



Parking Plan Appendices

Princeton Parking Strategy

Municipality of Princeton, New Jersey



November 2017

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EXISTING LAND USE SHARED PARKING MODEL¹

EXISTING LAND USE

Land use type, commercial gross floor area, residential units, and other considerations such as theater seats are the basis for the study area parking demand analysis. Nelson\Nygaard cross-checked data provided by the Mercer County Assessor's Office to confirm its accuracy, then separated the information by focus area into use categories that are compatible with ITE and ULI/Nelson\Nygaard parking demand equations. Parks, parking lots, vacant parcels, and vacant buildings are excluded as non-regular parking generators. Single family, two-family, and three-family housing were also excluded in this modeling exercise because these developments typically have their own driveway parking and do not rely on other parking resources.

The existing land use summary is shown in Figure 1. The square feet and units shown are not adjusted for any existing vacancies.

¹ For methodology review and future demand modeling, see main body of report

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Figure 1 Existing Land Use in Study Area

Land Use	Study Area Characteristics
Apartments	648 Units
Athletic Club	69,191 Square Feet
Bank	34,797 Square Feet
Church	116,431 Square Feet
Clothing	69,477 Square Feet
Coffee/Donut	10,174 Square Feet
Community Center	14,915 Square Feet
Condos	172 Units
Convenience	4,874 Square Feet
Dry Cleaners	5,400 Square Feet
Fast Food, No D-T	15,868 Square Feet
Furniture/Carpet	15,912 Square Feet
Gas Station	8 Pumps
Grocery Store	6,670 Square Feet
Health/Fitness	3,267 Square Feet
High Turnover Resto	28,442 Square Feet
Hotel	204 Rooms
Library	200,000 Square Feet
Light Industrial	5,886 Square Feet
Liquor Store	9,539 Square Feet
Medical	53,743 Square Feet
Movie Theater	480 Seats
Municipal	35,995 Square Feet
Museum	10,021 Square Feet
Office	409,778 Square Feet
Pharmacy	6,000 Square Feet
Post Office	3,750 Square Feet
Quality Restaurant	5,340 Square Feet
Religious	3,832 Square Feet
Retail - Generic	51,726 Square Feet
Service - Generic	38,834 Square Feet
Sit Down Resto No Bar	28,114 Square Feet
Sit Down Resto w Bar	19,692 Square Feet
Theater	1,473 Seats

EXISTING MODELED DEMAND

Weekday

Unshared Demand

According to national parking generation rates from ITE, the needed number of parking spaces on weekdays—assuming that each land use has its own dedicated supply of parking—is 5,774 spaces. The study area has an existing supply of 7,025. Thus, even after allowing for a 10% reserve supply, the parking supply is about 675 spaces greater than what national standards would suggest is needed, assuming each land use had its own separate parking supply.

Figure 2 Weekday Modeled Parking Demand (ITE) by Category

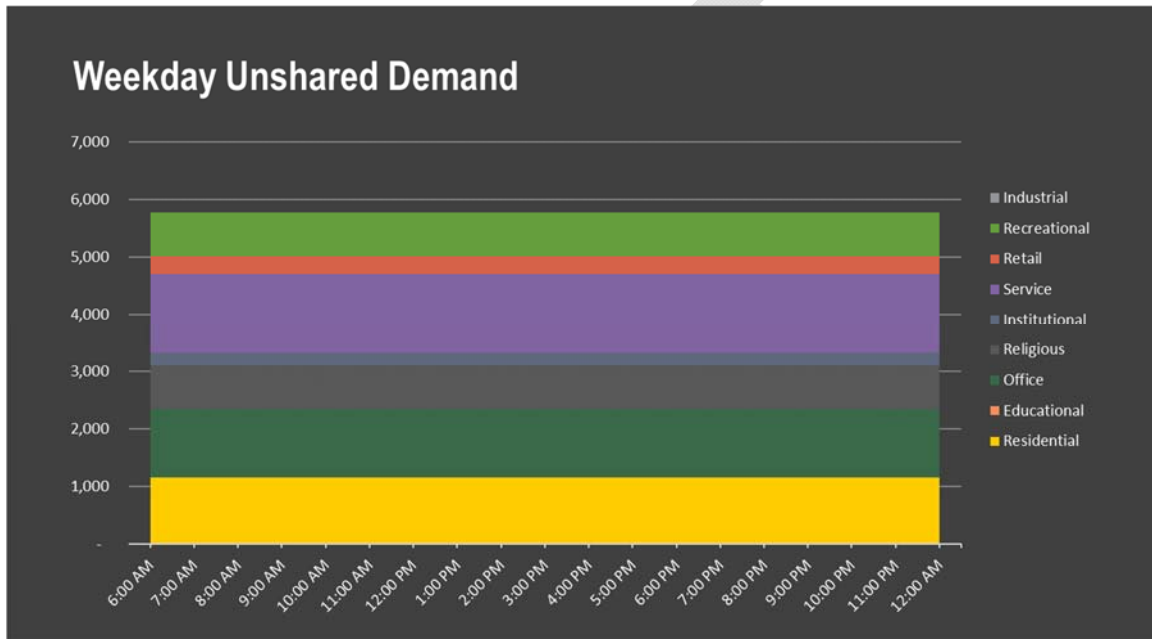
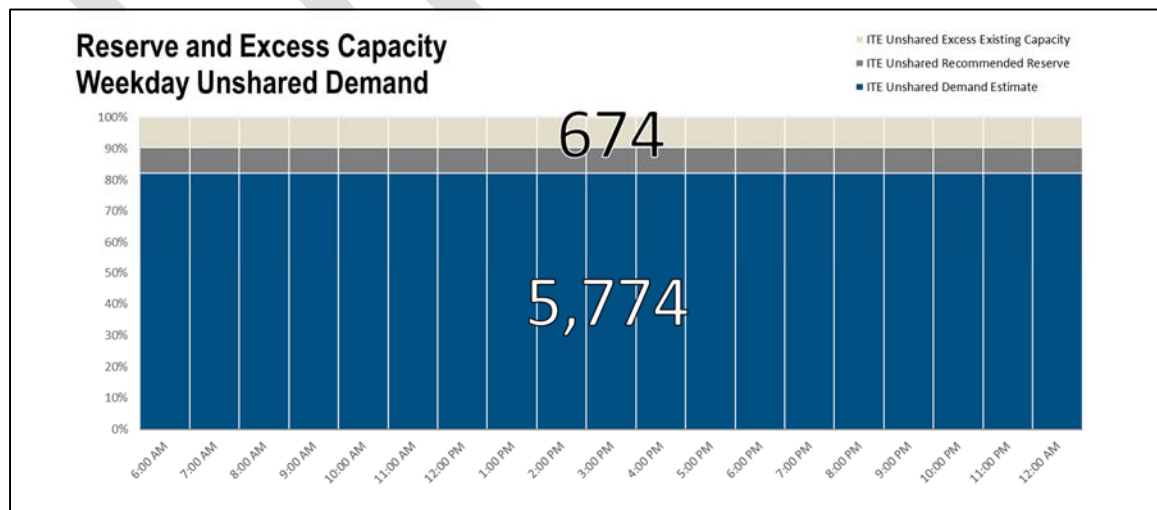


