations. One such component is to track parking occupancy and duration data on a regular basis with the intention of re-evaluating parking demands for the Village, Barrio and Beach areas. Tracking parking demands annually will help the city make data-driven decisions on how to manage the parking system. Many decisions such as shared parking opportunities, parking time limits, and extension of the in-lieu fee boundaries rely on parking occupancy information. Annual analysis will allow the city to track how parking demands change as a result of decisions made and to allow it to continue to implement beneficial changes proactively to meet the needs of the community.

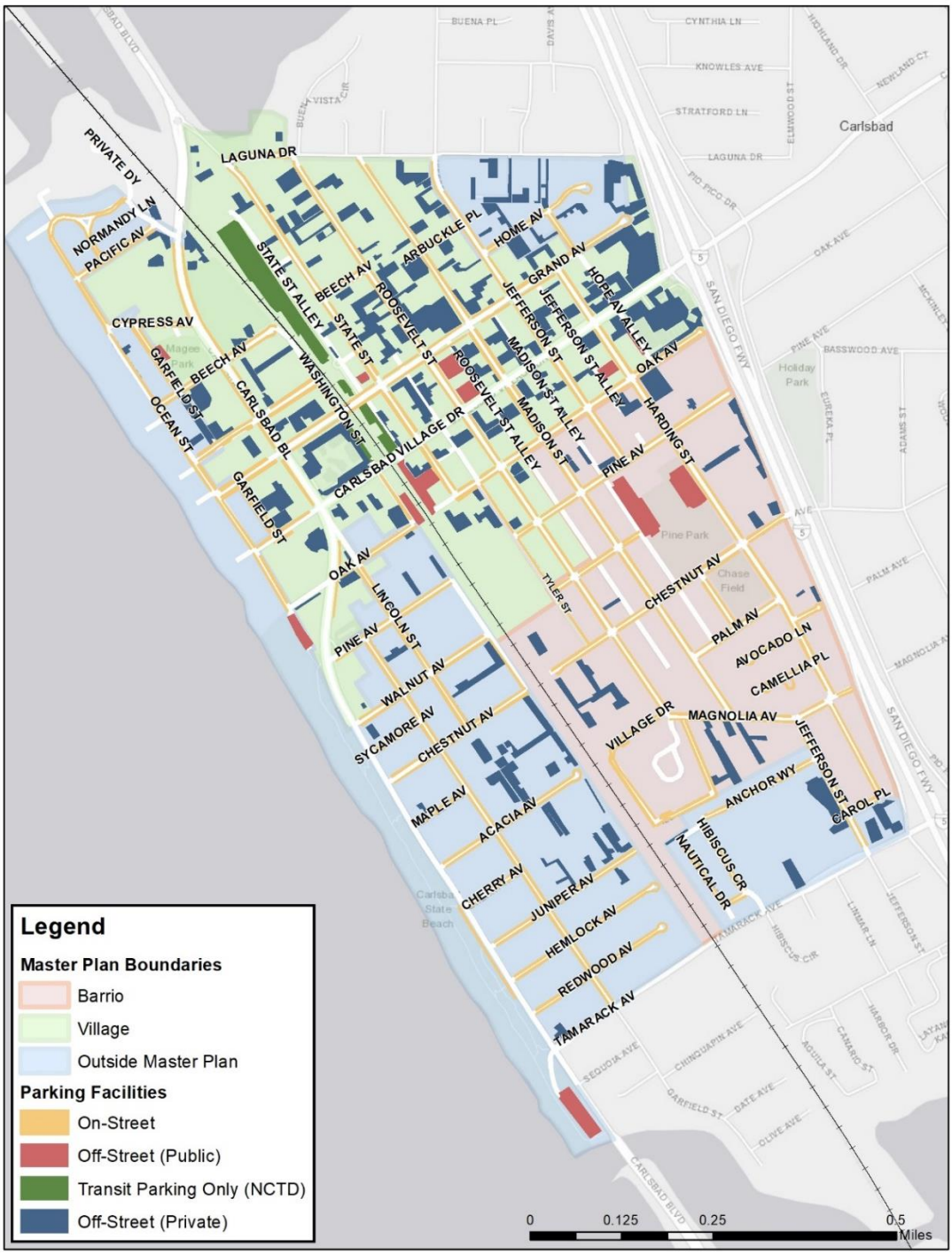
In 2018, the city implemented the recommendation to track parking occupancy by commissioning another round of data collection to compare to the 2016 data. The analysis in this document compares the May 2016 and May 2018 parking demands and durations for the Village, Barrio, and Beach areas. The intent of this document is to identify trends and inform the implementation of other PMP recommendations related to occupancy and duration.

It is important to note that the inventory of analyzed spaces is not inclusive of all parking spaces in the study area, but rather those spaces that are accessible for data collection and have an impact on the implementation of various parking management strategies. Residential spaces, especially those with gated access or enclosed garages, are generally not included in the study area parking inventory and subsequent parking analysis.

This document provides a comparison of May 2016 and May 2018 results and findings for the entire study area. In addition, this document discusses findings specific to four sub-areas, Village, Barrio, areas outside the Master Plan boundary, and an analysis of the east and west sides of the railroad tracks. These areas differ slightly from the 2016 PMP sub-areas. In 2016,

the PMP examined the Village, Barrio, and Beach areas. In 2018, while the overall study area boundary remains the same, the sub-areas were dissected differently to compare Village, Barrio, east of the tracks versus west of the tracks, and areas outside of the Master Plan boundary. ***Figure 1*** on the following page illustrates the study area and the four sub-areas analyzed in this document. The east and west of the tracks sub-area is simply the portions of the study area on either side of the railroad tracks shown on the figure.

Figure 1: Data Collection Study Area



Parking Data Collection Methodology

The intent of this 2018 round of data collection and analysis is to effectively compare any parking changes within the last two years. As such, the parking data collection in 2018 was conducted during the same month and time periods as was done in 2016 to present an "apples to apples" comparison of the data. In 2016, the data was collected in May, which represented the shoulder season. A separate peak season count was conducted separately from this analysis and will be discussed under a separate report. For this recent round of collection, the data was also collected in May 2018 during a typical weekday and weekend. Parking inventory, occupancy, and duration data was collected throughout the study area to determine and evaluate parking demands.

The data was collected in the same manner as was done in 2016, with the use of License Plate Recognition (LPR) technology. The mobile LPR equipment uses a dual camera configuration, placed on the roof of the data collection vehicle. The vehicle drives continuous loops through each collection area, counting the number of vehicles parking off-street and on-street. Data was collected from all accessible off-street and on-street parking facilities shown in ***Figure 1*** on the previous page.

Data was collected between the hours of 6 AM - 9 PM for the entire study area, with an additional run between 9 PM - 11 PM to capture additional on-street and off-street occupancies, as well as duration in the Barrio Area.

Parking Inventory Changes

Since the previous data collection in May 2016 for the PMP and as of the date of this study (May 2018), three developments were completed and five are under construction (***Table 1***). Some of these projects have impacted or will impact the parking supply within the Village, Barrio and Beach Area. However, it is important to clarify that developments providing residential parking, whether as private individual or common garages, may not be included in the parking inventory because parking cannot be consistently verified or is often inaccessible because of gates or private property restrictions. These types of facilities, while important to their respective development's parking needs, do not contribute to the parking supply available for the implementation of parking management strategies. Therefore, some projects identified in the table (e.g., 800 Grand Avenue) impact the parking inventory only if they remove spaces counted in the 2016 data collection. In addition, certain facilities have also been reclassified to better reflect the users they serve (e.g. public to NCTD). Accordingly, the parking inventory has

been updated (**Table 2**) to include the reclassification of spaces, removed parking due to completed development, and a space count correction, all as identified in ***Table 1***.

Table 1: May 2016 to May 2018 Inventory Changes

DEVELOPMENT	LOCATION	PARKING INVENTORY IMPACT	PARKING TYPE	NOTES
Seagrove Townhomes (completed project)	2500 Block of State Street	None (see notes)	Private	New development of 47 townhomes featuring 97 parking spaces on-site, most in private, individual garages. The project replaced a mix of commercial uses served by approximately 54 spaces, resulting in a net gain of 43 off-street spaces. However, as most spaces are in private garages, the added parking is not included in the parking inventory. Further, formerly existing commercial spaces were not counted in the 2016 inventory due to project construction.
Blue Water Grill Expansion (completed project)	417 Carlsbad Village Drive	10 Spaces Removed	Private	Inventory updated to reflect removed spaces in this study.
Pine Avenue Park Community Center and Garden (completed project)	3209 Harding Street	41 Spaces Removed	Public	Community Center construction removed a parking lot. Inventory updated to reflect removed spaces in this study.
Harding Community Center Lot	3096 Harding Street (behind center)	14 Spaces Reclassified	Public	In 2016 this was considered private. Updated to be classified as public for this and future data collection efforts.
Harding Community Center Lot	3075 Harding Street	30 Spaces Reclassified	Public	In 2016 this was considered private. Updated to be classified as public for this and future data collection efforts.
Washington Street NCTD Lot	Along Washington Street between Carlsbad Village Drive and Grand Avenue	30 Spaces Reclassified	NCTD	In 2016 this was considered public. Updated to be classified as an NCTD lot for this and future data collection efforts.

