



City of Portsmouth, NH

PARKING SUPPLY AND DEMAND ANALYSIS FINAL REPORT

January 2012



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INTRODUCTION

The City of Portsmouth retained Nelson\Nygaard to conduct a downtown parking supply and demand analysis. The work was conducted from October 2011 to December 2011 and is intended to help inform the City of Portsmouth's assessment of the need to provide additional off-street parking to accommodate existing development and future growth.

The supply and demand analysis is a continuation of the work that Portsmouth has completed to date in evaluating its parking supply. In 1998, the City conducted a Downtown Parking Study to assess existing conditions and project future parking requirements. The report concluded that additional downtown parking facilities were necessary to meet projected parking demand. The City then took several measures to expand the supply, including entering into a number of shared parking agreements, expanding the High-Hanover Parking Facility, and evaluating a number of private and public sites for feasibility in constructing a second public parking facility.

In 2010, the City established a focus group to compile data and evaluate existing parking supply in *A Report on Parking Impacts and Downtown Vitality*. This report recommended that the City plan the downtown parking supply based on a proposed ratio of 2.0 to 2.2 parking spaces per 1,000 square feet of building floor area, regardless of use, and determined that the existing parking supply shortfall was between zero and 300 spaces. The report recommended that the City move immediately to create additional off-street structured public parking, and work to identify additional areas for another future parking structure.

Following these reports, the City Council, Planning Board, and Economic Development Commission created the *Downtown Parking Omnibus* in 2011 that culminated in several recommendations, including zoning amendments and management strategies. The City Council implemented several ordinance changes. As a result of these recommendations, the City Council was to explore the need to assess parking supply and demand. The following report is an independent review of the City's existing and projected parking supply and demand, and whether or not its supply is adequate for its current and projected land use.

PROJECT PURPOSE

The Parking Supply and Demand Analysis report is not a comprehensive parking study, nor does it make recommendations on how Portsmouth should manage its parking supply and demand.

The purpose of this report is to:

- Estimate the existing private and public parking supply in the downtown
- Collect and analyze parking demand and utilization data in the downtown
- Identify whether or not there is an observed shortfall of parking in the downtown
- Identify sub-areas that may need additional parking spaces due to development projects in the pipeline

SUMMARY FINDINGS

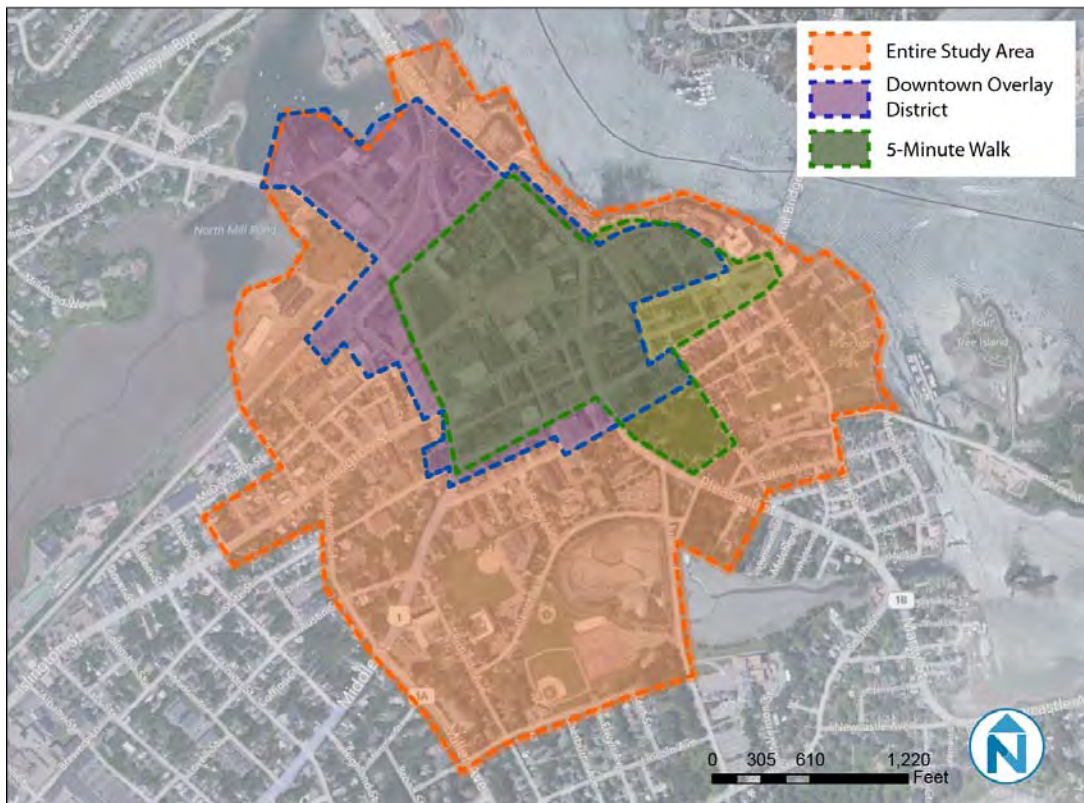
The findings below are highlights of the findings from the parking supply and demand data collection and analysis effort. Detailed findings and methodologies can be found in the sections that follow these summary findings.

STUDY AREA

The parking supply and demand study focused on three distinct areas, shown in Figure 1:

1. The study area is bounded by the Piscataqua River, the North Mill Pond, the South Mill Pond, and Miller Avenue.
2. The Downtown Overlay District covers a smaller area (a sub-area of the study area), bounded by Court Street to the south, Bridge Street to the west, North Mill Pond to the north, and the River to the east.
3. The 5-Minute Walking area is a 1/4 mile walking boundary from Market Square (a sub-area of the study area). This area is generally bounded by Deer Street to the north, the River to the east, State Street to the south, and Maplewood to the west.

Figure 1 Portsmouth Study Area



PARKING SUPPLY

The parking inventory identified Portsmouth's parking supply as:

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- 5,663 total public and private spaces in the study area
- 3,578 spaces in the Downtown Overlay District
- 2,438 spaces in the 5-Minute Walking Area

Most parking spaces in Portsmouth are off-street (79% of spaces, or 4,445 spaces). These spaces are controlled by a variety of off-street regulations, categorized as public/not time-limited, customer only, customers/employees, employee only, permit only, residential, and residents/employees. Almost half of off-street spaces, or 2,177 spaces, are dedicated to employee and customer parking, and 38% of off-street spaces are publicly-available.

The 1,208 on-street spaces in Portsmouth are categorized by five distinct on-street regulatory categories (15-minutes, 30-minutes, 2-hours, 4-hours, residential-only), plus unregulated spaces. About 95% of on-street spaces are publicly available. Nearly 60% of all on-street spaces are time-limited; most are for two hours or less.

One third of all spaces (1,875 spaces) are publicly-available, on- or off-street, without time-limits (besides a 72-hour storage limit). Over half (1,107 spaces) of these unlimited spaces are contained within the High-Hanover Garage and the Portwalk lot, which are both pay facilities.

PARKING DEMAND

Based on observed demand, as well as garage occupancy data provided by the City, the Study Area's peak utilization occurs at mid-day (12PM) and again in the evening (8PM) on the weekday, and in the evening (6-8PM) on the weekend.

On the weekdays, peak utilization reaches 65%. On the weekends, demand peaks at 69% overall. However, when looking at on-street spaces only, weekend utilization peaks at 90%.¹ On-street spaces always have a higher demand than off-street spaces (65% vs. 60% on the weekday and 90% vs. 65% on the weekend). When comparing peak utilization of publicly-available spaces versus use-restricted or private spaces, public parking spaces have a slightly higher utilization than private spaces (65% vs. 55%).

Demand in the sub-areas also have distinct utilization patterns. The Downtown Overlay District has slightly lower utilization on the weekend (peaks at 75% at noon) than the overall study area. During the week, the 5-Minute Walking Area reaches capacity for on-street parking at 8PM (90%), but public and private off-street utilization is low throughout the day.

Utilization of the High-Hanover Garage is moderately high on a weekday, but still below capacity at 78% at 12PM; however, on the weekend utilization increases to 88% at peak, nearing full capacity.

LAND USE ANALYSIS

The land use analysis examines the relationship among land use, parking supply, and parking demand (estimated and observed). This analysis relates the parking demand to surrounding land uses and national standards to determine if the parking supply is sufficient. This data is incorporated into a Shared Parking Model to more accurately estimate the parking demand of a mixed-use downtown like Portsmouth's. Figure 2 below shows land use and parking information

¹ Best national parking management practice suggests that parking is functionally full at 85% on-street (about one of every seven spaces is available) and 90% off-street.

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for three distinct areas, the Study Area, Downtown Overlay District, and 5-Minute Walking area. With the exception of the 5-Minute Walking area, Portsmouth's current supply of parking exceeds the Institute of Transportation Engineers' (ITE's) estimated demand for the sum of these land uses, irrespective of their local context.

Figure 2 ITE Estimated Parking Demand by Land Use Type

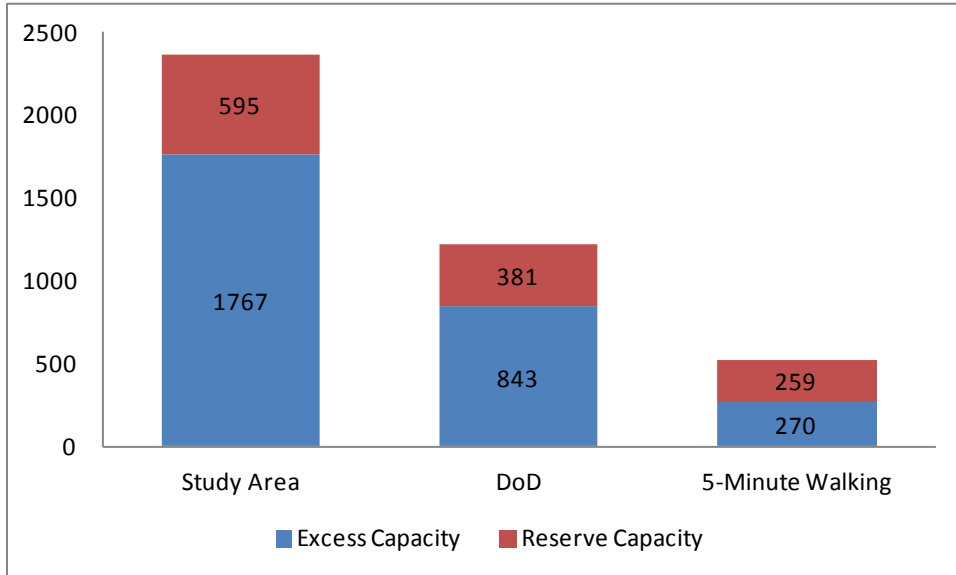
Land Use	Study Area	Downtown Overlay District	5-Minute Walking
Commercial	3,071	2,012	1,727
Industrial/Office	1,660	956	768
Residential	404	222	60
TOTAL (ITE Estimate)	5,135	3,191	2,555
<i>Existing Supply in Portsmouth</i>	<i>5,663</i>	<i>3,578</i>	<i>2,428</i>

Using this land use information and existing parking supply by sub-area, a shared parking model was developed to estimate how parking spaces typically serve multiple uses in a mixed-use downtown, thereby reducing the total number of spaces required compared to the same uses in stand-alone developments. This is a primary benefit in mixed-use development contexts of moderate-to-high density, like Portsmouth's. The results of the shared parking analysis for the sub-areas reveals lower parking need than an unadjusted ITE analysis would project. However, the story for downtown is still clear: the closer to the core of downtown Portsmouth, the more constrained the parking situation.

Figure 3 shows each sub-area's available effective capacity, i.e. the number of excess parking spaces that are effectively available, based on sharing parking. A "reserve" of 10-percent of the available supply is not considered as spare capacity as parking operators nationwide consider a facility effectively full at 90-percent of capacity. Given this analysis, there would be 1,767 available spaces (plus reserve) in the Study Area; 843 spaces (plus reserve) in the Downtown Overlay District; and 270 spaces (plus reserve) in the 5-Minute Walking Area. This includes the existing estimated property vacancy rates, so if the vacant units and offices in downtown today were to become active, there would be less excess parking than shown.

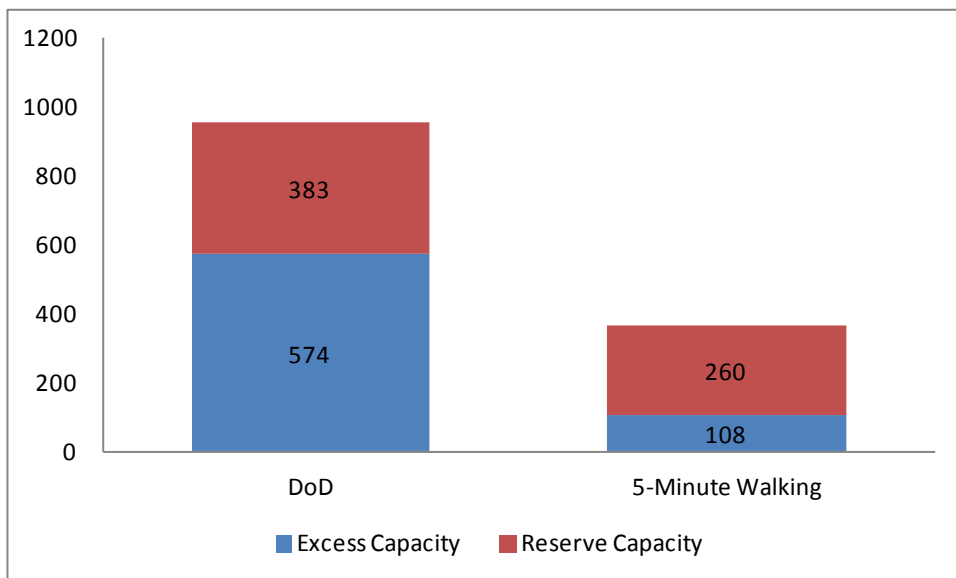
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Figure 3 Available Capacity Today (Number of Parking Spaces) With Today's Vacancy Rates



When including future development in the Downtown Overlay District and the 5-Minute Walking Area, there is less capacity than today. The figure below shows the number of available parking spaces after the future development is built, plus if all properties are 100% occupied (no vacancies). There would be 574 available spaces in the Downtown Overlay District, and 108 excess spaces in the 5-Minute Walking Area (plus reserve for each sub-area).