Figure 3 Weekday Modeled Supply and Demand Characteristics (ITE)



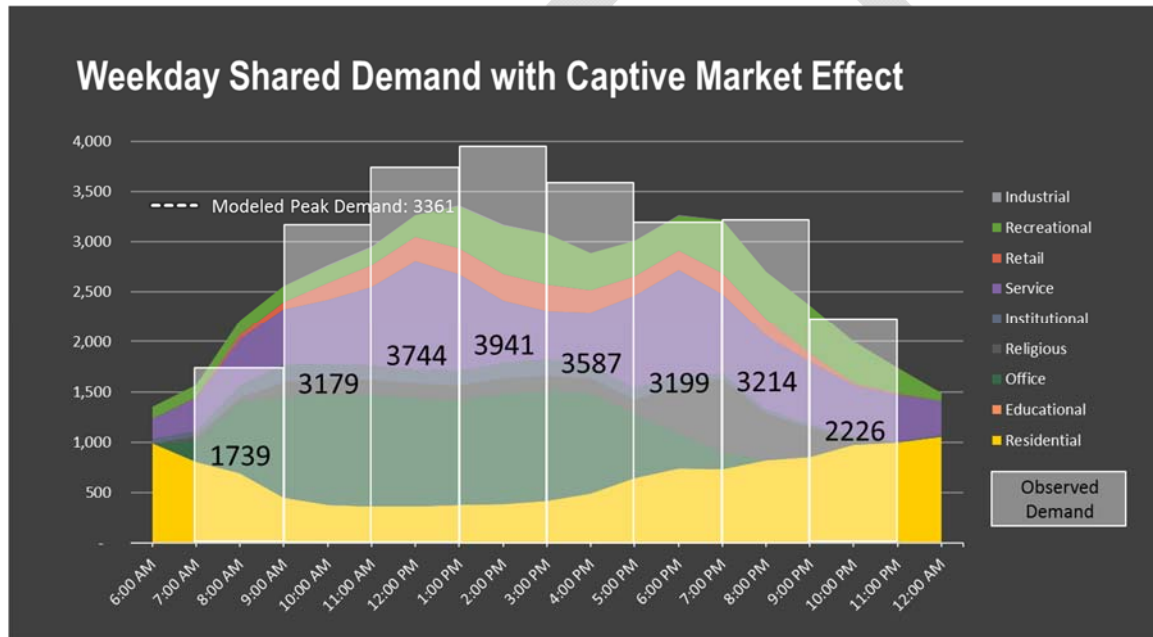
Model Parameters

The Princeton parking demand model applies only commercial and residential captive effects. There is no TDM Program or transit access benefit applied. The application is conservative (5% for commercial land uses, 5% for residential land uses) compared to ITE Trip Generation Handbook averages (32% commercial, 31% residential). This conservative application is meant to better represent and reflect observed weekday parking system behavior.