**Spaces to be added are based on the project staff report and will be verified after project completion.*

Table 1: May 2016 to May 2018 Inventory Changes (Continued)

DEVELOPMENT	LOCATION	PARKING INVENTORY IMPACT	PARKING TYPE	NOTES
Madison Street and Grand Avenue Private Lot	Northeast corner of Madison Street and Grand Avenue	50 Spaces Removed	Private	Duplicate entry from 2016 inventory. Removed to reflect current inventory.
800 Grand Ave Condominiums (under construction)	800 Grand Avenue	76 Spaces Removed	Private	Inventory updated to reflect removed spaces in this study. All new spaces on-site (66 total) for this residential project are in a private common garage and will not be counted in the parking inventory.
The Grand Madison Mixed-Use (under construction)	725 Grand Avenue	18 Spaces Removed	Private	Inventory updated to reflect removed spaces in this study. All new spaces on-site (20 total) are for the residential portion of the project, are in a private common garage, and will not be counted in the parking inventory.
Beachwalk at Madison Condominiums (under construction)	2664-2668 Madison Street	None (see notes)	Private	New development of six condominiums on a vacant lot. Since each unit has two-car private garage, project parking will not be counted in the parking inventory.
Magnolia Avenue Townhomes (under construction)	749 Magnolia Avenue	None (see notes)	Private	New development of 16 condominiums. No removed parking is reported since project replaces detached homes and garages not counted in 2016 inventory. Further, as each unit has a two-car private garage, new project parking will not be counted in the parking inventory.
Springhill Suites (under construction)	3136 Carlsbad Boulevard	125 spaces to be added*	Private	New 104-room hotel with 125 on-site parking spaces. The project replaced a mix of uses, including a restaurant and motel, that were demolished at the time of the 2016 inventory.

**Spaces to be added are based on the project staff report and will be verified after project completion.*

During the May 2016 data collection, the PMP study area consisted of 11,657 on-street and off-street parking spaces. In May 2018, the same study area decreased by 2 percent resulting in a total of 11,462 spaces (explained in "Notes" column of ***Table 1***). ***Table 2*** summarizes the parking inventory for both 2016 and 2018 by facility type.

Table 2: May 2016 vs. May 2018 PMP Parking Inventory

PARKING TYPE	2016 (SPACES)	2018 (SPACES)
On-Street	4,971	4,971
Public Off-Street	730	703
Private Off-Street	5,445	5,247
NCTD Transit Lots	511	541
Study Area	11,657	11,462

As noted, the May 2018 study area inventory decreased by 2 percent, or a total of 195 spaces compared to the May 2016 study area inventory. The inventory changes are due to the removal of 41 public spaces at the new Pine Avenue Park community center and garden, 10 private spaces at the expanded Blue Water Grill, 76 private spaces at 800 Grand Avenue (former office complex), 18 private spaces at the Grand Avenue Mixed Use (former medical office building), and a 2016 inventory discrepancy (duplicate entry) of 50 private spaces at one facility that was verified during the recent data collection efforts (explained in "Notes" column of ***Table 1***).

Moreover, one future development described in ***Table 1***, Springhill Suites, will further change the parking inventory as it may impact the implementation of parking management strategies. Upon project completion, the study area inventory will be updated for future analysis to reflect the changes in total parking supply caused by the new development.

In addition to the parking inventory changes associated with the recently completed developments and user-type reclassifications, one private off-street parking facility was inaccessible during the May 2018 data collection that was captured in the 2016 data collection. The Carlsbad Community Church parking lot, located on the NW corner of Jefferson Street and Pine Avenue, was chained-off and is reflected as empty (i.e., identified as 0 - 50% occupancy on the parking occupancy figures that follow) throughout the May 2018 collection period.

Parking Occupancy Comparison

One critical metric utilized in analyzing parking data is occupancy, which is a measurement of how much of a facility is being used at a given time. Occupancy can be used to indicate the parking efficiency associated with each facility. When analyzing parking occupancy, the primary industry accepted threshold for identifying demand constraints for a system is when occupancies reach 85% - 90% consistently. When occupancies for a parking system reach this level of occupancy, parking efficiency starts to deteriorate, and changes need to be implemented to maintain efficiency of the system. The 10% - 15% remaining capacity accounts

for those vehicles leaving a space and the few spaces that are scattered throughout the system or a facility that one might have to circle to find. For the purposes of this analysis, the critical threshold of 85 percent was used to determine how well the parking in the study area is operating.

During May 2018, the study area observed a weekday peak at 9 AM - 12 PM with an occupancy of 51 percent and a weekend peak at 12 PM - 3 PM with an occupancy of 56 percent. ***Table 3*** compares the peak times and occupancies, based on average occupancies for the entire system for each parking facility type, on the days surveyed in May 2016 and May 2018.

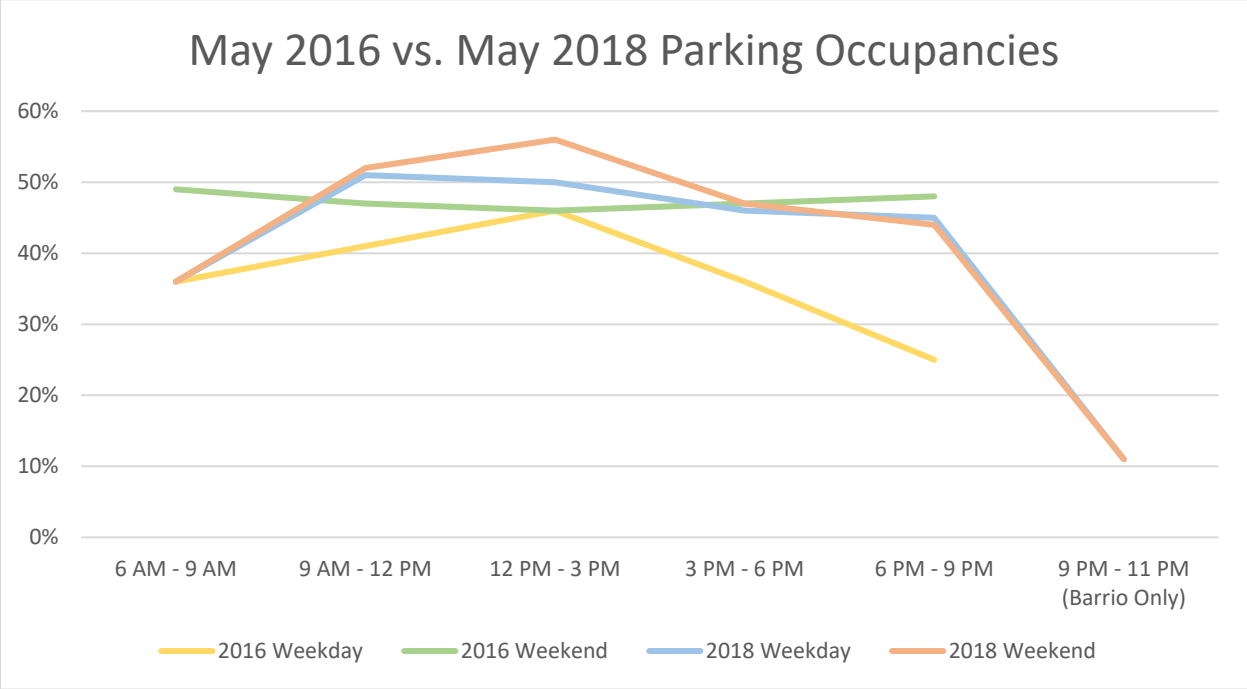
The May 2018 data collection period revealed different peak occupancies and times from the May 2016 collection. In the 2016 data collection period, parking occupancy in the study area was observed to have a weekday peak of 46 percent occupancy at 12 PM – 3 PM and a weekend peak of 49 percent occupancy at 6 AM - 9 AM. As previously mentioned in the parking data collection methodology, data was collected between the hours of 6 AM - 9 PM with one additional count between 9 PM and 11 PM. However, in 2016 the data for May was only collected between 6 AM and 9 PM. Due to community comments received, the City made the decision to extend the collection hours to 11 PM to capture residential parking demands in the Barrio neighborhood. The results in the following tables and figures include the data during the later evening only for 2018 Barrio area.

Table 3: May 2016 and May 2018 Peak Parking Occupancies by Facility Type

PARKING TYPE	2016 WEEKDAY (12 PM – 3 PM)	2016 WEEKEND (6 AM - 9 AM)	2018 WEEKDAY (9 AM - 12 PM)	2018 WEEKEND (12 PM – 3 PM)
On-Street	42%	50%	60%	72%
Public Off-Street	40%	24%	68%	76%
Private Off-Street	31%	32%	40%	38%
NCTD Transit Lots	74%	21%	63%	43%
Study Area	46%	49%	51%	56%

Figure 2 on the following page shows the daily occupancy trends between May 2016 and May 2018.

Figure 2: May 2016 vs. May 2018 Parking Occupancy Trends



The figure above illustrates the occupancy trends throughout the day for both May 2016 and 2018 weekday and weekend data. The intent of this figure is to show how the occupancies have increased throughout the day since 2016. Although the 2018 data resulted in different peak hours than 2016, the general trends show increasing occupancies for the weekday and weekend collections.

In ***Table 3*** on page 11, parking occupancies for both May 2016 and May 2018 weekday and weekend data are broken down by facility type, as well as, the study area as a whole. Comparing the entire study area for 2016 and 2018, occupancies have shown a 5 percent increase for the weekday peak from 46 percent to 51 percent, and a 7 percent increase for the weekend peak from 49 percent to 56 percent. Despite the increase in demand, the study area as a whole is underutilized.

