



# Princeton Parking Strategy

2017

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# 1 PROJECT OVERVIEW

Downtown Princeton's historic charm, vibrant retail outlets and restaurants, and walkable environment combine to make a lively atmosphere at all times of the day. The Municipality continues to prosper as an active community, with a walkable commercial center, the economic and civic vitality of Princeton University, as well as strong and multimodal connections to the surrounding region, eastern seaboard, and the world. Commuter rail connections to New York City and the Trenton/Philadelphia region is complemented by direct Amtrak service to Washington, DC, Boston, and all major points in between.

Of course, success has bred challenges in balancing the desire for walkable, transit-oriented stability and growth, with the common need or preference for convenient private-automobile accommodation. While there is strong, common desire to preserve the Municipality's character and the quality of life that has long attracted residents, employees, students, and visitors, the challenges and opportunities presented by changes in urban mobility and economics must be addressed and negotiated. This study seeks to address these and related challenges, and to identify strategic opportunities for parking to better support these aims, preserving the best of Princeton today and facilitating opportunities for appropriate, desirable, and sustainable development and growth.

## PROJECT GOALS

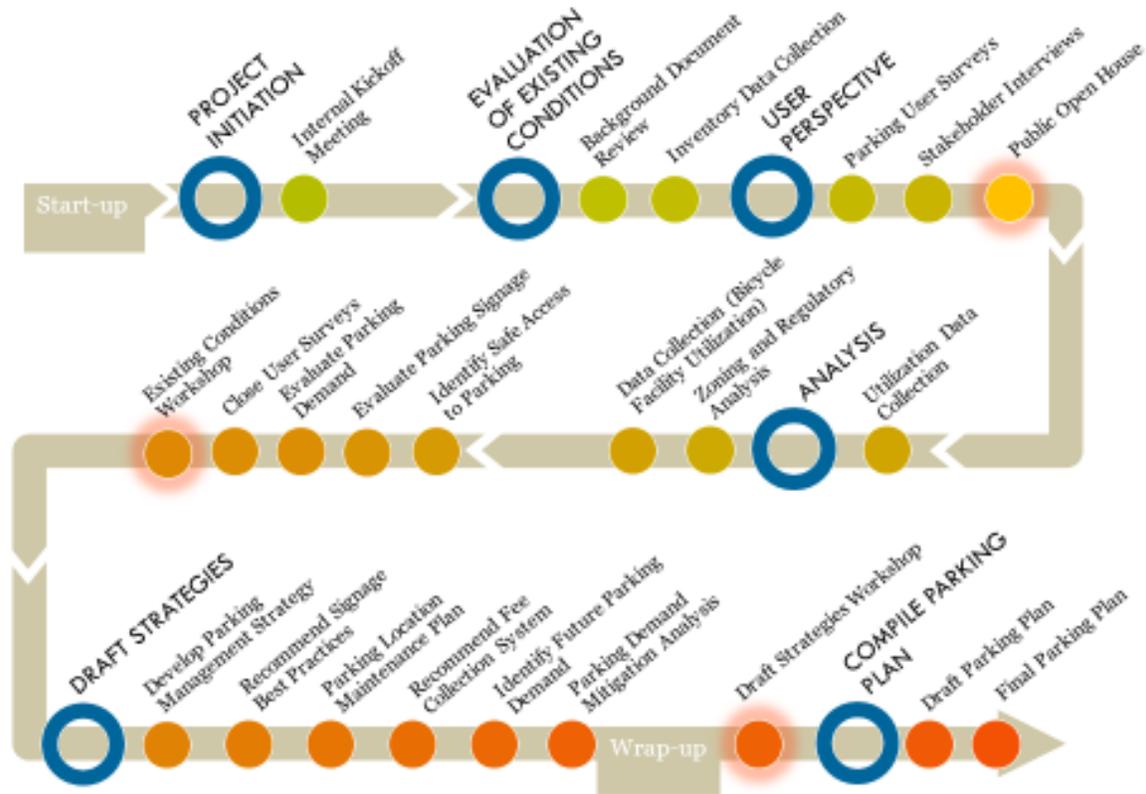
This study was guided by the following project goals.

- Evaluate parking to enhance the accessibility and vibrancy of Princeton's downtown
- Protect residential neighborhoods from detrimental parking effects
- Provide strategic accommodations for cycling and walking
- Address the particular parking challenges facing downtown employees
- Understand parking supply and demand and identify key solutions to address imbalances

# STUDY PROCESS

This study was completed through a series of analytical phases, documenting conditions, identifying and exploring key issues and opportunities, and developing strategic recommendations. Throughout the process, coordination with municipal project leaders, key stakeholders, and the public was an integral part of this process. Figure 1 provides an overview of this process.

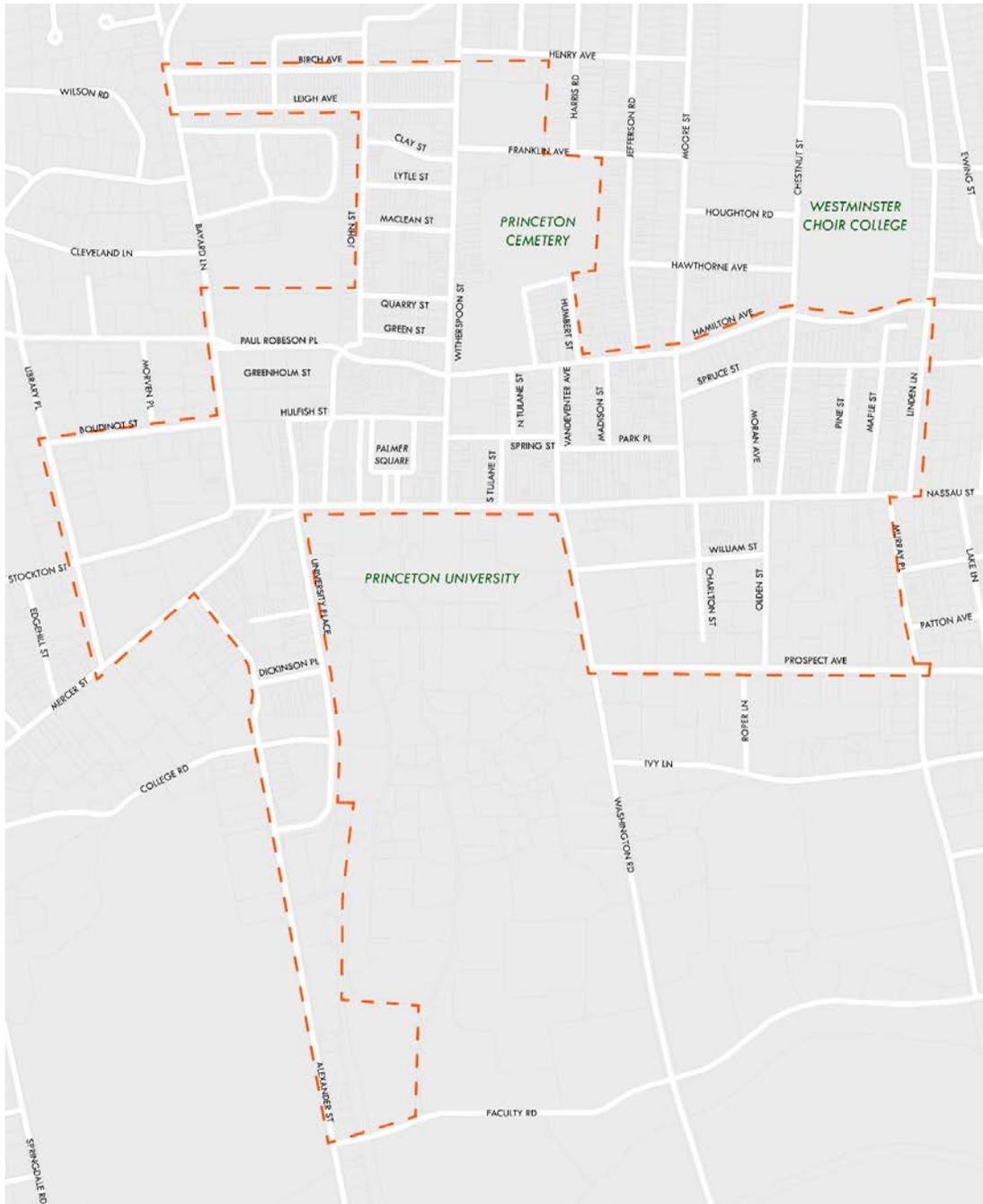
Figure 1 Study Process



## STUDY AREA

The Princeton Parking Study staff worked directly with municipal transportation staff to determine the appropriate parking study area. Given the project's intended focus on economic development, parking management in downtown Princeton, and alleviating spillover issues in neighborhoods adjacent to downtown, the study area in Figure 2 was selected.

Figure 2 Parking Study Area



## KEY FOCUS AREAS

This process facilitated a broad assessment of all aspects of public parking provision, use, and management throughout the municipality. And, while the resulting findings and recommendations are expansive in nature, three critical focus areas emerged during the process, which guided the development and organization of strategies and recommendations.

### Commercial Parking



Invariably, commercial-area visitors seek convenient parking options, and tend to lack a thorough understanding of all available parking locations. They also tend to be less familiar with rules and regulations, and often may not be particularly accustomed to the complexities of parking in a walkable, urban center. Ensuring that curbside parking along retail streets offers consistent availability, and clear, consistent regulations/restrictions is critical to reducing visitor frustration, excess traffic created by vehicles in search of available parking, and general perceptions that there is “nowhere to park” in Princeton. In Princeton, the competition for these spaces can be particularly intense and complex, as University-based trips bring added drivers to the area, many of whom are likely to seek parking on the same streets that upon which business owners and their customers rely.

## Residential Parking



Residents naturally expect to be able to consistently park near their homes, even in urban neighborhoods that might draw significant parking activity from nearby commercial uses. In Princeton, nearby university uses and regional rail connections add to the potential for “spillover” parking demand to reduce space availability on residential streets. Residents with driveways and/or garages for their cars may simply object to the traffic and parking activity that this creates on otherwise quiet residential streets. Many residents, however, rely upon street parking as their primary parking resource at home. For these residents, a lack of parking on their neighborhood streets can significantly reduce their quality of life.

## Parking in the Development Code

A majority of Princeton is built-out, with a distinctive historic character. As such, redevelopment opportunities within the primary study area are largely limited to “infill” projects on small sites and redevelopment projects on already developed sites. In the former circumstance, parking needs tend to be modest, in line with the scale of possible development. For the latter, changes in use and/or modest expansion of established uses can increase parking demand, but not as much as a comparable “greenfield” project would.

Nonetheless, parking issues often hinder development plans that might otherwise further enhance the town’s vibrant urban center. One of the primary purposes of this study, therefore, is to identify opportunities to remove parking requirements as a barrier to desirable forms of development/investment, while ensuring that the built projects enhance the community, add to shared/community resources, and do not overburden constrained roadway networks.

## 2 CONDITIONS SURVEY

The Princeton Parking Study relies on a comprehensive understanding of existing regulations, parking inventory, parking utilization patterns, and policy frameworks to develop strategies which effectively address the needs and goals outlined in the planning process. The Existing Conditions Survey summary below outlines these parameters as observed in the first stage of the study process.

### SUPPLY

A comprehensive inventory of all parking facilities within the Parking Study Area was conducted in the initial phase of the study process. This inventory serves as the foundation of the plan and informs the study team's analysis and recommendation efforts. The parking inventory recorded the number of parking spaces along all blocks in the study area, as well as the number of spaces in all off-street facilities in the study area. Regulations associated with each space, including time limits, pricing, and public/shared/reserved status, were recorded in order to fully understand the parking system and its capacity to meet shifting demand levels and patterns.

Princeton's large number of variations in time limits, pricing, and other regulations result in a complicated, interconnected array of parking regulations best understood when mapped and displayed in a visual representation. A total of 7,025 spaces were observed in the study area, with 1,633 of these being on-street spaces, and 5,392 of these being off-street spaces. On-street and off-street parking inventories were grouped by regulation type to understand the function of individual spaces and off-street facilities.

## On-Street



There are 1,633 total on-street spaces in the Princeton Study Area, all managed via some form of regulation, with time limits being the most common regulation. Just over half (54%) of these spaces are priced, with rates ranging from \$0.30/hour to \$1.25/hour. Only 15% of observed spaces are “unregulated,” although even these are subject to the overnight parking ban in effect throughout the study area. The majority of on-street spaces are short-term parking, with 56% of spaces limited to two hours or less.

Figure 3 breaks down the observed on-street parking supply by regulation type. Metered regulations range from 24-hour parking with no time limit, to meters with only a 30 minute limit. In terms of unmetered spaces, time limits ranged from 30 minutes to 14 hours, with the majority of unmetered spaces operating with a two hour limit. Within the regulation categories displayed in the table, additional sub-regulations exist. These primarily include variations in meter rates, which range from \$0.30/hour to \$1.25/hour. The various combinations of regulations result in 28 unique regulation types throughout the study area. This extensive array of regulations poses an obstacle to visitors, residents, and employees alike when attempting to park on-street in downtown Princeton.

Figure 3 On-Street Supply by Regulation

Sub-Inventory	# of Spaces	Percent of Total Inventory
Metered, 12-hour Parking	34	2.1%
Metered, 10-hour Parking	216	13.2%
Metered, 14-hour Parking	72	4.4%
Metered, 5-hour Parking	55	3.4%
Metered, 2-hour Parking	397	24.3%
Metered, 30-min. Parking	46	2.8%
Metered, 15-min. Parking	8	0.5%
Metered, no Time Limit	59	3.6%
Permit or Resident Parking	30	1.8%
14-Hour Parking	6	0.4%
2-hour Parking	445	28.4%
30-minute Parking	4	0.4%
No Regulations*	261	14.9%
<b>All Spaces</b>	<b>1,633</b>	<b>100%</b>

\*Excepting Princeton's general ban on overnight parking

## Off-Street



There are 5,392 total off-street spaces in the Princeton Study Area. Just over one-quarter of these spaces are maintained as public parking (always available to the public). The remaining spaces are located in facilities that are restricted to on-site tenants and visitors, including some such facilities that allow shared/public access at designated times — typically evenings and weekends. Figures 4 and 5 break down the observed off-street parking inventory into three categories, as follows:

### Public Parking Supply

Available, paid or unpaid, for open use by the public without limitations beyond pricing and time limits. These lots may be publically or privately owned and operated.

Municipally owned and operated public parking lots include the Spring Street garage, the MacLean Street lot, the Park Place lot, and the Mercer Street lot. Major privately operated public parking facilities include the Chambers Street and Hulfish Street garages near Palmer Square, as well as the smaller Griggs Corner Yard.

- 1,437 spaces (the lots marked in Green) in the map below)
- 26% of the overall supply

### Restricted Parking Supply

Available only to on-site users such as employees, residents, and visitors/customers of a specific building. These lots are spread throughout the study area and provide reserved parking for a variety of small businesses, residences, and larger institutions.

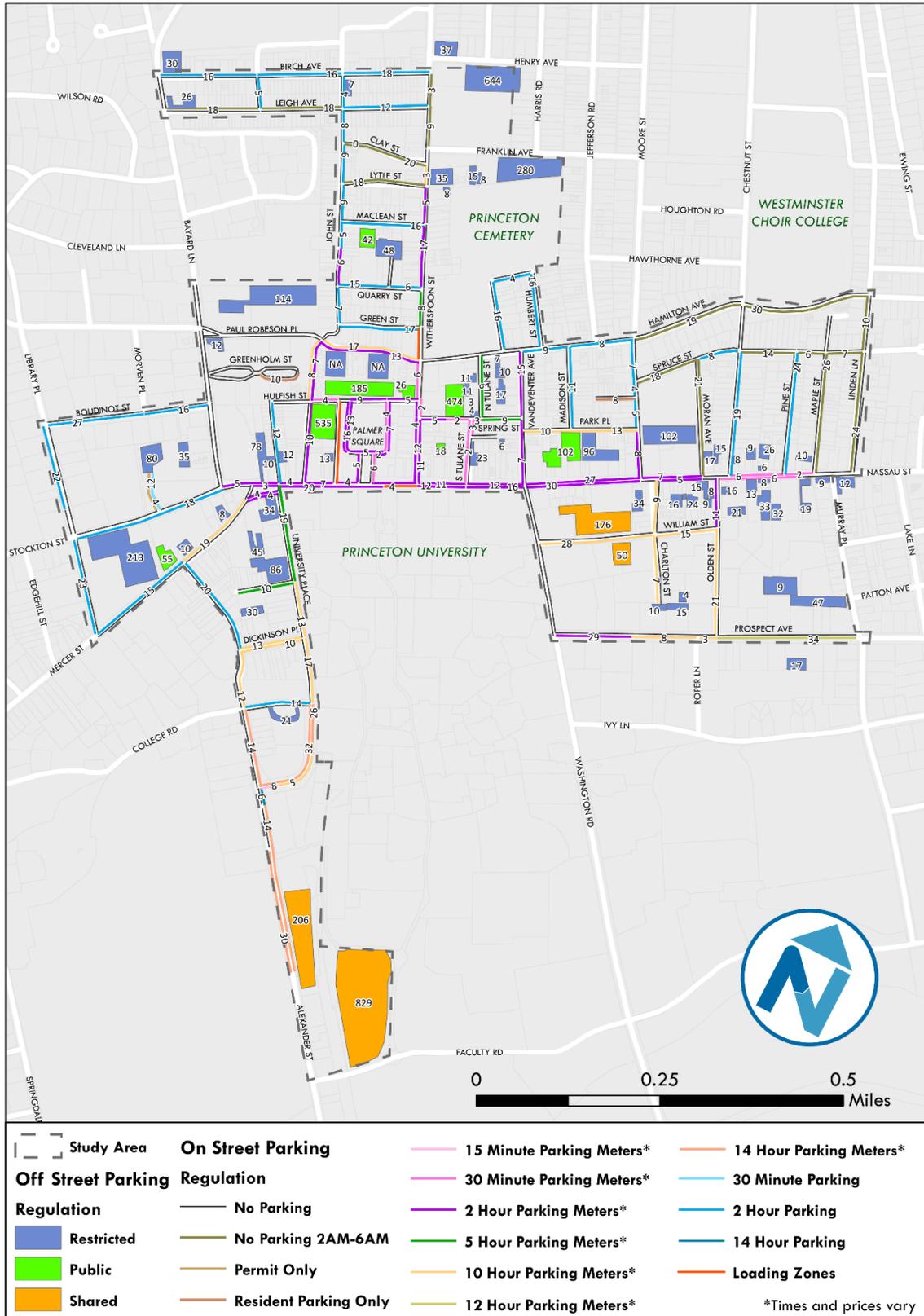
- 2,694 spaces (the lots marked in Blue in the map below)
- 50% of the overall supply

### **Shared Parking Supply**

Shared parking indicates parking facilities which may be reserved for a portion of the day or week, but open to the public at times when the demand from the primary associated use is low. These are primarily Princeton University lots, which require permits during weekdays, but are open to the public after 5 PM and on weekends. This category also includes the parking lot adjacent to the Princeton Station, which includes a variety of public metered spaces and reserved spaces.