Figure 4 Available Capacity in the Future (Number of Parking Spaces) With Full Occupancy of Vacant Space



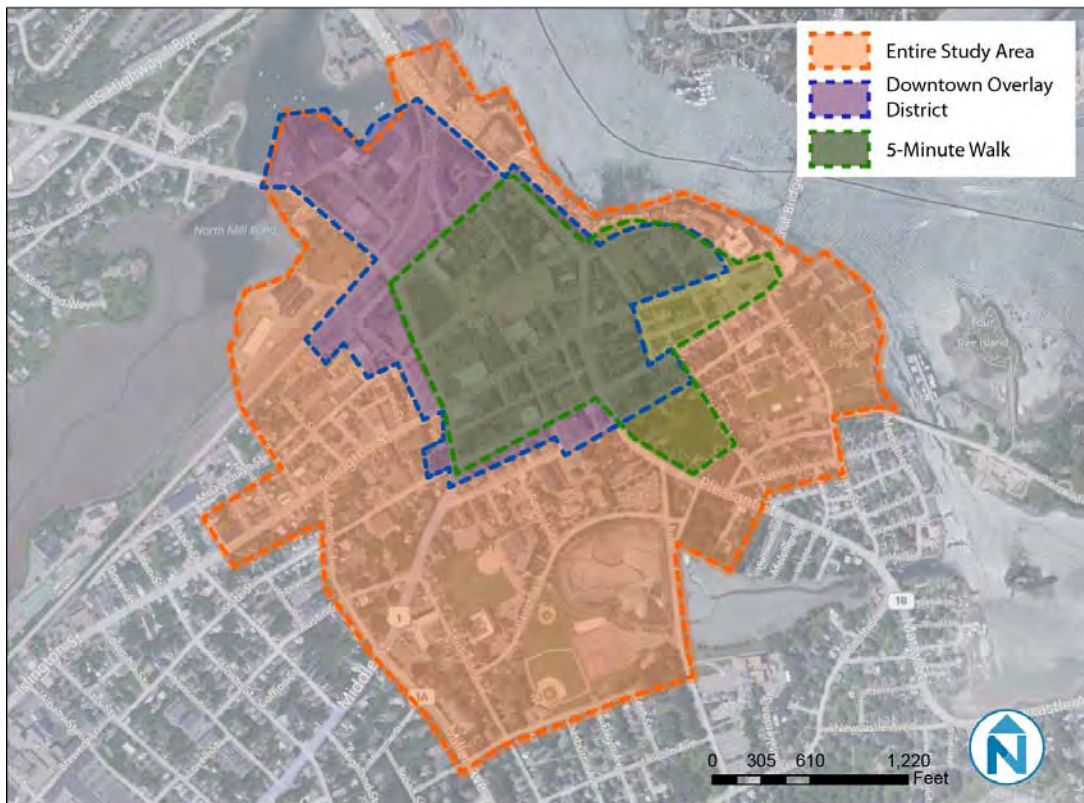
PARKING SUPPLY AND DEMAND

STUDY AREA

The parking supply and demand study focused on three distinct areas, shown in Figure 5:

1. The study area is bounded by the Piscataqua River, the North Mill Pond, the South Mill Pond, and Miller Avenue.
2. The Downtown Overlay District covers a smaller area, bounded by Court Street to the south, Bridge Street to the west, North Mill Pond to the north, and the River to the east.
3. The 5-Minute Walking area is a 1/4 mile walking boundary from Market Square. This area is generally bounded by Deer Street to the north, the River to the east, State Street to the south, and Maplewood to the west.

Figure 5 Portsmouth Study Area



The parking inventory includes all on-street spaces and any off-street spaces in lots, garages, or driveways that contained more than three spaces. Single-family residential driveways were excluded. This inventory included a total of 5,663 spaces, of which 2,825 are publicly-available and 2,838 spaces are private or permitted.

Figure 6 Study Area Supply²

Type	Spaces
Off-Street	4,455
On-Street	1,208
TOTAL	5,663

REGULATIONS

The use category and regulation were recorded for all spaces (Figure 8). In addition to public parking with no time limits, five on-street regulations were noted, as well as nine off-street regulations for reserved use, or private spaces. A few of the regulations apply to both on-street and off-street, such as some time-limited spaces. The regulations include 15-minute, 30-minute, two-hour, 4-hour, customer, customer/employee, permit, residential, and residential/employee. A third of all the spaces are unrestricted and available to the public for free or a fee. Included in the supply are 101 handicap spaces available in the study area.

The largest paid parking facility that exists in Portsmouth is the High-Hanover Garage, which has 902 spaces. Hourly and monthly rates are available. Monthly permits are for purchase (\$100 per month for 24-hour access; \$80 per month for 7AM - 7PM access; \$50 per month for 7PM - 7AM access) or visitors may pay \$0.75 per hour.

There are also a variety of off-street parking facilities, particularly lots of varying sizes. A summary of the number of spaces in each lot is in Figure 7.

Figure 7 Number of Lots by Number of Spaces (Entire Study Area, Publicly and Privately Held)

Lot Size	Number of Lots
100+ spaces	5
75-99 spaces	6
50-74 spaces	10
25-49 spaces	21
Less than 25 spaces	87

² The following supply and demand data is not included in this study: the HarborPlace Residential Garage (garage is gated off and the consultants were not able to access it), the lot at Islington Street and Tanner Street (under construction), and the lot adjacent to the Portwalk Lot on Hanover Street (hotel parking under construction).

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Figure 8 also includes the regulations in the Downtown Overlay District. The majority of public and customer parking is available in the Downtown Overlay District, while only a small portion of the dedicated employee and residential parking is available in this area.

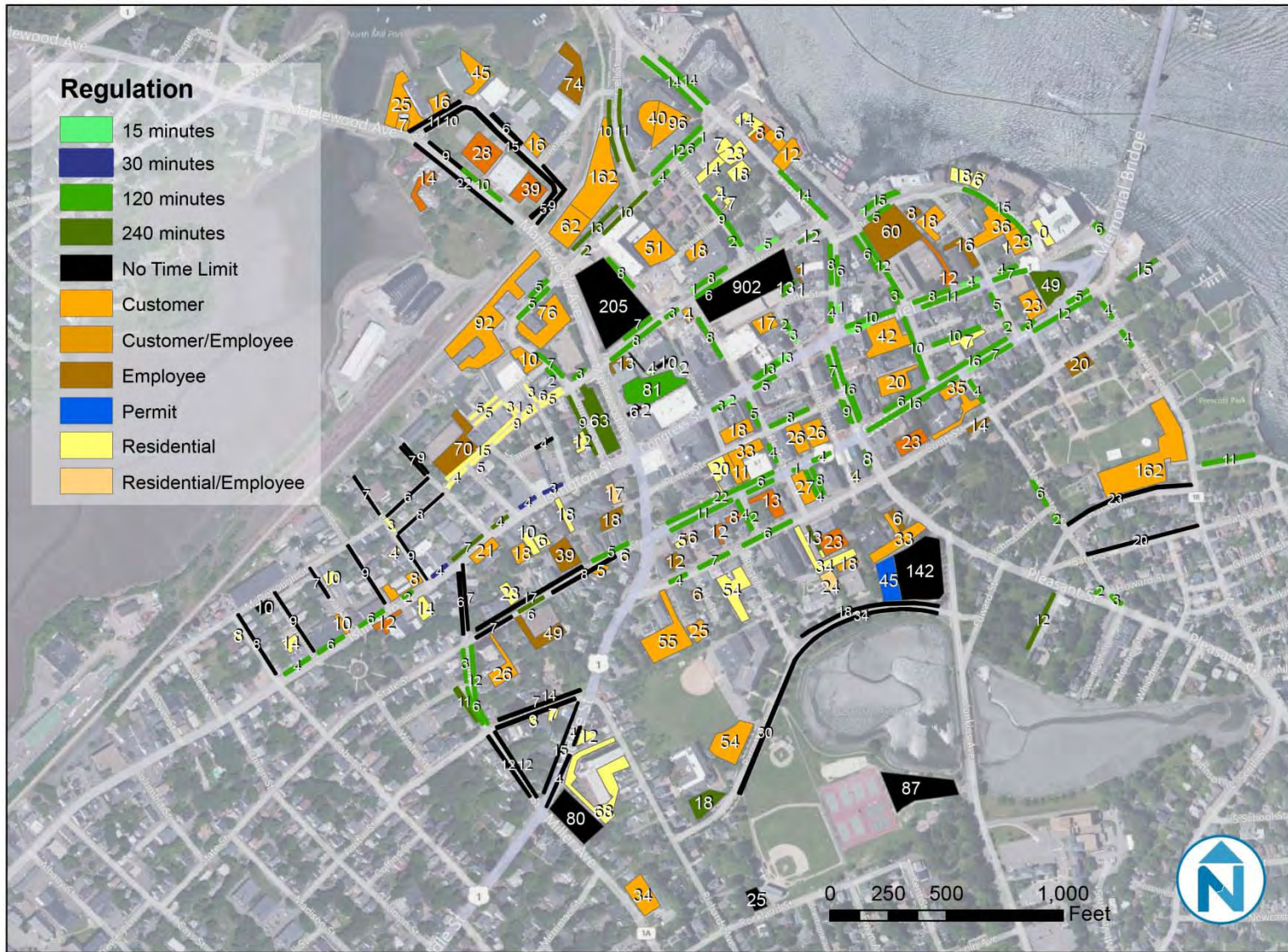
Figure 8 Inventory by Regulation

Regulation	Study Area	Downtown Overlay District
120 minutes (free and paid)	727	563
15 minutes (free and paid)	37	35
240 minutes (free and paid)	238	118
30 minutes (free)	11	0
Customer (private)	1,572	1,080
Customer/Employee (private)	195	160
Employee (private)	410	225
Permit (school employees)	45	0
Residential (private)	512	170
Residential/Employee (private)	41	17
No Time Limits (free and paid)	1,875	1,210
TOTAL	5,663	3,578

The full parking inventory is depicted in the parking regulatory map below (Figure 9). The grey numbers on each lot and on-street segment represent the total number of spaces for that particular lot or on-street segment.

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Figure 9 Parking Regulations



PRIVATE VS. PUBLIC

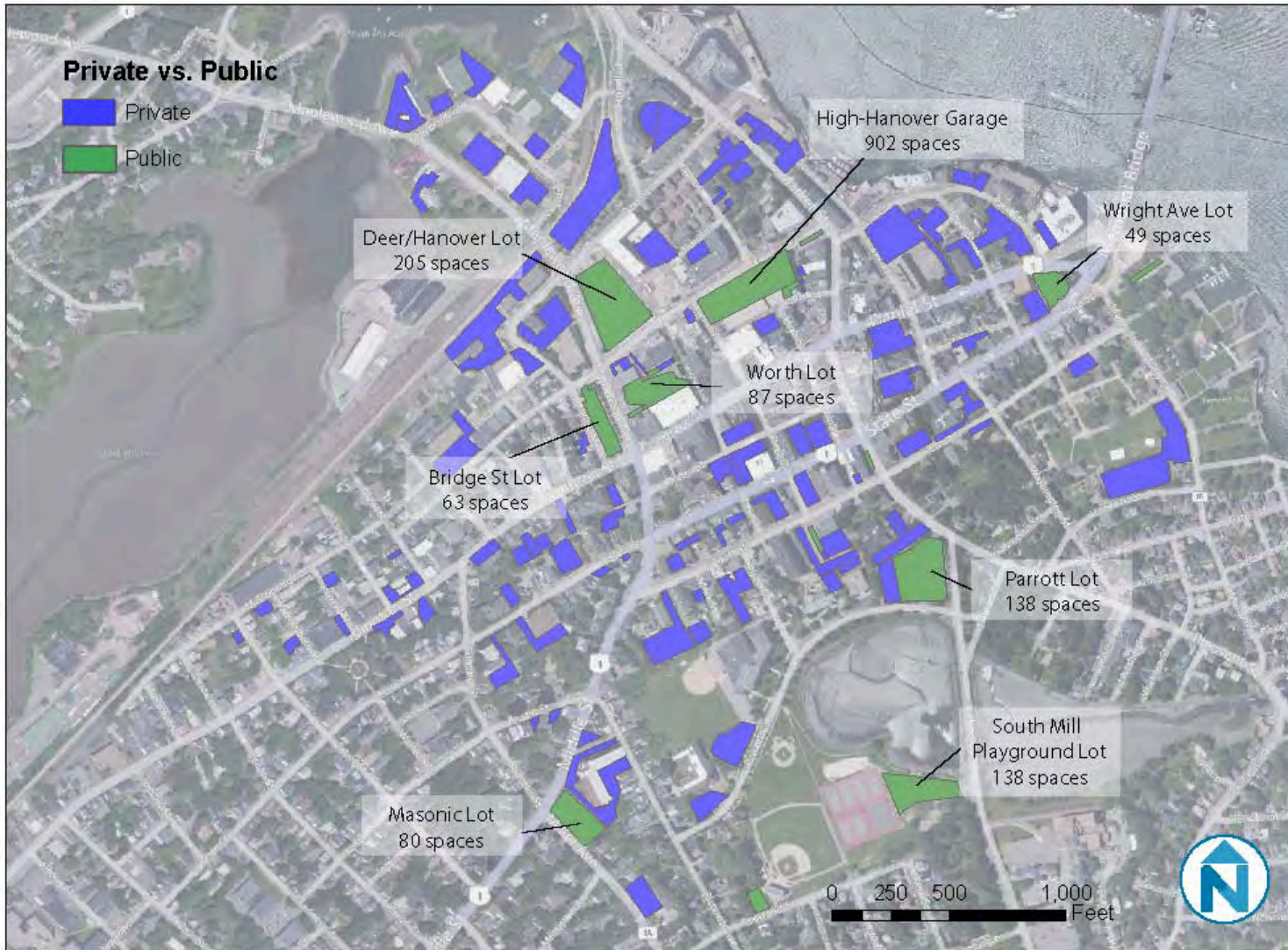
As noted in Figure 10, Portsmouth has an almost equal split of public (those spaces available for public use) and private (those spaces limited to reserved uses, such as customer or permit). Figure 10 depicts the location of both public and private parking. There is a substantial amount of public parking both on-street and off-street in Portsmouth.

Figure 10 Private vs. Public Supply

Type	Spaces
Publicly Available	2,825
Private/Reserved Use	2,838

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Figure 11 Private vs. Public Parking



PARKING UTILIZATION PATTERNS

In order to eliminate the perception that parking is not available, it is ideal to have at least one empty space per block face in a downtown, ensuring easy customer access to businesses. This typically equates to about 1 out of 8 on-street spaces free, or a target of 15-percent vacant per block face. Similarly, a goal of at least 10-percent vacancy in off-street lots is optimal. If any facility has less availability, it is effectively at its functional capacity.

To determine availability of parking in Portsmouth, consultants conducted parking utilization counts in October 2011. On a weekday (Thursday) all parked cars within the study area were counted every two hours between 8AM and 8PM. On a weekend day (Saturday) all parked cars within a modified study area were counted every two hours between 10AM and 8PM.

Results from the parking utilization counts are shown below.

Study Area Utilization Profiles

As shown in the charts below, of all 5,663 on-street and off-street spaces in the Portsmouth study area, the observed maximum utilization is 65-percent (3,371 spaces) – which occurs at noon (Figure 12). On the weekends, demand peaks at 69% overall at 6PM (Figure 13).

Figure 12 Study Area: Weekday

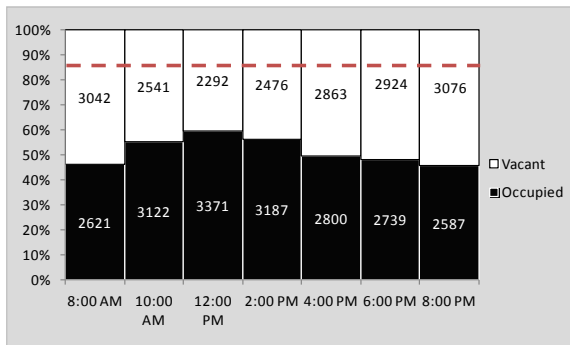
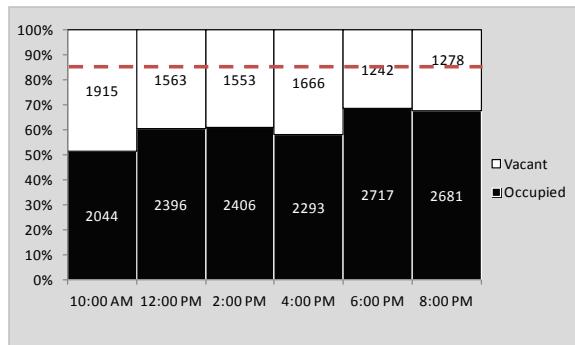


Figure 13 Study Area: Weekend



These utilization patterns include all inventoried spaces – both public and private. Compared to the ideal occupancy (shown by the red dotted line), these results indicate that for the majority of the time Portsmouth has more than adequate parking supply to satisfy its demand.

Figure 14 and Figure 15 show the weekday utilization profile for all on-street and off-street spaces, which never reaches more than 65%. Both on-street and off-street parking utilization steadily increases in the morning and peaks at 12PM; however, off-street parking utilization declines after 12PM, while on-street parking utilization remains relatively constant at around 65% utilization.