Although the May 2018 results show the study area having plenty of parking supply available during the weekday and weekend peaks (9 AM - 12 PM & 12 PM – 3 PM), some facilities are either approaching and/or exceeding the effective capacity threshold. ***Figure 3***, which illustrates May 2018 weekday data collected, consists of several on-street and private off-street facilities with occupancies approaching and/or exceeding the 85 percent effective capacity threshold (represented by the orange and red colors) mainly in the Village and north Beach

areas (i.e., west of Carlsbad Boulevard generally north of Pine Avenue). ***Figure 4***, which illustrates the May 2018 weekend data collected, shows on-street facilities throughout the Barrio and south Beach areas (i.e., west of the railroad tracks and generally south of Pine Avenue) with occupancies approaching and/or exceeding this threshold. During the 2018 weekend collection, several private off-street facilities in the north end of the study area experienced occupancies over 75 percent which are still underutilized, but over time may change if vehicles are unable to find an available spot in a surrounding facility exceeding the 85 percent effective capacity.

The increase in parking occupancies from the May 2016 weekend peak to the May 2018 weekend peak, particularly for public parking both off- and on-street, may have been impacted due to several unique events that occurred throughout the day. In the Barrio Area, there was an event at Jefferson Elementary, as well as Opening Day for the new Pine Avenue Park Community Center & Gardens, which impacted the surrounding on-street facilities. Within the Village Area, there was a football event at the Army and Navy Academy football field near Beech Avenue and Carlsbad Boulevard that increased on-street occupancies along Beech Avenue. There was also a Live Roller Derby Game that occurred at the Army and Navy Academy skating rink within the Beach Area located on Mountain View Drive and Carlsbad Boulevard. During the 2016 data collection, there were no similar events observed, which may have contributed to the lower occupancies in 2016.

Occupancies in May 2018 represent the effects of multiple events on the parking system and may represent a reasonable “worst case scenario” in terms of parking demand. While future data collection efforts will aim to capture periods such as the more “typical” parking demand with fewer events, the May 2018 data sheds light on how parking occupancies respond to atypical conditions. Overall, despite the unusually high number of special events, parking spaces remained available at acceptable utilization rates within the study area.

Figure 3: 2018 May Weekday Peak Parking Occupancy (9 AM - 12 PM)

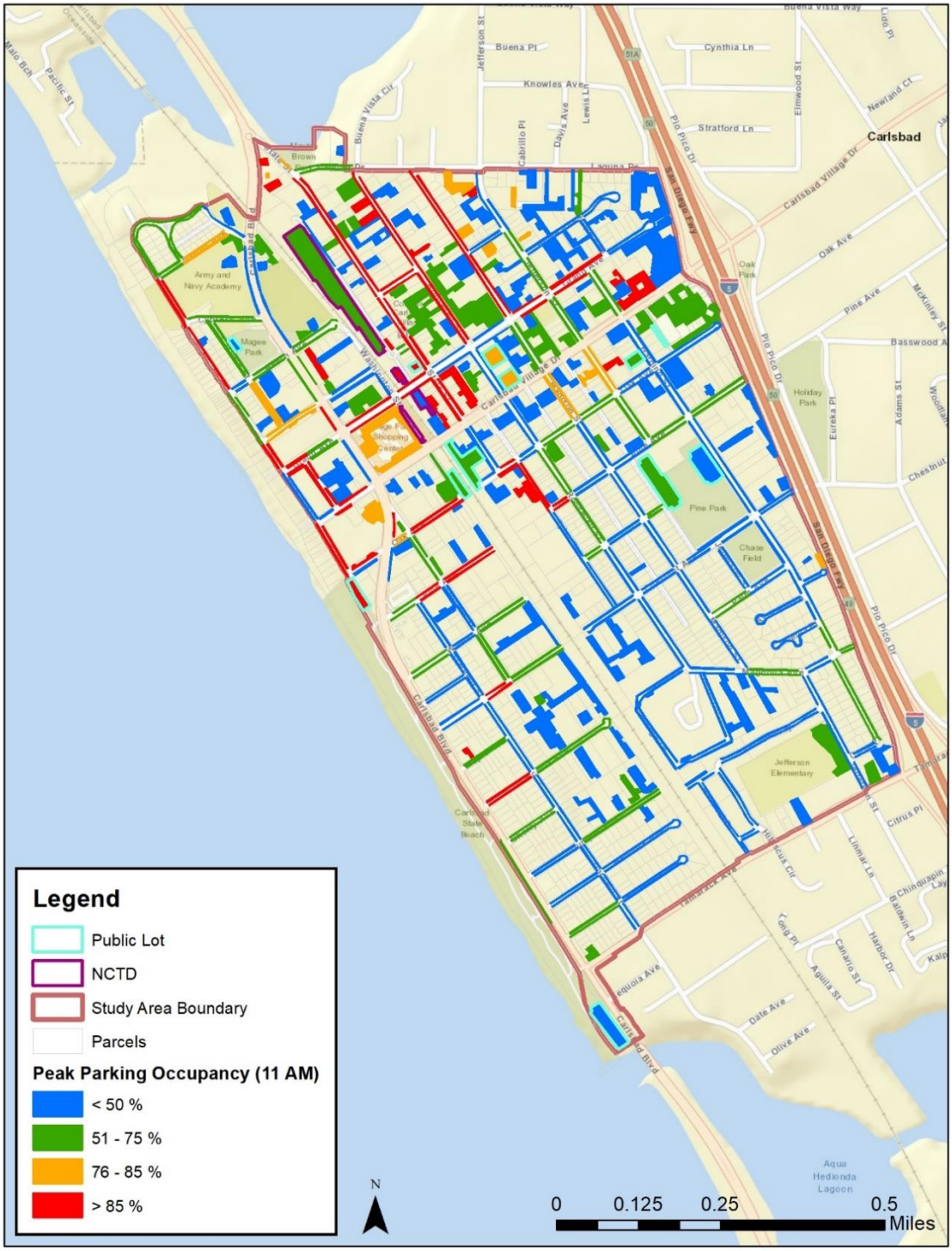
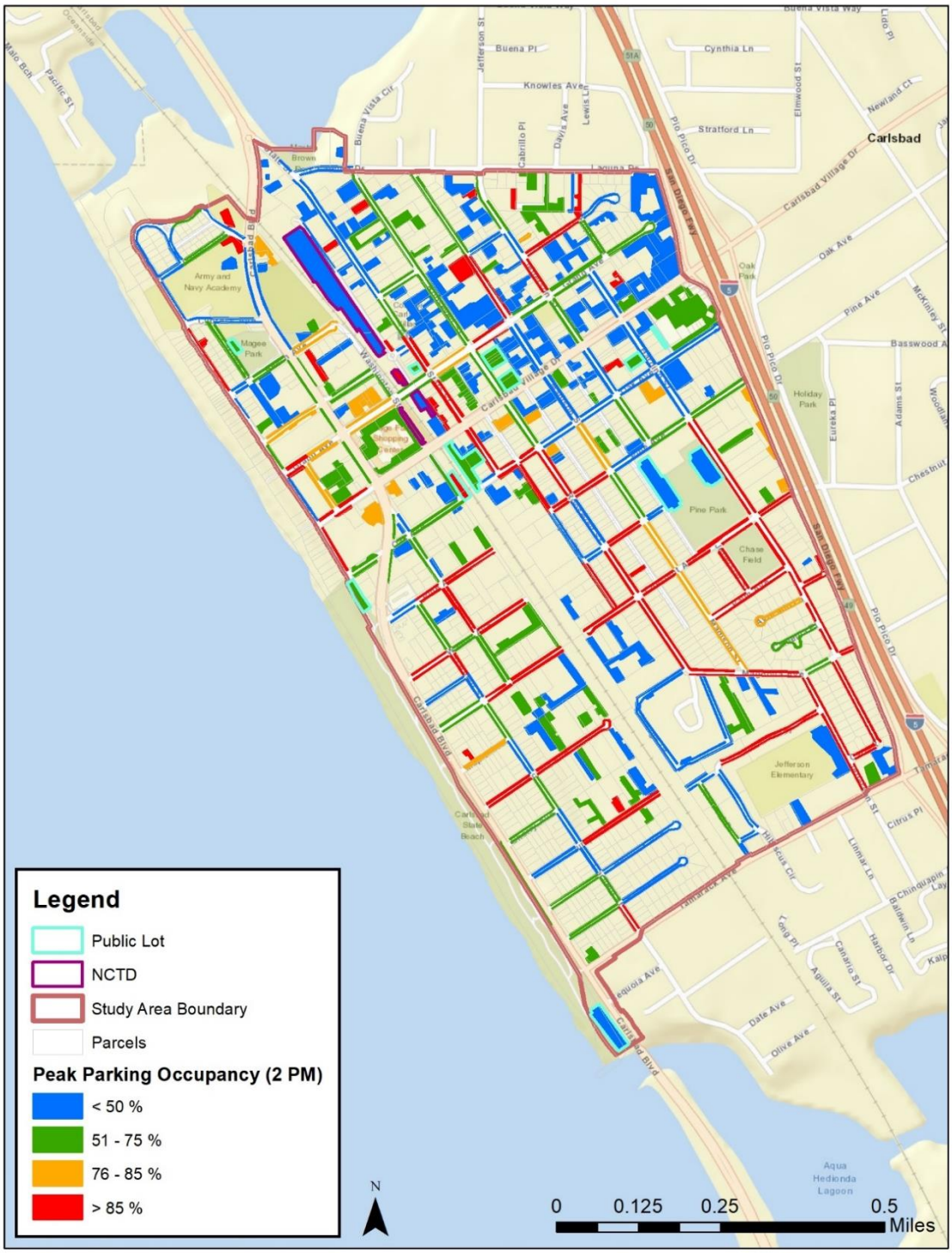


Figure 4: 2018 May Weekend Peak Parking Occupancy (12 PM – 3 PM)



Parking Thresholds

As stated previously, occupancy data is a metric widely used to evaluate the effectiveness of a parking system. At 85 percent occupied, a parking system is considered to be at effective capacity and changes need to be implemented to make more parking available for people. Conversely, underutilized parking is also not desirable as it indicates that the parking is inconvenient. A typical "sweet spot" for parking occupancy is 75 percent. At this level, the area is active and lively, but people are able to find available parking. Additionally, facilities at the 75 percent threshold are ones that should be observed from year to year for occupancy changes. Additional demand in these facilities can easily tip these facilities into the 85 percent threshold. While 75 percent occupancy is desirable, it must be actively maintained through annual observations and management.