- 1,261 spaces
- 24% of the overall supply

Figure 4 Study Area Parking Capacities and Regulations



## MANAGEMENT

### Commercial Areas

Pricing and time limits are the primary tools used to manage demand and maintain space availability within Princeton's commercial areas. The highest prices are concentrated near Palmer Square and along Nassau Street, reflecting higher demand in this commercial core, where Princeton's shopping and restaurants are concentrated.

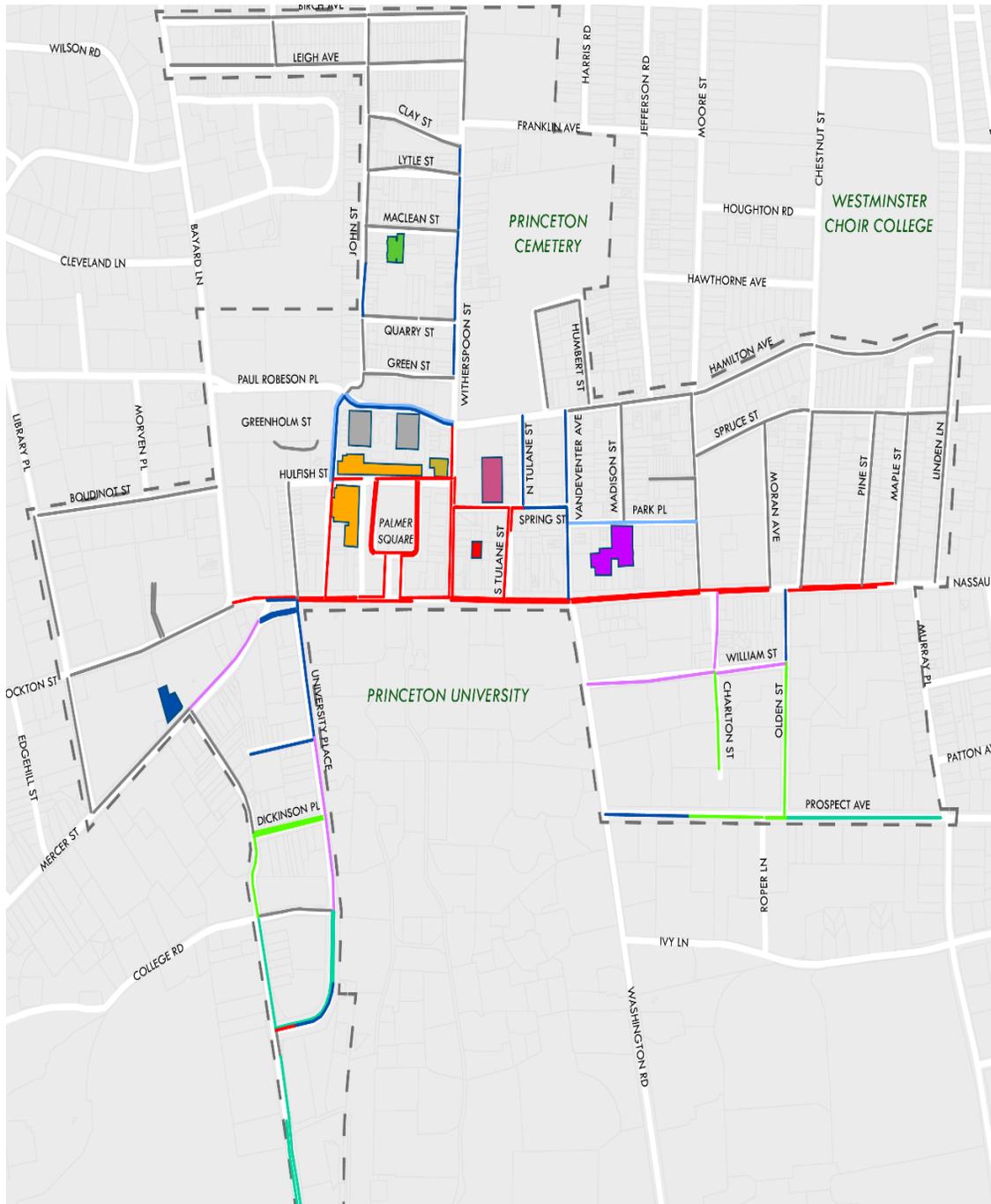
In addition to primary regulations, publically accessible parking facilities were mapped according to their pricing structure, as displayed in Figure 5.

Coordination between municipal and commercial parking facilities is necessary to ensure that pricing strategies manage demand effectively. In Princeton's commercial core, Palmer Square, a mismatch in pricing exists between privately operated garages at Chambers Street and Hulfish Street, as well as the Griggs Corner Yard, and municipally operated facilities at the Spring Street garage. The privately operated lots are more expensive than the municipal garage, despite the fact that the product being provided is essentially the same. All of these facilities are within easy walking distance of Palmer Square. Furthermore, the Spring Street garage allows for validation from library patrons, a further incentive to choose this garage over other nearby facilities.

Princeton currently allows for a "grace period" of eight minutes following meter expiration. While customers are likely not directly aware of this policy, the grace period shields the customer from receiving a costly parking ticket for overstaying their meter by only a few minutes, leaving a strongly negative impression on their downtown experience.



Figure 5 Pricing



## Residential Areas

The primary tools for managing demand and maintaining availability along Princeton's residential streets are time limits, and an overnight parking ban. Residents can acquire permits for overnight parking, but must abide by posted time limits, even with a permit. The overnight parking ban complicates the options for residents who lack on-site parking options. Ultimately, this may reduce the value of homes without on-site parking, and incentivize developers to include excessive on-site parking supplies with their projects.

**Figure 6 Residential Street on a Fall Weekday**



### Residential Permit Program

Princeton provides permits that allow residents of the former Borough who lack on-site parking at their homes to park overnight on their street at a cost of \$30 per quarter. Borough residents are allowed one parking permit per dwelling without off-street parking. Unlike a traditional "resident parking permit", the offered permits do not exempt vehicles from the time limits commonly found on neighborhood streets. As such, residents with daytime parking needs must secure access to off-street parking, or seek to avoid time-limit restrictions.

In the former Township, permits are offered for free, with one permit given for households with a driveway, and two permits given for households without a driveway. These permits also exempt holders from the daytime limits. The disparity between the former Borough and Township permit structures creates a sense of inequity among some Princeton residents.

Overnight off-street parking permits are also available, for \$25 per month and allow holders to park in the Park Place West and MacLean Street Yard lots. Waiting lists for these off-street permits, however means that this option is not currently available, due to high demand.

Visitor parking passes are available at a cost of \$10 per week and allow residents to provide temporary off-street parking for their guests in specific municipal surface lots. In addition to this, residents frequently contact the police department to request an exemption for their visitors' vehicles from the overnight parking ban. While the police department does typically grant these requests, this is not the desired process and has proven burdensome for the police department as well as unfair to residents who play by the rules.

All parking permits are processed via the Municipal Clerk's office.

**Figure 7 Residential Parking and Permit Example on Bank Street**



## DEMAND/UTILIZATION

Aggregate demand and supply (utilization) measures, based on an extensive set of field surveys, reveal consistently high levels of excess capacity, even during times of peak parking demand. However, much of this capacity is managed as private parking, restricted to on-site tenants and visitors. While some of these private facilities are shared during off-hours (Princeton University opens up its parking during evenings and weekends, for example) the overall impact of these restrictions is that available supplies are not fully available to meet aggregate parking needs during times of peak demand. This helps create the common perception that parking is scarce in downtown Princeton.

Figures 8 and 9 display observed parking utilization at the aggregate level, over several hours of weekday and weekend surveys. Areas of dark blue indicate aggregate occupancy measures (the total number of cars parked across all locations), while the areas of light tan indicate remaining capacity at those times. A dashed line marks the 90% occupied level, which is a standard measure of "effective capacity" or "functional capacity" for a given parking supply, which can be considered a performance target for optimal supply efficiency.

Figure 8 Weekday Utilization

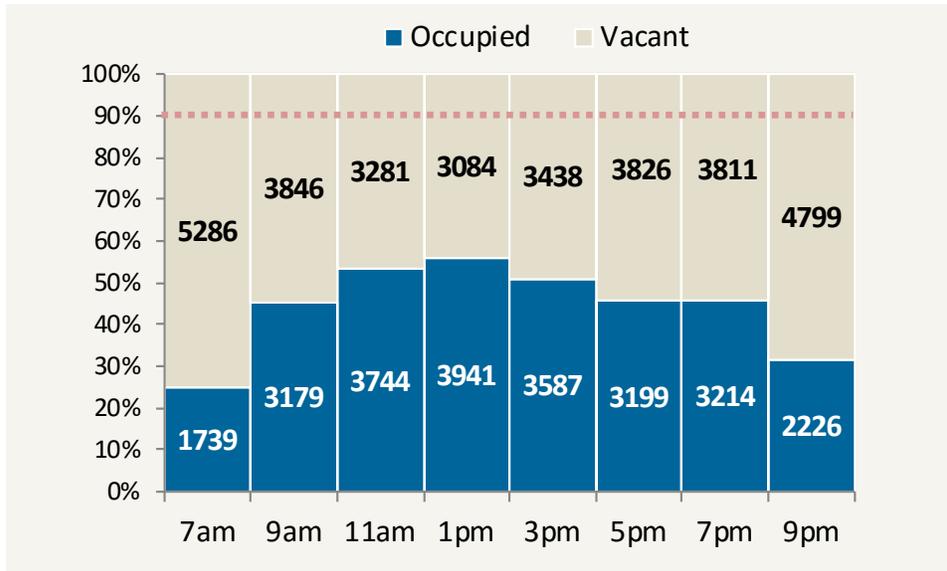
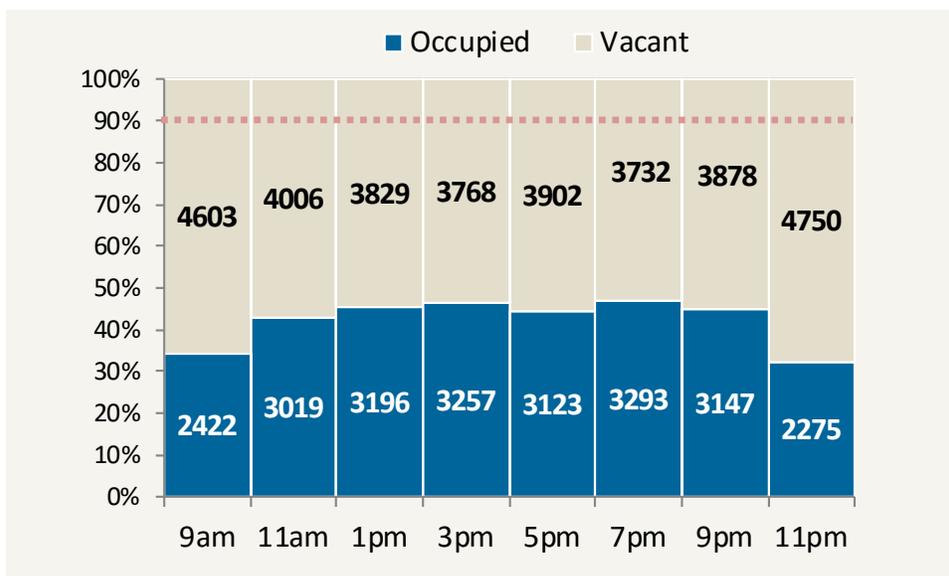


Figure 9 Weekend Utilization



**Figure 10 Visible Availability Defines Parking Experiences and Supply Perceptions**



Aggregate utilization measures like these, however, do not capture the experience of seeking parking, in real time, and with limited information beyond what is immediately visible to drivers. Block- and facility-level measures, by contrast, can capture detailed utilization patterns that tend to create perceptions that supply is insufficient, despite an overall abundance of parking capacity. The maps and charts on the following pages provide a visual summary of these patterns, across several key times during a weekday and weekend observation period.<sup>1</sup>

## Weekdays

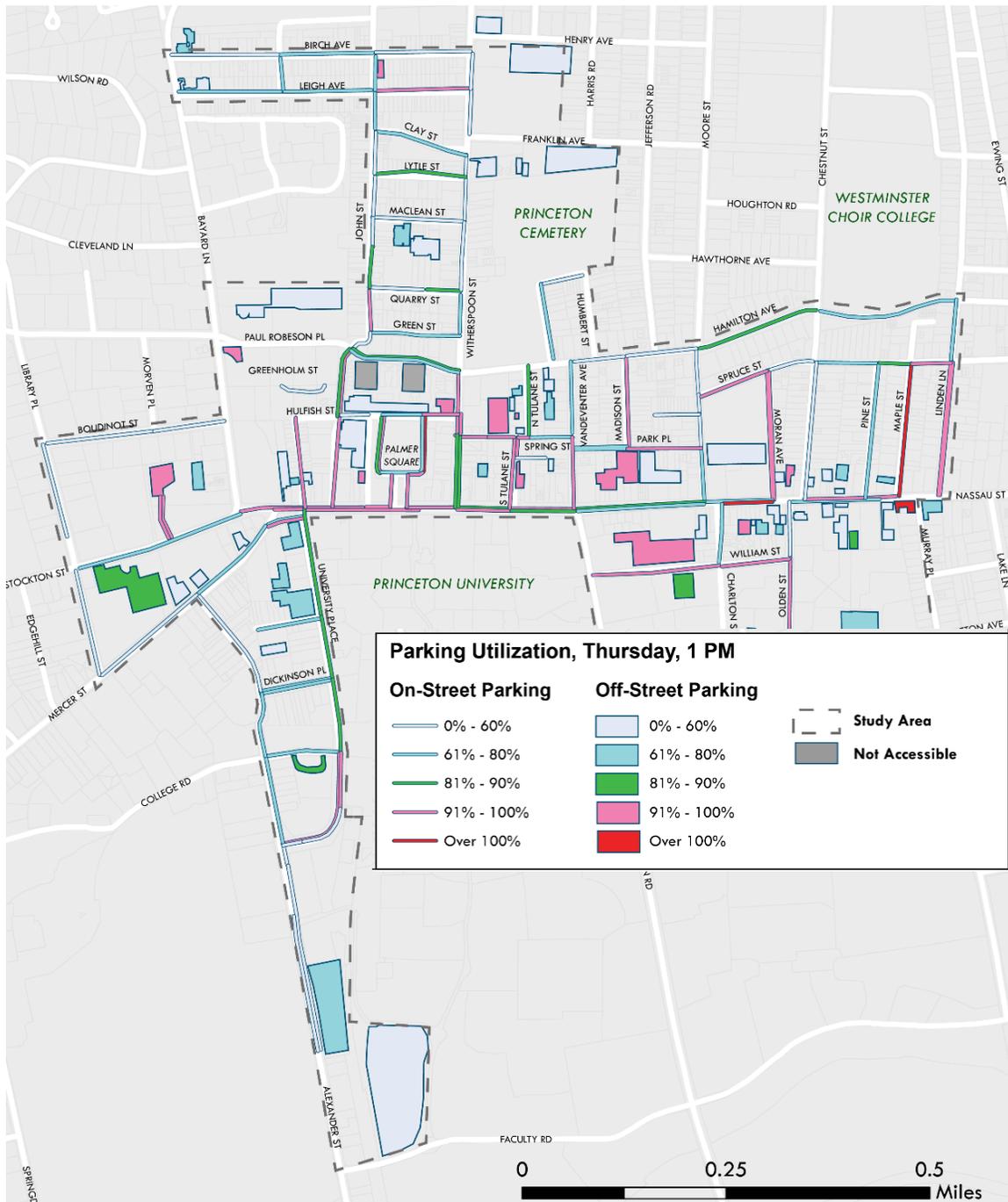
As noted above, weekday utilization peaks at 1 PM. Figure 11 on the following page illustrates that demand is concentrated in several key areas at this time, as follows:

- Palmer Square, especially on-street
- Nassau Street
- Maple Street and Linden Lane (currently unregulated except for the overnight parking ban)
- The Spring Street garage
- Princeton University affiliated lots, which are restricted to the public at this time

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<sup>1</sup> Only peak period maps are displayed in the body of this document. The remainder of parking utilization maps are included in the Appendices of this report.

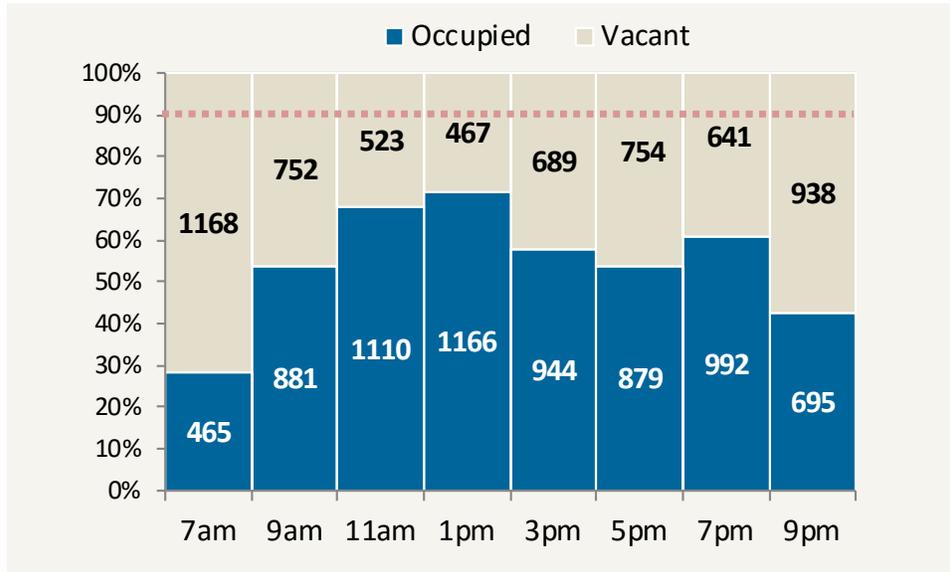
Figure 11 Weekday Parking Utilization Map, 1 PM



## On-Street

On-street utilization is higher, on average, than off-street utilization. These spaces experience both a midday utilization peak, at 1PM, and a smaller secondary peak at 7 PM (when most meter regulations end).