Shared Demand

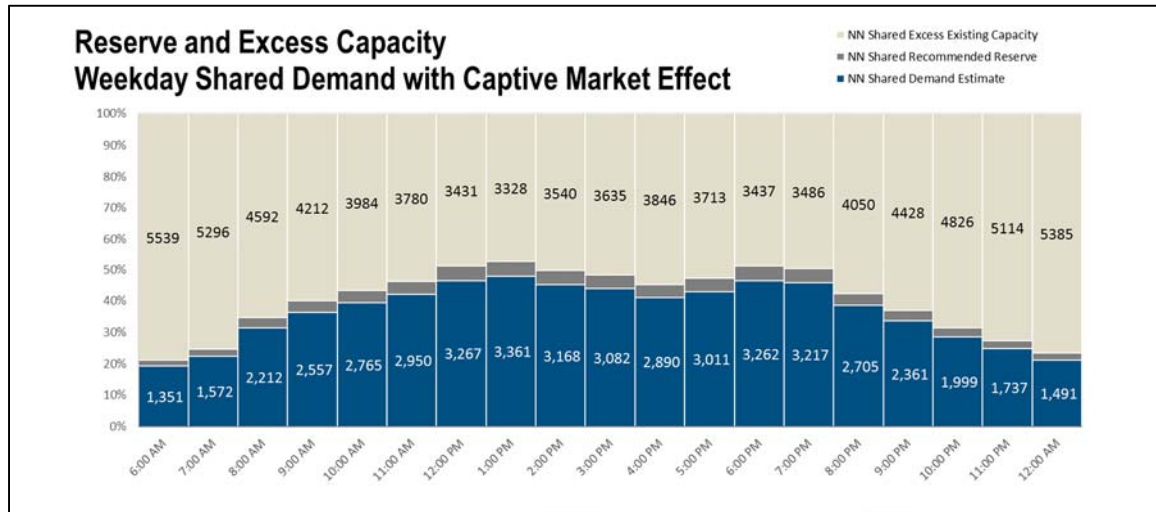
The modeled and observed demand show similar trends throughout the course of a day, peaking near 1:00 p.m., which indicates that the parking demand estimated by land use correlates to the area's observed parking demand. However, modeled demand is generally lower than observed demand between 9:00 a.m. and 9:00 p.m. This condition indicates a "spillover effect"—parking demand generated by uses outside of this particular area—from adjacent areas which may not have adequate publicly accessible supply.

Figure 4 Modeled and Observed Weekday Parking Demand



Overall, there is still ample parking supply. Not all of the parking is currently open to the public, which may need to change to accommodate future development. Development which generates both daytime and evening demand could occur if there was additional formal and informal shared parking.

Figure 5 Modeled Weekday Supply and Demand Characteristics (ULI/NN)



Weekend

Unshared Demand

As office demand factors diminish during the weekend, the ITE recommended parking supply is reduced to 5,021 spaces. As existing weekend supply remains 7,025 spaces, the parking supply is about 1500 spaces greater than predicted need in a non-shared situation. This includes a 10% reserve supply allowance over predicted demand.

Figure 6 Weekend Modeled Parking Demand (ITE) by Category

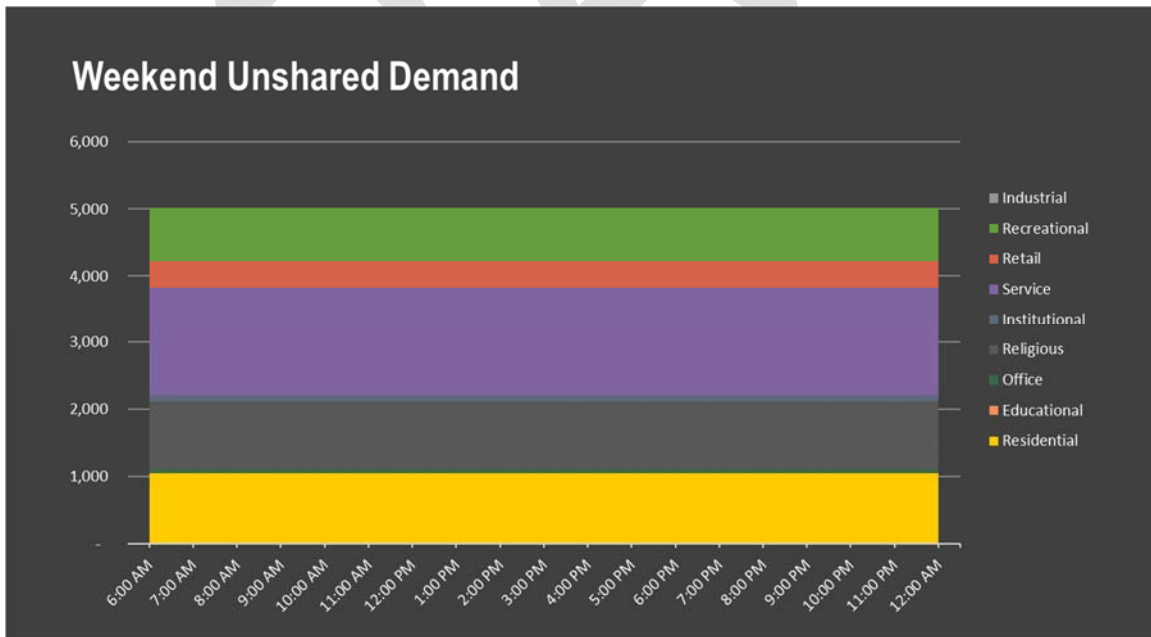
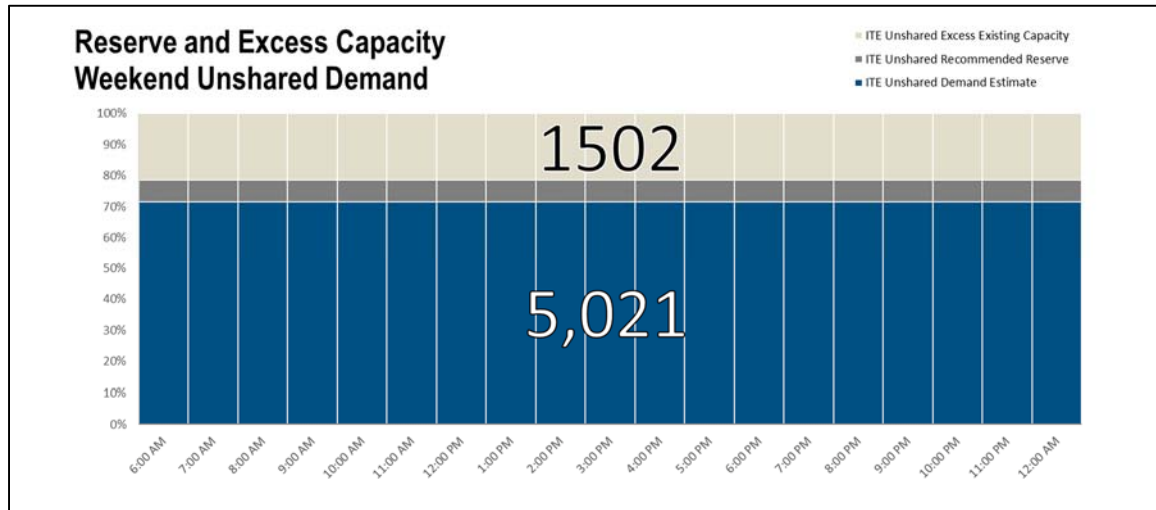