This section of this document examines the facilities that are operating at an acceptable level of 75 percent and up to an occupancy of 84 percent, at or above the 85 percent effective capacity, or are considered underutilized (below 75 percent) and present options for future growth or shared parking opportunities.

75 Percent Threshold

In May 2016, the weekday peak (12 PM – 3 PM) had a total of six facilities that had occupancies between 75 percent and 84 percent. This accounts for 6 percent of the spaces (690 spaces of the total 11,657 spaces) in the study area. In May 2018, the weekday peak (9 AM - 12 PM) had over double the facilities with occupancies between 75 percent and 84 percent (14 facilities), and accounting for 13 percent of the spaces for a total 1,497 spaces of the 11,462 spaces in the study area. Although the 2018 data experienced an uptick in facilities with occupancies between 75 percent and 84 percent, 400 of the 1,497 spaces were the same facilities as in the 2016 data.

Figure 5 illustrates the location of the facilities with occupancies between 75 percent and 84 percent for May 2016 and May 2018. As the map shows, most of these parking facilities are located in the Village and north Beach Area. This is expected since this part of the study area is mostly commercial and will have increasing demands at a higher rate than the more residential parts of the study area. Additionally, the facilities that are within this acceptable range shown in ***Figure* 5** are mostly off-street private facilities.

In May 2016, the weekend peak (6 AM - 9 AM), had a total of 32 facilities with occupancies between 75 percent and 84 percent. This accounts for 8 percent of the spaces (965 spaces of the total 11,657 spaces) in the study area. During the May 2018 weekend peak (12 PM – 3 PM),

86 facilities were observed to have occupancies between 75 percent and 84 percent. This accounts for 26 percent of the spaces for a total of 2,974 spaces in the study area.

Unlike the 2016 and 2018 weekday peaks (12 PM – 3 PM & 9 AM – 12 PM), the facilities for both 2016 and 2018 weekend data were not concentrated in one specific area, rather they were spread out through the entire study area. ***Figure 6*** illustrates the facilities with occupancies between 75 percent and 84 percent for the weekend collections. The map indicates that during the weekend, the on-street facilities in the Barrio and Beach areas are more affected by increased parking demands. This is likely due to the beach and park visitors parking on neighborhood streets during the weekend.

Figure 5: May Weekday Peak Parking Facilities 75 to 84 Percent Occupancy
(Peak Hours: 2016 – 12 PM - 3 PM, 2018 – 9 AM - 12 PM)

Figure 6: May Weekend Peak Parking Facilities 75 to 84 Percent Occupancy
(Peak Hours: 2016 – 6 AM - 9 AM, 2018 – 12 PM – 3 PM)

85 Percent Threshold

During the weekday peak (12 PM – 3 PM) in May 2016, 17 facilities were observed to have occupancies of 85% or greater, which accounts for 6 percent of the spaces (716 spaces out of the 11,657 total spaces) in the study area. In May 2018, during the weekday peak (9 AM - 12 PM), 50 facilities were observed to have occupancies of 85% or greater, which accounts for 14 percent of the spaces (1,638 of the 11,462 total spaces) in the study area.

The parking facilities consisting of these spaces are shown in ***Figure 7***. The map indicates that the May 2018 data resulted in an increase in on-street and private off-street facilities mainly in the Village and north Beach areas. Similar to the 75 percent analysis, State Street, Roosevelt Street and Madison Street, north of Carlsbad Village Drive, observed higher demand in 2018 than 2016. The increase in facilities with higher occupancies could be due to overall increased demands in the area from new developments and growing population. It may also be that there were minor events being held during the May 2018 collection that weren't being held during May 2016 collection.

In May 2016, during the weekend peak (6 AM - 9 AM) 24 facilities were observed to have occupancies 85 percent or greater. This accounts for 8 percent of the spaces (895 spaces of the 11,657 total spaces) within the study area. Most of the facilities in 2016 were in the residential areas within the Barrio and Beach neighborhoods. During the weekend peak (12 PM – 3 PM) in May 2018, 80 facilities were observed to have occupancies of 85% or greater. This accounts for 24 percent of the spaces (2,735 spaces of the 11,462 total spaces) in the study area, resulting in an increase of 1,840 spaces with observed occupancies of 85 percent or greater. Similar to the 2016 data, 1,967 of the 2,735 total spaces were within the residential Barrio and Beach neighborhoods. ***Figure 8*** illustrates the weekend parking facilities greater than or equal to the 85 percent threshold.

The data represented in ***Figure 8***, shows an increase of on-street facilities within the Barrio and Beach areas with occupancies greater than 85 percent during the May 2018 weekend peak (12 PM – 3 PM) compared to the May 2016 weekend peak (6 AM - 9 AM). Public off-street facilities in the Village, north of Carlsbad Village Drive, also experienced higher demands in 2018 than 2016.

Although the 2018 peak data experienced an increase of parking facilities with occupancies approaching or over the 85 percent threshold, the study area hosted several events throughout the day as well as a different peak hour (12 PM – 3 PM) than 2016 which may have caused this result.

This analysis revealed areas of very high demand in the Village and north Beach areas during the week and high demand in Barrio and south Beach area during the weekend. Despite these pockets of demand and the unusual level of special event activity, there were no areas without available supply in close proximity and within a comfortable walking distance.

Figure 7: May Weekday Peak Parking Facilities 85 Percent Occupancy or Greater

(Peak Hours: 2016 – 12 PM – 3 PM, 2018 – 9 AM - 12 PM)