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Figure 14 Study Area: Weekday On-Street

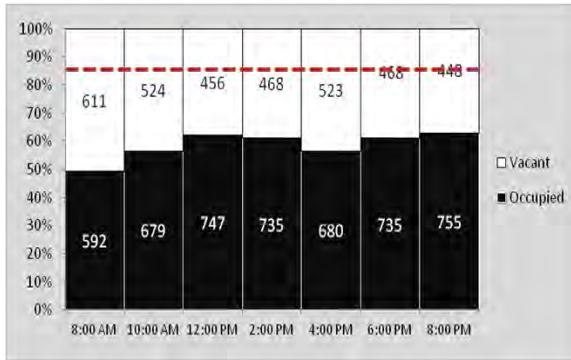
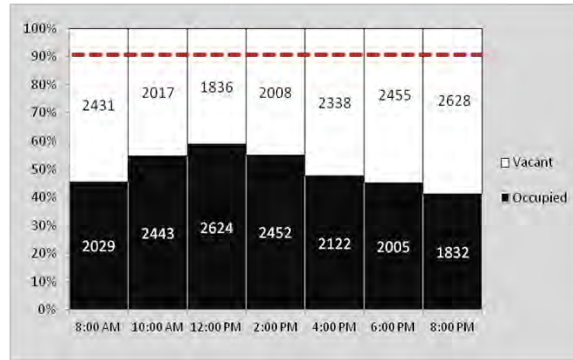


Figure 15 Study Area: Weekday Off-Street



As shown in Figure 16 and Figure 17, on the weekend, a peak utilization of 90% utilization (553 spaces) occurs in on-street spaces around 8PM. On-street parking is heavily used on the weekend, increasing steadily from the morning into the evening and peaking above the ideal utilization level; however there is ample parking available off-street throughout the day.

Figure 16 Study Area: Weekend On-Street

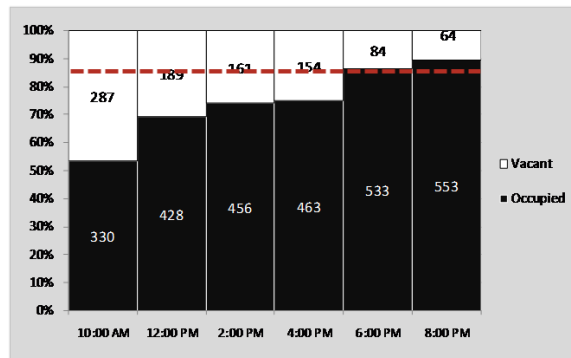
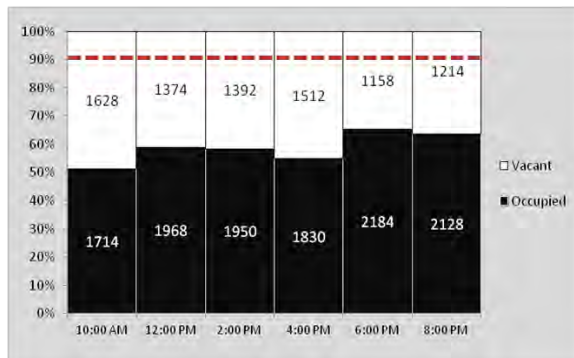


Figure 17 Study Area: Weekend Off-Street



Private vs. Public

During the week, both private and public parking spaces are used similarly (Figure 18 and Figure 19); neither reaches a higher utilization than 53% at 12PM. Public on-street and off-street spaces (Figure 20 and Figure 21) show that off-street spaces are slightly better utilized. Figure 22 and Figure 23 compare the utilization patterns between time-limited spaces (15 minutes, 30 minutes, two hours, and four hours) to unlimited (72 hour) spaces. The unlimited spaces are better utilized throughout the day.

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Figure 18 Study Area: Weekday Private

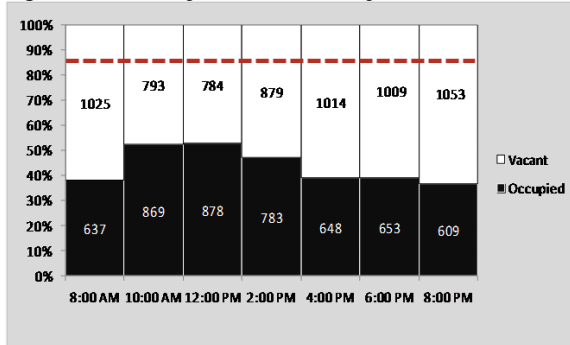


Figure 19 Study Area: Weekday Public

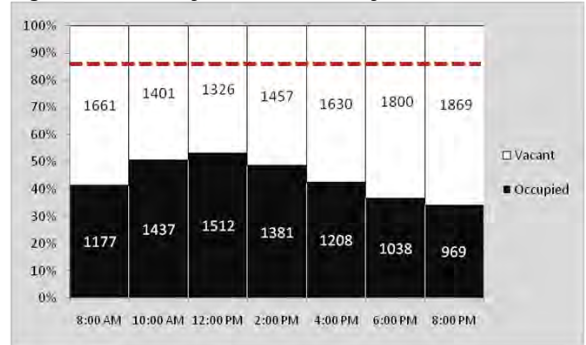


Figure 20 Study Area: Weekday Public On-Street

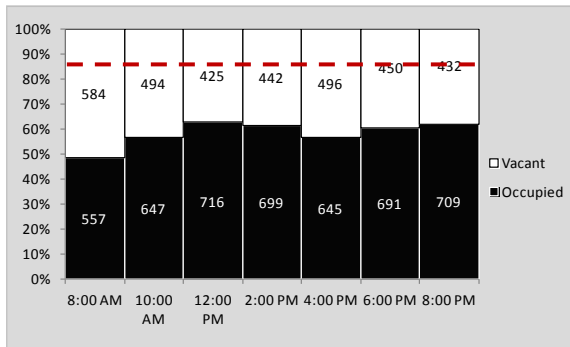


Figure 21 Study Area: Weekday Public Off-Street

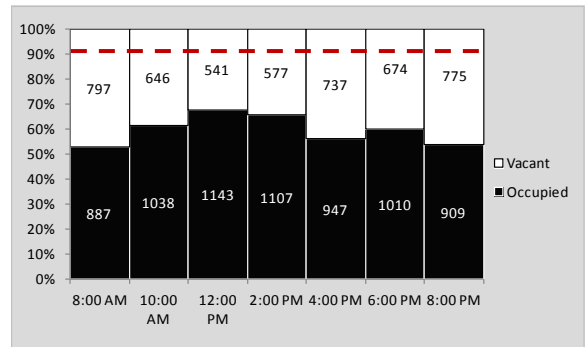


Figure 22 Study Area: Weekday Public Time-Limited Spaces

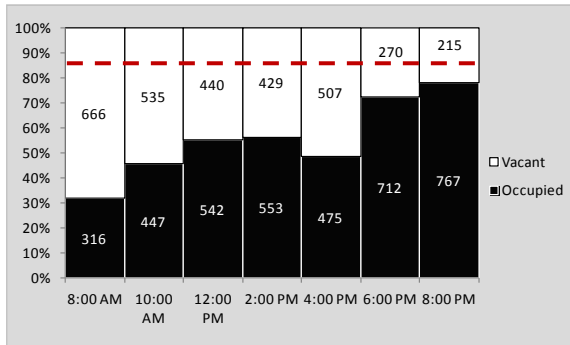
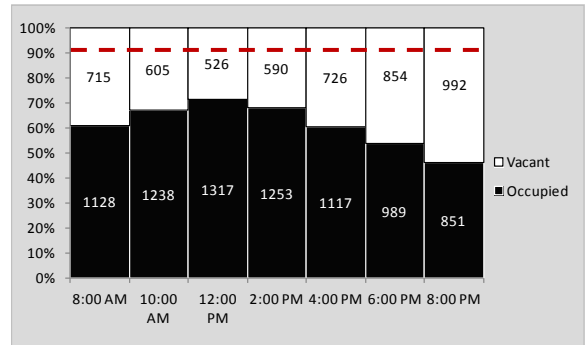


Figure 23 Study Area: Weekday Public Unlimited (72hr) Spaces



Downtown Overlay District Utilization Profiles

Although utilization across all of Portsmouth demonstrates that there is plenty of parking available, a snapshot of the study area does not accurately represent a visitor's actual parking experience. Most customers come to downtown Portsmouth to patronize the shops and restaurants within the Downtown Overlay District (DoD), so they are likely to park in a lot or on-street in this area.

Weekday

During the week, the off-street parking in both the Downtown Overlay District and the surrounding spaces have similar utilization patterns, although in the evening people are more likely to park in the Downtown Overlay District (as shown in Figure 24 and Figure 25).

The difference in use of parking within the Downtown Overlay District is more apparent for on-street parking; the Downtown Overlay District parking reaches a peak of 75% during the evening hours (Figure 24), while the surrounding area spaces never reach more than 60% and drop to 50% during the evening hours (Figure 27). During this peak evening period there is plenty of off-street parking available in both the Downtown Overlay as well as the entire study area, as shown by Figure 28 and Figure 29.

Figure 24 DoD: Weekday

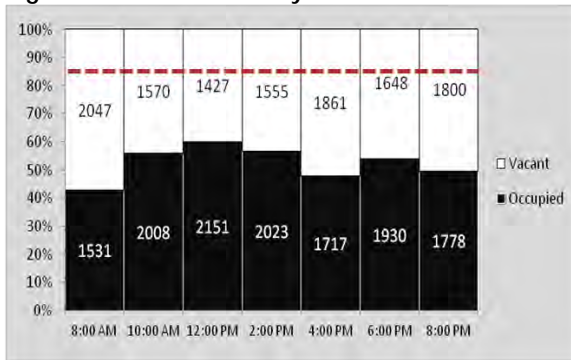


Figure 25 Surrounding: Weekday

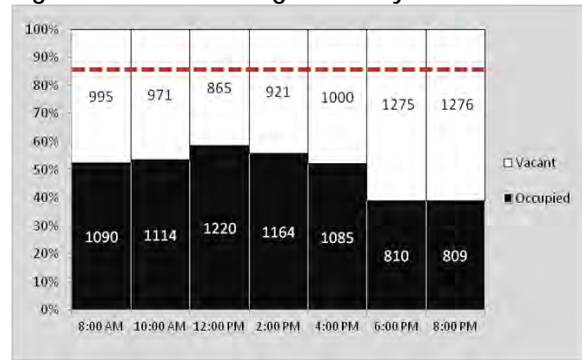


Figure 26 DoD: Weekday On-Street

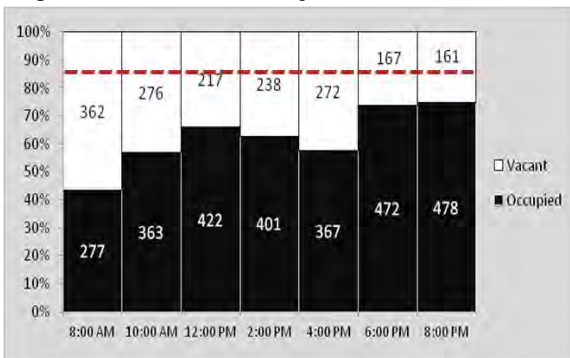
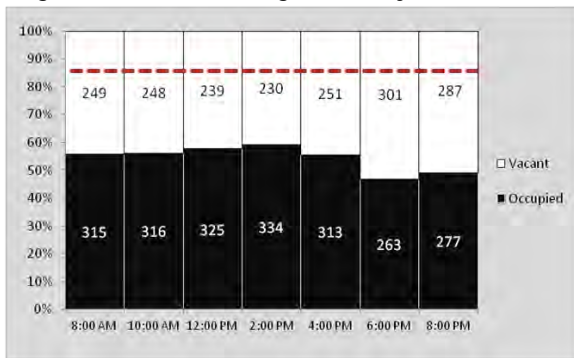


Figure 27 Surrounding: Weekday On-Street



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Figure 28 DoD: Weekday Off-Street

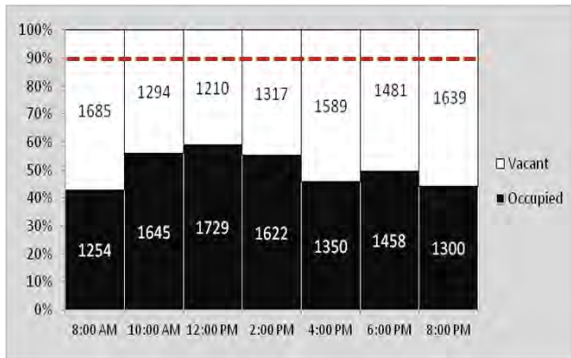
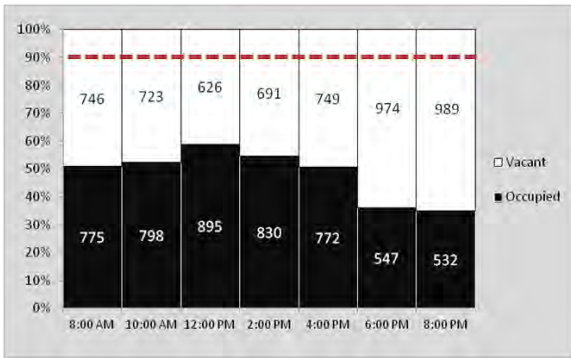


Figure 29 Surrounding: Weekday Off Street



Weekend

As shown in Figure 30 and Figure 31, on the weekend, the Downtown Overlay District has heavier use than surrounding spaces. On-street spaces within the Downtown Overlay District have increasing utilization throughout the day and peak at 8pm at 90%, which is over ideal capacity, as shown in Figure 32). Even the on-street spaces in the surrounding area reach capacity during this time (Figure 33). But even though on-street spaces on the weekend are heavily used and reach capacity during the evening, off-street spaces have availability throughout the day, inside the Downtown Overlay District and in the surrounding spaces (Figure 34 and Figure 35).