Figure 7 Weekend Modeled Supply and Demand Characteristics (ITE)



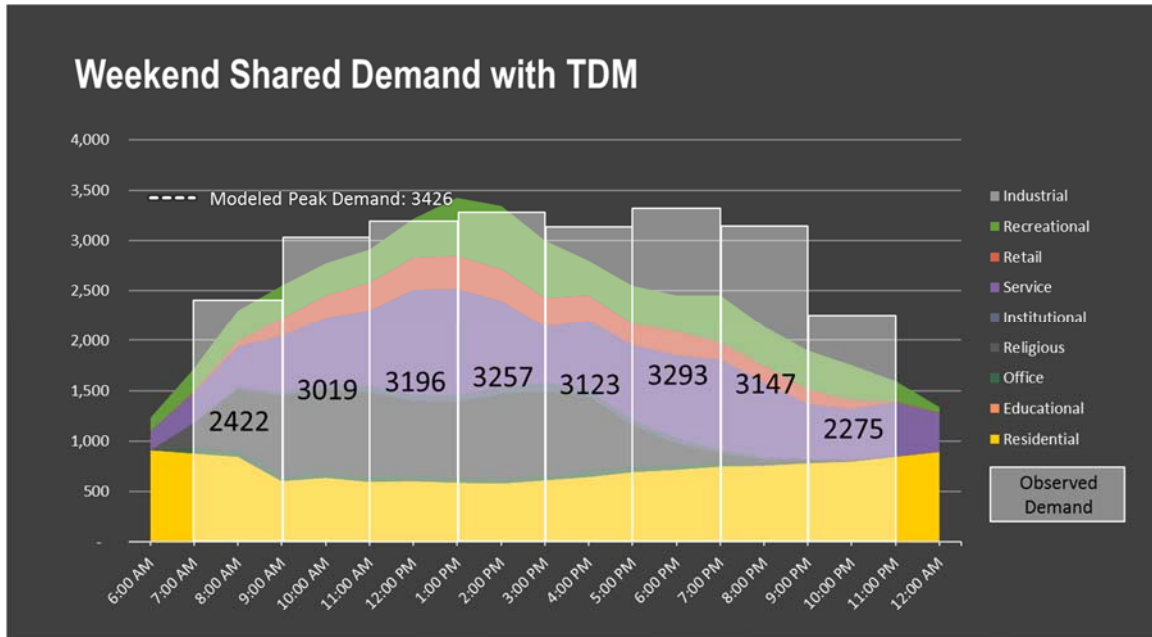
Model Parameters

As in the case of the weekday model, the weekend model applies only commercial and residential captive effects. Compared with the weekday, when many system users park their cars for long period of time without moving them, weekend behavior exhibits shorter duration and more of a propensity to chain trips within the captive market. Thus, the application of captive market effects is more significant (15% for commercial land uses, 10% for residential land uses compared to ITE Trip Generation Handbook averages (32% commercial, 31% residential). These levels better calibrate the model to observed weekend parking system behavior.