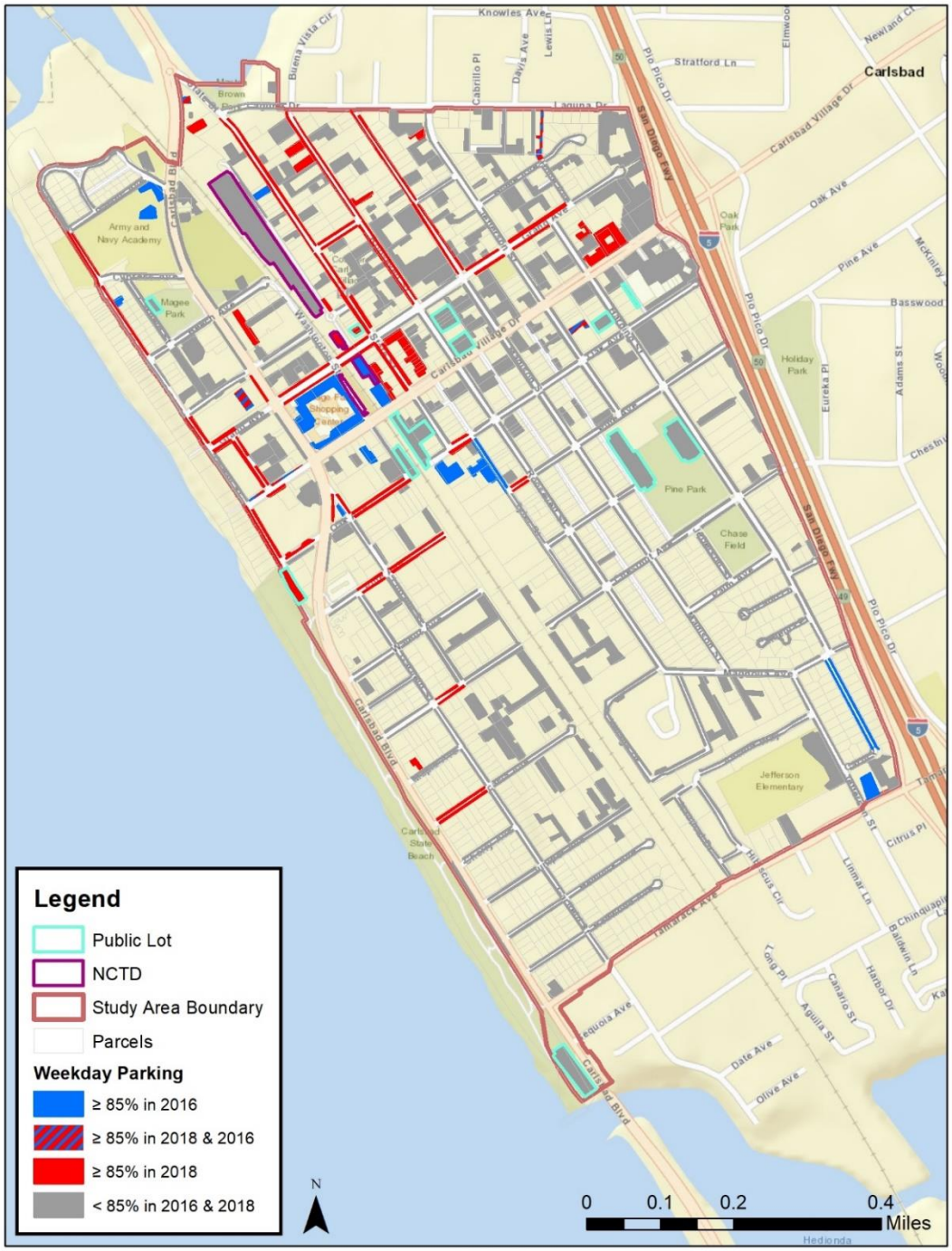
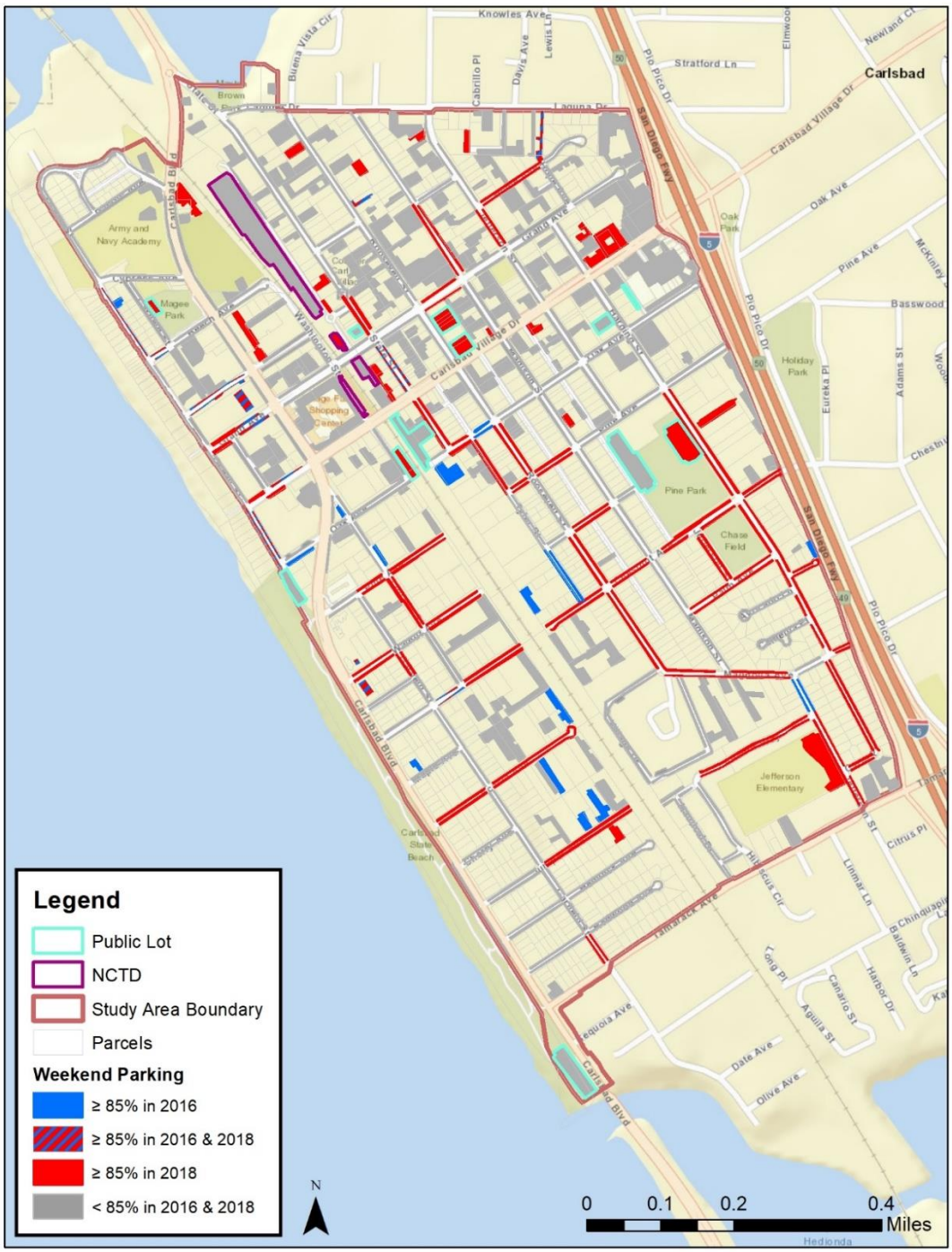


Figure 8: May Weekend Parking Peak Facilities 85 Percent Occupancy or Greater

(2016 – 6 AM - 9 AM, 2018 – 12 PM - 3 PM)



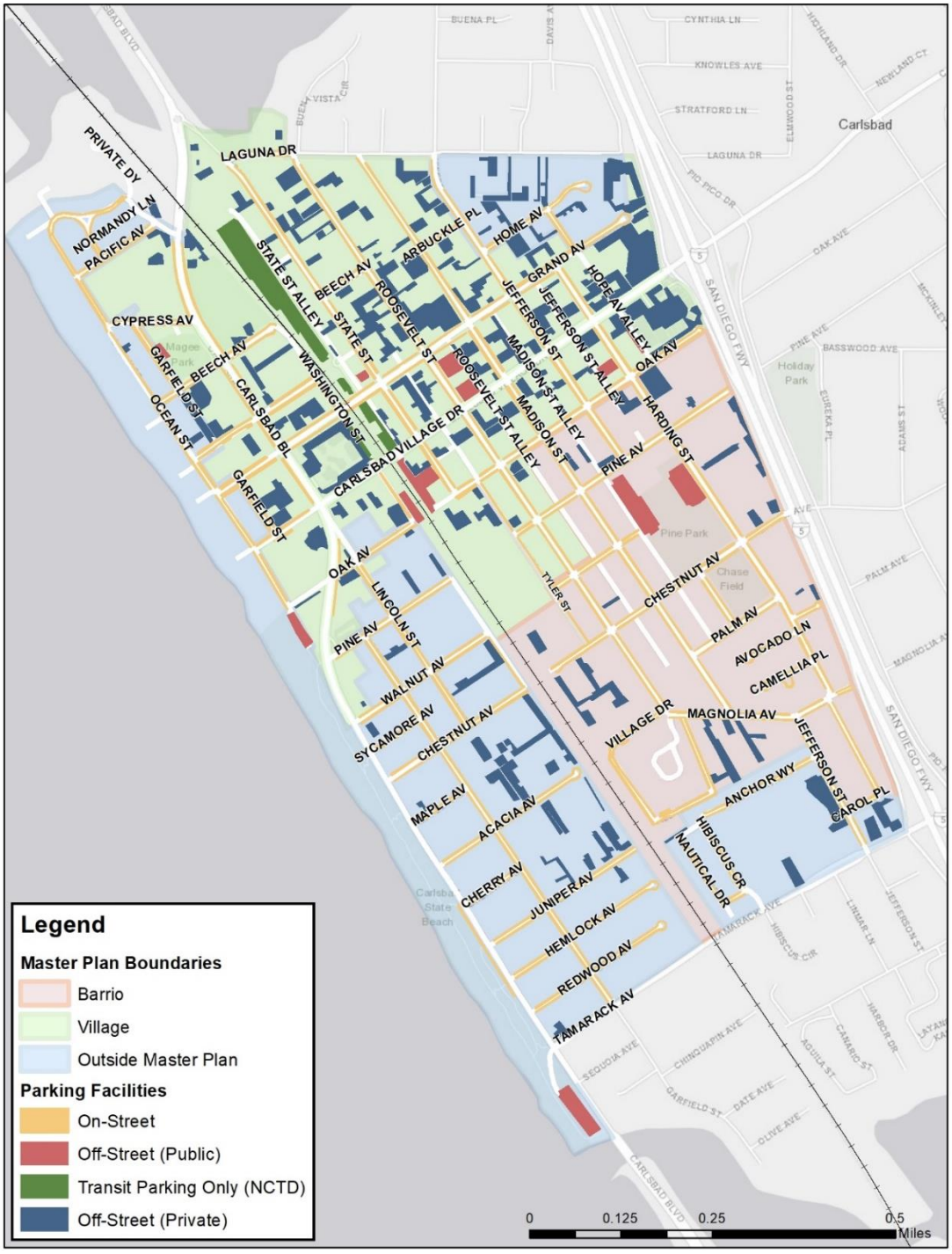
Sub-Area Analyses

The previous section reviewed the data analysis and findings for the study area as a whole in comparison to 2016 May data. However, the study area is comprised of four sub-areas that have differing characteristics and should be reviewed separately to highlight specific trends and challenges unique to each area.

- The Barrio area, as defined by the Village and Barrio Master Plan
- The Village area, also as defined by the Village and Barrio Master Plan
- "Outside Master Plan" areas, which encompass primarily the beach neighborhoods south and west of the master plan but also residential areas south of the Barrio around Jefferson Elementary School and east of the Village in the neighborhood bordered generally by Grand Avenue, Jefferson Street, and Laguna Drive
- Areas east and west of the railroad tracks, which include and sometimes separate the other sub-areas.

Figure 9 illustrates the boundaries of the Village and Barrio Master Plan and the Outside Master Plan sub-areas and ***Figure 10,*** on page 28, highlights the areas east and west of the railroad tracks. Separating the data in these sub-area boundaries allows the data to be analyzed in a way that focuses on facilities that have a higher impact on that specific area. This analysis can also be helpful for making parking management decisions as different strategies may have to be implemented differently or at different times in each sub-area, depending on what the data indicates.

Figure 9: Village and Barrio Master Plan Boundaries



Barrio Area

The Barrio area is located in the southeast portion of the study area, generally bounded by Interstate 5 to the east, the railroad corridor to the west, Oak Avenue to the north and Tamarack Avenue to the south. This area is mainly residential; however, there are a few local businesses along Roosevelt and Tyler Streets in its northwest end. The Pine Avenue Park, Community Center and Gardens are located within the center of this area. Parking within the Barrio contains mainly public on-street and private off-street, with the exception of two public off-street facilities at Pine Avenue Park. ***Table 4*** below, compares the May 2018 average parking occupancies throughout the day for each facility type within this area.