Figure 30 DoD: Weekend

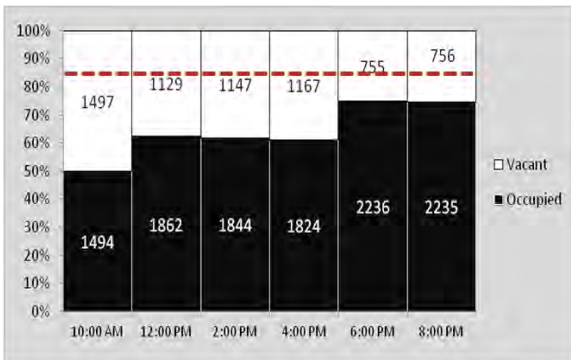
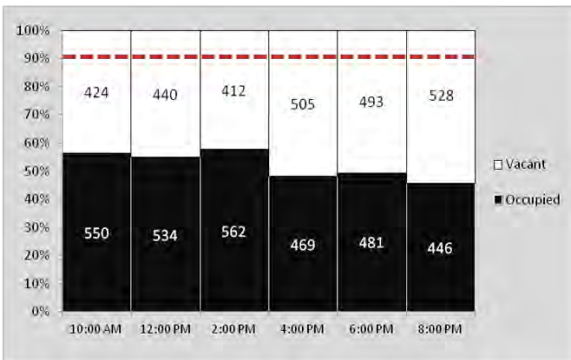


Figure 31 Surrounding: Weekend



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Figure 32 DoD: Weekend On-Street

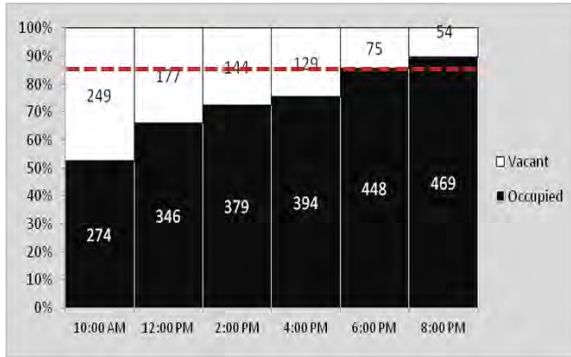


Figure 33 Surrounding: Weekend On-Street

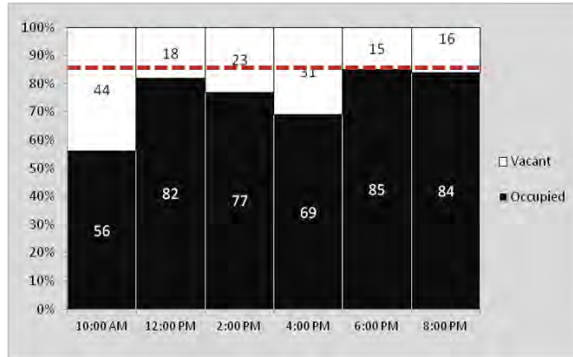


Figure 34 DoD: Weekend Off-Street

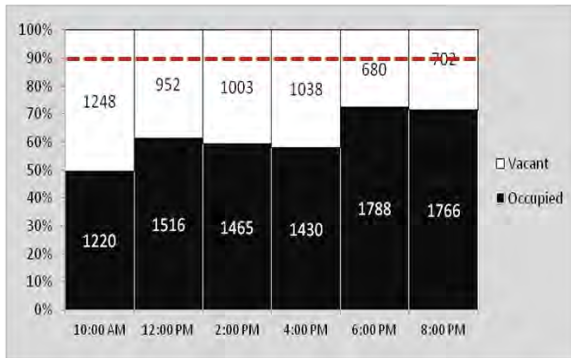
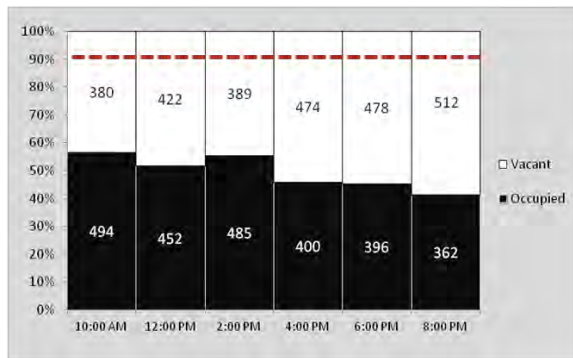


Figure 35 Surrounding: Weekend Off-Street



5-Minute Walk Utilization Profiles

The 5-minute walking area shows the area within a 1/4 mile walk in each direction from Market Square, the heart of Downtown Portsmouth. This area is the center of shopping, dining, and entertainment and has the heaviest foot traffic during the day and at night.

Weekday on-street parking within the 5-minute walk reaches near capacity during the evening hours from 6PM to 8PM, as shown in Figure 36; however, there is public and private parking available in the parking lots within the same 5-minute parking area, as shown in Figure 37.

Figure 36 5-Minute Walk: Weekday On-Street

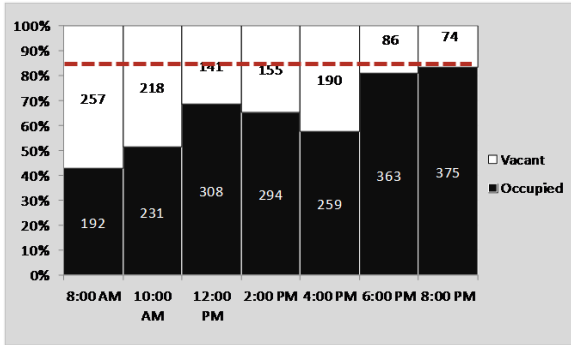
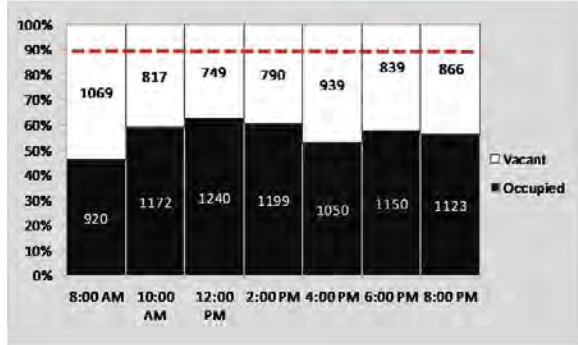


Figure 37 5-Minute Walk: Weekday Off-Street



High-Hanover Garage Utilization Profiles

High-Hanover Garage experiences varied utilization throughout the weekday, and heavy utilization on the weekend. During the week, the High-Hanover Garage reaches a peak of 78% at 12PM (Figure 38), and on the weekend it reaches a peak of 88% at 6pm (Figure 39), which is near ideal utilization (90%); where the garage still have some availability and parking resources are being used efficiently).

The Garage utilization data was provided by the City entry/exit receipts for the same days that parking utilization data for the rest of the Study Area was collected. Additional entry/exit receipt data was provided for the months of October 2010 - October 2011.

Figure 38 High-Hanover Garage: Weekday

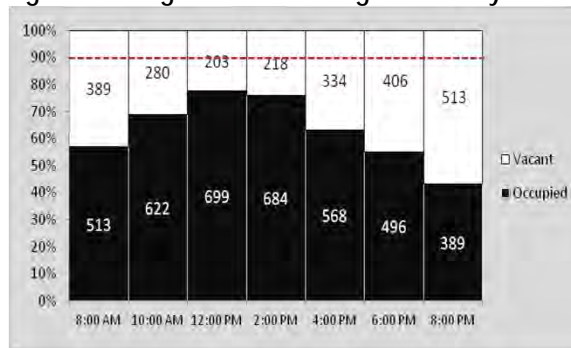
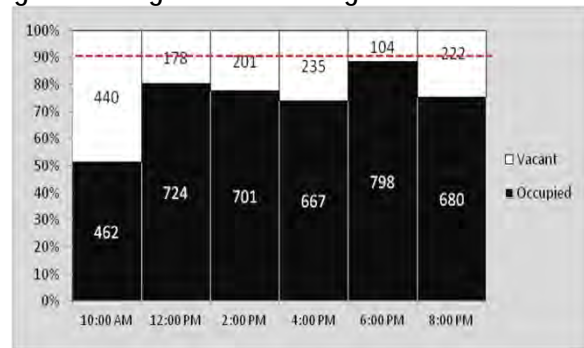


Figure 39 High-Hanover Garage: Weekend



High-Hanover Garage data was provided for the months of October 2010 and October 2011. The data in Figure 40 and Figure 41 represent an average day in each month. The charts below show that the garage is in more demand in October 2011 than in October 2010 and thus has fewer available spaces throughout the day. Comparing Figure 41 (average day in October 2011 utilization) to Figure 38 and Figure 39, the demand curves are almost exactly the same, which validates the days of data collection as average days in October.

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Figure 40 High-Hanover Garage: October 2010

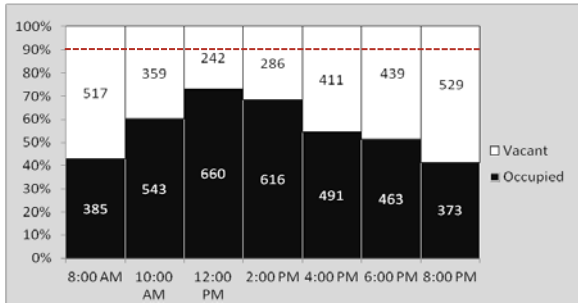
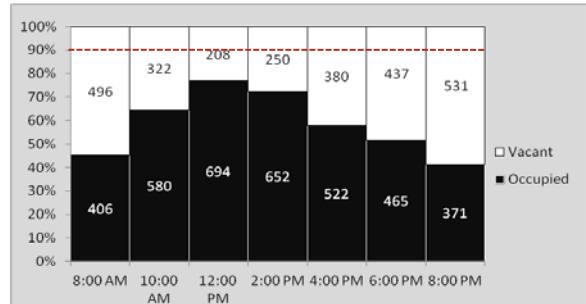
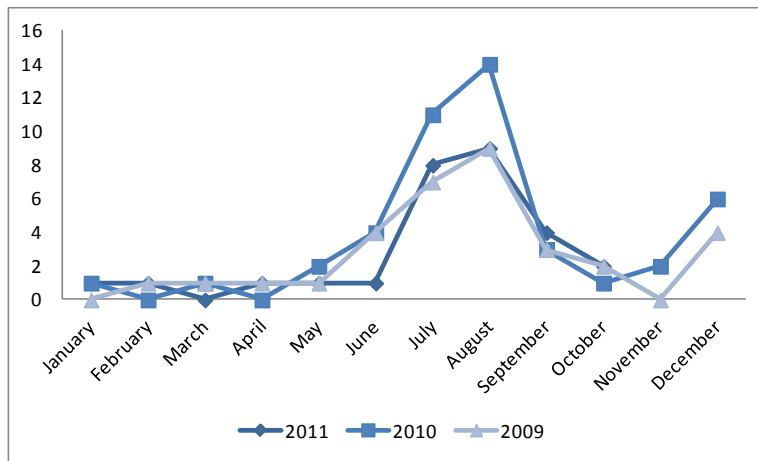


Figure 41 High-Hanover Garage: October 2011



The High-Hanover Garage does experience times when all spaces are full and the garage is at maximum capacity. Garage receipts from 2009, 2010, and 2011 (to October 2011) indicate that during July and August, the Garage is full up to 14 times in one month, which is certainly significant on a busy summer day. When the Garage is at capacity, it is on average closed for nearly one hour.

Figure 42 High-Hanover Garage - At Capacity Per Month



Public Facilities Utilization Profiles

Portsmouth's public parking lots and garage have varying levels of utilization by location and by time of day. In Figure 43, the observed weekday utilization at noon in the lots shows that only the Parrott Lot is at capacity. There are a total of 518 vacant spaces in the lots, and overall, these lots have a utilization of 68%.

Figure 44 shows the observed weekday utilization in the evenings, at 8pm. Four of the lots are at capacity: the Bridge Street Lot, the Worth Lot, the Wright Avenue Lot, and the Parrott Lot. Many of the other lots have plenty of available space. Overall, at 8pm, the utilization of public lots is at 53%, with 860 occupied spaces and 755 vacant spaces.

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Figure 43 Public Lots: Weekday Utilization at Noon

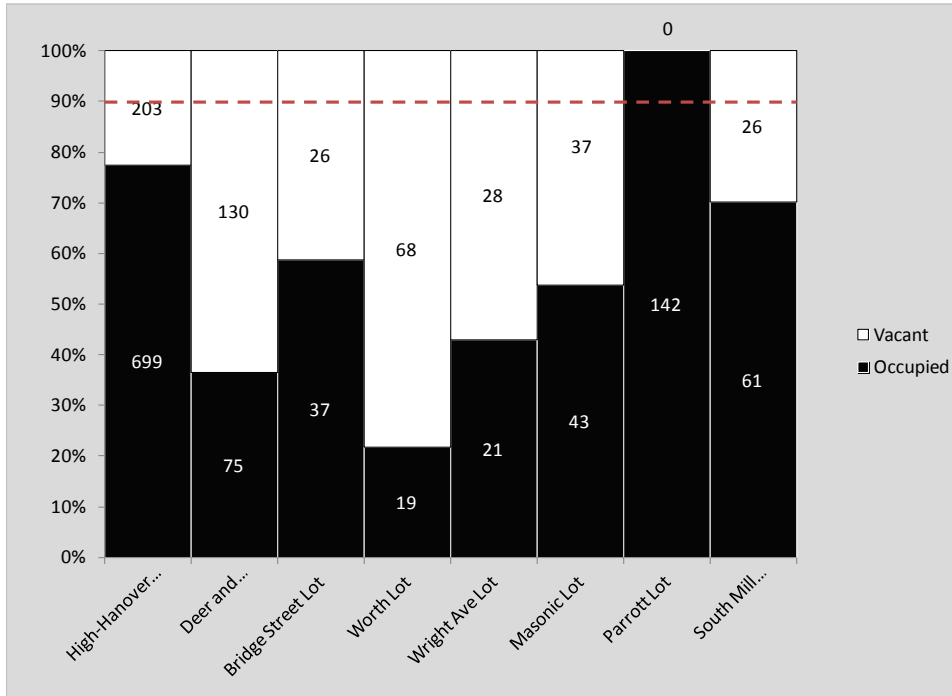
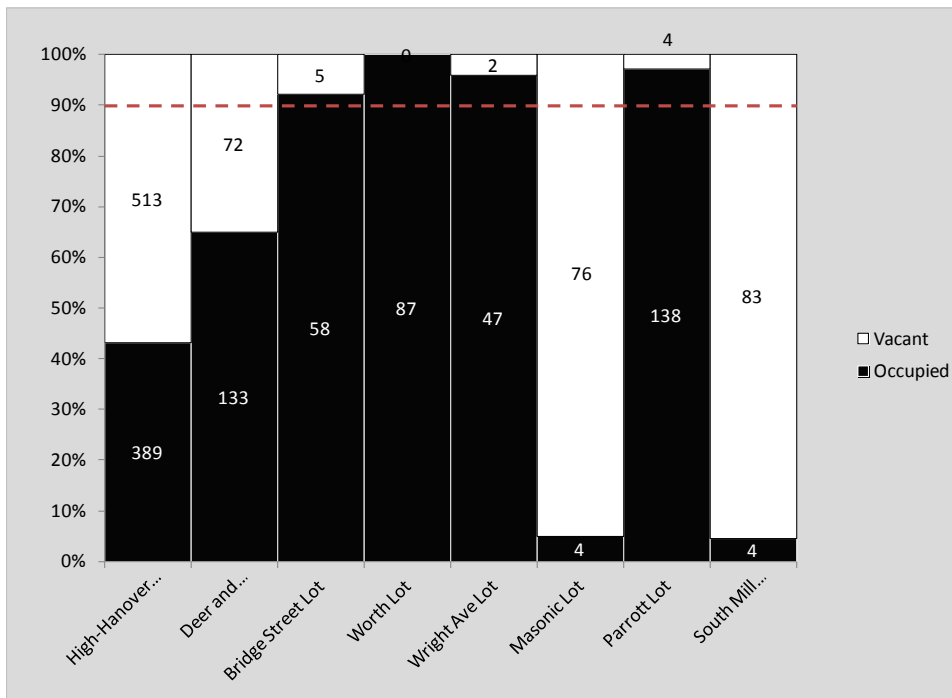


Figure 44 Public Lots: Weekday Utilization at 8pm



SPATIAL ANALYSIS OF PARKING UTILIZATION

An important part of understanding how parking is managed in any downtown is being able to describe how various parking facilities and segments of on-street parking interact with each other throughout the course of a day. A chart of hourly utilization rates for one specific location is valuable, but seeing how that location behaves among others located nearby can reveal patterns and trends not evident in numbers alone. The lot which is completely full may be right around the corner from another lot that has plenty of availability at that same time.