**Figure 12 Weekday On-Street Parking Utilization**



## Off-Street: All facilities

Utilization among all off-street spaces does not surpass 50% utilization, throughout the week. Conditions varied significantly among these facilities, however. Utilization is much higher at the Spring Street garage, compared to Chambers Street and Hulfish Street garages, likely due to pricing differences and the library validation program. As a result, capacities at the Spring Street garage did become constrained during the midday peak, while hundreds of spaces remained empty at the other facilities.

Figure 13 Weekday Off-Street Parking Utilization, All Facilities

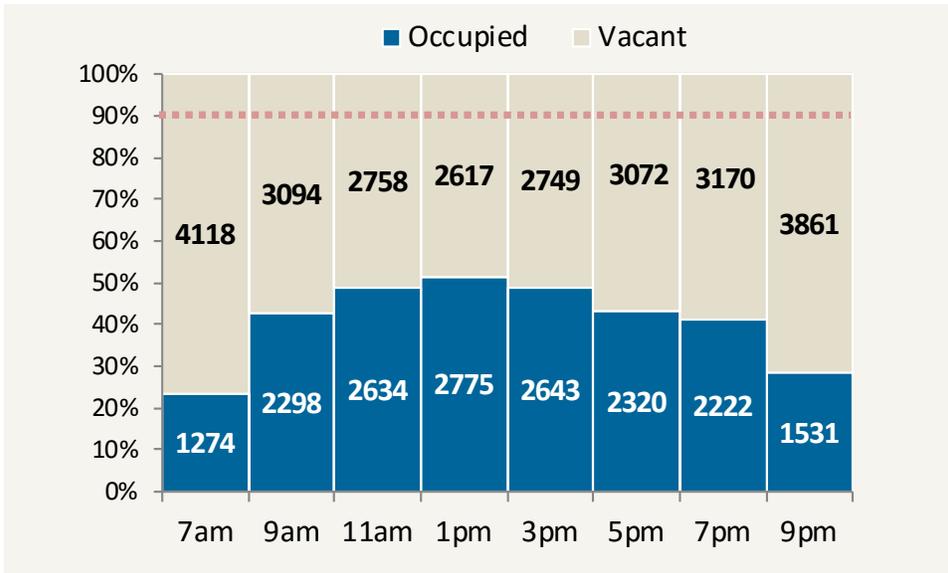
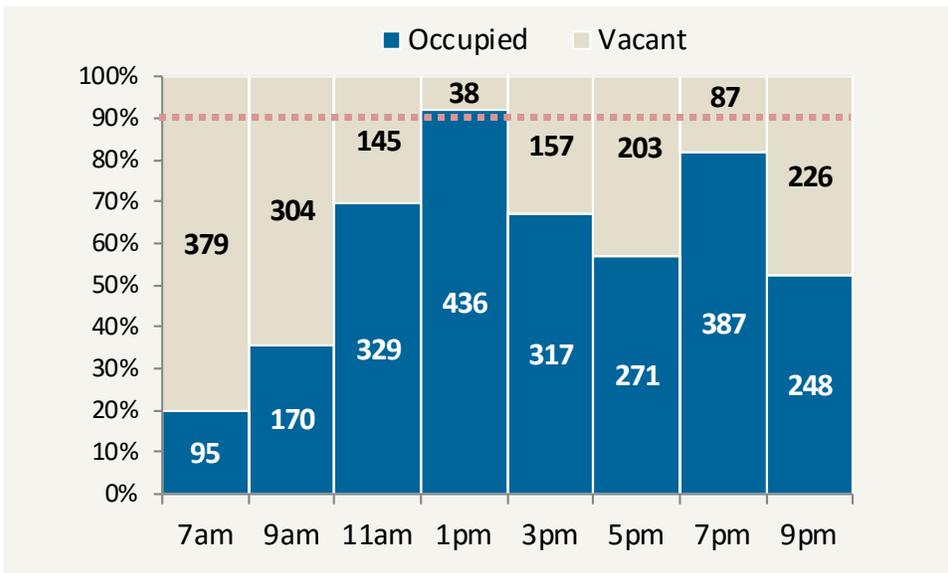
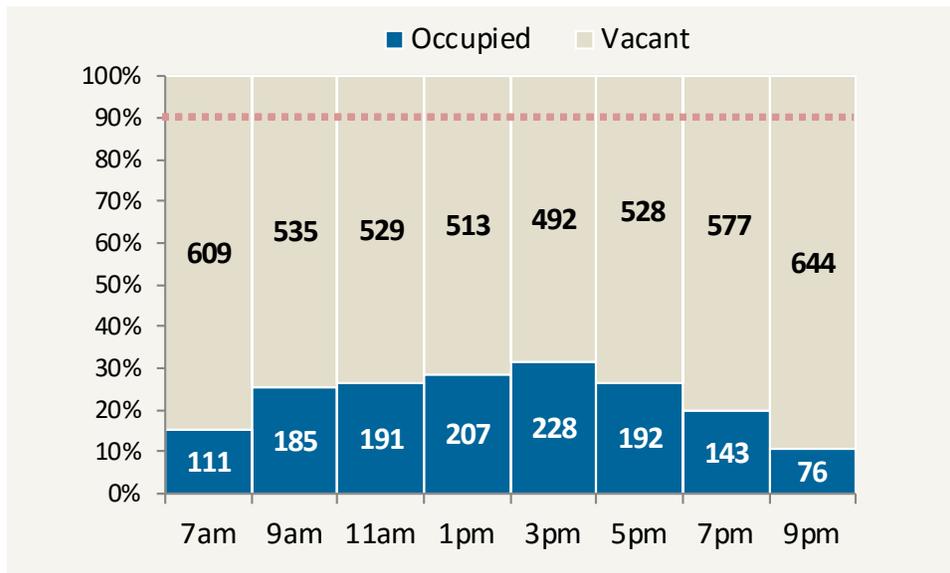


Figure 14 Weekday Spring Street Garage Parking Utilization



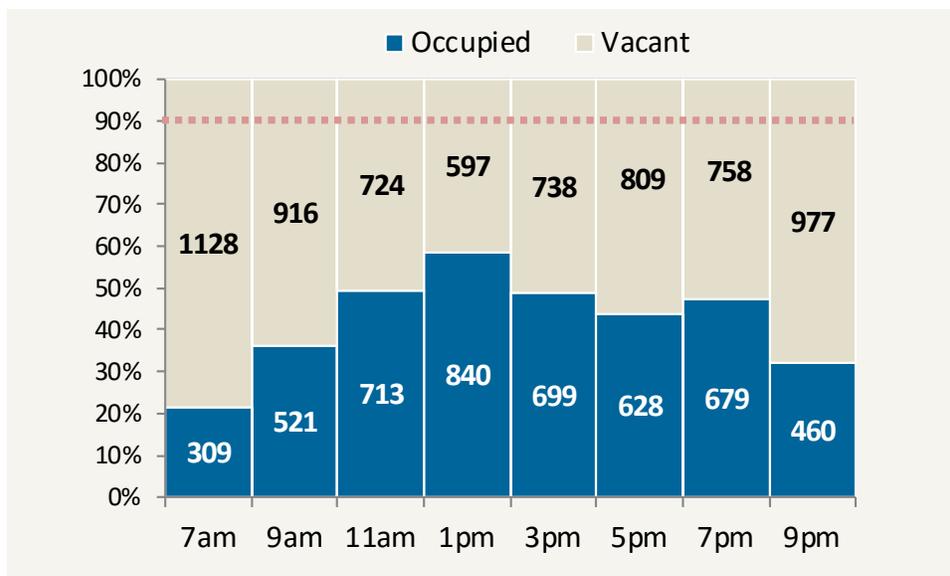
**Figure 15 Weekday Chambers Street and Hulfish Street Garages Parking Utilization**



**Off-Street: Public Facilities (commercial & municipal facilities)**

While overall parking utilization peaks at 55% during the observed weekday, utilization of public parking facilities is significantly higher. This helps to create the perception that downtown parking options are more limited than raw supply data might suggest. Nonetheless, overall parking utilization for downtown’s public off-street parking spaces does not surpass 60%, peaking at 58% around 1PM, leaving a significant level of capacity still available.

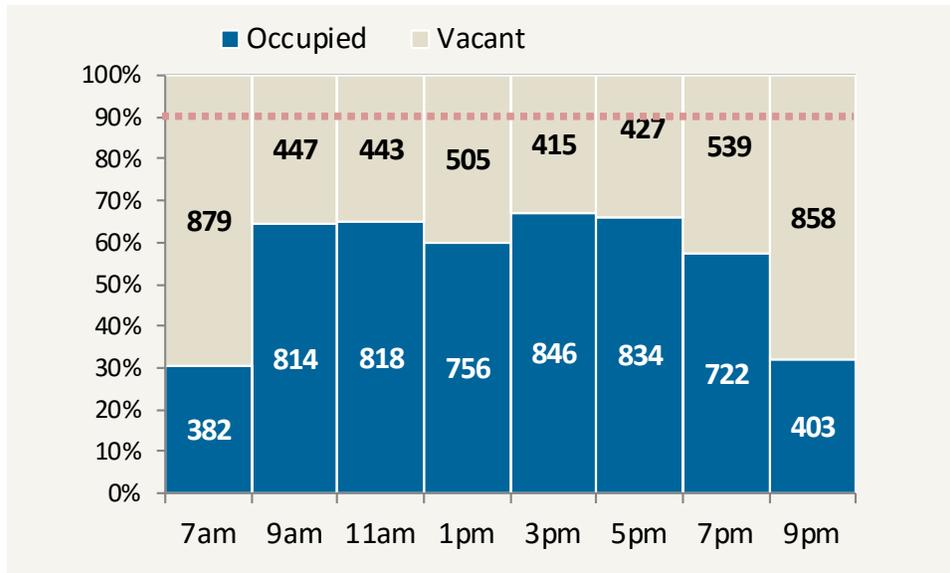
**Figure 16 Weekday Off-Street Publicly Available Parking Utilization**



### Off-Street: Shared Facilities (publicly available evenings & weekends)

Princeton University parking facilities, which are publicly available after 5 PM and on weekends, were lightly utilized during these “off hour” periods. This is likely due to a lack of available information and publicity surrounding the shared status of these Princeton University facilities.

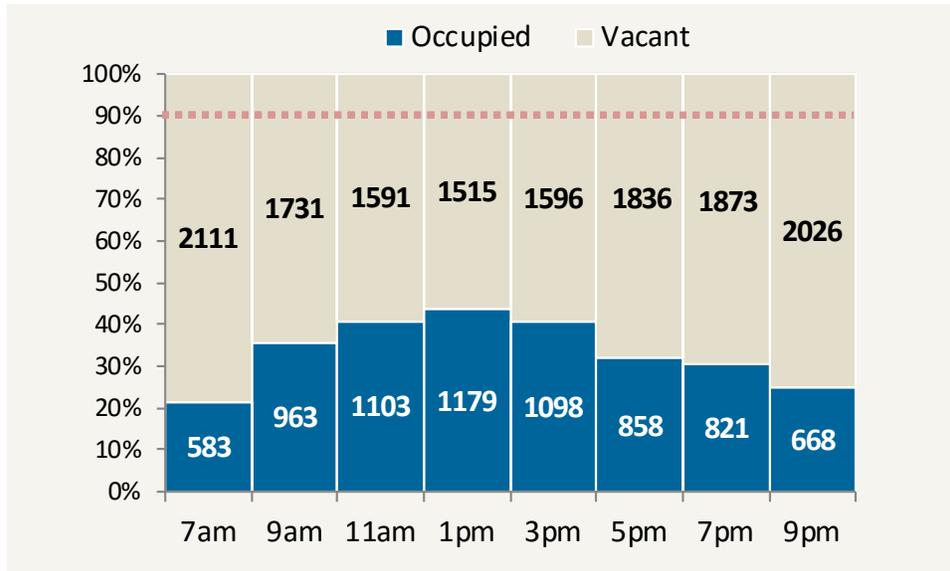
Figure 17 Weekday Shared Parking Utilization



### Off-Street: Private Facilities (restricted to on-site tenants/visitors, at all times)

There remains significant excess capacity among these spaces, at all times. This indicates an important opportunity to pursue shared-parking strategies that could make more of these spaces publicly available during evenings and weekends. While there is no overall shortage of publicly-available off-street spaces, even during peak-demand periods, many of these private facilities are likely located in convenient locations that would better address many drivers’ parking preferences.

**Figure 18 Weekday Private Off-Street Parking Utilization**

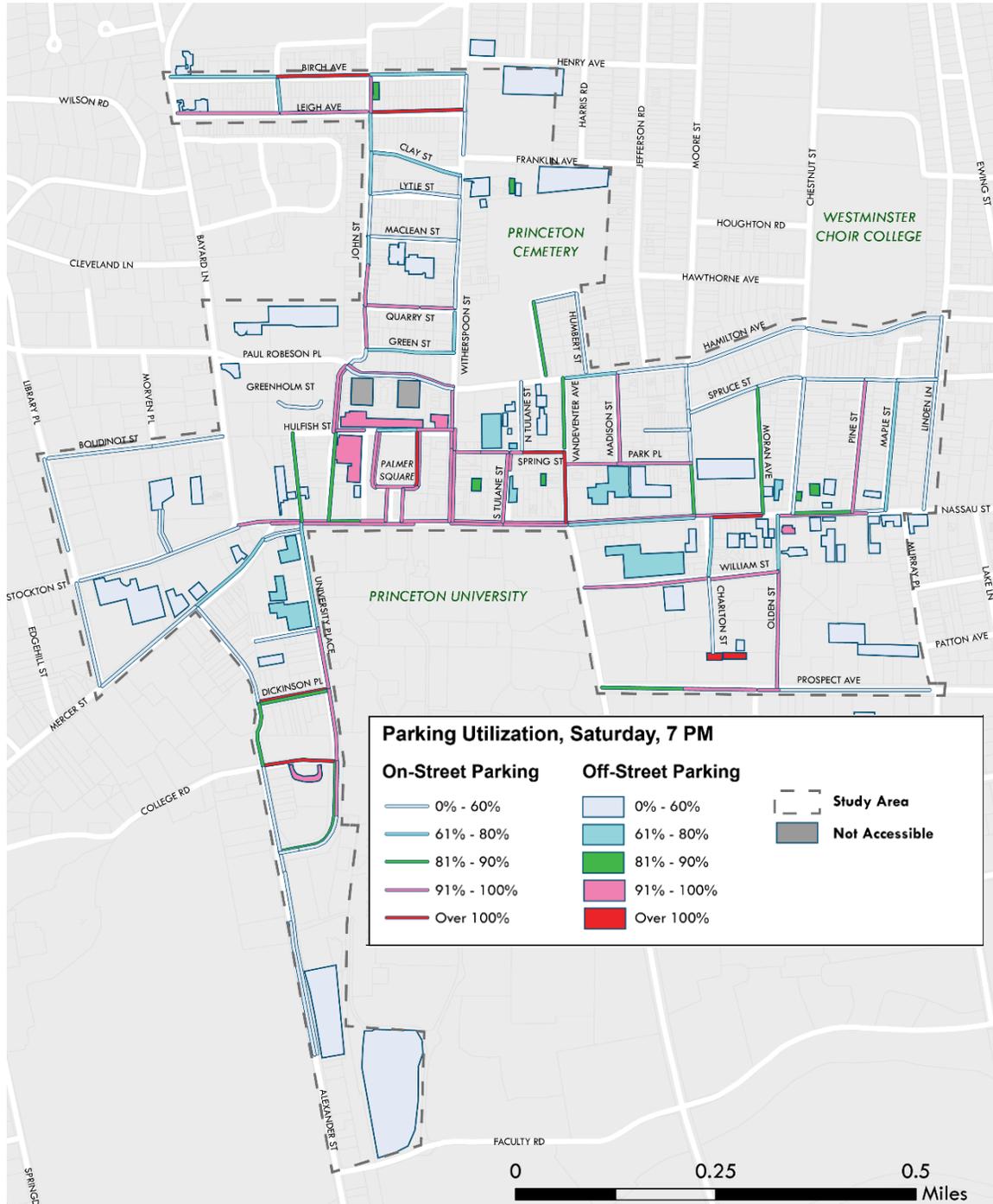


## Weekends

As previously displayed in Figure 9, weekend utilization peaks at 7 PM. Demand is generally more concentrated around Palmer Square, Nassau Street, and the commercial core than during the weekday period. The map on the following page illustrates that demand during this peak is concentrated in several key areas, as follows:

- Palmer Square, in both on-street and off-street facilities
- Nassau Street
- Birch Avenue and Leigh Avenue (resident areas)
- The McCarter Theater area around College Road
- All on-street metered areas north of Nassau Street near the commercial core

Figure 19 Weekend Utilization Peak, 7PM<sup>2</sup>

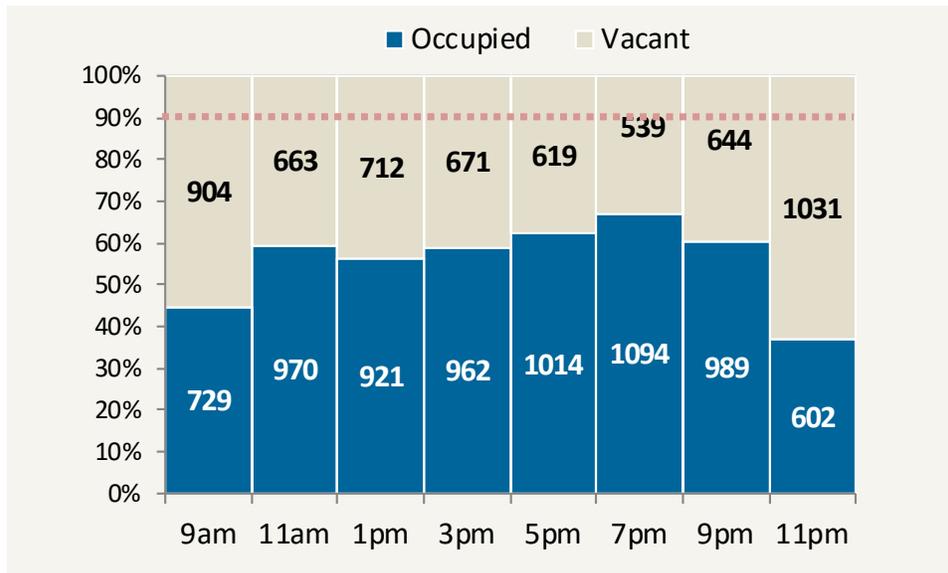


<sup>2</sup> A full set of utilization maps for all survey time periods can be found in the Appendix document under Utilization Maps.