Shared Demand

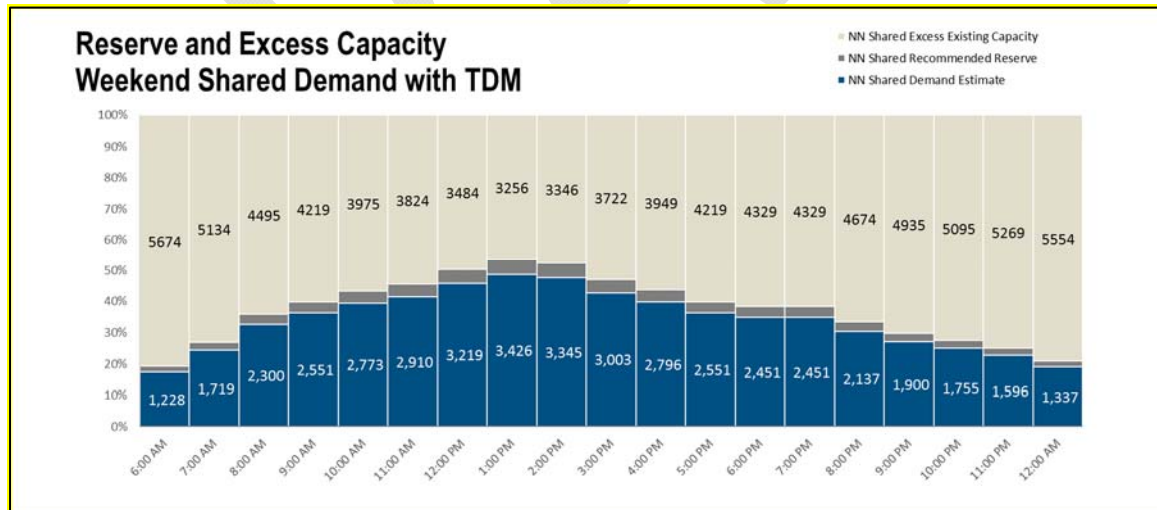
The observed and modeled demand show similar trends throughout the course of the day (Figure 8), which indicates that the parking demand estimated by land use is calibrated properly (and somewhat conservatively as model predicted a greater peak demand) to the area's observed parking demand.

Figure 8 Modeled and Observed Weekend Parking Demand

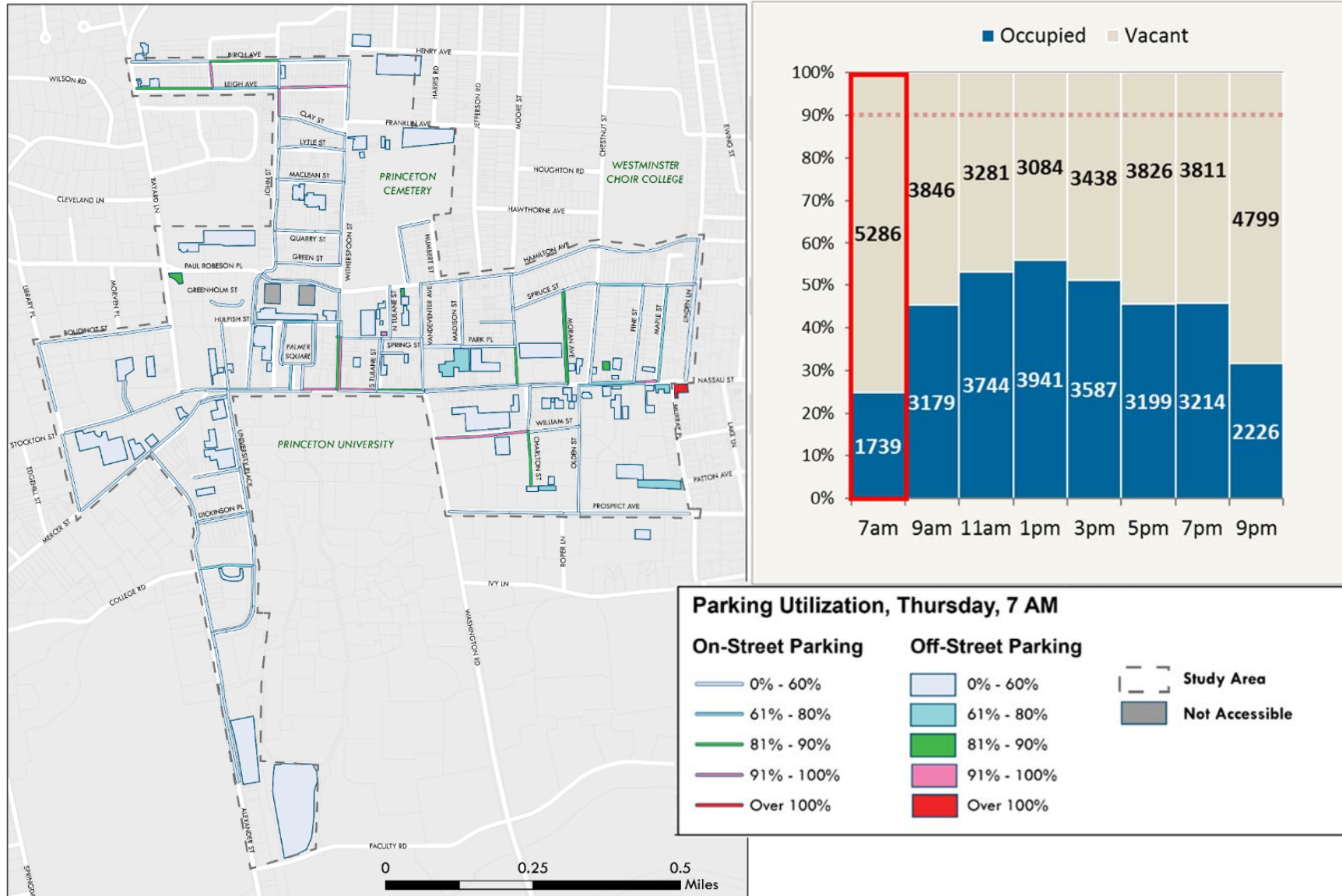


The adapted model for the focus area estimates a peak demand at 1 p.m., when over 3,400 spaces would be required (Figure 9). During this timeframe there is a surplus of more than 3,200 vacant spaces not including a 10% reserve supply. Currently, all of these spaces may not be open to the public; they represent the potential to accommodate demand without building new parking.