Table 4: May 2018 Parking Occupancies by Facility Type Master Plan Barrio Area

PARKING TYPE	DAY	6 AM – 9 AM	9 AM – 12 PM	12 PM – 3 PM	3 PM – 6 PM	6 PM – 9 PM	9 PM – 11 PM (BARRIO ONLY)
On-Street	Weekday	55%	39%	53%	54%	48%	52%
	Weekend	55%	55%	88%	53%	48%	55%
Public Off-Street	Weekday	21%	55%	55%	28%	2%	7%
	Weekend	14%	72%	72%	13%	3%	6%
Private Off-Street	Weekday	34%	34%	34%	32%	9%	31%
	Weekend	39%	52%	52%	32%	7%	36%

The results in ***Table 4*** show occupancies for on-street facilities within the Barrio at or over 39 percent throughout both the weekday and weekend days surveyed and reaching 88 percent during the weekend peak hour (12 PM – 3 PM). Given that public off-street parking is limited in this area (located at Pine Avenue Park), these facilities generally reflect increased demand during hours associated with park use, which is shown during the 9 AM - 12 PM and 12 PM – 3 PM counts. As for private off-street facilities within this area, the data results generally remain constant during the weekday until the late evening which shows a sharp decrease at 6 PM - 9 PM followed by an upswing at 9 PM – 11 PM. These facilities also experienced an increase in demand during the weekend peak (12 PM – 3 PM) by 18 percent when compared to the weekday peak (9 AM - 12 PM).

During the weekend peak, the higher demands for on-street facilities could be due to the school event at Jefferson Elementary and the grand opening for the new Pine Avenue Park Community Center & Gardens. These events may have also caused the identical peak occupancies for the public off-street facilities.

Village Area

The Village area is located north of the Barrio area predominately between Interstate 5 west to the east, the Pacific Ocean to the west, Laguna Drive to the north and Oak Avenue and Walnut Avenue to the south. However, there are a couple "pockets" within these boundaries that will be analyzed in the next section. Refer to ***Figure 9*** for the Village area boundary. This area consists of various land uses, such as apartments, general retail, offices, restaurants, and single-family homes. ***Table 5*** below, compares the May 2018 average parking occupancies throughout the day for each facility type within this area.

Table 5: May 2018 Parking Occupancies by Facility Type Master Plan Village Area

PARKING TYPE	DAY	6 AM – 9 AM	9 AM – 12 PM	12 PM – 3 PM	3 PM – 6 PM	6 PM – 9 PM
On-Street	Weekday	29%	78%	78%	61%	63%
	Weekend	27%	71%	64%	59%	65%
Public Off-Street	Weekday	9%	68%	68%	70%	58%
	Weekend	10%	76%	76%	74%	64%
Private Off-Street	Weekday	28%	48%	48%	44%	34%
	Weekend	28%	44%	44%	40%	30%
NCTD Transit Lots	Weekday	43%	63%	63%	60%	24%
	Weekend	16%	31%	31%	33%	38%

Table 5 occupancy results shows, the Village Area experiencing higher demand for both on-street and off-street facilities. During the May 2018 weekend data, 8 of the 20 average occupancies were greater than 50 percent, some of which are approaching, though still several points below, the 85 percent effective capacity threshold. Given the weekday peak at 9 AM - 12 PM and weekend peak at 12 PM - 3 PM, parking within this area is overall underutilized and has availability in all facilities, as seen in ***Figure 3***. In reality, if area visitors, employees, and residents were aware of the available parking and willing to walk a little further to their desired destination, the parking system in this area could satisfy all of the demand generated within it.

Outside Master Plan Areas

Areas "outside" the master plan consists of predominately beach neighborhoods, with a couple residential areas north of the Village and south of the Barrio areas. The beach portion of this area is primarily bounded by the Pacific Ocean to the west, the railroad corridor to the east, Ocean Street to the north, and Tamarack Avenue to the south. Uses here include a mix of

residences, some businesses, and Army and Navy Academy facilities. The residential area north of the Village is generally east of Jefferson Street and north of Grand Avenue. The area south of the Barrio borders Tamarack Avenue and is centered around Jefferson Elementary School. Please refer to ***Figure 9*** for more detailed boundary information.

Table 6 below compares the May 2018 average parking occupancies throughout the day for each facility type within this area.

Table 6: May 2018 Weekday and Weekend Parking Occupancies by Facility Type

Outside Master Plan Areas (Predominately Beach Area)

PARKING TYPE	DAY	6 AM – 9 AM	9 AM – 12 PM	12 PM – 3 PM	3 PM – 6 PM	6 PM – 9 PM
On-Street	Weekday	32%	89%	56%	62%	77%
	Weekend	33%	82%	65%	71%	72%
Public Off-Street	Weekday	2%	28%	28%	20%	19%
	Weekend	2%	28%	28%	40%	22%
Private Off-Street	Weekday	12%	23%	23%	23%	23%
	Weekend	13%	21%	21%	32%	38%

Table 6 shows on-street facilities experiencing higher occupancy than the public and private off-street facilities. On-street facilities experienced demand as high as 89 percent for the peak weekday period (9 AM - 12 PM) and 82 percent for the peak weekend periods (12 PM – 3 PM). As for public and private off-street facilities, occupancies either remained consistent throughout the day for the weekday after 6 AM - 9 AM or experienced a moderate increase for the weekend in the evening. As previously mentioned, the weekend experienced an event at Jefferson Elementary during the day, which may be the result of the spike in on-street demand at 9 AM - 12 PM. Given the results from the 2018 data, some of the on-street facilities during the weekday peak (9 AM - 12 PM) are the only facilities that are overutilized as seen on ***Figure 3***. Otherwise, the parking system as a whole in this area has plenty of availability.

Areas East and West of the Railroad Tracks

The railroad tracks analysis consists of comparing occupancy data for both on and off-street parking facilities east and west of the railroad tracks. East of the tracks consists of Village and Barrio areas, while west of the tracks is predominately beach and a portion of the Village

neighborhood. A map of the boundary area used in the comparison analysis is shown in ***Figure 10***.

Figure 10: Areas East and West of the Railroad Tracks

East of the tracks analysis

In ***Table 7*** below, average occupancies east of the tracks generally increased for each facility type until the peak (12 PM – 3 PM) and then decreased in the evening. Of all parking types, public off-street facilities experienced the highest parking demands for both the weekday peak (9 AM – 12 PM) and weekend peak (12 PM – 3 PM).

Table 7: May 2018 Parking Occupancies by Facility Type East of the Tracks

PARKING TYPE	DAY	6 AM – 9 AM	9 AM – 12 PM	12 PM – 3 PM	3 PM – 6 PM	6 PM – 9 PM	9 PM – 11 PM (BARRIO ONLY)
On-Street	Weekday	42%	59%	67%	58%	55%	28%
	Weekend	41%	61%	74%	53%	53%	29%
Public Off-Street	Weekday	9%	74%	74%	75%	60%	0%
	Weekend	9%	75%	75%	69%	57%	0%
Private Off-Street	Weekday	32%	42%	42%	39%	23%	10%
	Weekend	32%	43%	43%	34%	18%	11%
NCTD Transit Lots	Weekday	43%	63%	63%	60%	24%	0%
	Weekend	16%	31%	31%	33%	38%	0%

The land uses of the area such as restaurants, offices, apartments, general retail and single-family homes and the event at Jefferson Elementary, may play a factor in the increasing occupancies throughout the day in the Village and Barrio areas. Although there are some facility type approaching the 85 percent effective capacity threshold, the system as a whole is underutilized for both weekday and weekend.

West of the tracks analysis

Table 8 compares average occupancy trends by facility type for both May 2018 weekday and weekend data.

Table 8: May 2018 Parking Occupancies by Facility Type West of the Tracks

PARKING TYPE	DAY	6 AM – 9 AM	9 AM – 12 PM	12 PM – 3 PM	3 PM – 6 PM	6 PM – 9 PM
On-Street	Weekday	28%	80%	54%	59%	75%
	Weekend	30%	82%	67%	73%	73%
Public Off-Street	Weekday	12%	46%	46%	54%	51%
	Weekend	16%	78%	78%	88%	87%
Private Off-Street	Weekday	13%	38%	38%	36%	36%
	Weekend	15%	36%	36%	44%	50%

In ***Table 8***, public parking, whether on-street or public off-street, experienced the highest parking demands of all facilities west of the railroad. Public off-street parking during the weekend reached consistent and high occupancies from 9 AM to 9 PM, with occupancies in the evening exceeding 85 percent. At 9 AM - 12 PM on-street parking occupancies for both the weekday and weekend, peaked at 80 and 82 percent, respectively. During the afternoon period, 12 PM – 3 PM, on-street facilities decreased and then increased again at 3 PM – 6 PM and into the evening.