## On-Street

Utilization of on-street facilities was significantly greater than utilization of off-street facilities. On-street parking approached 70% utilization during the peak, while off-street parking did not surpass 45% utilization for the overall study area. While 70% on-street utilization represents significant demand, it does mean that over 500 on-street spaces still exist within the study area even during the 7 PM peak. On-street demand continued well into the evening, with 60% of on-street spaces in use at 9 PM, and 35% of on-street spaces in use at 11 PM.

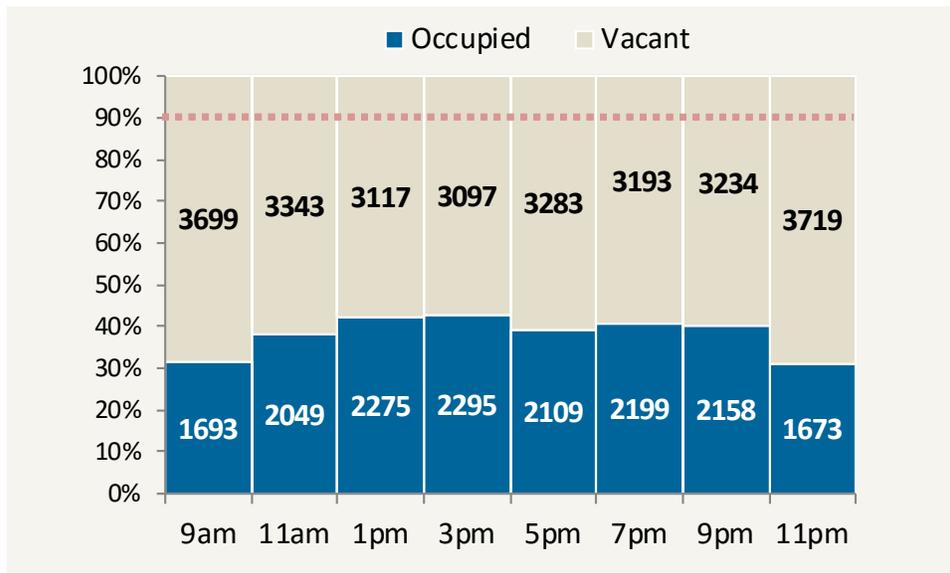
**Figure 20 Weekend On-Street Parking Utilization**



## Off-Street: All facilities

Off-street parking did not surpass 45% utilization for the overall study area on the weekend. Much of this is due to the lack of employees and Princeton University staff and students on the weekend, leaving the majority of restricted lots much emptier than during the week.

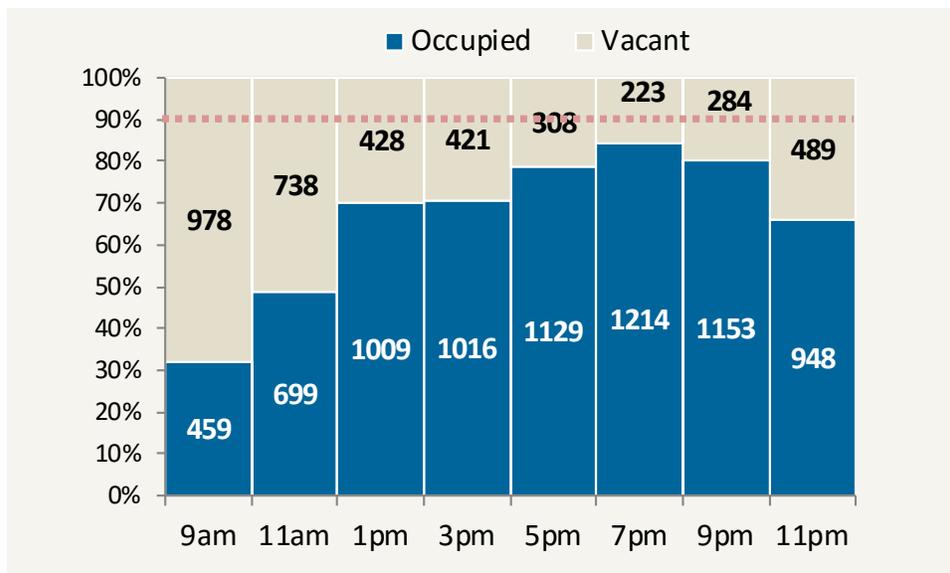
**Figure 21 Weekend Off-Street Parking Utilization**



**Off-Street: Public Facilities (commercial & municipal facilities)**

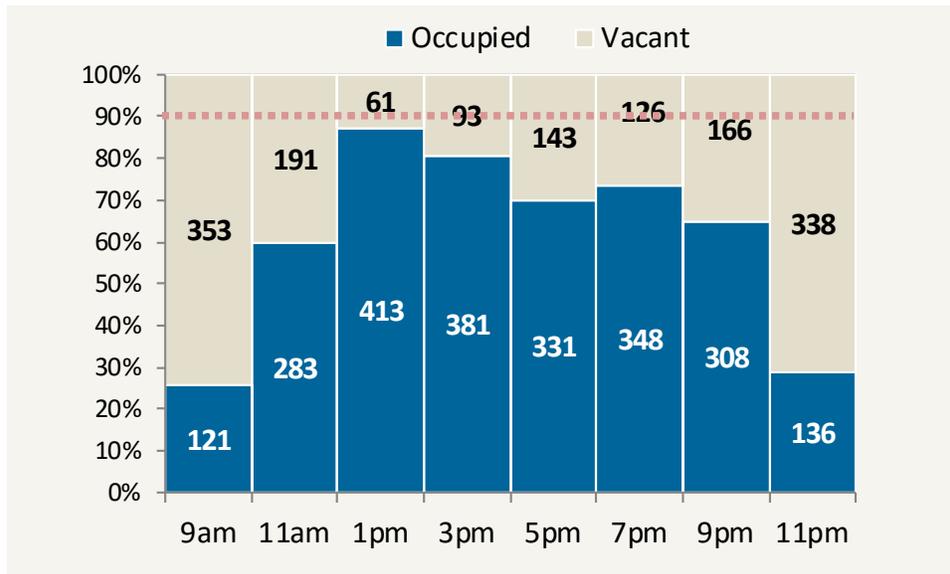
When utilization is narrowed to publically accessible parking, observed demand increases further. 80% of all publically available off-street parking spaces were in use at 7 PM, with just over 200 remaining public spaces available. Both on-street and off-street parking was highly utilized, with the core Palmer Square and Spring Street garages nearing or at capacity.

**Figure 22 Weekend Off-Street Publically Available Parking Utilization**



The Spring Street garage was highly utilized throughout the day, peaking near 90% at 1 PM, and falling to a secondary peak of 75% at 7 PM. As the premier publically operated facility in downtown Princeton, the Spring Street garage is an effective indicator of demand for off-street public parking.

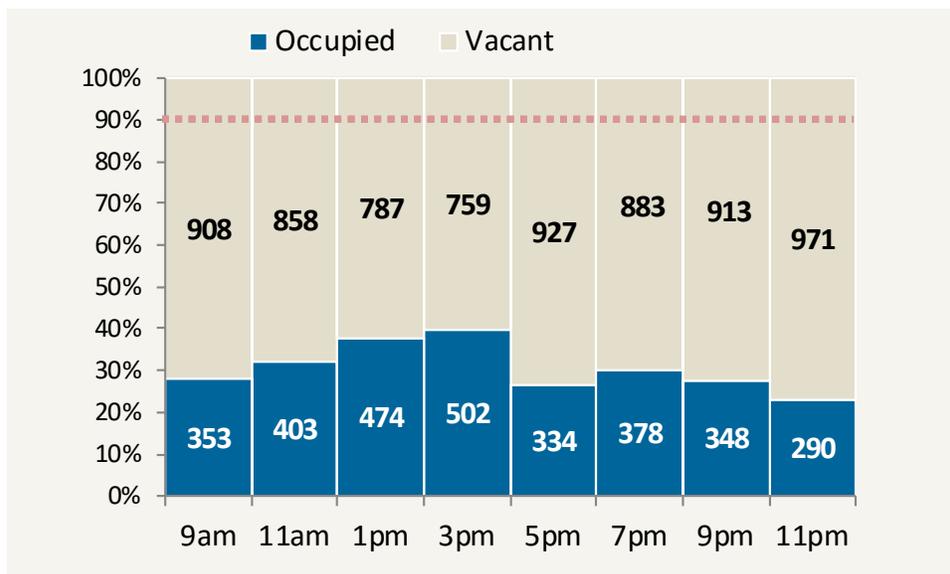
**Figure 23 Weekend Spring Street Garage Parking Utilization**



**Off-Street: Shared Facilities (publicly available evenings & weekends)**

Shared parking, however, was highly underutilized throughout the weekend day. While publically available parking hit 80% utilization at 7 PM, shared parking facilities were only 30% utilized. This represents almost 900 shared parking spaces not in use due to lack of awareness and publicity surround Princeton University shared lots.

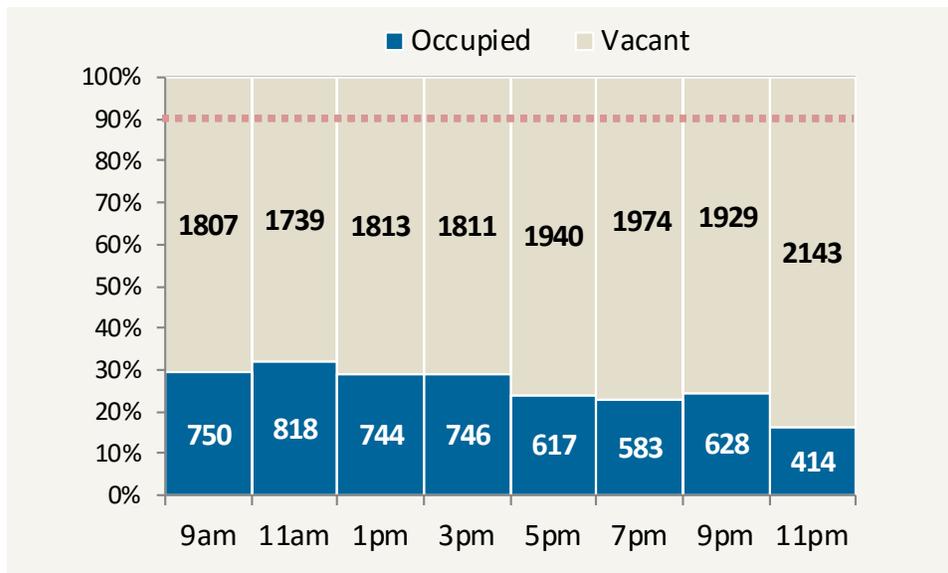
**Figure 24 Weekend Shared Parking Utilization**



### Off-Street: Private Facilities (restricted to on-site tenants/visitors, at all times)

Restricted access off-street parking was even more underutilized than shared parking areas, with only 20% of restricted spaces in use at the 7 PM peak. This represents a high potential for shared parking agreements given the low observed demand across restricted spaces.

Figure 25 Weekend Private Off-Street Parking Utilization



## Summary

### Weekdays

- Peak demand occurs at 1 pm with 53% total utilization
- Parkers do not appear to be aware that Princeton University lots become available to the public after 5 PM
- Spring Street garage is used at a higher rate than the Palmer Square garages due to lower pricing and validation options
- Parking in on-street metered spaces spikes at 7 PM when meter enforcement ends
- There is capacity in the core at peak times in off-street facilities like the Chambers Street and Hulfish Street garages as well as restricted lots

### Weekends

- Parking demand is more concentrated in the core area at Palmer Square, compared to weekdays
- Off-street parking is used at a much higher rate on Saturday
- Publicly available garages are full during peak times
- 80% of all publicly available parking is full at the 7 PM peak, while shared Princeton University lots are only 30% full

- Nassau Street and Palmer Square parking is full throughout the day
- 2,000 restricted off-street spaces are not in use at 7 PM peak
- Birch Avenue and Leigh Avenue are highly utilized due to dense residential development and the presence of unregulated blocks of on-street parking, representing primarily resident demand with additional pressure from customers and employees

# 3 STAKEHOLDER INPUT

## OVERVIEW

Hard data on parking supply and demand conditions is essential for measuring the capacity and effectiveness of parking infrastructure. Such infrastructure represents a significant commitment of land and resources, dedicated to accommodating auto-based mobility and access. In walkable, urban communities, such commitments can reduce the capacity to provide and maintain functional walk, bike, and transit networks, as well as the land-use densities that best support these modes of travel. The measures and conditions outlined above provide an objective overview of the balance between the scale of this infrastructure and peak levels of parking need. This is the best means of understanding whether or not simply expanding area parking supplies might effectively address common parking challenges, constraints, and frustrations. Findings outlined above indicate that this is not the case, and that management, perhaps complemented by strategic expansions of capacity, offers the best chance for improved conditions.

Defining effective management solutions, however, requires more than hard measures of supply and demand. It requires a deeper understanding of the subjective, personal experience of parking, in specific situations and contexts. The only meaningful way to gain such understanding is to engage with those who most consistently have these experiences, the area's Stakeholders: its residents, employees, business and property owners, and frequent visitors.

Stakeholder input was gathered via two open-house style public meetings, focus groups and interviews, and an online survey that garnered 1,552 responses from area residents, employees, business owners, and customers. These efforts are described briefly below, followed by a short summary of input received via each outreach component. Key issues and opportunities from these stakeholder and public input efforts as well as the data analysis efforts are synthesized in section five of this report, where they are grouped by theme.

## OPEN HOUSE AND PARKING WORKSHOP

The first open house functioned primarily as a "fact-finding" initiative and secondarily as an opportunity to vet the study's goals and objectives and promote the online survey.

Initial parking inventory maps were presented to participants, who were also invited to suggest and discuss project goals, and provide comments across all aspects of parking in Princeton. A variety of interactive stations were used to promote conversation and innovative thinking, including:

- Parking goal prioritization workstation
- The "Parking Confessional," an opportunity for parkers to anonymously map their favorite parking spot, usual parking spot, and secret parking spot.
- A word association exercise with broad parking and transportation related buckets intended to spur general comments

- A draft inventory map for markup and review
- A station promoting the online survey

The second meeting summarized key findings from the utilization and inventory studies, as well as the online survey and parking management reviews. The end of this meeting briefly introduced key strategies for discussion. This discussion, in turn, framed the recommended strategies contained in later sections of this report.

## FOCUS GROUPS & INTERVIEWS

Key stakeholder interviews and focus groups were scheduled to gain more specific and more detailed input on parking conditions from key stakeholders. The following groups were selected for interviews:

- Downtown bar and restaurant owners
- Representatives from the Witherspoon-Jackson neighborhood
- Representatives from the Tree Streets neighborhood
- Business and personal service owners
- Retail shop and gallery owners
- Representatives from the Princeton Future community group
- Representatives from the following institutions:
  - Princeton University
  - Princeton public schools
  - The Princeton Public Library
  - Princeton Housing Authority
- Enforcement managers and on-street personnel, as well as the police department
- Princeton's parking management staff

Key comments from the initial workshop and associated stakeholder meetings include:

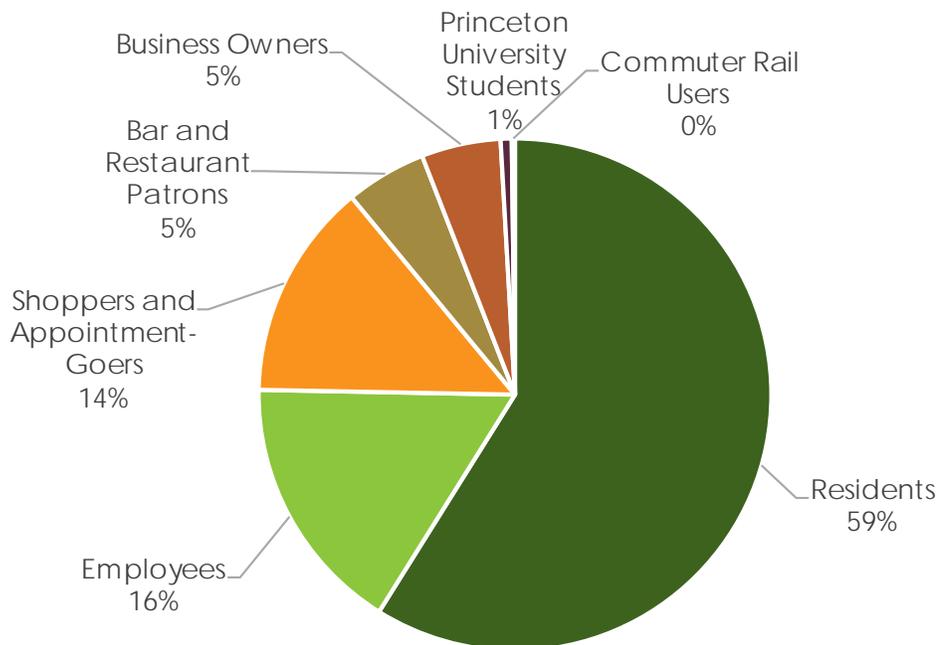
- Princeton's business owners indicated that enforcement and confusing regulations can be intimidating for customers and visitors
- Princeton's police force indicated that residents call on an individual basis to report the presence of an on-street parking visitor and request a fine exemption, a practice which is not manageable for the police
- Business owners indicated that small business employee parking is difficult to find or expensive
- Time limits create a barrier to visitors enjoying multiple establishments, as indicated by residents and business owners alike
- Business owners indicated that parking apps which allow on the fly time additions (like ParkMobile) could improve visitor experience
- Enforcement managers indicated that loading zones are difficult to enforce, especially with tour buses
- Princeton University staff and Tree Streets residents indicated that perception of spillover parking from Princeton University staff and students creates frustration

- Tree Streets and Witherspoon-Jackson residents experience difficulty parking due to other users parking on their streets as well as dense residential development
- Difficulty of parking and harsh enforcement discourages visitors
- Many residents wondered why there is an overnight parking ban
- Developers indicated that zoning creates a barrier to redevelopment and change of use, often due to limiting parking requirements

## THE ONLINE SURVEY

An online survey was developed, then promoted and maintained for two months. The survey was designed to link responses to specific stakeholder identities – residents, employees, business owners, etc. In order to address the reality that residents are often visitors, and business owners and employees are often residents, the survey was designed to allow participants to complete it multiple times so that their responses would be linked to each of their respective relationships to parking in the Study Area. Figure 26 shows the distribution of survey respondents throughout the course of the study as indicated by these roles. There were 1,552 unique responses to the Princeton Parking Survey.<sup>3</sup>

**Figure 26 Princeton Parking Survey Response Distribution**



## FINDINGS & ISSUES OPEN HOUSE

Following the completion of the utilization surveys, the closing of the online survey, management review of findings and issues and other existing conditions activities, a second open house was held to present and discuss key findings. This meeting presented results from all existing conditions activities, as well as comments from the first meeting,

<sup>3</sup> Full results from the online survey are included as Exhibit B of this report.