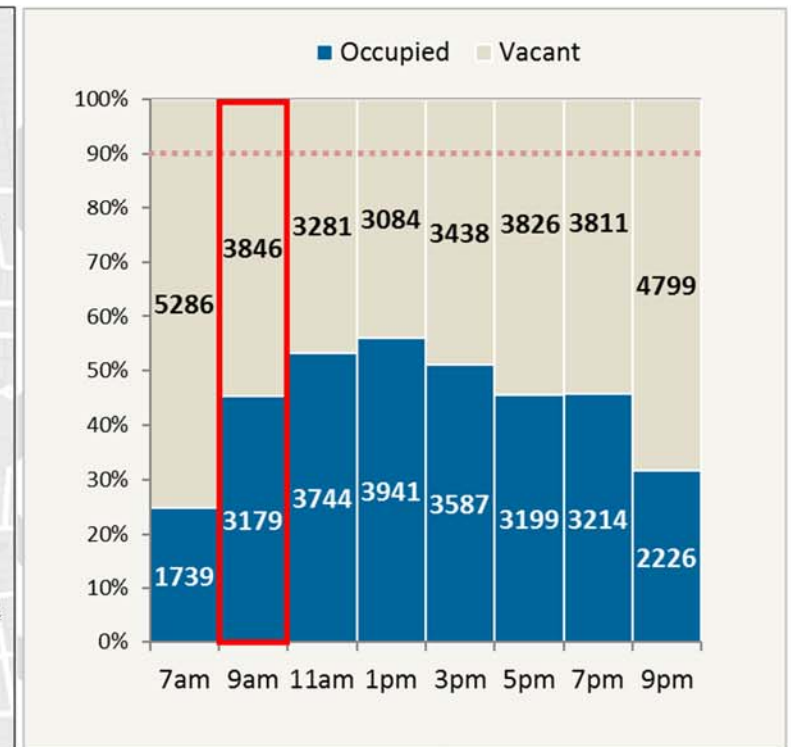
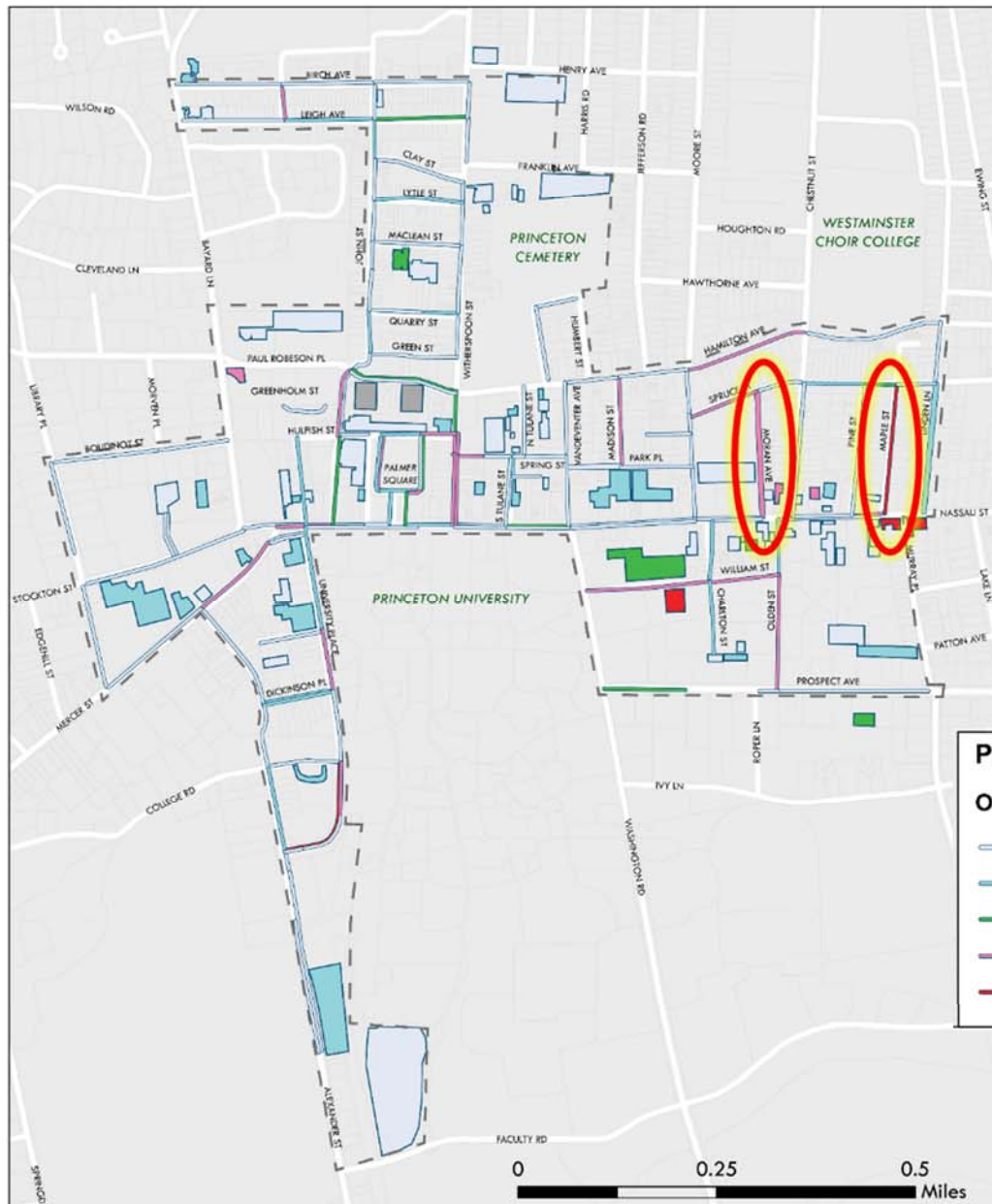
Figure 9 Modeled Weekend Supply and Demand Characteristics (ULI/NN)