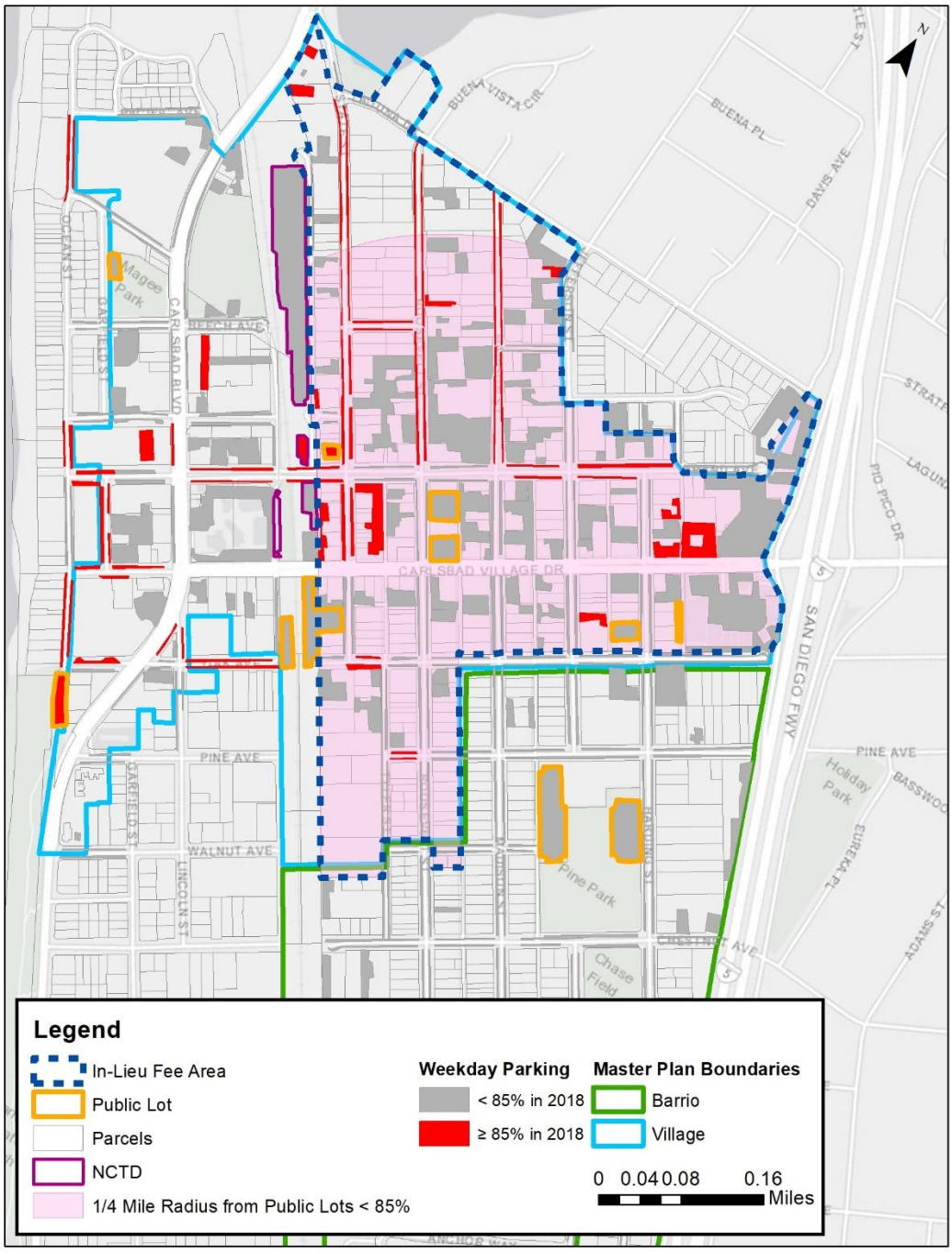
Similar to the "Outside Master Plan" analysis, the area West of the Tracks is predominately beach which is why this area experienced high public on-street and off-street parking demands. During the afternoon hours, on-street parking may be more "attractive" than public off-street; however, surrounding public and private off-street facilities have the availability to accommodate the area demands and still provide a comfortable walking distance to the beach areas.

In Lieu-Fee Program Areas

The Village and Barrio Master Plan's Parking In-Lieu Fee Program allows developers to pay for the construction of parking spaces that are not provided on-site, which can be used for shared or leased parking or other mobility improvements that reduce parking demand. Non-residential uses eligible to participate in the program may satisfy up to 100 percent of their parking requirement through payment of a fee. Participation is subject to requirements and findings, including a provision where the uses must be within a defined area of the master plan and must

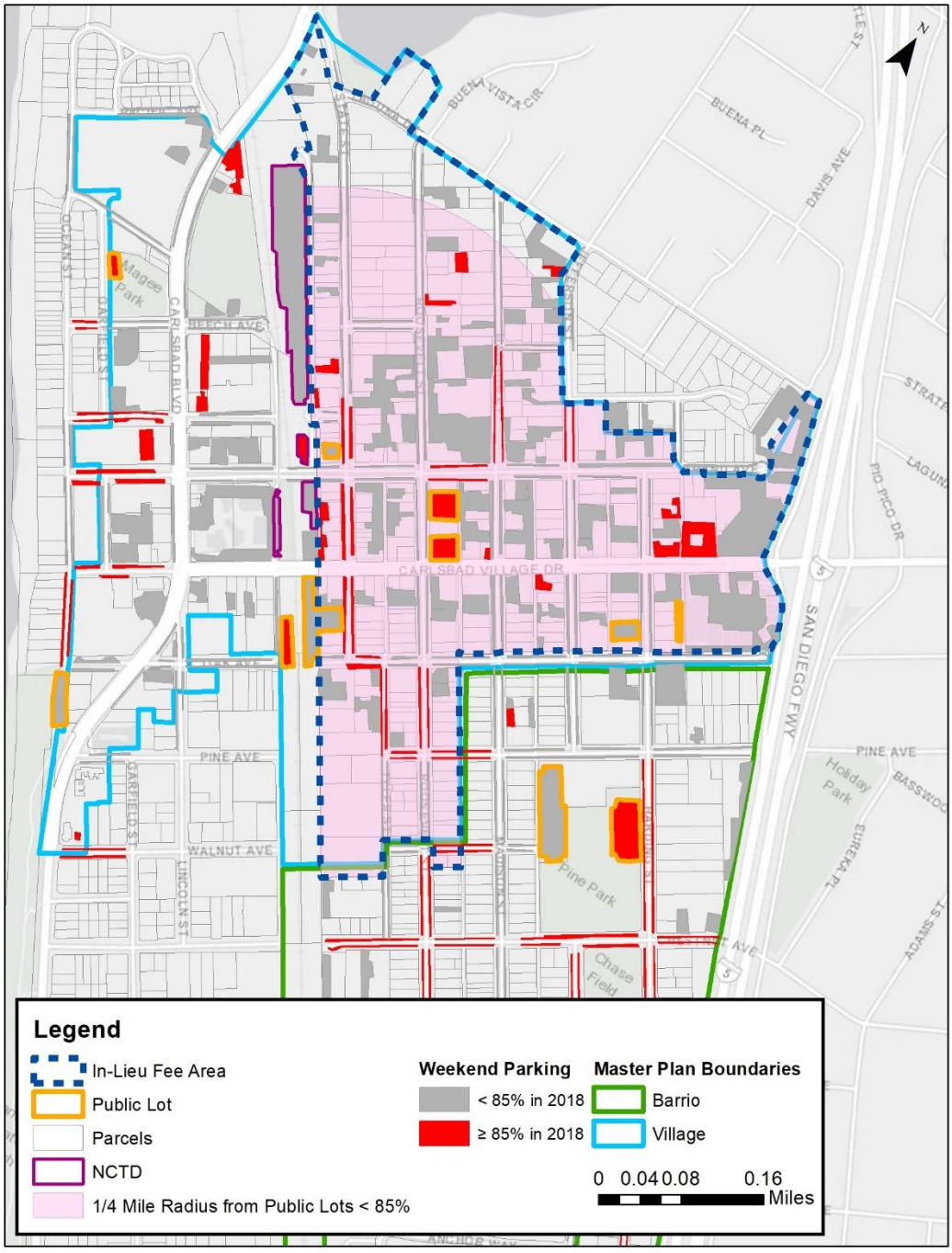
be within a quarter mile of an off-street public parking lot with an occupancy under 85 percent. ***Figures 11*** and ***12*** provide information to help determine eligibility and show that the vast majority of parcels are within a quarter-mile of a public lot with peak utilization under 85% with the exception of several parcels on the north edge of the in-lieu fee area along Laguna Drive and State Street. Complete information on the Parking In-Lieu Fee Program may be found in Section 2.6.6 and Table 2-4 of the Village and Barrio Master Plan. Further, eligibility to participate in the Parking In-Lieu Fee Program shall be verified with the city's Planning Division.

Figure 11: Parking In-Lieu Fee Program Information – May 2018 Weekday Parking



Note: Eligibility to participate in the Parking In-Lieu Fee Program shall be verified with the city's Planning Division.

Figure 12: Parking In-Lieu Fee Program Information - May 2018 Weekend Parking



Note: Eligibility to participate in the Parking In-Lieu Fee Program shall be verified with the city's Planning Division.

Average Parking Duration Comparison

Along with the occupancy data, the LPR technology also measures how long vehicles are parked in the study area. This data, known as *duration*, was analyzed for the on-street parking facilities. A duration of 2 hours or less is considered *short-term* parking. Comparing the May 2016 data to the May 2018 data, the average duration for the study area shows 65 percent of users parking for 2 hours or less, an increase of 2 percent from 2016. In the Village only, in 2016, 66 percent of patrons parked for less than 2 hours. In 2018, 76 percent of patrons parked for less than 2 hours in the Village area, an increase of 10 percent in short-term parkers. Although there were more short-term parkers overall, the study area experienced a small increase of 4 to 6-hour and 6 to 8-hour parkers. When analyzing the data by neighborhood, the "Outside Master Plan" area had the most patrons parking 4 to 6 hours while the Barrio had the highest percentage of patrons parking 10 to 12 hours.