Using the utilization data, a series of maps was developed based on the parking inventory map above. Colors have been assigned for the percentage of spaces utilized at each location based on notable breaks used to evaluate the adequacy of a parking facility:

“Cool” light blue/blue refers to 0-80% utilization, a point at which parking is considered underutilized

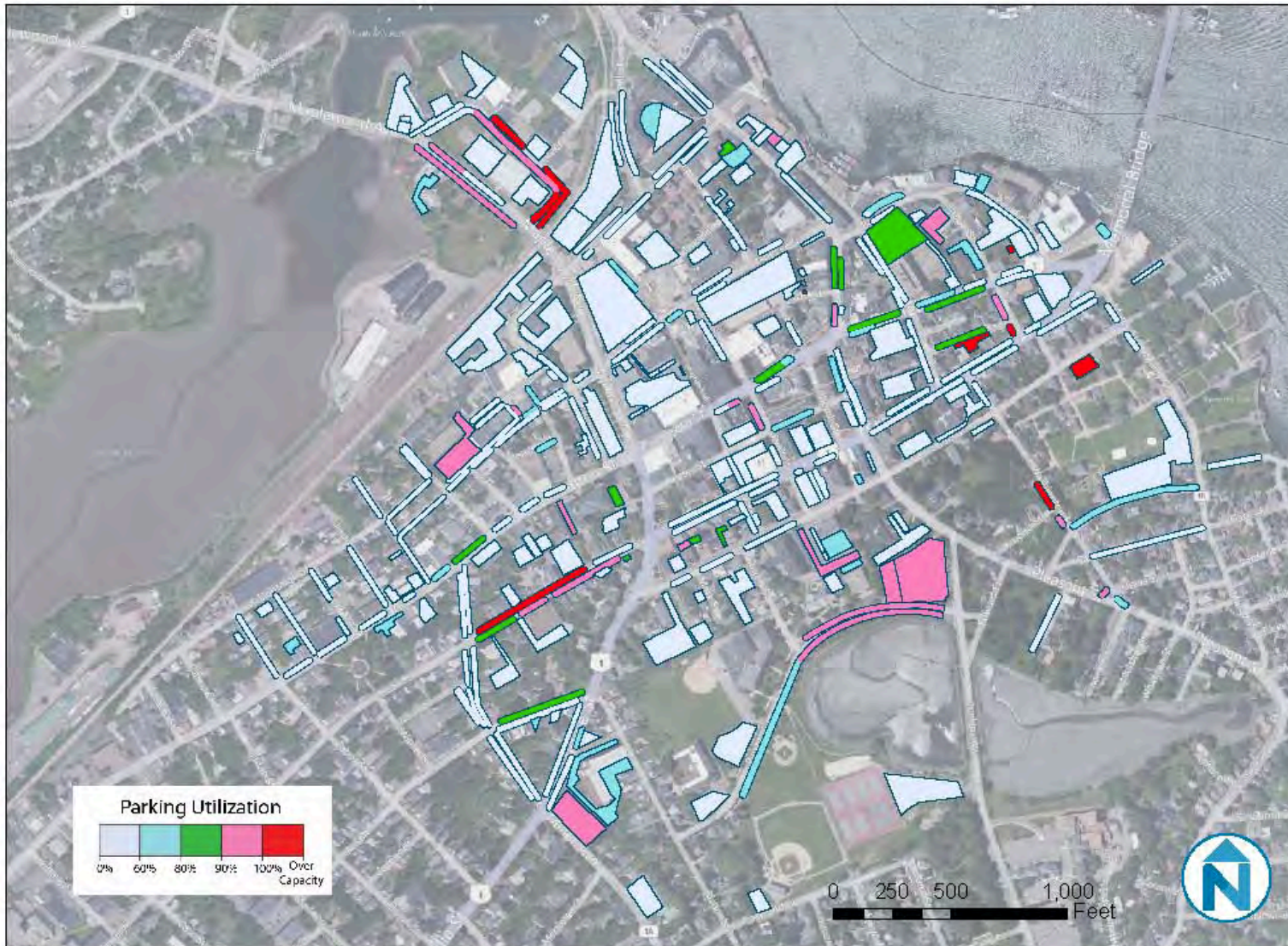
“Ideal” green refers to 81-90% utilization

“Warning” pink refers to over 91% utilization

“Critical” red denotes parking beyond the marked capacity

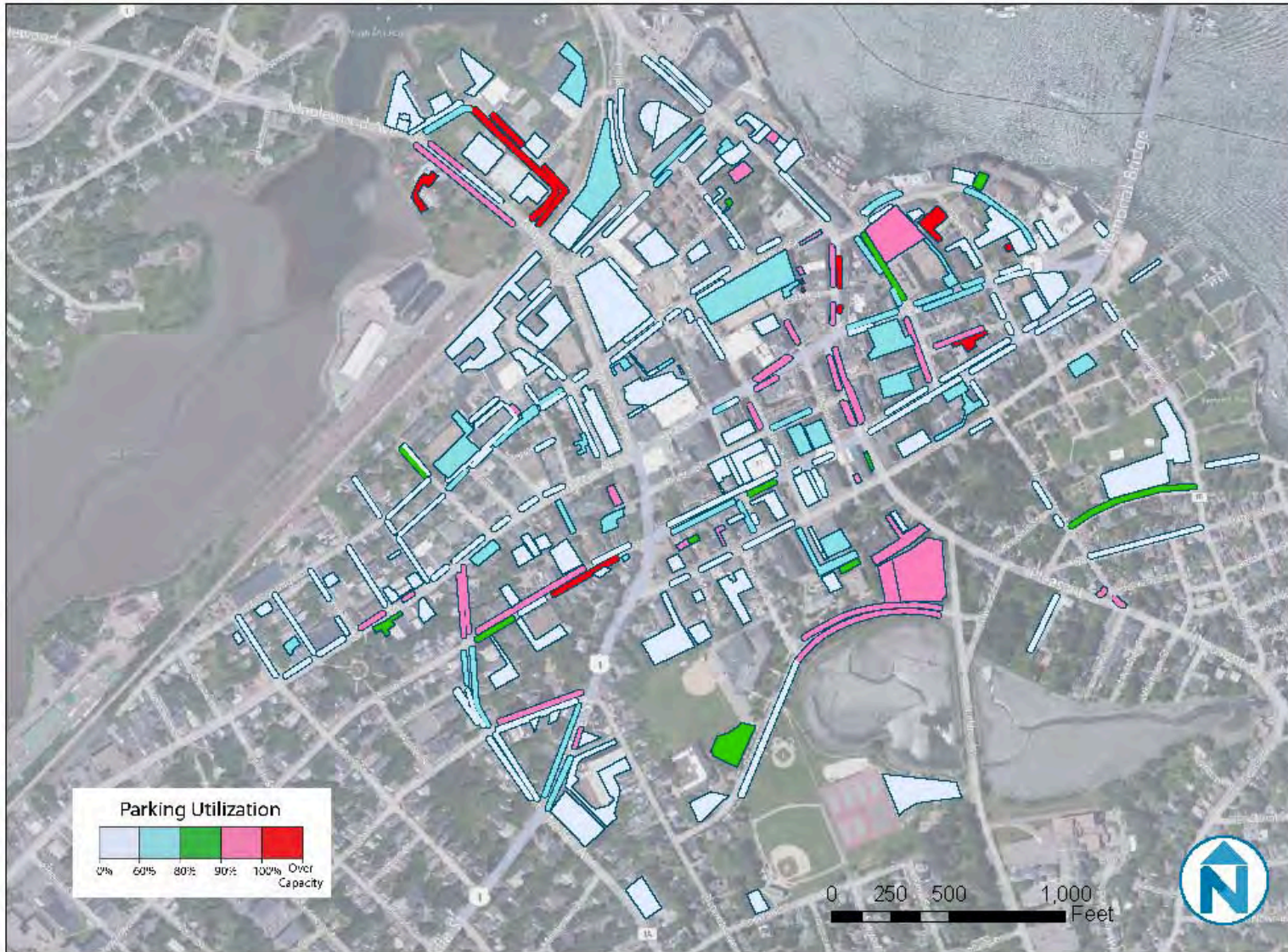
Weekday Utilization Mapping

Figure 45 Weekday 8am Utilization



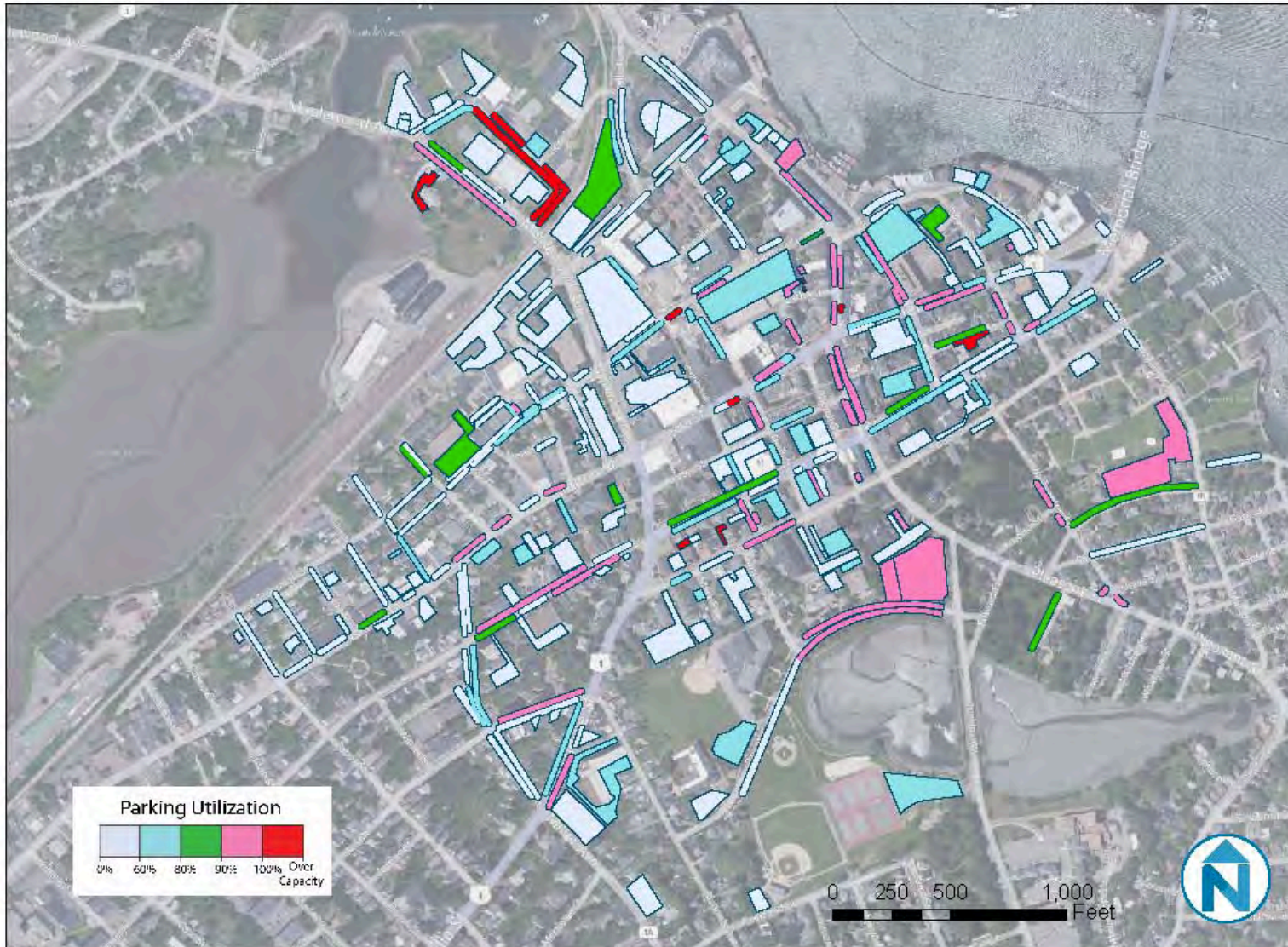
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Figure 46 Weekday 10am Utilization



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Figure 47 Weekday 12pm Utilization



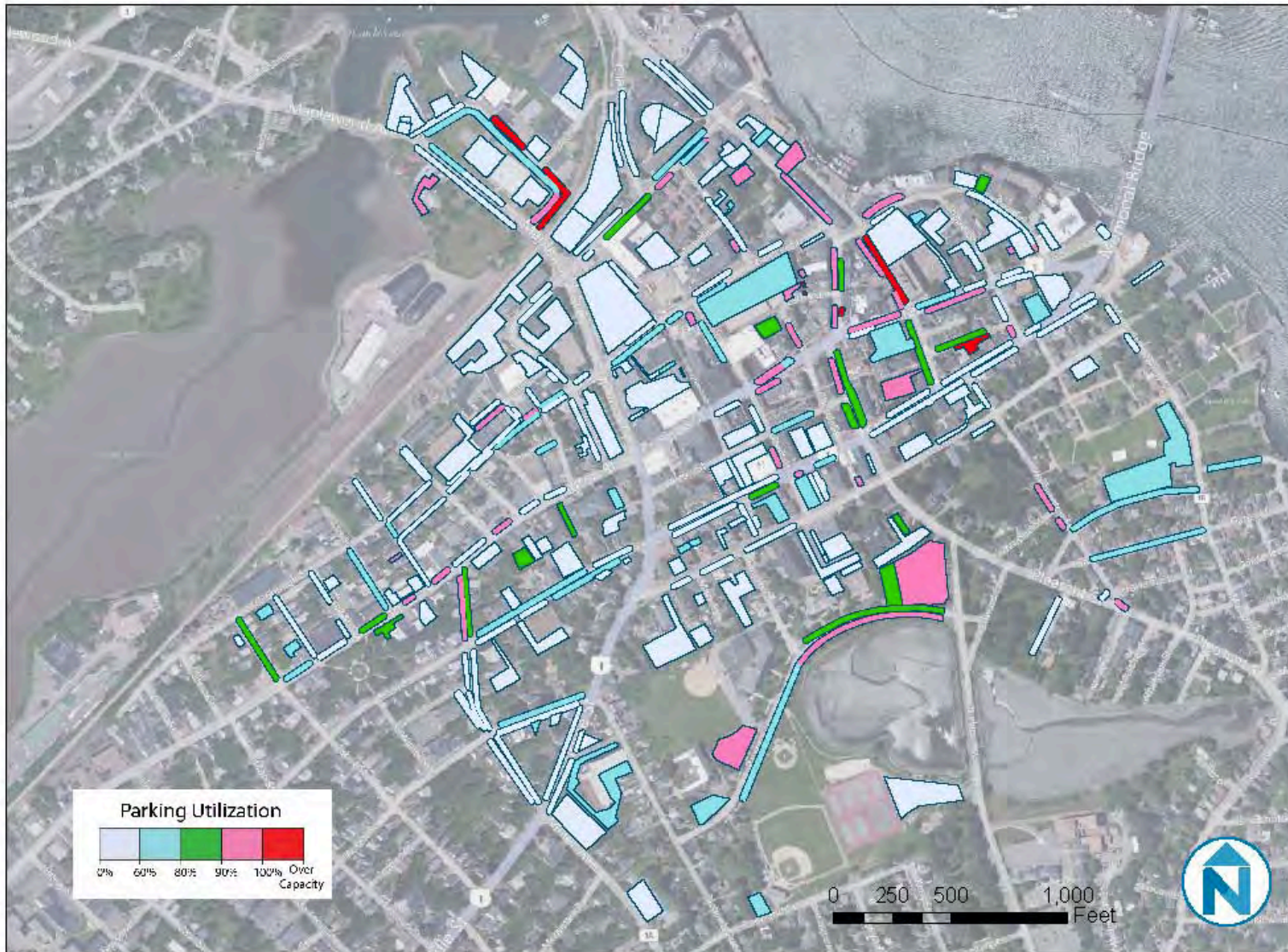
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Figure 48 Weekday 2pm Utilization