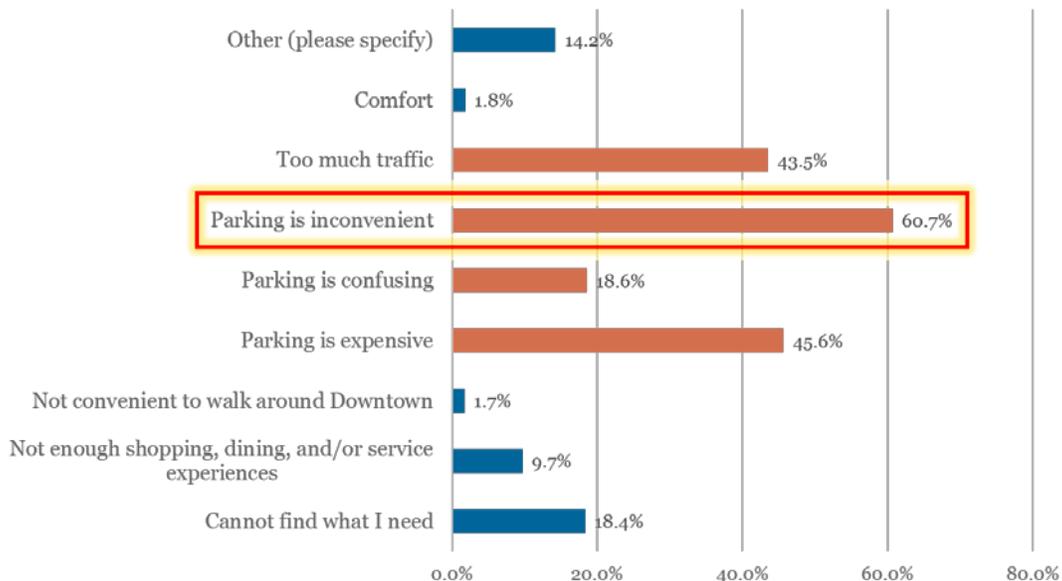
the online survey, and stakeholder interviews. A large number of attendees had completed the online survey, and overall survey results were viewed favorably, with an excellent sample size.

- Residents expressed concern regarding overnight parking for visitors given the overnight parking ban (although a weekly \$10 visitor pass program is in place)
- The overnight parking ban became a focal point, with residents from denser neighborhoods less favorable, and others expressing concern over students parking overnight on their streets
- Price increases were flagged as an equity concern
- A drop in overall customer activity was flagged as a concern for business owners due to increased parking rates

### Parking is Inconvenient

Figure 27 demonstrates that a large number of individuals rank parking as a key reason to not visit Princeton's downtown due to inconvenience. Other key factors included expensive parking, and too much traffic. Few respondents indicated that walking convenience or lack of shopping and dining were reasons to not visit downtown.

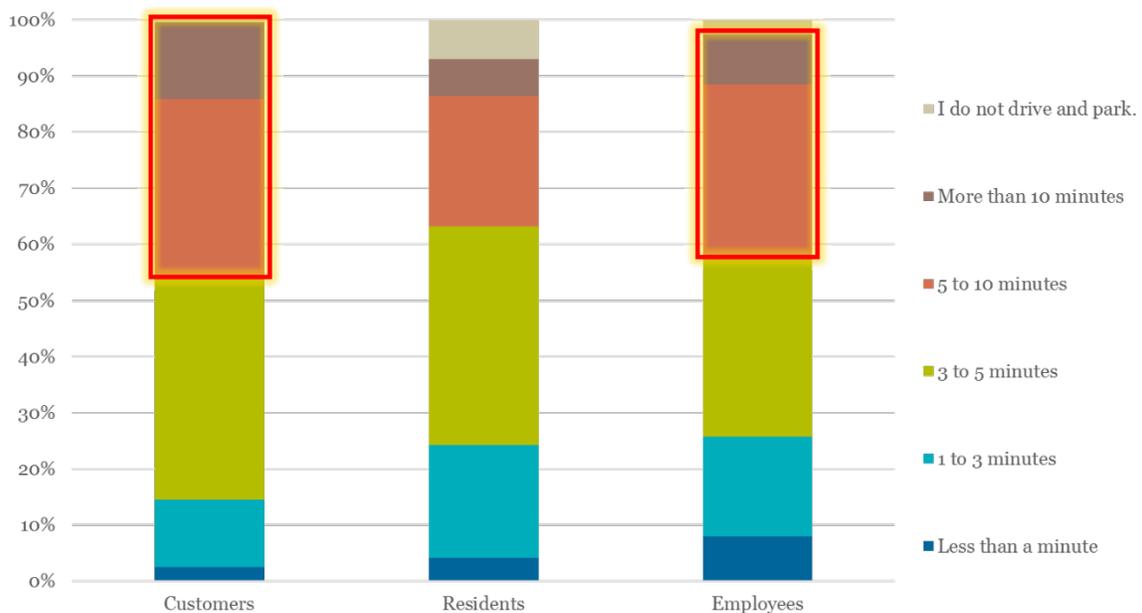
**Figure 27 Why Don't You Go to Downtown Princeton?**



### Employees and Customers Hunt for Parking

Figure 28 indicates that customers and employees spend more time than residents searching for available parking, likely due to unfamiliarity with regulations and constraining time limits at most parking locations.

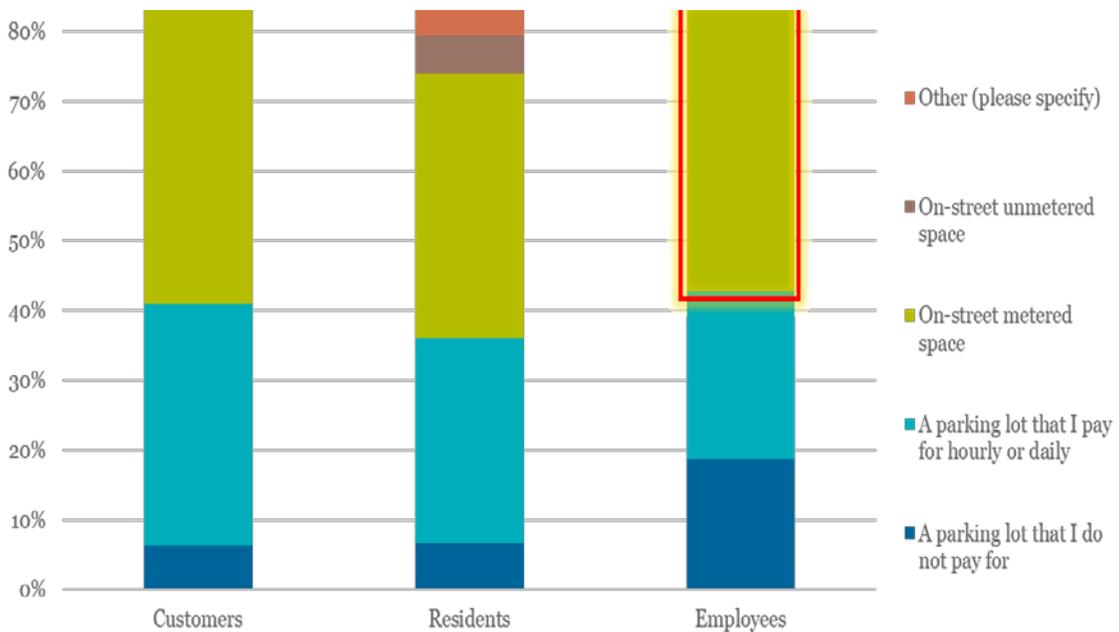
**Figure 28 Time Searching for Parking, by User Type**



**Employees Typically Park On-Street**

Figure 29 indicates that a large percentage of employees park in on-street metered spaces. While it is expected that shoppers may make use of metered spaces, employees have longer-term parking needs that are best served by other facility types. Addressing the needs of downtown employees is a key issue.

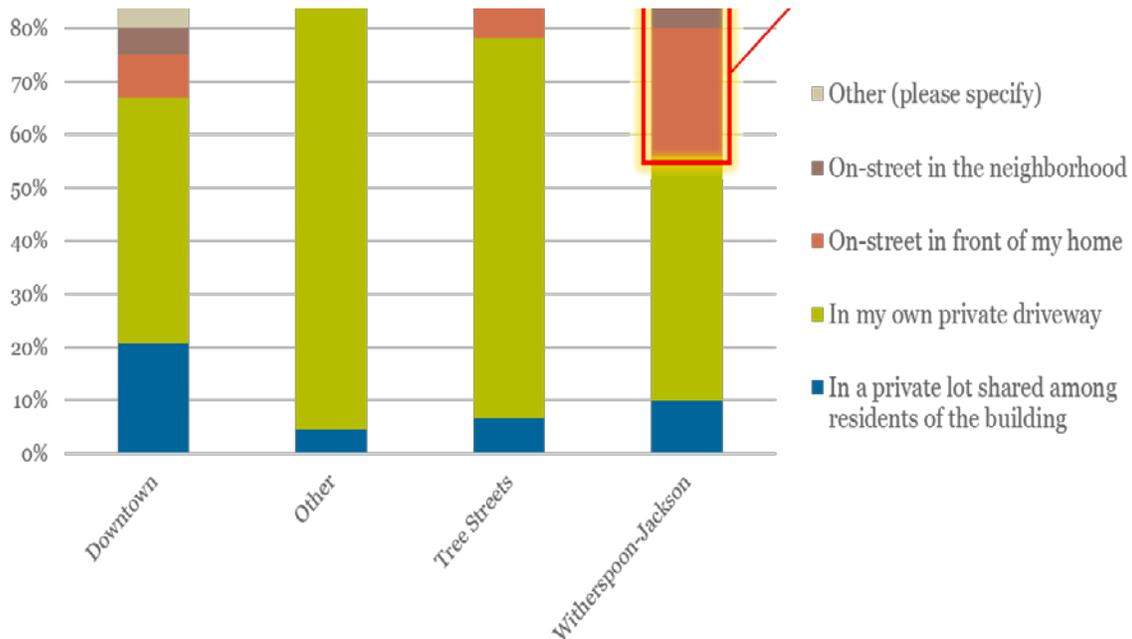
**Figure 29 Typical Parking Facility by User Type**



## Residential Parking Differs by Neighborhood

Figure 30 indicates that parking patterns differ across Princeton’s residential neighborhoods. While most respondents from “other” neighborhoods park in their own private driveways, one third of Witherspoon-Jackson residents park on the street. Contention surrounding parking setbacks in private driveways also affects residential parking, as, by code, many homes with driveways, cannot make full use of this on-site parking capacity for their cars. These disparities and issues suggest the need for a resident permit program that responds to the varying needs of residents from across Princeton.

**Figure 30 Typical Resident Parking Locations by Neighborhood**



## Further Key Survey Findings

In addition to those results highlighted above, other key findings from the Princeton Parking Survey include:

- 45% of customers and 40% of employees say it takes them 5-10 minutes or more to find parking
- Nearly 90% of customers and employees drive alone to Downtown
- Over half of users still pay for parking with coins or cash (less convenient than other options)
- Residents from the Tree Streets, Downtown, and Witherspoon-Jackson neighborhoods face more parking difficulties
- Most residents park in their driveways, but 33% of Witherspoon-Jackson residents park on the street
- Most residents who park on street do so because they cannot fit all of their vehicles in their driveway

- Respondents indicated that “Ability to park for longer periods of time” would provide a significant benefit to parking, a sentiment echoed by business owners
- Respondents did not indicate significant issues with Princeton's walking environment
- Half of business owners cited availability and/or cost of parking as Princeton's biggest challenge in terms of parking and transportation
- As a personal matter, business owners consider ease of finding a space, time limits, and proximity to one's destination as the most important factors in choosing where to park in Princeton

## 4 PROJECTED CONDITIONS & GROWTH OPPORTUNITIES

Development and economic growth is likely to affect the current demand and supply balance as Princeton continues to attract new businesses, jobs, residents, students, and visitors. At present, just two projects are either under construction or approved for construction.

1. A combined commercial/apartment building is currently under construction at 203-205 Nassau Street that will contain 1,900 square feet of office/retail space as well as three apartments.
2. A mixed-use project containing 2,060 square feet of commercial space and six apartments is pending approval.

Beyond development projects, reuse of vacant retail space as food & beverage uses will increase parking demand, due to the higher volume and turnover of customers typical of these businesses, relative to retail uses.

### PROJECTED DEVELOPMENT & CHANGES OF USE

The following sections summarize projections of how this combination of new development and changes among existing land uses and building spaces will affect future parking demand over the next five years. Our analysis was based on input from Princeton town staff and subject-area experts regarding recent and expected development activity, and likely rates of re-use and re-occupancy of currently-vacant retail space. This input provided a baseline for a set of growth scenarios that also assume various levels of implementation for the Parking Strategy developed through this study, as described below.

### Growth Scenarios

Effective parking strategies that increase the efficiencies and/or capacities of existing parking resources can facilitate and increase growth rates, including re-occupancy rates for vacant storefronts, in two significant ways.

1. Increased supply efficiencies reduces the value of maintaining excess capacities, and thus may facilitate the redevelopment of surface lots, creating more downtown uses and activities.
2. Improved short-term parking conditions may support faster absorption of currently-vacant retail space.

Following is a set of Growth Scenarios that assumes various levels of impact, from improved parking supply efficiencies and customer parking conditions, on these two factors.

#### Baseline

This development scenario assumes that any changes in parking management have no impact on rates of development or use-turnover, and that recent trends among both continue, resulting in the following:

- New development, roughly in line with recent years, creating:
  - 4,000 SF of commercial space
  - 10 new, multifamily dwelling units
- 10% of currently-vacant retail spaces is newly occupied as some form of Food & Beverage use.
  - A net gain of 3,000 SF of these uses.

### **Modest Impact**

This development scenario assumes that the strategies developed for this parking study have a modest impact on growth and use-turnover, resulting from improved supply efficiencies and customer-parking conditions, resulting in the following:

- Modestly greater new development, compared to recent years, bolstered by the redevelopment of one or more surface lots, creating:
  - 8,000 SF of commercial space
  - 20 new, multifamily dwelling units
  - 50 Hotel Units
- 25% of currently-vacant retail space is newly occupied as some form of Food & Beverage use, a rate supported by improved short-term parking access during peak-demand times.
  - A net gain of 7,500 SF of these uses.

### **Significant Impact**

This development scenario assumes that the strategies developed for this parking study have a larger impact on growth and use-turnover, resulting from improved supply efficiencies and customer-parking conditions, resulting in the following:

- Significantly more new development, compared to recent years, bolstered by the redevelopment of three or more surface lots, creating:
  - 12,000 SF of commercial space
  - 30 new, multifamily dwelling units
  - 100 Hotel Units
- 50% of currently-vacant retail space is occupied as some form of Food & Beverage use, a rate supported by improved short-term parking access during peak-demand times.
  - A net gain of 15,000 SF of these uses.

## Growth Assumptions

Figure 31 Growth Scenarios Overview

Additional Land Uses	Baseline	Modest Impact	Significant Impact
Apartments	10 Units	20 Units	30 Units
High Turnover Restaurant	1,500 SF	3,750 SF	7,500 SF
Restaurant/Bar	1,500 SF	3,750 SF	7,500 SF
Office	4,000 SF	8,000 SF	12,000 SF
Hotel	-	50 Rooms	100 Rooms

## DEMAND PROJECTIONS

Figure 32 provides projections of parking demand from the added land use outlined above, using demand generation rates from the Institute of Transportation Engineers' (ITE) periodic report titled *Parking Generation*, which is the prevailing national standard in determining parking demand for a development. To calculate the parking required for a development according to the ITE manual, an analyst compares peak parking demand by use to the size of the use and assumes that the peak amount of parking is required all day every day exclusively for that use.

Because ITE rates assume a single demand level for the entire 24-hour day, they do not account for demand reductions due to varying demand patterns among varieties of land uses. For example, office space and residential parking uses generally do not overlap, but are typically calculated individually to arrive an aggregate peak-demand measure of parking need. Thus, ITE rates will consistently over-estimate demand in a walkable, mixed-use context like Princeton. Nevertheless, the rates are useful as a comparative starting point to determine and test baseline assumptions.