The length-of-stay data for both May 2016 and May 2018 study areas for on-street facilities and by neighborhood is shown in ***Figures 11, 12, and 13*.**

Figure 11: Comparison by Year of Average Duration for On-Street Facilities

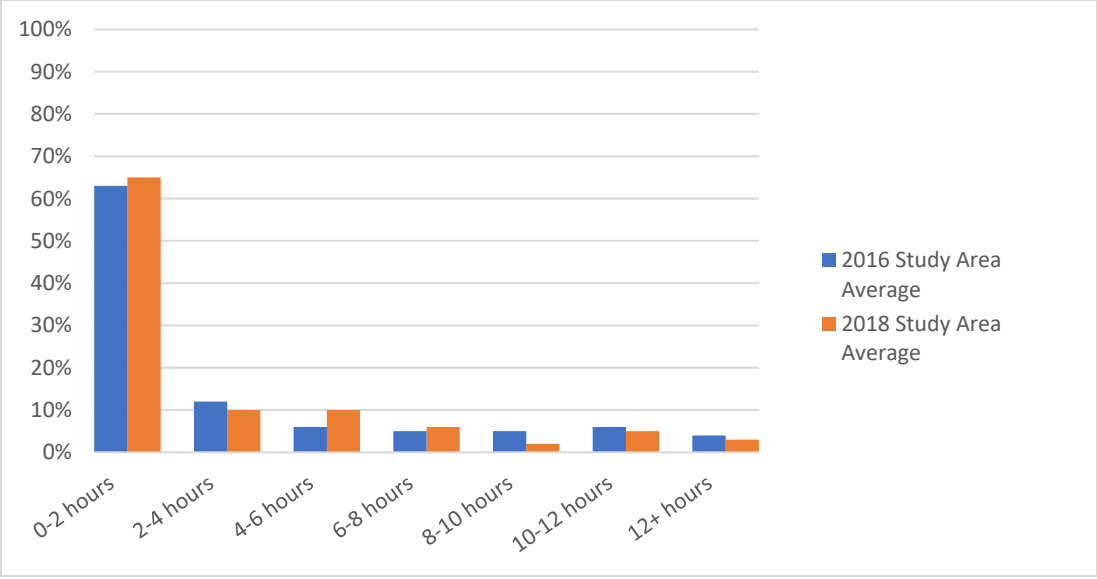


Figure 12: May 2016 Average Duration for On-Street Facilities by Area

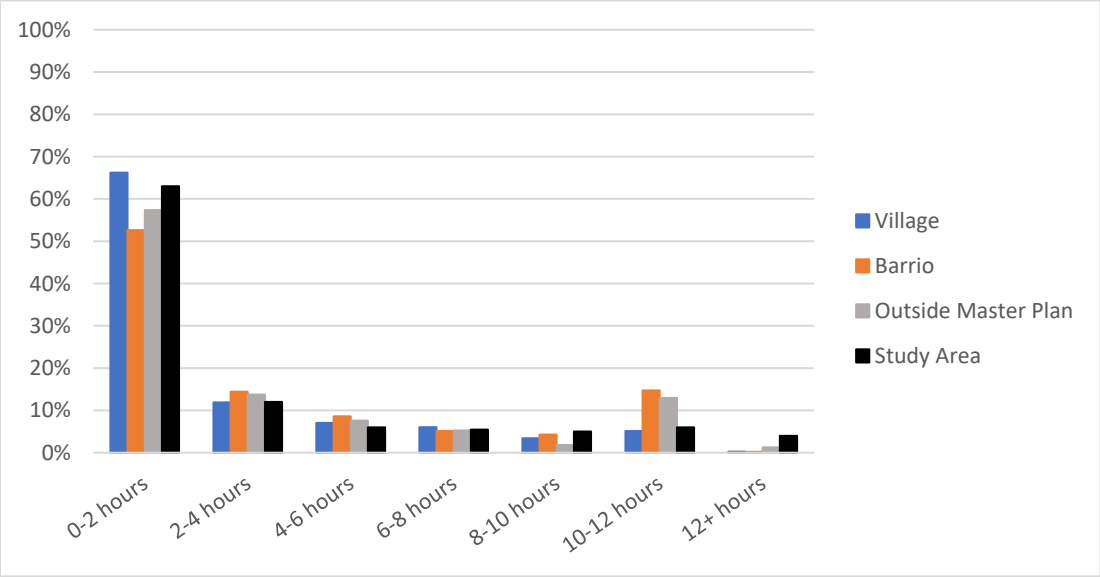
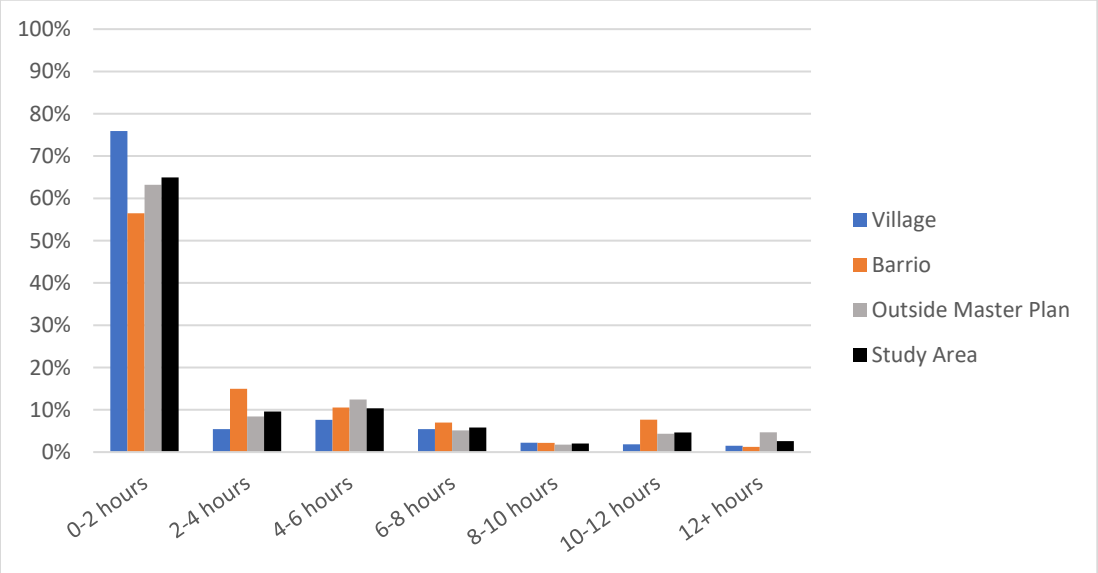


Figure 13: May 2018 Average Duration for On-Street Facilities by Area



Conclusions

The May 2018 results show the peak to be during the weekend at 12 PM – 3 PM with an observed occupancy of 56 percent; a 7 percent increase from the May 2016 weekend peak (49 percent at 6 AM – 9 AM). Although the increase in occupancy might be due to a variety of events occurring in the area throughout the weekend, the weekday data also shows an increase of 5 percent with a peak occupancy of 51 percent. The duration analysis indicates that in 2018 there was a 10 percent increase in short-term on-street parkers in the Village area, as indicated on page 34.

After comparing the May 2018 weekday peak (9 AM - 12 PM) data to May 2016 weekday peak (12 PM – 3 PM) data for on-street and off-street facilities with occupancies between 75 and 84 percent, the 2018 data experienced an increase of 7 percent. The 2018 data experienced 1,497 spaces of the total 11,462 spaces with occupancies between 75 and 84 percent for a total of 13 percent of the total spaces. During the May 2018 weekend peak (12 PM – 3PM), there were 86 facilities that experienced occupancies between 75 and 84 percent resulting in 26 percent of the total spaces for an increase of 18 percent compared to 2016 weekend peak (6 AM - 9 AM) data. Even though these facilities have not reached the 85 percent threshold, they should be monitored for additional increases in demand.

The May 2018 peak data for both weekday (9 AM – 12 PM) and weekend (12 PM – 3 PM) were analyzed and compared to the May 2016 weekday and weekend peak data (12 PM – 3 PM and 6 AM - 9 AM) for occupancies greater than 85 percent. The 2018 weekday data resulted in 50 facilities (14 percent of total spaces) with occupancies over 85 percent for a total increase of 8 percent compared to 2016 data (6 percent of total spaces). As for the weekend data, 2018 experienced 80 facilities over 85 percent, 2,735 spaces out of the 11,462 total spaces, which was a 16 percent increase compared to 2016 data (895 spaces of 11,657 total spaces). For the facilities that have reached or exceeded the 85 percent threshold, parking management strategies should be considered where appropriate. Despite these pockets of demand and the unusual level of special event activity in May 2018, there were no areas without available supply in close proximity and within a comfortable walking distance.

Along with the effective capacity threshold analysis, the sub-area analysis resulted in their own conclusions after separating the data differently. The Barrio and “Outside Master Plan” areas experienced high on-street demands during both the weekday and weekend peak hours; however, many events occurred in these areas throughout the day that may have impacted the results. In the Village area, some facilities observed higher occupancies than others, some which were approaching the 85 percent threshold. Although, these higher occupancy, “more

attractive" facilities may frustrate the search for available parking, the overall parking system within the Village area is underutilized.

Similar to the Village area, the East and West of the tracks analysis showed public facilities experiencing higher demands; however, overall parking remains underutilized.

The comparison of the data collected for May 2016 and May 2018 may suggest an increasing demand for parking in the study area. If the increased demand continues during the 2018 peak season and/or the 2019 off-peak season, additional parking management strategies could be useful to manage high-demand areas.