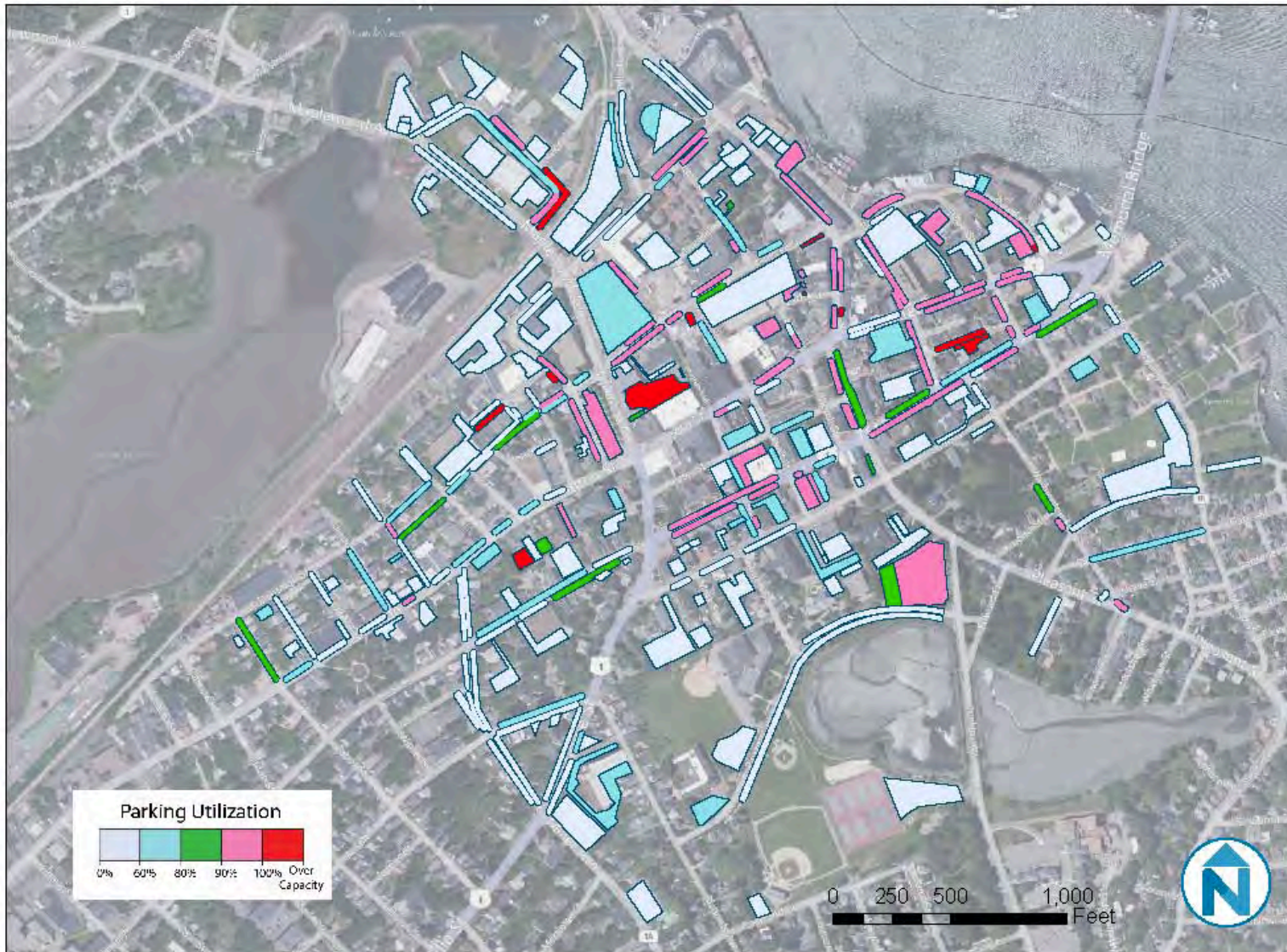
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Figure 49 Weekday 4pm Utilization



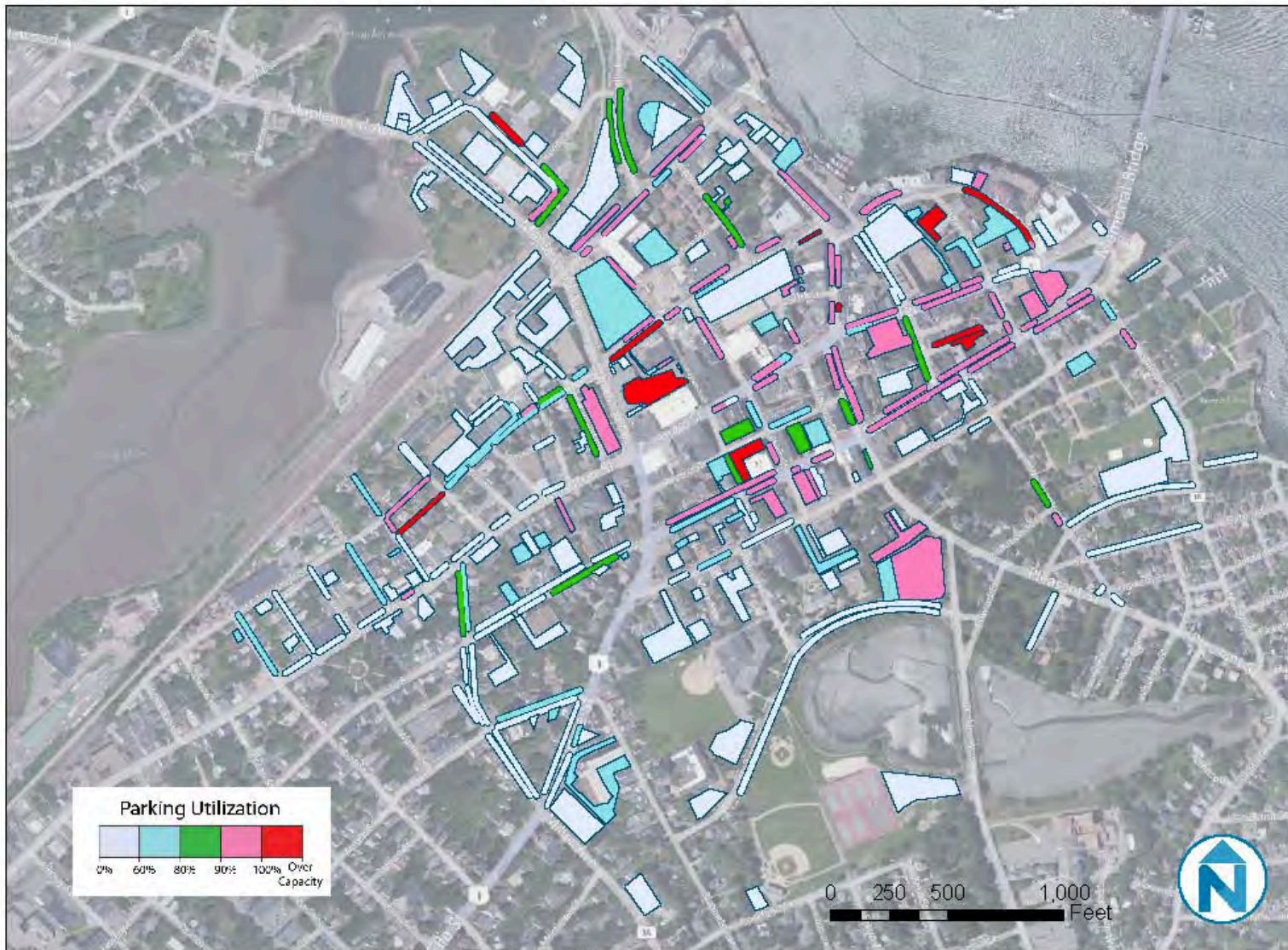
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Figure 50 Weekday 6pm Utilization



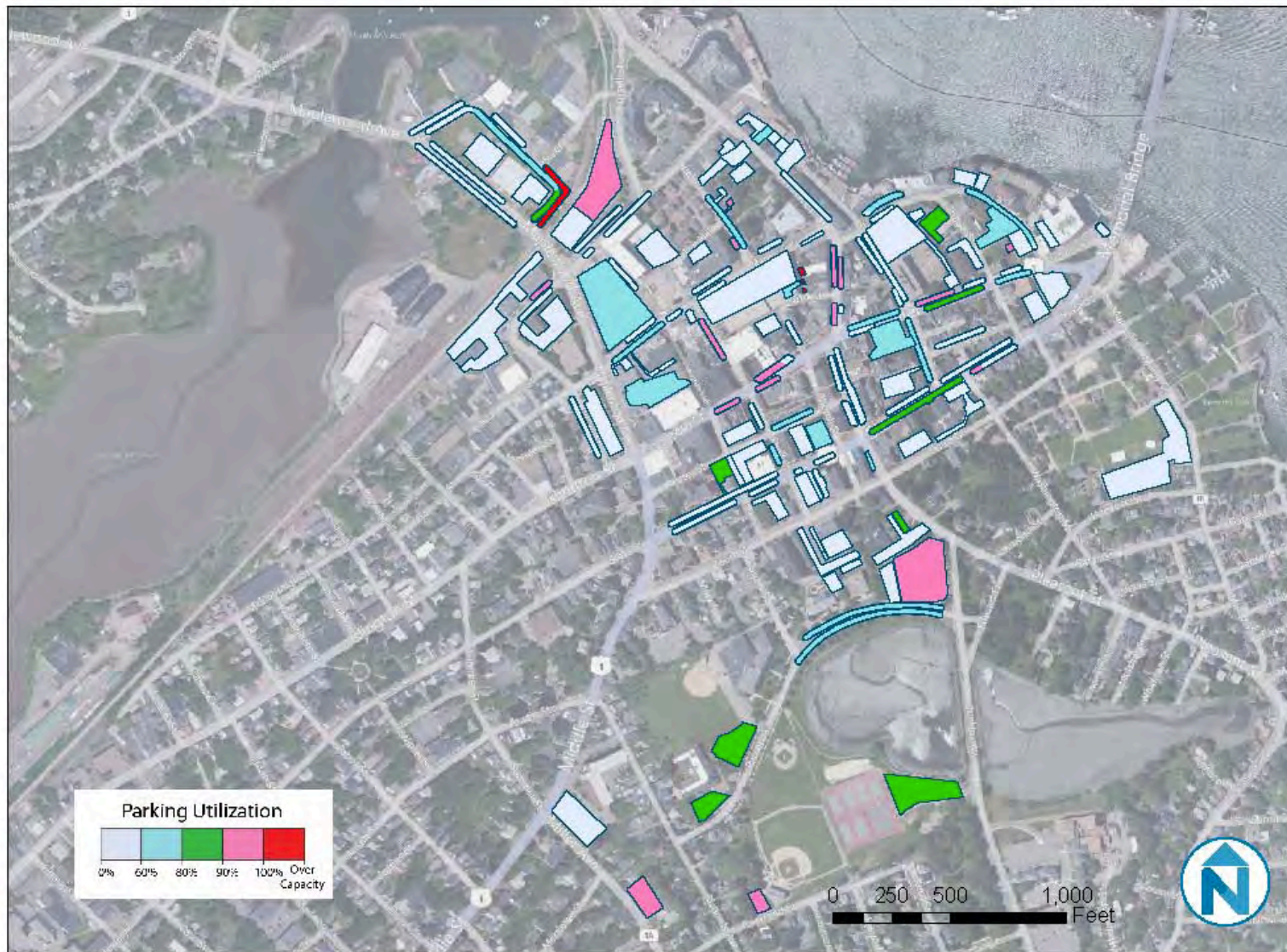
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Figure 51 Weekday 8pm Utilization



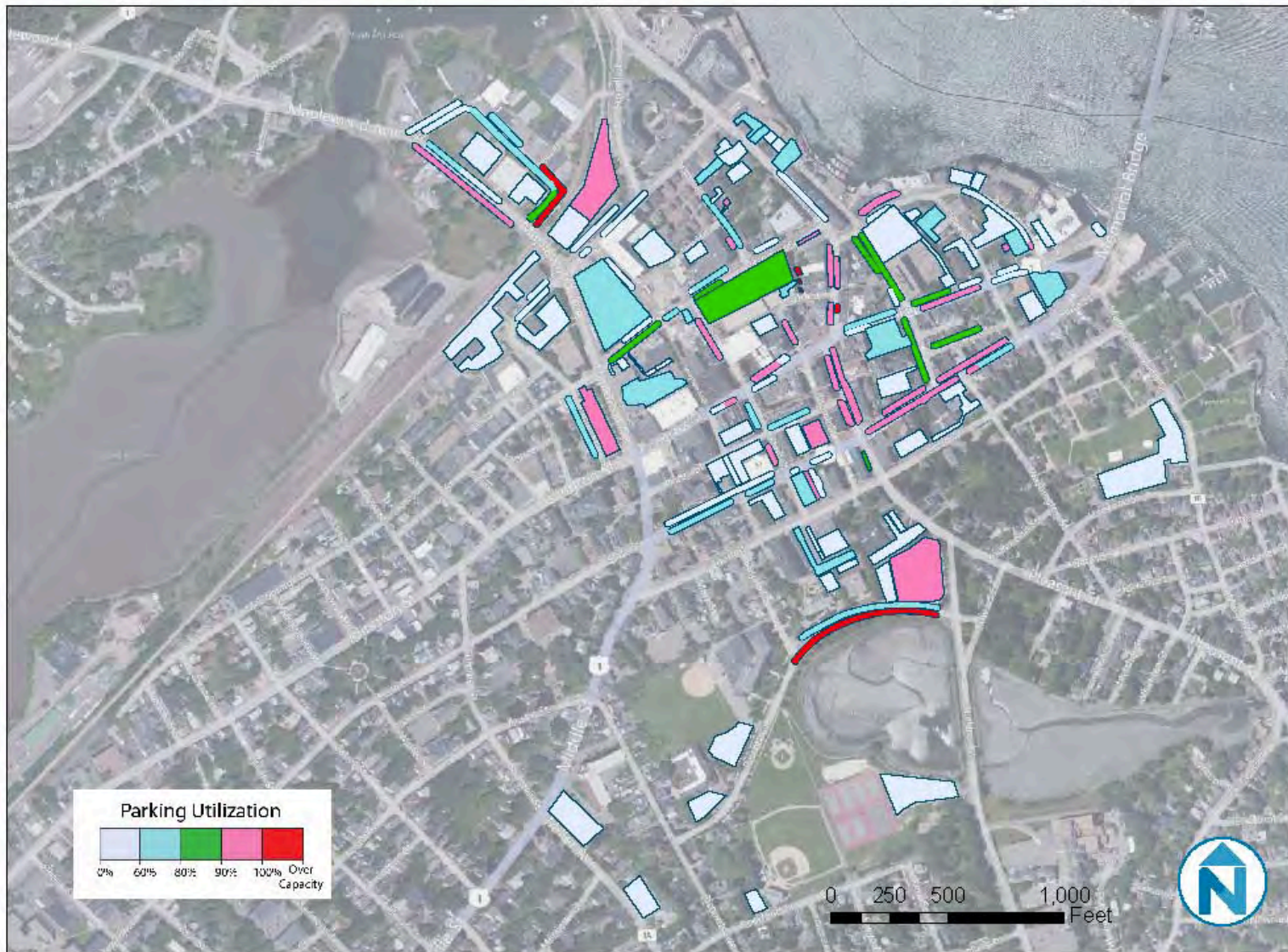
Weekend Utilization Mapping

Figure 52 Weekend 10am Utilization



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Figure 53 Weekend 12pm Utilization