PARKING UTILIZATION MAPS

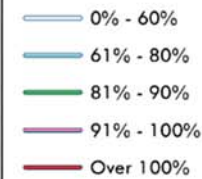


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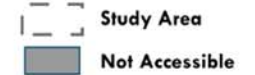
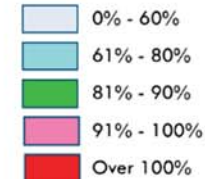


Parking Utilization, Thursday, 9 AM

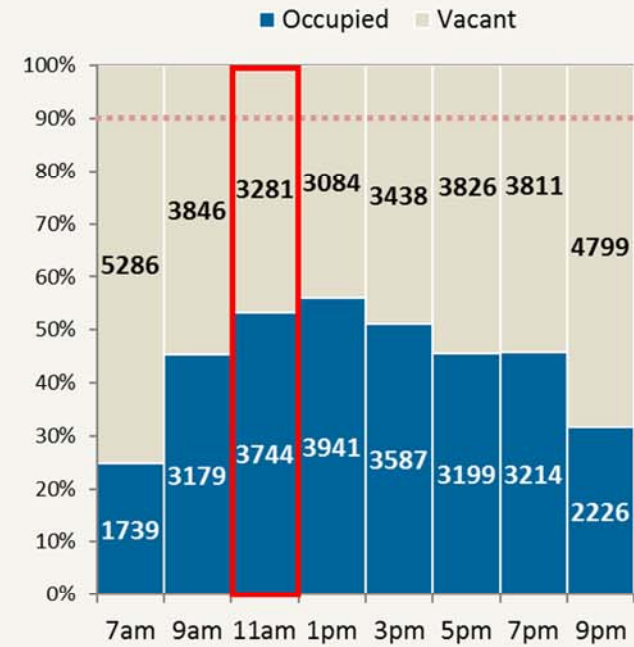
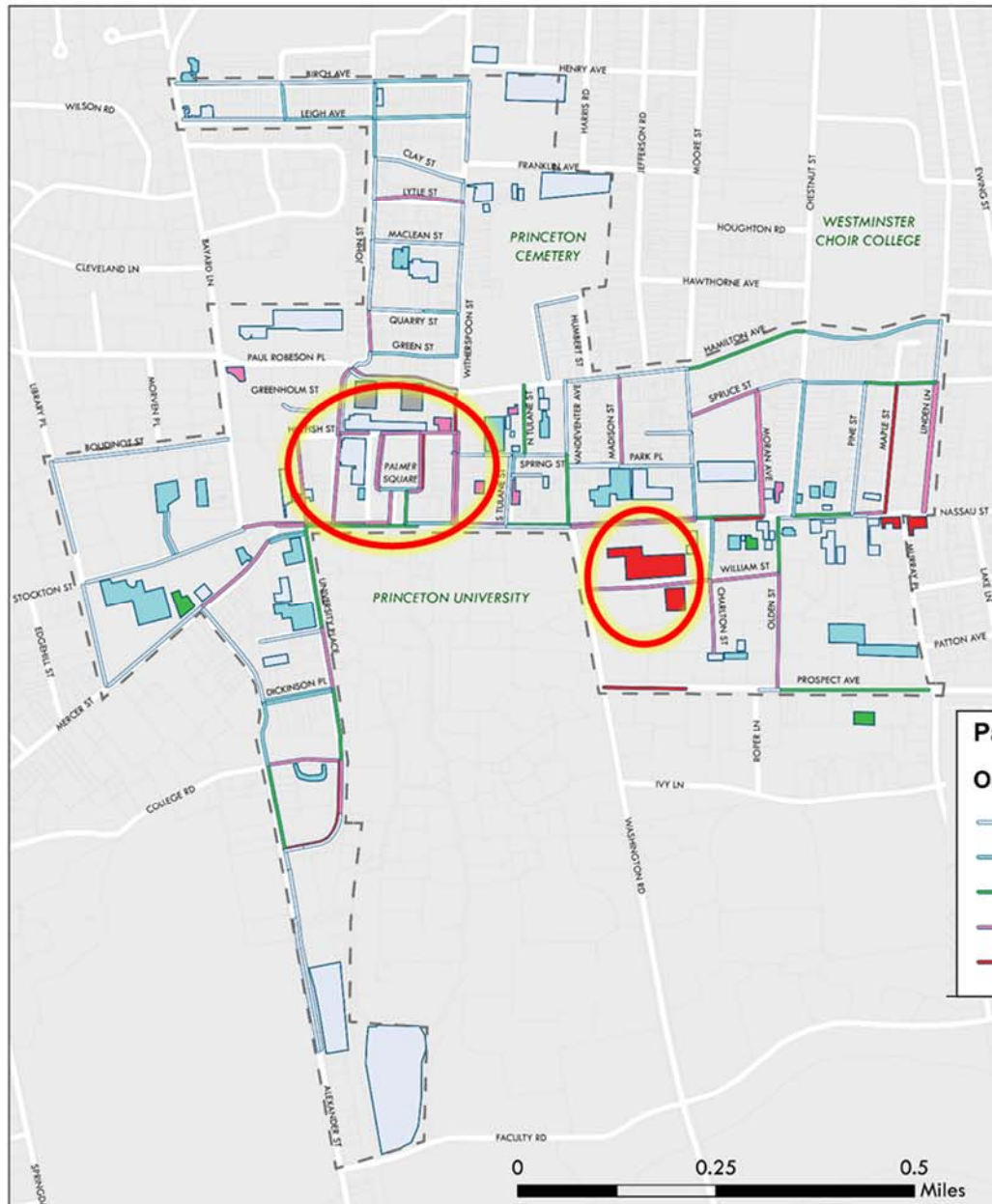
On-Street Parking