Figure 32 Growth Scenarios Overview

Additional Land Uses	Projected New Parking Demand (spaces at peak)		
	Baseline	Modest Impact	Significant Impact
Apartments	12	24	36
High Turnover Restaurant	20	51	101
Restaurant/Bar	24	61	122
Office	10	20	30
Hotel	NA	45	90

## IMPACTS ON CURRENT PARKING CAPACITIES

Figure 33 compares peak demand projections for the above new land uses to measures of excess capacity at weekday and weekend peak periods. Current excess parking supply is displayed on the right side of the figure, while projected added demand for each scenario is displayed on the left. Subtracting the projected added demand for each scenario from the current excess capacity provides the projected excess capacity in the future for each development scenario.

**Figure 33 Modeled Peak Demand Characteristics**

Scenarios	Projected Added Parking Demand (spaces)		Current Excess Capacity	
	Weekday Peak	Weekend Peak	At Weekday Peak	At Weekend Peak
Baseline	58	54	592	276
Modest Impact	166	179		
Significant Impact	310	345		

Under the baseline scenario:

- 534 spaces of excess capacity are projected during Weekday Peaks
- 222 spaces of excess capacity are projected during Weekend Peaks

Under the Modest Impact scenario:

- 426 spaces of excess capacity are projected during Weekday Peaks
- 97 spaces of excess capacity are projected during Weekend Peaks

Under the Significant Impact scenario:

- 282 spaces of excess capacity are projected during Weekday Peaks
- 69 spaces of supply deficit are projected during Weekend Peaks

The above analysis suggests that downtown Princeton has ample publicly available parking in reserve to accommodate the baseline and modest impact future growth scenarios. While a weekend supply deficit is identified under a significant impact future growth scenario, projects can be expected to provide on-site parking or other access accommodations per existing and recommended zoning standards, mitigating the impact on the overall parking system from residential and commercial tenants.

Additionally, a focus on optimizing a robust and comprehensive shared parking environment that maximizes the utility of existing reserves would best support future growth under any scenario. Recommendations and strategies to facilitate this environment are detailed in the Recommended Strategies section of this report.

## PARKING IN THE DEVELOPMENT CODE

### Minimum Parking Requirements

In Princeton, parking requirements have unintentionally created a set of problematic conditions. When a property changes their primary function—for example from retail to restaurant—parking requirements may escalate and create a barrier to potential re-development. This issue is at the forefront of zoning-related parking problems as retrofitting existing sites is the most anticipated form of development activity for Princeton moving forward. Figure 34 is an overview of current code requirements for on-site parking at new and re-use development sites, compared to parking-generation rates provided by the Institute of Transportation Engineers (ITE). These rates provide a benchmark, often used to set minimum parking requirements for land uses proposed for suburban locations. As such, these rates tend to over-anticipate demand in walkable, urban centers and neighborhoods. Princeton requirements currently set above comparable ITE rates are marked in red, underlined text in the table below.

**Figure 34 Current Parking Requirements vs. Industry Standards<sup>4</sup>**

Land Use Type	Current Requirement	ITE Parking Rate
Single Family Dwelling	1 space per dwelling	1.83 spaces per dwelling
Two Family Dwelling	1-0.5 space per dwelling	1.38 spaces per dwelling
Multi Family Dwelling	1-0.5 space per dwelling	1.2 spaces per dwelling
Libraries	<u>1 space per 200 SF</u>	0.084 space per 200 SF
Hospitals	1 space per bed	3.47 spaces per bed
Office Buildings	<u>1 space per 300-370 SF</u>	0.741 space per 300 SF
Eating & Drinking Places	1 space per 5 seats / 400 <u>SF</u>	6.56 spaces per 400 SF
Retail Uses	1 space per 475 <u>SF</u>	2.22 space per 475 SF
Hotels	<u>1 space per room/580 SF</u>	0.9 spaces per room
Institutional	1 space per 360 <u>SF</u>	1.5 space per 360 SF
Child Care Facilities	1 space per 6 students	1.44 spaces per 6 students
Dental & Medical Offices	<u>1 space per 250 SF</u>	0.8 space per 250 SF

The majority of Princeton’s parking requirements are below standard ITE rates. Those that are above the ITE rate are not significantly higher, nor are they linked to land uses expected to have a significant role in downtown growth.

<sup>4</sup> The existing Princeton parking requirements represent an average based on both the Borough and Township parking codes. ITE rates are adjusted to match the denominations of the existing codes.

# 5 KEY ISSUES & OPPORTUNITIES

Following is a summary of key issues and opportunities as identified through the study processes outlined above. Capturing the most pressing concerns, challenges, and potential solutions, these provided a basis for the development of study recommendations. For clarity of purpose and intent, they are organized into the following categories.

- Commercial Parking Supply and Demand
- Commercial Parking Management
- Neighborhood Parking
- Projected Conditions & The Development Code

## COMMERCIAL PARKING SUPPLY & DEMAND

### Overall, Supplies are Adequate

- Parking constraints, while likely significant and vexing to drivers, are not a result of insufficient supply.
- At all times, there is underutilized capacity, within publicly available supplies, despite persistent constraints nearby.
- The mismatch between customer/resident perception (reported 5-10 minutes on average to find parking downtown) and the available supply indicates a need to reconfigure management, take advantage of shared parking opportunities, and improve wayfinding and signage.

### The Bulk of Off-Street Supplies is Private

- Nearly three-quarters of the area supply is privately controlled, offering limited or no public access
- While many employees have access to dedicated restricted parking, nearly 40% of employee survey-respondents indicate that they park on the street
  - Shared parking agreements should be used to transfer employee demand from valuable on-street spaces to underused off-street restricted spaces

### Visitors Show Susceptibility to Pricing

- Business owners perceive that parking is a significant obstacle to their customers
- Spring Street garage is used at a higher rate than the Palmer Square garages due to lower pricing and validation options
- On-street metered parking spikes at 7 PM when meter enforcement ends
- These indicate that pricing is an effective means of influencing demand patterns.
  - This underscores the importance of pricing that strategically redistributes demand away from locations of constrained supply, to locations where capacities are underutilized.

### **On-Street Time Limits May Be Increasing Off-Street Demand on Weekends**

- Weekend demand is more concentrated in the core area at Palmer Square, compared to weekday patterns.
- Off-street parking is used at a much higher rate on weekends.
- Publicly available garages are full during peak times.
- Demand in commercial areas continues later into the evening on weekends, until 10 or 11 PM

### **Nonetheless, Shared Facilities Remain Underutilized**

- 80% of all publicly available parking is full at the 7 PM weekend peak, while shared Princeton University lots are only 30% full
- Further Shared Parking opportunities may offer relief
  - 2,000 restricted off-street spaces are not in use at 7 PM peak

### **Small Business Employee Parking is Limited**

- Employees of small businesses without dedicated off-street parking have limited options
- Many employees park on-street at metered spots that are better put to use serving customers and visitors
- Employee parking permits are limited in availability and a long waiting list currently exists
  - Expansion of the employee parking permit program to specific streets or zones may be necessary to better serve small business employees

## **COMMERCIAL PARKING MANAGEMENT**

### **Effective Management is Key to Meaningful Improvement**

- Effectively addressing parking frustration will require management strategies, whereas supply expansions would only increase the number of spaces left empty while drivers circle the most popular downtown blocks waiting for a space to free up.
- Parking enforcement should be branded as an “ambassador” service to combat the perception that enforcement is too harsh or strict

### **Pricing Induces More On-Street Demand**

- Rates that discount on-street parking create added pressure on these limited resources, which are also critical to the success of walkable commercial businesses in the downtown
- Small business owners can benefit from efficient on-street parking usage near their businesses (targeting 85% utilization of a given block)

### **On-Street Regulations are Overly Complex**

- 28 varieties of on-street regulation make visitor and customer parking challenging, even when ample spaces are available

### **Shared Parking Opportunities are Significant (and Improving)**

- Over 1,000 publicly accessible spaces are added by Princeton University lots after 5 PM and on weekends, creating a huge shared parking opportunity
  - However, visitors do not appear to be aware of this opportunity
- Evolving pay-by-phone technologies may incentivize more private-facility owners to agree to off-hours sharing

## **NEIGHBORHOOD PARKING**

### **Residential Parking Options are Limited**

- Permit programs are not comprehensive and do not exempt from daytime time limits in many cases
- Residents without off-street parking are particularly affected by program limitations
  - Most Princeton residents have access to off-street parking; however, one third of residents in the Witherspoon-Jackson neighborhood (former Township with access to free permits) say they park on the street
  - Given the difficulty and inconvenience of parking on-street in the Witherspoon-Jackson neighborhood, it is likely that most residents park on-street out of necessity, rather than out of convenience or the incentive created by free permits
- Demand among residential streets varies significantly, including some streets on which residential demand alone can overwhelm curbside capacities
  - This suggests that a one-size-fits-all program may be a poor fit for many locations
  - The Witherspoon-Jackson neighborhood, in particular, is vulnerable to a mismatch of residential parking demand and available supply due to dense development
  - The Tree Streets neighborhood is vulnerable to spillover parking due to a lack of regulation and proximity to Princeton University and the Nassau Street commercial corridor
- High demand for off-street resident parking in the MacLean Street and Park Place lots due to the inflexibility of the on-street permit program has created a lengthy waiting list

## PROJECTED CONDITIONS & THE DEVELOPMENT CODE

- Overall parking supply is ample and can support all proposed future growth
- Existing parking requirements are largely in-line with ITE standards
  - Most current parking requirements are below ITE standard ratios, indicating an intentional effort to “right size” requirements to the Princeton context
- However, within Princeton’s walkable, commercial core, any level of on-site parking requirement may be a significant barrier to investment, even with change-of-use redevelopment
  - Sites in these areas tend to be smaller, leaving little to no capacity to provide surface parking with any efficiency
  - The cost and spatial requirement of incorporating parking on such sites tends to be too significant relative to the amount of land uses that can be built on the remaining footprint for the project to be financially viable
  - While subsurface parking would preserve more of the footprint on these sites, increasing the scale of the land uses that could be built, such parking tends to be far too expensive to be financially viable, particularly on smaller sites
- Princeton has made the best of this situation, by using variances to support desirable forms of investment – a common response to code requirements that often prove a poor fit for walkable, urban centers
- This however, often results in developers making little to no contribution to the burdens that new developments will invariably place on parking and mobility infrastructure
  - Even carless developments will increase pressure on walking, cycling, and transit resources
- Formalizing a more flexible code would allow developers to contribute to the expanded resources necessary to support the new land uses they would bring to Princeton, often through investments in parking and mobility resources that will be more efficient and effective than the private/reserved parking that standard development codes tend to generate

# 6 RECOMMENDED STRATEGIES

Following is a comprehensive series of parking management and supply strategies recommended to address six, overarching opportunities to improve parking conditions in Princeton. A companion document to this report provides more detail on several, key recommendations; these strategies are indicated via **orange text** below.

1. **Rebalance Parking Demand** – Ensure effective distribution of Princeton’s parking demand to make the most use of available parking capacities, and to maintain consistent space availability across all parking options.
2. **Reduce Demand** – Reduce parking supply needs, primarily by improving the functionality and cost-effectiveness of non-driving options for accessing downtown destinations.
3. **Optimize Parking Management** – Adopt key best practices for urban parking management, to complement and optimize individual strategies, with a particularly focus on increasing the efficiencies and benefits of existing commercial parking resources.
4. **Expand Effective Capacities** – Increase the capacity of existing parking (and curbside loading) supplies, primarily by making available options more broadly accessible and functionally viable via shared parking initiatives.
5. **Improve the Residential Parking Experience** – Integrate the parking system into a larger community access context where system users develop trust and confidence that the system is working to meet their needs.
6. **Update The Zoning Code** – Update development codes and policies to reduce barriers to wanted forms of investment, while helping to make parking resources more flexible and resilient to change.

## REBALANCE DEMAND

### Emphasize Pricing as Primary Management Tool

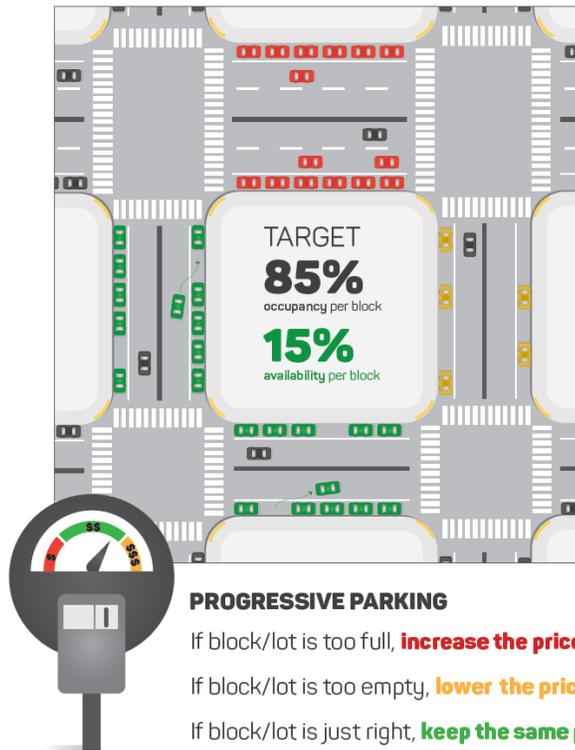
#### Adopt Performance-Based Pricing

Princeton’s parking policies should be dynamic to respond to changes in parking supply and demand. Princeton should formally define *Availability* as the primary performance measure for parking management. Availability should be defined as the number of empty parking spaces available, at any given time, along individual block faces and within individual off-street parking facilities.

Define performance targets for the following:

- On-street parking: 15%, or about 1-2 spaces, on each block-face, is recommended as a starting point
- Off-street, visitor parking: 10% is recommended
- Off-street, long-term parking: 5% is recommended, with no wait list for monthly permits

A performance-based approach should also apply to off-street parking rates, for hourly, daily, and monthly parking. For hourly and daily parking, rates should seek availability of spaces, during peak-demand times, similar to what is listed above for on-street parking. For monthly parking the primary performance target should be the elimination of wait lists – increasing the permit rate until capacity is created to offer a permit to anyone willing to pay for one.



### Create Tiered Rates

Simplify the current range of on-street parking rates, creating three tiers as follows.

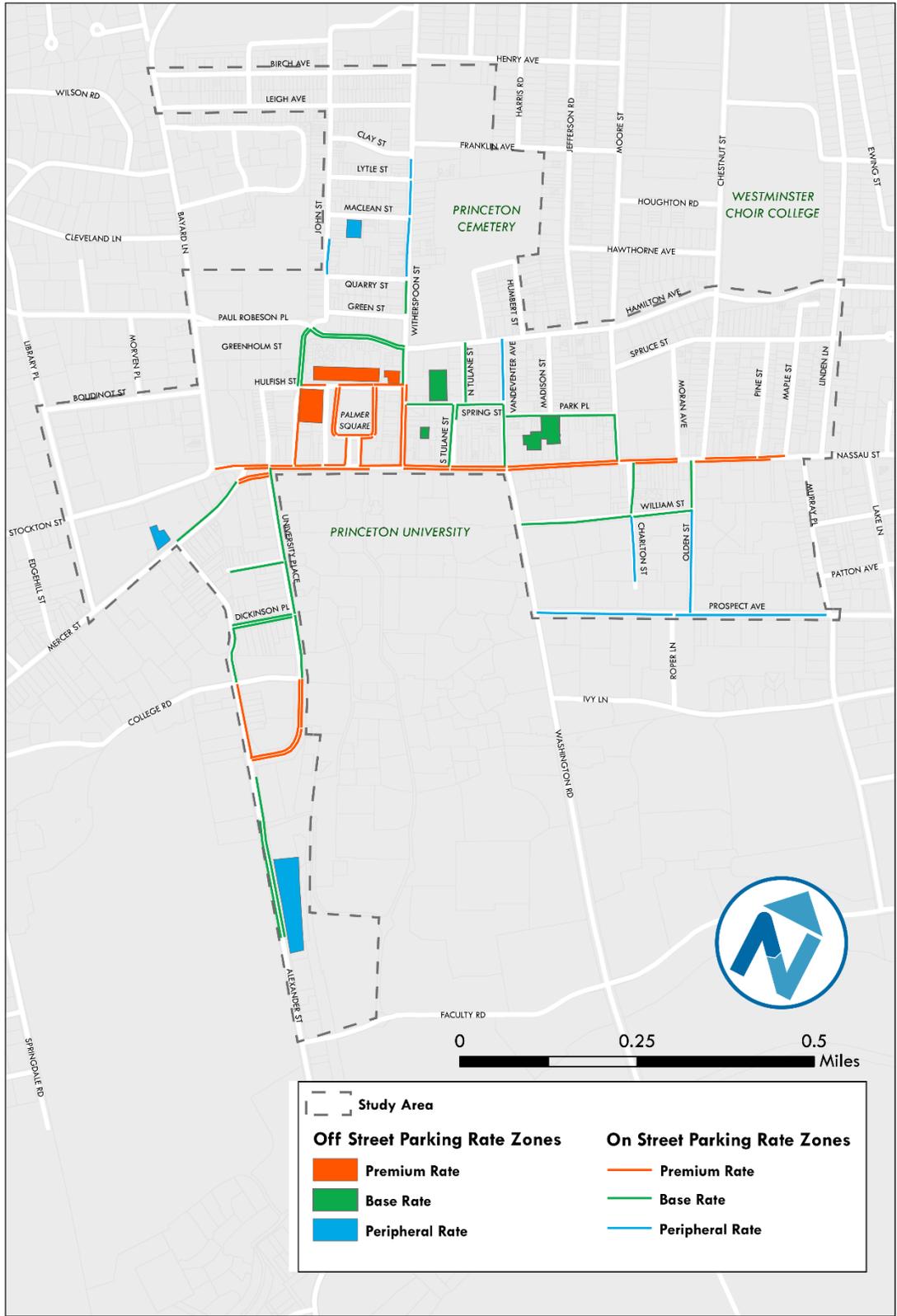
- Premium Spaces: \$2/hour
- Base-Rate Spaces: \$1.50/hour
- Peripheral Spaces: \$1/hour

Apply these rates to distinct zones, based on demonstrated demand and availability conditions. Distinct zones are conducive to affecting driver behavior, by creating an intuitive environment, in which low-, medium-, and high-cost parking options can be quickly found with minimal search.