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City of Portsmouth

Figure 54 Weekend 2pm Utilization



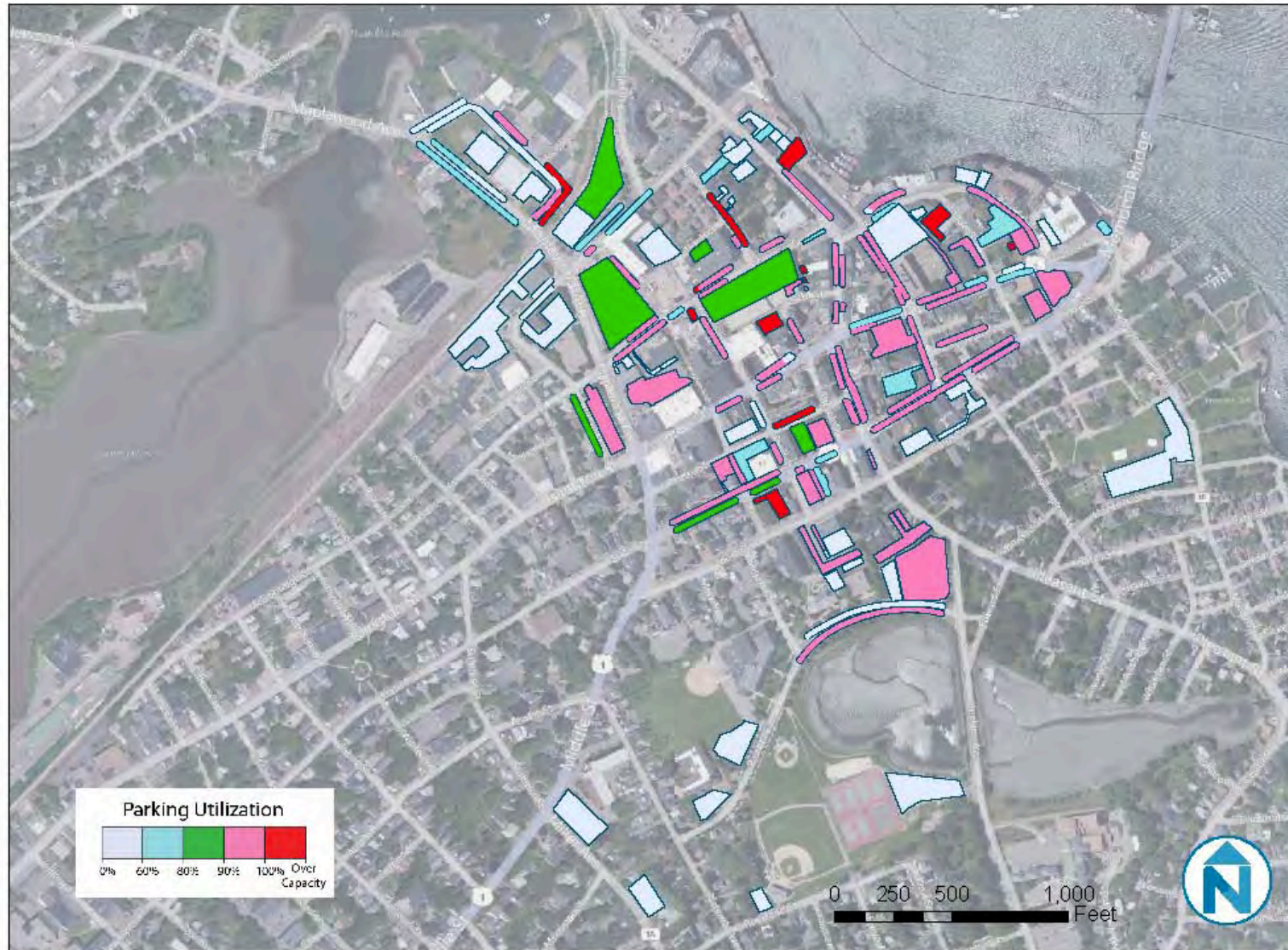
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Figure 55 Weekend 4pm Utilization



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Figure 56 Weekend 6pm Utilization



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Figure 58 Weekend 8pm Utilization



LAND USE ANALYSIS

In this section, the land use analysis examines the relationship among land use, parking supply, and parking demand (estimated and observed). This work stems from data collection efforts presented in the preceding pages. The land use analysis takes the parking utilization data one step further by relating it to surrounding land uses and national standards to determine if the parking supply is sufficient. This data is incorporated in a Shared Parking Model to more accurately estimate the parking demand of a mixed-use downtown like Portsmouth's. Estimates of current property vacancy rates are also factored into this analysis. This analysis leads us to incorporate projections of future parking supply and demand based on changes in land use in the study area.

The land use analysis is also presented in three sub-areas: the Study Area, the Downtown Overlay District, and the 5-minute walking area, as measured from Market Square.

EXISTING LAND USE

Downtown Portsmouth is comprised of a variety of industrial, commercial, office, and residential property (Figure 59). This land use data was obtained from the GIS Coordinator in Portsmouth and includes a database with a record for each building in Portsmouth, coded by land use and New Hampshire land use code number. The database includes the number of square feet of living area and the number of units for each building. This data is summarized below into a variety of categories. The total square footage in the study area is over two million square feet. Thirty-eight percent (38%) of this square footage is non-office commercial property, and 22% is general office space.

Figure 59 Existing Land Use

Land Use	Study Area Square Footage/Units	Downtown Overlay Square Footage/Units	5-Minute Walking Square Footage/Units
Apartments*	420 units	228 units	56 units
Banks	63,579 sq ft	47,579 sq ft	47,579 sq ft
Commercial	851,848 sq ft	657,189 sq ft	558,682 sq ft
Charitable Organizations	96,431 sq ft	16,261 sq ft	14,859 sq ft
Athletic Facilities	28,770 sq ft	28,770 sq ft	-
Gas Stations	3,184 sq ft	-	-
Government Office	260,807 sq ft	111,893 sq ft	76,424 sq ft
Hotels/Inns	320 rooms	282 rooms	134 rooms
Industrial/Warehouse	117,849 sq ft	51,351 sq ft	-
General Office	487,817 sq ft	462,864 sq ft	312,370 sq ft
Religious Institutions	96,888 sq ft	11,836 sq ft	47,232 sq ft
Restaurants	94,634 sq ft	73,844 sq ft	59,180 sq ft
Schools	113,786 sq ft	-	-

* Single and two-family residential units are excluded from the residential land use analysis since private driveways were not counted in the parking inventory.

APPLYING ITE PARKING DEMAND RATES

The Institute of Transportation Engineers (ITE) produces a periodic report titled *Parking Generation*, which is the accepted national standard in determining parking demand for a development. ITE standards are based on parking demand studies submitted to ITE by a variety of parties, including public agencies, developers and consulting firms. The current parking generation manual available is the 4th edition (2010) and is a comparative starting point to determine baseline assumptions.

We include the ITE rates as guidelines to benchmark how Portsmouth’s existing supply compares to its land uses. While recognizing that every community’s needs are different, below we show what ITE would recommend as the number of spaces needed in Portsmouth without adjustment for the downtown’s mixed-use characteristics.

Rates from ITE are used to determine the average peak period parking demand. The average peak period demand is the parked cars observed at the peak period divided by the quantity of the independent variable, such as building area or employees, expressed as a rate. To estimate the average peak period demand in Portsmouth, we used the City’s land use data to determine the square footage of each land use in Portsmouth, and multiplied that square footage (or other independent variable, such as residential units or employees) by the ITE average peak period demand.

For matters of simplicity, the land uses shown in Figure 59 are summarized in three categories (commercial, industrial/office, and residential) below in Figure 60. The columns for the sub-groups, the Study Area, Downtown Overlay District, and 5-Minute Walking area, show the number of parking spaces that ITE rates would estimate: 5,135 for the Study Area, 3,191 for the Downtown Overlay District, and 2,555 for the 5-Minute Walking area.

The last row, Existing Supply, shows today’s parking supply in Portsmouth by sub-group. With the exception of the 5-Minute Walking area, Portsmouth’s current supply of parking exceeds ITE’s estimated number of spaces.

Figure 60 ITE Estimated Parking Demand by Land Use Type

Land Use	Study Area	Downtown Overlay District	5-Minute Walking
Commercial	3,071	2,012	1,727
Industrial/Office	1,660	956	768
Residential	404	222	60
TOTAL	5,135	3,191	2,555
<i>Existing Supply</i>	5,663	3,578	2,428

COMPARISON TO THE SHARED PARKING MODEL

Nelson\Nygaard’s shared parking model uses an Urban Land Institute (ULI) methodology to estimate the opportunities to share parking spaces between various land uses over the course of the day. For example, if a residential building is near an office building, the parking demand of

the residents and employees are likely opposite (residents need evening and overnight parking; office employees need daytime parking). The shared parking model uses peak demand data from the ITE Parking Generation manual, ULI, and other sources to determine typical demand profiles by use throughout all of the hours of a typical day. The model can accurately reflect, for example, how communities like Portsmouth that have a substantial number of restaurants and evening activities, as well as downtown office employees, will have elevated parking demand in the late afternoon.

Shared Parking Methodology

Mixed-use developments settings offer the opportunity to share parking spaces between various uses, thereby reducing the total number of spaces required compared to the same uses in stand-alone developments. This is a primary benefit in mixed-use development contexts of moderate-to-high density. Shared parking operations offer many localized benefits to the surrounding community, including a more efficient use of land resources and reduced traffic congestion. There are two basic types of shared parking opportunities: 1) proximate uses with staggered demand peaks, and 2) internal capture of trips between proximate uses.

Staggered Peaks

The first shared parking opportunity offered by mixed-use development comes from the staggered demand peaks associated with each use. Different land uses generate unique levels and patterns of parking demand. Parking supplies at mixed-use locations accommodate these demand fluctuations more efficiently than segregated supplies by accommodating peaking uses with spaces left vacant by other uses. Thus, the same parking lot that was full of workers' vehicles during the day can be used for residents at night.

Internal Capture

Mixed-use districts such as downtown Portsmouth allow for parking efficiencies through "internal capture" trips. Such trips are made by patrons who, having already parked, travel between uses without accessing their vehicle. Restaurants and retail services are common generators of internal capture trips in mixed-use developments, as they serve both employees and residents within the same development. Not only does this proximity of uses present an opportunity to conserve land area from parking uses, but it reduces localized congestion as local employees and residents are presented with daily goods and services within walking distance.

Vacancy Rates Methodology

The land use data obtained by the City does not account for vacancies in office, residential, and retail spaces. As determined by City staff, Portsmouth has a vacancy rate in 2011 that should be accounted for in the data analysis. Thus, the shared parking analysis adjusts the land use square footage based on current vacancy rates in Portsmouth³:

- Office: 20% vacancy
- Retail: 5% vacancy
- Residential: 2% vacancy

³ Portsmouth Planning Department staff review of available real estate and compilation of square feet of vacant and currently available downtown office, retail and residential space (for sale and for lease), December 2011.

Study Area - Shared Parking

Figure 61 shows the ITE estimated unshared demand in the study area throughout the day. The chart shows that ITE estimates just over 5,000 spaces in the study area. Figure 62 shows the parking supply needed if parking was shared in Portsmouth. The shared parking model includes a reserve capacity (pink area at the top)⁴. The light blue area indicates the excess capacity throughout the day (parking supply that is available but not in demand if parking is shared).

Figure 62 indicates that of the available parking supply in Portsmouth, at peak (12PM), the model predicts that there would be more than 1,500 available parking spaces within the study area.

Figure 61 Study Area: ITE Unshared Demand

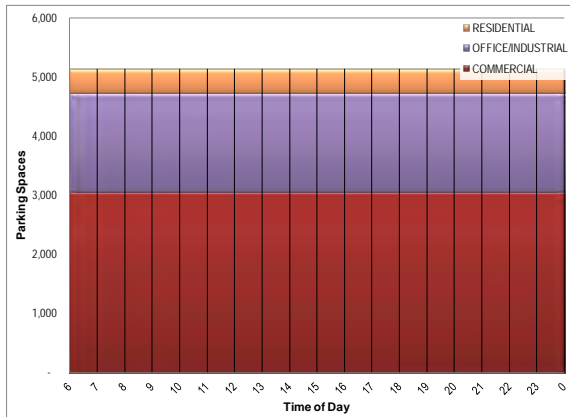


Figure 62 Study Area: ULI/ITE Shared Demand

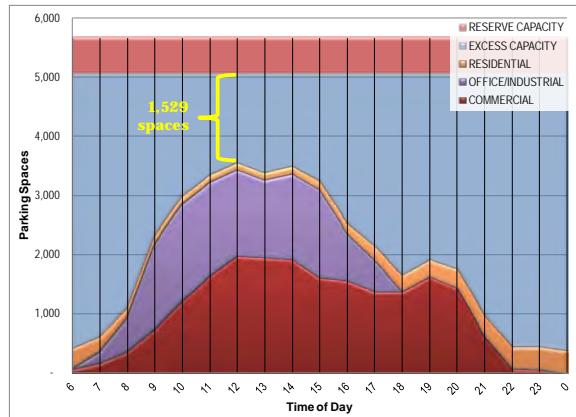


Figure 63 and Figure 64 show parking demand in downtown Portsmouth with land use vacancy. Accounting for 20% office, 5% retail/commercial, and 2% residential vacancy rates, the land use is decreased significantly. With less square footage, ITE would estimate that Portsmouth needs 4,875 parking spaces (260 parking spaces less than Portsmouth study area at full capacity). As a result, even more of the parking supply is expected to be underutilized: 1,767 spaces are available, even at expected peak utilization.

Figure 64 has the observed demand from the data collection superimposed on the shared parking chart. The observed demand is higher than the expected shared parking demand; this is the result of land uses in the entire study area being not as susceptible to sharing as land uses in the core of downtown (i.e. land uses are less mixed and less dense in the study area than in Downtown Overlay District).

⁴ The reserve capacity accounts for a 15% of public on-street spaces, 10% reserve of public facilities (lots, garages), 10% reserve of private commercial lots, and a 5% reserve of private residential spaces.

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Figure 63 Study Area: ULI/ITE Shared Demand - Adjusted for Vacancy

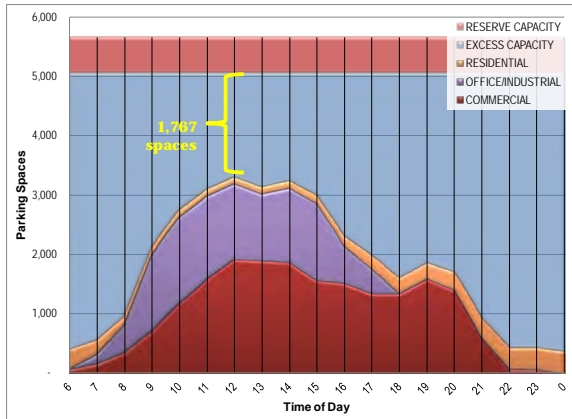
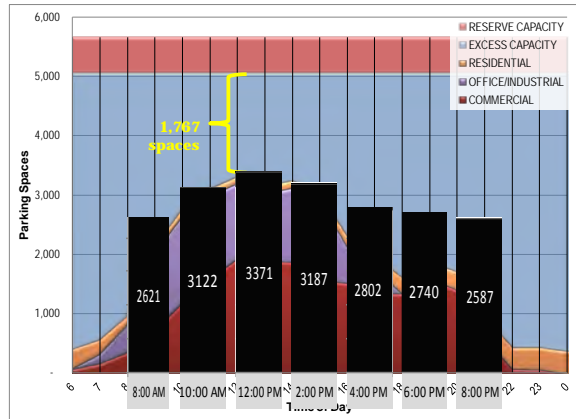


Figure 64 Study Area: ULI/ITE Shared Demand and Observed Demand - Adjusted for Vacancy



Downtown Overlay District - Shared Parking

Figure 65 shows the ITE estimated unshared demand in the Downtown Overlay District throughout the day. The chart shows that ITE estimates over 3,000 spaces in the Downtown Overlay. Figure 66 shows the parking supply needed if parking was shared in Portsmouth. At the peak hour (12PM), with shared parking for different land uses, there is expected to be 627 spaces available for parking.

Figure 65 DoD: ITE Unshared Demand

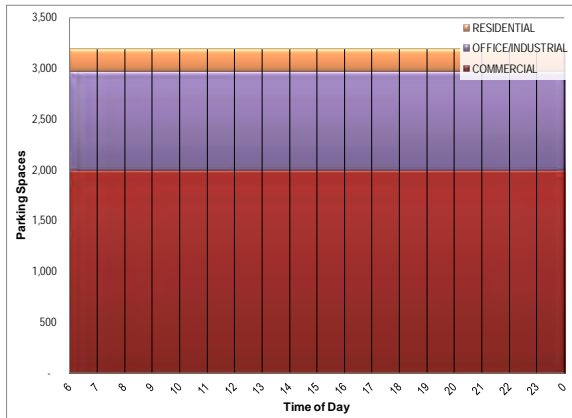


Figure 66 DoD: ULI/ITE Shared Demand

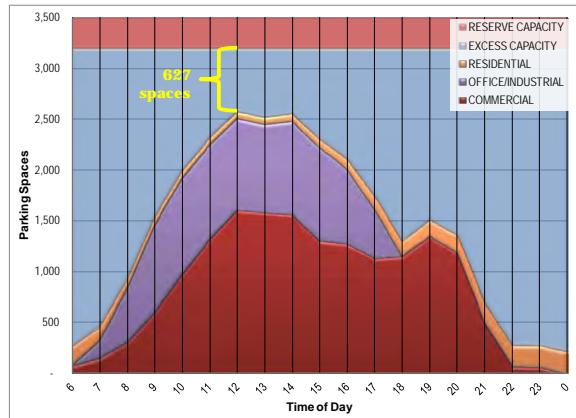


Figure 67 and Figure 68 show parking demand in the Downtown Overlay District with land use vacancy. Accounting for 20% office, 5% retail/commercial, and 2% residential vacancy rates, the land use is decreased significantly. With less square footage, ITE would estimate that the Downtown Overlay District needs 2,959 parking spaces (232 parking spaces less than the Downtown Overlay at full capacity). As a result, even more of the parking supply is expected to be underutilized: 843 spaces are available, even at expected peak utilization.

Figure 67 DoD: ULI/ITE Shared Demand - Adjusted for Vacancy

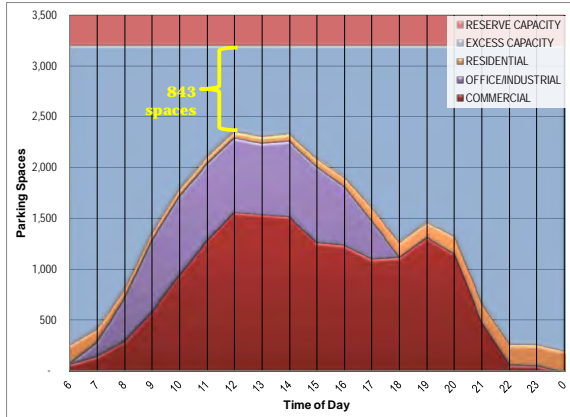
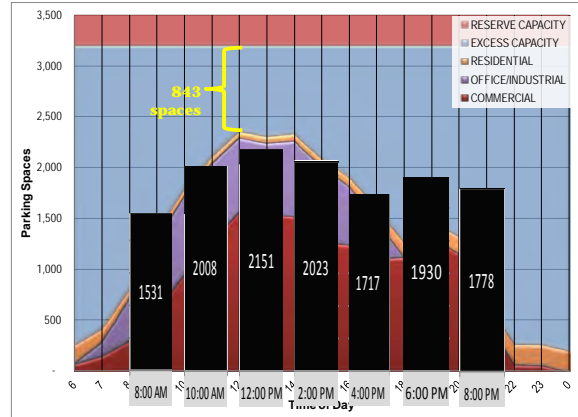


Figure 68 DoD: ULI/ITE Shared Demand and Observed Demand - Adjusted for Vacancy



5-Minute Walking Area - Shared Parking

Figure 65 shows the ITE estimated unshared demand in the 5-Minute Walking area throughout the day. The chart shows that ITE estimates a demand for over 2,500 spaces in the area. Figure 66 shows the parking supply needed if parking was shared in Portsmouth.

Figure 69 5-Minute Area: ITE Unshared Demand

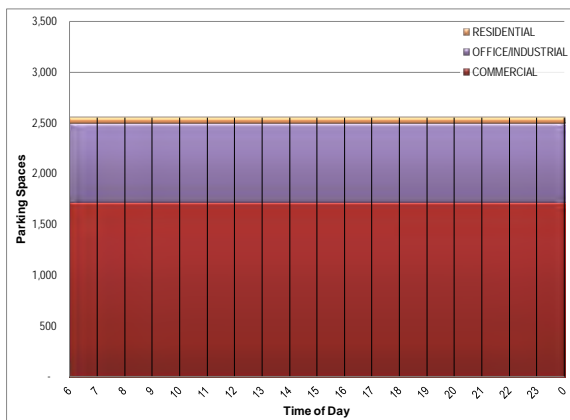


Figure 70 5-Minute Area: ULI/ITE Shared Demand

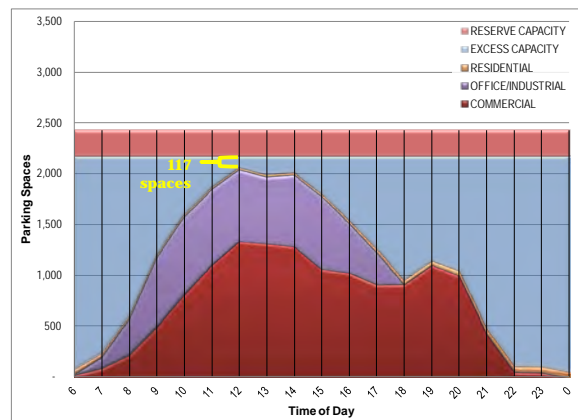


Figure 71 and Figure 72 show parking demand in the 5-Minute Walking Area with land use vacancy. Accounting for 20% office, 5% retail/commercial, and 2% residential vacancy rates, the land use is decreased significantly. With less square footage, ITE would estimate that the 5-Minute Walking area needs 2,397 parking spaces (158 parking spaces less than the 5-Minute Walking area at full capacity). As a result, even more of the parking supply is expected to be underutilized: 270 spaces are available, even at expected peak utilization.

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Figure 71 5-Minute Area: ULI/ITE Shared Demand - Adjusted for Vacancy

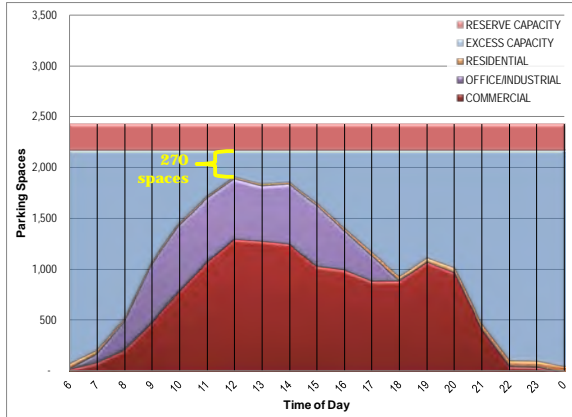
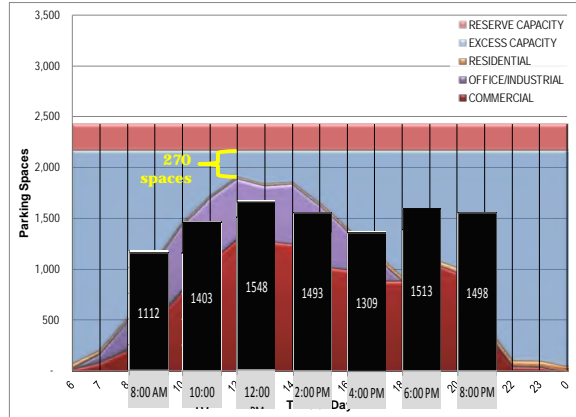


Figure 72 5-Minute Area: ULI/ITE Shared Demand and Observed Demand - Adjusted for Vacancy



FUTURE LAND USE

To determine if Portsmouth's parking supply will be sufficient for all existing and known development, the most recent project information was gathered from the Planning Director at the City. Three major development projects are expected, as shown in Figure 73. This analysis only includes these three projects; it does not include other potential development in Portsmouth.

Figure 73 Portsmouth Expected Development

Project	Square Footage/Units	Parking Spaces
Portwalk	Phase 2: 36 residential units 10,000 sq ft retail	35
	Phase 3: 90 residential units 120 hotel rooms 30,000 sq ft retail	250
51 Islington	28 residential units 10,000 sq ft retail	32
30 Maplewood	Phase 1: 9 residential units 12,000 sq ft retail Phase 2: 30 residential units 10,000 sq ft retail/restaurant	40 ⁵

⁵ per email from Rick Taintor, 1/18/2012

These developments will also displace current parking supply: 205 spaces in the Portwalk Lot and 76 spaces at 30 Maplewood Ave.

Since these expected developments occur in the Downtown Overlay District and 5-Minute Walking area, the shared parking model was adjusted to account for the increase in built environment and net parking space increase. There are no vacancies accounted for in the future development models.

Downtown Overlay - Pipeline Development

The Downtown Overlay District's parking supply will increase by a net of 96 spaces and over 100,000 square feet of retail, restaurant, hotel, and residential land uses. Including the expected development, ITE would estimate 3,487 spaces (compared to the existing 3,578 spaces in the Downtown Overlay today). Figure 74 shows the total number of spaces as ITE would recommend with the future development; Figure 75 demonstrates the effect of shared parking on the supply. With a reserve capacity of nearly 400 spaces, and peak demand at 12PM of 2,718 spaces, there would be 574 parking spaces available (plus the reserve). This assumes that there are no vacancies in the downtown overlay.

Figure 74 DoD: ITE Unshared Demand: Future Development

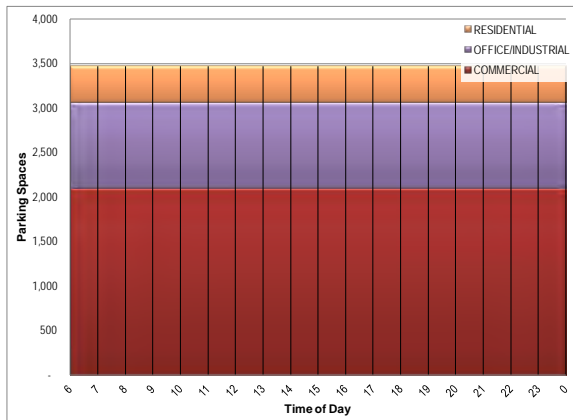
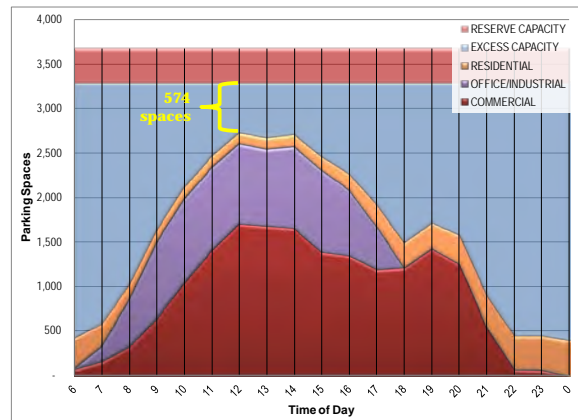


Figure 75 DoD: ULI/ITE Shared Demand: Future Development



5-Minute Walking Area - Pipeline Development

Within the 5-Minute Walking Area, pipeline development includes the Portwalk Phase 2 and 3 developments, which adds 285 parking spaces, replacing 205 spaces, for a net increase of 80 spaces. ITE would estimate that this area would then need a total of 2,725 parking spaces, compared to the 2,428 that exist today. However, due to opportunities to share parking, demand is 2,140 spaces at peak. This leaves 260 spaces as reserve and 108 spaces of excess parking supply (Figure 77).

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Figure 76 5-Minute Area: ITE Unshared Demand – Future Development

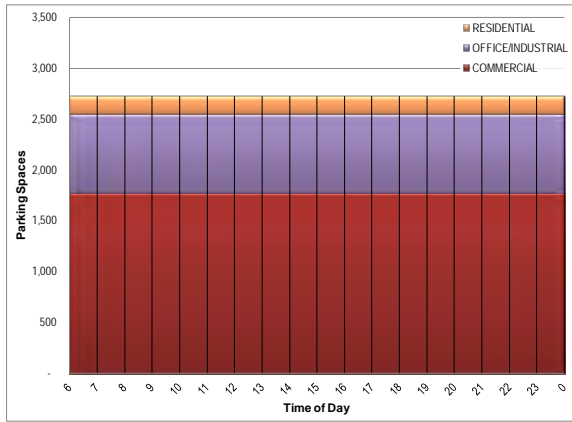
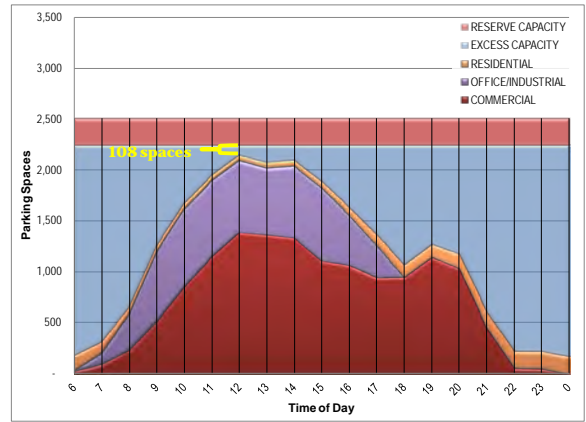


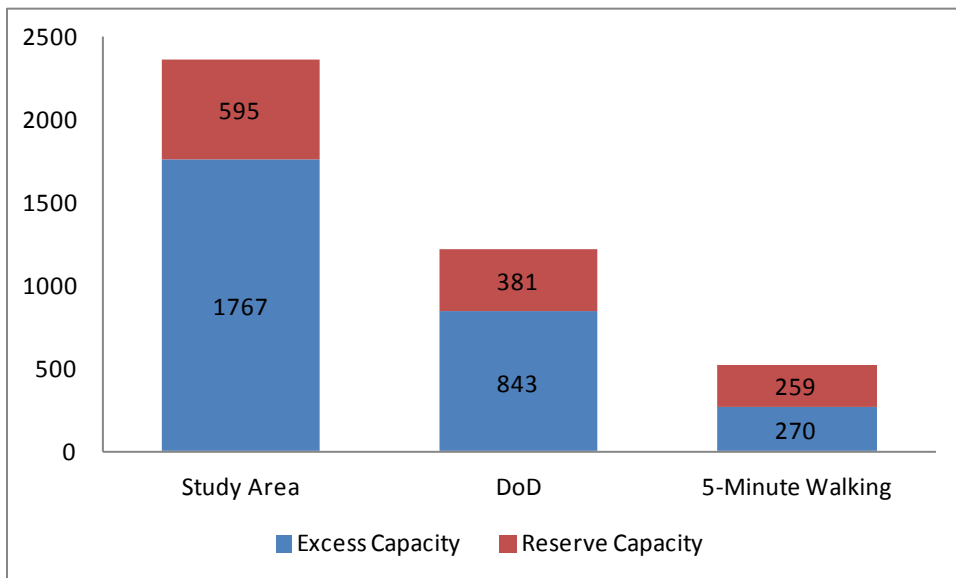
Figure 77 5-Minute Area: ULI/ITE Shared Demand – Future Development



SUMMARY OF LAND USE/SHARED PARKING ANALYSIS

The results of the analysis of the Portsmouth Study Area, Downtown Overlay District, and 5-Minute Walking Area is a clear story: the closer to the core of downtown Portsmouth, the more constrained the parking situation. Figure 78 shows each sub-area's available capacity, i.e. the number of excess parking spaces based on shared parking. below in Figure 78. There would be 1,767 available spaces (plus reserve) in the Study Area; 843 spaces (plus reserve) in the Downtown Overlay District; and 270 spaces (plus reserve) in the 5-Minute Walking Area. This includes estimated property vacancy rates, so if the vacant properties were to become active, there would be less excess parking than shown.

Figure 78 Available Capacity Today (Number of Parking Spaces) With Today's Vacancy Rates



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When including future development in the Downtown Overlay District and the 5-Minute Walking Area, there is less capacity than today. Figure 79 shows the number of available parking spaces after the future development is built, plus if all properties are 100% occupied (no vacancies). There would be 574 available spaces in the Downtown Overlay District, and 108 excess spaces in the 5-Minute Walking Area (plus reserve for each sub-area).

**Figure 79 Available Capacity in the Future (Number of Parking Spaces)
With Full Occupancy of Vacant Space**