Proposed rate zones should be calibrated according to ongoing resident and business interests, as well as observed demand. A starting platform for these rate zones is displayed in Figure 35 and is calibrated according to weekend peak demand at 7 PM. Pricing strategies for publically available but privately owned facilities (such as the Palmer Square garages) should be coordinated to the degree possible with the Municipality's broader parking rate tiers.

Expansion of existing metered on-street areas is not recommended at this time. However the rate tier zone map below assumes that additional shared parking opportunities will bring additional lots into the publically accessible inventory. The rate tier zones should be used accordingly to price any new shared parking areas as they come online.

Figure 35 Initial Rate Tier Zones



## Provide Parking Manager with Rate-Setting Authority

This typically requires a municipal ordinance that includes requirements to document performance measures, and sets parameters within which parking managers can adjust rates on a set schedule, in response to those measures.

## Simplify Regulations and Time Limits

Princeton should ease time limits as pricing creates more consistent availability. Time limits do not enhance customer experience but instead limit visitors, shoppers, and diners to shorter periods of stay. Turnover data and enforcement input both reflect that many parking users wish to stay longer than the on-street meters allow, particularly on weekends. Many experience meter violations and associated fines after stretching their outings beyond established limits, or finding their pockets quarter-less during a last-minute meter feeding run. Instead of using short time limits to encourage turnover (which often just encourage "shuffling" by customers and employees), price should be used to manage parking availability.

Time limits and pricing structures that do remain should be simplified and consistent. All on-street pricing should fall within the three-tiered structure recommended previously. All downtown meters should operate during a consistent period of 10 AM – 7 PM Sunday through Thursday, and 10 AM – 10 PM on Friday and Saturday.

Time limits for metered spaces should be loosened and aggregated into two categories. As demand-based pricing is calibrated and begins to influence parking patterns, time limits should be further loosened and, ultimately, removed.

- 2 hour meters in high demand areas that require more turnover. The 2-hour limit allows visitors and customers to visit multiple establishments, while preventing employees and longer-term visitors from occupying key premium spaces.
- 12 hour meters for all-day visitors and employees
- A limited number of 15-30 minute metered pickup spaces can be provided near business uses which induce such activity

Note that the time limits indicated above are a framework that should be regularly adjusted based on demand patterns. Smart parking meters can be used to easily change time limits at individual spaces as necessary. Progressive pricing (pricing that increases as stays lengthen), discussed further below, promotes efficient turnover even as hard time limits loosen or disappear.

**“...price should be used to manage parking availability.”**

## Monitor Performance

Parking Demand is not a static measure. It is generated by land uses, which change over time. It is also susceptible to the cost and availability of parking accommodations, as well as the availability and appeal of alternative means of access. Within thriving, walkable, urban, mixed-use districts, demand can be particularly responsive to changing conditions, including strategic management policies and actions, such as the performance-based pricing strategy outlined above. The effectiveness of such a strategy

depends upon regular performance measures – utilization and availability conditions during peak-demand times – that, in turn, must inform rate-adjustment options.

The basic steps of a recommended performance-monitoring regime include:

1. Survey key, on-street blocks each month
2. Identify times and locations of constrained availability (less than 15% of spaces available)
3. Adjust rates, or rate zones, in response to patterns in which availability is consistently, and meaningfully, above or below performance targets.

### **Provide a Grace Period**

“Grace periods” for paid parking can avoid customer frustration with paid parking systems and payment media. New and infrequent visitors, in particular, face challenges in anticipating and complying with payment requirements. Very short grace periods of 15 minutes or less can make Princeton more visitor friendly, without undermining the effectiveness of performance-based parking rates. The existing grace period of 8 minutes should be considered for expansion to 15 minutes based on observed behavior. Grace periods will be applied at the beginning of vehicle stays.

### **Use Progressive Rates to Keep Rates Low for Short Stays**

Progressive rates, which increase the hourly rate for extended parking stays, incentivize shorter stays and more turnover of spaces by making longer stays particularly expensive. This can help shield most drivers from rising costs for premium parking spaces. To the extent that higher hourly rates for the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> hour of parking can bring demand in line with performance targets, the rate for the 1<sup>st</sup> hour can be kept much lower. This can be particularly effective in discouraging use of on-street parking by local employees or business owners, as incremental costs add up for frequent parkers. Payment compliance also tends to be easier than time-limit compliance, further underscoring the value of this option for discouraging long-term occupancy of prime on-street spaces.

**“Coordination between public and private parking operators is necessary to align pricing strategies and spread demand efficiently across the available parking supply.”**

### **Coordinate with Private Facilities**

Coordination between public and private parking operators is necessary to align pricing strategies and spread demand efficiently across the available parking supply. The more that private, publically accessible parking operators can be brought in line with municipal strategies for rate tier zones and progressive pricing, the more efficiently the parking ecosystem will operate.

## Adjust Meter Schedules

Figure 36 Temporary Sign in Seattle Notes New Hours for Paid Parking



Image source: Seattle DOT

With the notable exception of Witherspoon Street, between Nassau and Hulfish Streets, most blocks of on-street parking are lightly used before midday. This presents an opportunity to shift meter schedules later on all other streets, to both redistribute demand off of Witherspoon, and thus make parking easier to find there, and encourage more people to come downtown during these early-morning hours when parking is widely available.

Conversely, Princeton's commercial center remains quite active and vibrant well beyond into the evening, even on weekdays. Extending meter schedules toward 10pm would help support evening-oriented businesses by creating more-consistent availability. This is particularly important, as evening visitors tend to value convenience over cost-savings, compared to midday visitors. Furthermore, free evening parking creates an incentive for evening-shift employees to use these spaces for long-term parking. Meter schedules should be shifted as follows:

- 10 AM – 7 PM Sunday through Thursday on all streets, excepting Witherspoon Street between Nassau Street and Hulfish Street, which should begin operating at 8 AM
  - End time limits at 4 PM, recognizing the longer stays typical of evening trips and relying on progressive pricing to keep spaces turning over. Meters will stay in operation until 7 PM but parking duration will no longer be monitored.
- 10 AM – 10 PM Friday and Saturday on all streets, excepting Witherspoon Street between Nassau Street and Hulfish Street, which shall begin operating at 8 AM

- End time limits after 4pm, recognizing the longer stays typical of evening trips and relying on progressive pricing to keep spaces turning over. Meters will stay in operation until 10 PM, but parking duration will no longer be monitored.

It is critical to **update parking signage to accurately reflect meter operations** as designated. Clear signage allows visitors to rapidly process the parking environment and make appropriate decisions according to their visit type.

## REDUCE DEMAND

### Mobility Improvements

The simplest way to reduce parking demand at any destination is to make it easier to get there without a car. A robust transportation environment reduces pressure on limited parking facilities and promotes a healthier, more livable downtown environment.

#### Bicycling Facilities

Adequate bicycle parking, including secure, indoor facilities for commuters, can provide cyclists with reassurance that they can always find appropriate and convenient parking for their bikes when traveling to, or within, Princeton.

Bicycle repair facilities can also make cycling a more reliable transportation mode for occupants and visitors and reduce barriers to owning and maintaining a bike. They also keep bicycles in circulation, ensuring that people who come and go from the site by bike will continue to do so unimpeded by repair issues.

Princeton should consider implementation of the following:

- During non-winter months, remove one on-street parking space from service along Nassau Street or Palmer Square and replace with bicycle parking facilities. Observe and record usage for future calibration and expand program as necessary
- Create a permanent free bicycle repair station along Nassau Street or Palmer Square that includes a bicycle pump

#### Bikeshare

Bikeshare programs promote bicycle use for short trips, by making a shared pool of bicycles available to the public, and pricing usage to encourage turnover. Princeton can take advantage of the Zagster system, by helping to fund and plan further expansion of its network into the Princeton community. Such expansion would make downtown Princeton more accessible from the Dinky train station, and would make various remote parking locations more accessible to more employees, residents, and visitors.

#### Carshare

Carsharing programs can significantly reduce car-ownership rates among area residents and employees by providing reliable access to vehicles without the expense and hassles of maintaining a personal vehicle. Zipcar, the dominant carshare provider in the US, has

a presence in Princeton, with cars stationed at the Spring Street garage in downtown. Means of expanding the number of cars provided by Zipcar, or of encouraging other providers to station vehicles in Princeton, include the following:

- Providing dedicated, on-street parking spaces for shared vehicles
- Encouraging developers to dedicate spaces for carsharing at any project with on-site parking
- Encouraging developers to provide memberships to their initial tenants
- Replacing part or all of Princeton's vehicle fleet with vehicles maintained by a carshare provider (and made available to the public on evenings and weekends)

## Transit

Reducing financial barriers to using transit reduce parking demand among local employees, while also making local jobs easier to access, and thus to maintain. Providing free or deeply-discounted transit passes to local employees can be an easy means of reducing cost-barriers to transit commuting, and to economic opportunity. Cities like Boulder, Colorado and Ann Arbor, Michigan have used parking revenues to fund such programs, and reduced drive-alone mode shares well below regional averages.

The multiple seat ride required to access Princeton from many neighboring communities poses a significant barrier to increasing regional employee transit ridership. While increasing the number of single-seat transit options to Princeton is an important long-term strategy to reduce parking demand, it is unlikely that the majority of regional visitors and employees will achieve this access in the short term due to the configuration of NJ Transit services. With this in mind, Princeton must focus on alleviating the frustration of multiple-seat transit service by providing financial incentives, complementary services such as bikeshare and carshare, and promoting easy access to both Princeton Station and Princeton Junction.

The Free B shuttle provides a further opportunity to use transit to alleviate parking demand. The free shuttle between the DINKY station and downtown Princeton should be promoted in municipal materials as much as possible. Free B shuttle stops should be branded and advertised, with clearly marked signage and physical route maps. The Free B shuttle service should also be branded as a connector to key remote parking locations such as the Princeton Shopping Center. Free B operations and increased frequency can be subsidized using parking revenues via a parking benefit district (discussed later in this document).



Recommendations for transit service expansion are as follows:

- Brand Free B service to Princeton Shopping Center as a remote parking connector and broker a formal shared parking agreement
- Sign and brand Free B stops consistently and with high visibility
- Provide physical copies of the online Free B map at key stop locations
- Use some parking revenues to fund Free B service expansion, increase frequency
- Promote the recent expansion of the overnight parking limit at Princeton Branch Station, from 3 to 7 days, to encourage more use of NJ Transit by travelers.

Figure 37 Free B Shuttle Service



## Emerging Mobility Services

Services such as Lyft and Uber provide further opportunities to reduce parking demand and maximize the use of existing spaces. Princeton should prepare for the expected growth of these services by ensuring that adequate pickup and drop off space exists in the downtown area for travelers arriving via Lyft, Uber, and other taxi and ride sharing services. Loading areas that are not in use during peak retail and restaurant activity periods can be repurposed as dedicated drop off areas to ease the impact of multiple Lyft and Uber drop-offs. These services can also be promoted as an alternative to driving and parking when accessing NJ Transit rail or when traveling to downtown Princeton during festivals and other high impact events. Summit, NJ provides subsidized Uber rides for passengers traveling to and from the commuter rail station to alleviate parking demand in key locations. While conditions in Princeton do not currently require such an initiative, Princeton should consider implementing a similar subsidized ride program should parking demand at Princeton Station or Princeton Junction begin to outstrip supply.

## OPTIMIZE PARKING MANAGEMENT

### Improve & Coordinate Wayfinding, Signage & Information

Signage should clearly convey parking rates, regulations, and restrictions, while also directing drivers' attentions to less obvious parking options. Wayfinding, signage, and information should be designed and deployed to address three, distinct opportunities to inform drivers of their options.

- **Before Arrival:** Making parking information available for visitors and customers before arriving will allow parkers to plan their trips ahead of time and find parking with ease. Having a single, simple map posted on the Municipal website, merchants' websites, and posted at other activity centers, will provide a consistent informational guide. Off-street parking lots should be consistently branded on the website as well as on site.
- **Upon Arrival:** Signage should be clearly visible, designed consistently, placed in strategic locations, and should provide clear guidance to and from parking locations. Off-street lots should have easy-to-read identification entrance signs and exit signs, including information on regulations.
- **Post Arrival:** Providing clear pedestrian signage helps to create and promote a "park once" district, allows customers to feel comfortable walking to multiple locations on foot. Signage also allows parkers to easily find their destination and parked vehicle at either end of their trip.

Nationally, many towns have adopted the traditional MUTCD D4-1 sign (green letters on a white background), as pictured below. Other towns have made use of "blue P" signage that stands apart from other roadway signs and contributes to a local branding opportunity. Regardless of the parking signage format chosen, all parking signage should be consistent, highly visible, and provide direct wayfinding to public parking facilities. It is critical that the signage structure is easy for first-time visitors to understand and use.

Rather than signage that tells parkers where they can't go, this signage is welcoming and helps parkers figure out where parking is available to them. Parking signs should mimic the branding of any and all online parking maps or materials made available to promote immediate recognition among visitors.

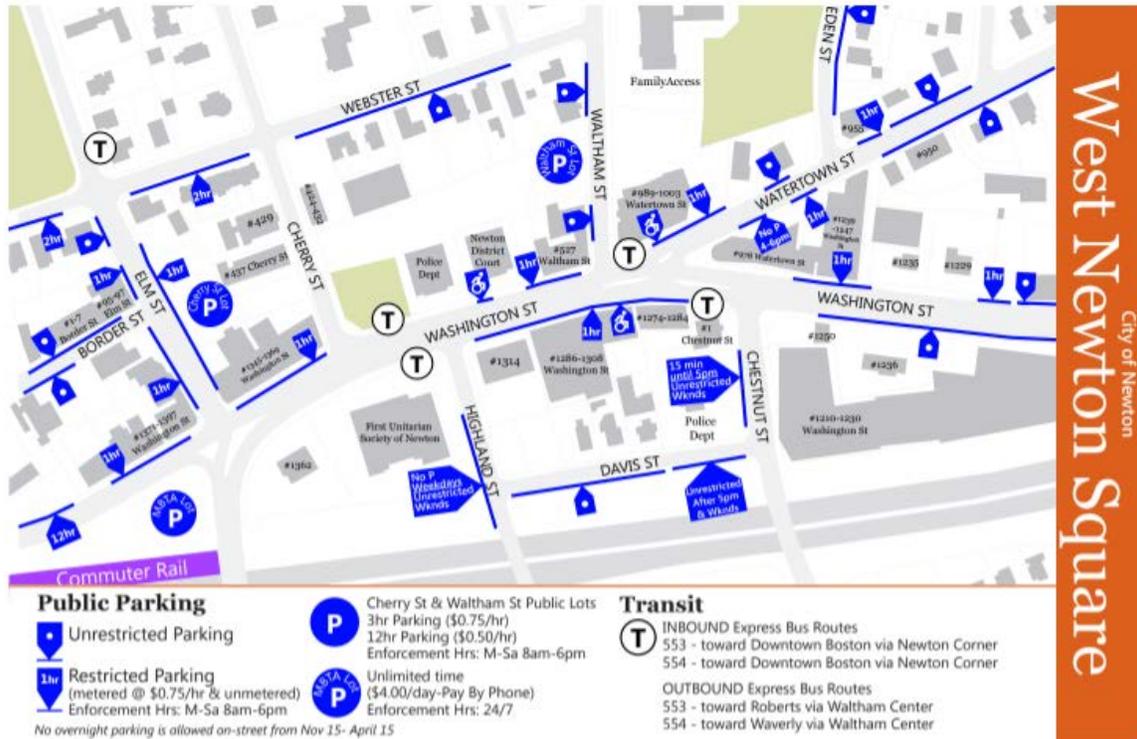
**Figure 38 Clear and Visible Parking Wayfinding, Various Formats**



## Create a Parking and Access Map

Making parking information available for visitors and customers before arriving will allow parkers to plan their trips ahead of time and find parking with ease. Having a single, simple map posted on Princeton's website, downtown merchants' websites, and posted at activity centers, will provide a consistent informational guide. Off-street parking lots and garages should be branded consistently on the website and on the street. The Free B shuttle map may be combined with a parking map to show the connectivity between both services.

Figure 39 Best Practice: Parking and Transit Route with Destinations, Newton, MA



## Expand Payment Options

Upgrades in technology have increasingly enhanced the customer and visitor parking experiences, made more efficient use of enforcement personnel, and simplified the evaluation and monitoring of parking utilization.

Local stakeholders and survey respondents stated that payment via cash and coins is less convenient than other payment options. New payment technology eases the burden of payment for the user, and several options should be made available. Princeton should consider options that:

- Make payment easy and convenient
- Use technology to pay by coin, debit/ credit, and cell
- Function as both kiosks and individual meters
- Can offer a "first 15 minutes free" option
- Use "virtual" permits, using license plates not stickers or hangtags
- Integrate with enforcement equipment

Figure 40 Payment Technologies Include Credit Card Meters and Pay by Phone



App Image source: Town of Chapel Hill, <http://www.townofchapelhill.org/town-hall/departments-services/police/parking/parking-in-downtown-chapel-hill/on-street-parking/how-to-use-parkmobile-when-paying-for-meters>

## Update Parking Validation

Parking validation allows businesses to subsidize parking costs for their patrons. Garages and parking lots will often offer validation to customers of nearby shops, restaurants, and entertainment venues. This is most common with use of municipal parking facilities, but it can also incorporate private parking facilities. The entity in charge of managing the lots will set prices for available parking and give local merchants the chance to offer their customers free or discounted parking as a reward for shopping with them. Some cities or towns charge merchants by the number of times the validation is used, while others impose a monthly fee for the service.

The Princeton Library offers validation to its patrons, but this is not tightly controlled and does not offer any incentive to patronize other downtown destinations. Updating and formalizing a municipal program could address both of these shortcomings. Princeton should incorporate the following into a validation program as desired:

- Collaborate with business leaders to establish a parking validation program
- Establish a monthly opt-in fee, pay-by-use fee, or other fee structure for parking validation at individual businesses
- Determine parameters for the validation exemption. Most likely the validation will exempt from up to 2 hours of meter parking or parking in municipal facilities such as the Spring Street Garage

## Incorporate Technology

As more and more on- and off-street parking fees are being paid by credit-card swipes and mobile payments, new validation systems are emerging to continue to provide this system of customer reward, in a variety of ways.<sup>5</sup>

- Future Validation: After visiting a merchant in the area or shopping center, the user may receive a code for free or discounted parking to use the next time they

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<sup>5</sup> Discussion with ParkMobile on March 2, 2016.

visit as an incentive to come back to the area. Most pay-by-phone (PBP) service providers accommodate the entry of these codes as payment for parking.

- **Real-Time Validation:** A user will park in a designated spot and purchase parking using the PBP service. While visiting a local merchant, they will receive a code to discount their parking. They will then enter that code into the PBP interface while they are still parked, and receive discounted or free parking that is subtracted from their original transaction.
- **Advanced Validation:** A user will purchase a ticket for a specific event (e.g. sports, musical events, etc.). Through the vendor website, the users will receive a promo code that they can enter into the parking payment machine or mobile app when they have parked.
- If a valet system accommodates digital payments, via Square<sup>6</sup> for example, or via the PBP interface, validation options for valet parking at businesses which opt-in can function the same as validation for self-parking.

### **Case Study: Ponce City Market, Atlanta, GA**

Ponce City Market, located in downtown Atlanta, is a multipurpose redevelopment with restaurants, retail, offices, residences, and a dedicated parking garage. Regular parking costs \$1 for 1-30 minutes, \$1 for each additional 30 minutes after the first 30 minutes, \$10 for 4-8 hours and \$15 for 8-24 hours. Utilizing ParkMobile parking systems, Ponce City Market management provides special codes that restaurants, merchants, offices, and residence managers can purchase to allow their special guests and patrons to park at a discounted rate.<sup>7</sup>

## **Create a Parking Benefit District**

Capturing parking revenues for local, public improvements can amplify the benefits of performance-based pricing. As demand goes up, available revenues will increase, creating more opportunities to fund noticeable improvements that further enhance the downtown experience. Using revenues to fund non-driving mobility can also help keep downtown affordable and accessible to all.

Continue to reinvest parking revenues to fund synergistic downtown/mobility improvements; priority consideration should be given to the following potential investments that would directly support TDM efforts:

- Co-funding the Free B community shuttle
- Co-funding a downtown employee bus-pass program
- Co-funding a downtown bike-share program
- Co-funding complete-streets, street design projects

Case studies that reflect the initiatives highlighted above are provided in the appendices to this document.

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<sup>6</sup> <https://squareup.com/>

<sup>7</sup> Discussion with ParkMobile on March 2, 2016.

## Optimize Enforcement

### Invest in Enforcement Technology

License Plate Readers can streamline compliance monitoring for payment, time-limit, and permit-based regulations. While monitoring, readers also generate data that can be used to track occupancy/availability conditions.

### Lobby Trenton for More Control of Violation Fines

The best means of ensuring that robust and effective enforcement efforts keep repeat-violators from occupying the best downtown parking spaces, without scaring away visitors who will inevitably make honest mistakes, is to issue “First Time Forgiveness” tickets and to use an escalating fine structure. Fines and fine structures for municipal parking violations, however, are controlled by the State in New Jersey. Princeton should lobby for more flexibility in this system in order to improve the enforcement atmosphere in downtown Princeton.

## EXPAND EFFECTIVE CAPACITIES

### Broker Shared-Parking Agreements

Shared parking is an effective means of capitalizing on parking availability in private lots with consistent periods of low utilization. Office-serving parking lots tend to be crowded during the day, but empty at night, when activity among nearby food & beverage destinations are at their busiest, and when residential parking needs are at peak. Acknowledging these offsetting needs and occupancy patterns, creates shared-parking opportunities to reuse the same infrastructure, rather than creating redundant resources to serve each of these uses.

Princeton University provides an important precedent for this, having long made most of its parking facilities publicly available after 5pm on weekdays, and all weekend long. The University’s lots are positioned nearby the core demand zone and, as such, offer a prime opportunity for shared parking. Princeton must further publicize, sign, and spread awareness of the University’s shared lots for evening and weekend use.

Other opportunities for shared parking include:

- Houses of worship
- Private business lots with consistent “workday” utilization patterns
- Oversupplied shopping center lots, such as the Princeton Shopping Center, an ideal remote parking area for downtown

Details of individual shared parking agreements may vary as necessary to achieve desired results, but all shared parking agreements should be formalized to ensure consistency for the parking public. Please refer to the appendices of this document for further information on shared parking agreements.

## Use Technology to Incentivize Shared Parking

Pay-by-phone options have greatly expanded shared parking in urban centers, where private lot owners have used this payment options, typically established to accommodate payment for metered on-street parking, to monetize their off-hour capacities. Once a pay-by-phone service provider is established, owners of private lots can work with that provider to set the hours and rates for public use of their lots, with payment revenue going directly to the lot owner.

This can be particularly effective for lot owners whose primary parking needs are confined to weekdays, allowing them to monetize the capacity this creates during evenings and weekend, when public parking demand can be significant. It also provides an opportunity to expand “effective” parking capacities, in support of general downtown vitality and economic development, precisely when the need for more parking options is greatest. This has been used effectively in places like Asheville, NC with no involvement from the City, and in places like Omaha, Nebraska, where the City has used this technology to build a Parking Partners program of shared, private facilities, specifically to avoid having to build any more municipal parking garages.

### **Case Study: Park Omaha**

Park Omaha launched the Park Omaha Partners program to “boost the number of public parking spaces and help visitors easily locate them in the popular downtown area”.<sup>8</sup> The program provides a user-friendly, online process for property owners to offer their unused spaces, at a specified schedule, to the Park Omaha network through a shared parking agreement. The process begins with an online application – see below.

Accepted Partner locations are added to the Park Omaha interactive map. An expanded map view also provides information on rates, hours of operation and payment options. Park Omaha identifies these facilities, as “partner” facilities, and distinguishes them from Park Omaha facilities, in its maps and information materials. As Partner facilities, private lots are given official (copyrighted) signage/iconography with a distinct logo that identifies them as part of the City parking system, while indicating that hours of access, rates, and other regulations may vary from standard Park Omaha facilities. The copyrighted branding helps to prevent unapproved private lots from using the same design and calling themselves Park Omaha Partners.

One of the key tools to make this work has been facilitating payment via the Park Omaha App. Partner facilities are given a unique payment-zone designation to use this mobile-payment system, allowing drivers to pay for parking exactly as they would in a City facility. Payment revenue goes directly to the facility owners, thus allowing private facility owners to monetize their excess parking without having to set up payment systems. This has been a critical component in recruiting new Partners to the program.

## Flexible Curbside Regulations

Loading/unloading activity tends to be minimal during evenings and weekends. Conversely, demand for short-term tends to be modest before midday. Flexible curbside

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<sup>8</sup> <https://parkomaha.com/about/park-omaha-partners/>

regulations can make use of these offsetting patterns to create generous loading zones during mornings, which can encourage more truck deliveries at these times, while ensuring that short-term parking is prioritized during middays, and especially during evenings and weekends. Meters should be installed, as appropriate, in loading locations to repurpose these curb areas during non-loading times.

**Figure 41 Prioritize Curbside Activity Based on Demand and Value Provided**



## Employee On-Street Parking Permits

Non-residential streets with low-utilization can be used to accommodate employee parking demand, and thus shifting this demand away from prime commercial blocks. This can include metered blocks, such as the blocks of Witherspoon Street north of Green Street. Another promising location is University Place, between College Road and Edwards. By creating on-street permits, similar to those currently provided to eligible residents, the Municipality can make use of this existing infrastructure, expanding the effective capacity of these curbside spaces by making them suitable for new uses.

## Targeted Meter Expansions

Installation of additional meters at the peripheral rate in key non-residential areas will add to the available public parking supply and provide additional locations for employee and longer term visitor parking. New meters in key areas will also support development in outlying development nodes that currently lack metered on-street parking, such as the intersection of Henry Avenue and Witherspoon Street. Peripheral rate meters should be installed in the following locations:

- Witherspoon Street from the existing meters north to Henry Avenue

- Henry Avenue between Witherspoon Street and Harris Road

Meter rates for these added blocks should be set in accordance with the principles outlined in this document. Rates for adjacent meter areas, such as Franklin Avenue, should be adjusted accordingly.

## IMPROVE THE RESIDENTIAL PARKING EXPERIENCE

Figure 42 Paved Side-Yard Parking off of Bank Street



### Formalize a Resident Permit Parking Program

Normalizing Princeton's resident-permit program will address key issues related to both daytime and overnight parking needs among many residents, while optimizing the value of existing on-street parking resources. Residents without driveways currently face difficulty if they must own multiple vehicles due to personal responsibilities. Meanwhile, other residents face impacts from employee spillover parking onto their streets. The overnight parking ban further complicates the residential parking situation for those without space to park their vehicles in driveways or garages.

Normalizing and simplifying this program across the Municipality will better serve all residents, and provide particular improvement to those lacking on-site parking options at home.

### Update the Rate Structure and Benefits

Figure 43 outlines recommended rates and benefits for an updated permit program based on existing permit rates and typical rates observed in similar communities. All on-street resident permits should exempt vehicles from both daytime time limits and the overnight parking ban. Permits should be valid only for the resident holder's street unless observed residential demand is too great for that street, in which case a secondary street should be designated.

**Figure 43 Recommended Resident Parking Permit Structure**

Permit	Options for Households With Off-Street Parking	Options for Households Without Off-Street Parking
1st	\$30/quarter	\$30/year
2nd	Off-Street Only	\$30/quarter
3rd	Off-Street Only	Off-Street Only

The cost of making the first permit highly inexpensive to households without off-street parking (the only households currently eligible for overnight permits) will be offset by revenue from allowing all households to purchase a permit, including second permits for households without off-street parking.

### Optional Elements

Allow residents to identify the most-appropriate set of regulations/restrictions for each street, the primary components of which should include the following.

- Parking options for non-permitted vehicles: None, 1-hour parking, or 2-hour parking
- Schedule: Days of the week, and hours of the day, that any time limit restrictions should be in place
- Non-Resident Permits: Whether or not to allow non-residents (employees) to buy daytime permits, with revenue set aside for neighborhood investments (with revenue going to a fund for that street, which can be used for physical improvements/maintenance, block parties, or other options to be selected by residents). These non-resident permits serve to alleviate employee parking issues that result in meter-feeding and unregulated spillover into residential streets.

### Permit Media and Distribution

A web portal should be developed to accommodate online permit applications and payments. Such a web portal would provide convenience to residents as well as clarity regarding eligibility and RPP district location.

A transition away from physical permits should also be sought, in conjunction with the adoption of license-plate-reader (LPR) enforcement protocols for the overall parking

system. LPR devices would allow residents to simply register their license plates in order to attain permit benefits.

### **Visitor Permits**

Visitor permits should be provided for on-street as well as off-street use to ensure availability. A new opportunity to accommodate guests, visitors, and service providers will also be created by allowing residents with off-street parking to purchase a permit. This would allow residents to park on the street while their visitors use their off-street parking, avoiding the need to secure an on-street permit at those times. The Police Department should no longer grant exemptions for residents who personally call on behalf of visitors, and should instead refer residents to the formalized visitor permit program.

### **Enforcement**

Using a license-plate based system will allow simpler enforcement of resident permits. This will also allow the Municipality of Princeton to fold employee permits into the same system, without having to create a new form of physical permit. The “back office” software connected to LPR devices would link plate IDs to any particular on-street parking eligibility for which that vehicle is registered. This would generate an instant read on whether or not each vehicle is validly parked, based on the time and location of the plate “read” and any recorded virtual permits.

## **UPDATE THE ZONING CODE**

### **Provide and Formalize Change of Use Exemptions**

Historic downtown codes need to facilitate appropriate turnover of land uses as community needs and desires shift. Minimum parking requirements should not pose a barrier to this sort of positive redevelopment. This is increasingly relevant given the broader conversion from retail to service-based uses in urban areas throughout the nation.

Recommendation:

- Waive parking requirements for Change of Use proposals that result in requirement of less than three parking spaces.
- For Change of Use proposals resulting in a requirement of more than three parking spaces, provide a Fee in Lieu alternative to meeting these requirements.
- Explore the possibility of establishing a **progressive-rate structure for the Fee in Lieu** option, so that the fee multiplier increases based on the number of required spaces calculated for the Change of Use. This will encourage smaller projects to avoid providing on-site parking, while incentivizing larger, or more impactful, which tend to occur on larger sites that can more effectively accommodate some parking, to provide on-site parking.
  - So, for example, a proposal with a requirement of between 3 and 10 parking spaces might pay \$10,000 per space exempted, while one with a require of between 10 and 20 spaces might pay \$20,000 per space exempted, and so on.

## Redefine Requirements

Parking requirements defined within municipal zoning codes are a powerful tool for shaping a municipality's transportation and development character. For several decades, zoning codes across the United States have emphasized minimum requirements for on-site, tenant-reserved parking spaces to protect local street-parking capacities from parking activity generated by new development. The concern was that without these requirements, developers would save money and developable land area by not building any parking, relying instead on nearby street parking to accommodate their project's parking needs. In response, cities began to require sufficient accessory parking at each new development — enough to ensure that a space would always be available for anyone who needed one.

### Access Accommodation

Princeton should redefine parking requirements so that most parking provides access benefits that go beyond the development site. This will allow for private and public investments to shift away from parking where and when alternative programs become more relevant and effective. This approach provides a range of options for developers to meet requirements that focus on parking solutions in the near-term as well as longer-term mobility-based solutions to the same parking issues. Developers may choose to:

1. Provide on-site parking, which will be credited toward (or even decrease) requirements, depending on how it is managed and how broadly accessible the spaces are. Shared spaces are more valuable to the community than dedicated private spaces.
2. Provide on-site mobility amenities such as bike parking or car-share vehicles which may lessen the need for vehicle ownership, reducing the parking requirement via a credits system.
3. Provide TDM amenities (E.g. free/discounted bus passes) and appropriately price parking in order to make non-private vehicle travel to and from the site more viable and appealing. These agreements will reduce the parking requirement via a credits system.
4. Pay an In-Lieu fee per parking space which funds district-level investments, including public parking, mobility, and TDM benefits.

**“As the transportation environment shifts away from personal vehicle use, private parking facilities will become less relevant.”**

## Access Management Requirements

The framework above can be used to establish a requirement that is shifting away from parking toward a requirement to manage the project's access needs and impacts, measured as an Access Management Requirement (AMR) score. Any development or conversion would be required to meet a score calculated using a use-based formula, an example of which is described in Figure 44.

**Figure 44 Example Access Management Requirement Scoring**

Land Use	AMR Points Required
Multi-Family Housing	1 to 3 per dwelling unit, increasing by # of bedrooms
Offices	1 per 200 SQ FT FA - 1 per 400 SQFT FA
Medical Facilities	1 per 4 Planned Bed sites, or 300 SQ FT.
Standard Restaurant	1 per 4 seats, plus 1 per employee on largest shift
Retail Trade	1 per 150 SQ FT FA
Drinking & Entertainment	1 per 4 persons based on building's maximum capacity

Developers would be able to meet the AMR score through any combination of:

- On-site parking (see Figure 45 for example parking space credit structure)
- Bonus TDM measures or mobility amenities
- In-Lieu Fee Payments

### On-Site Parking Credits

On-site parking spaces included in a proposal are credited toward the AMR, according to how those proposed spaces will be managed. Management approaches that facilitate shared-parking efficiencies increase space credits toward an AMR. Those that reduce these efficiencies decrease the project's AMR score. Spaces that are unbundled and priced receive more credits toward an AMR. Rather than assigning a "hard cap" on parking, spaces in excess of the project's baseline AMR actually decrease the AMR score, thus necessitating increased TDM commitments, fee payment, or inclusion of public parking. While this adds flexibility in how much parking can be provided, it adds a "cost" to each space built above the AMR, in the form of public-benefit contributions.

**Figure 45 Example Parking Credits Table**

Created Parking Space Type	Credit Toward AMR (points)
Reserved Spaces	-0.25
Accessory Spaces	0.75
Public Spaces	1.0
Priced Spaces	0.25 (additive)
Municipal Spaces	1.5
Excess Spaces	-0.75 (additive)

**Demand-Management and Mobility-Amenity Credits**

AMR deficits can be satisfied through the provision of an approved TDM/Multimodal package that includes an assortment of measures described in the TDM Strategies sub-chapter of the chapter focused on reducing demand. The AMR value of a TDM/Multimodal package can vary and the number of applicable packages/credits may be capped. AMR scoring for TDM proposals should be tailored to the individual programs available in Princeton. For example, given the lack of reliance on NJ Transit services for most of Princeton’s commuters, subsidized NJ Transit passes for employees may not score as highly as providing Zipcar carshare or Zagster bikeshare memberships to employees. Scores for each TDM initiative should be oriented around the relative importance of that TDM strategy to the community.

**In-Lieu Fee Credits**

Any remaining AMR deficit should be met via cash-in-lieu payment, which can be used to fund public parking, demand-management, or mobility resources. In-lieu fees per space vary based on the appraised value of parking in a community. A typical in-lieu fee in a dense urban town center such as Princeton may vary between \$2,000 and \$27,000.<sup>9</sup> Examples from other communities with in-lieu fees include:

- Lake Forest, IL: \$22,000 per stall
- Jackson, WY: \$8,500 per stall up to five stalls, \$17,000 per space for six and more
- Coconut Grove, FL: \$10,000 per stall
- Santa Monica, CA: \$20,000 per stall
- Kirkland, WA: \$6,000 per stall

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<sup>9</sup> Best Practices, Parking In-Lieu Fee, Columbus Short North Parking Study,

Princeton should conduct a parking value appraisal to set in-lieu fees appropriately. These fees can easily be factored into developer funding strategies and streamline the permitting process as variances become less common. Funds received via the in-lieu fee program should be earmarked for TDM programs such as the Free B shuttle, public parking improvements, roadway improvements and redesigns, and other downtown community improvement projects, as desired.

***Case Study: Aspen, CO***

The City of Aspen, Colorado recently adopted this framework, which provides an optimal amount of flexibility for developers and the town to shift investments away from parking as emerging mobility innovations start to reduce parking needs in urban centers and neighborhoods. As the transportation environment shifts away from personal vehicle use, private parking facilities will become less relevant. Progressive zoning policies such as those outlined above mitigate the impact from these changes and prepare Princeton for the future.