Off-Street Parking

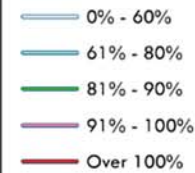


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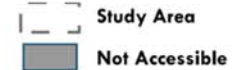
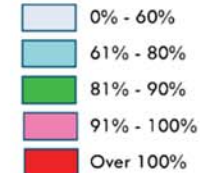


Parking Utilization, Thursday, 11 AM

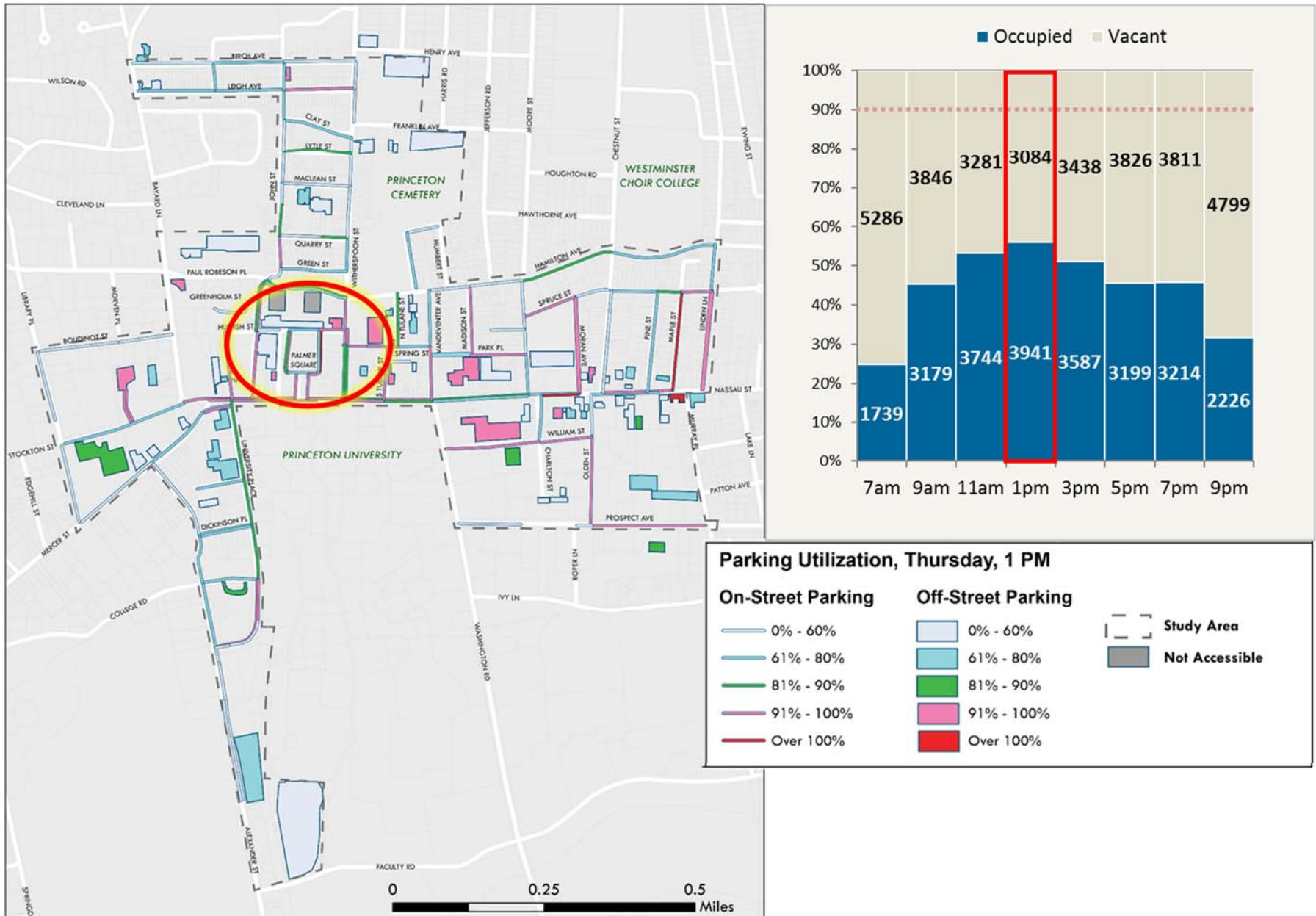
On-Street Parking



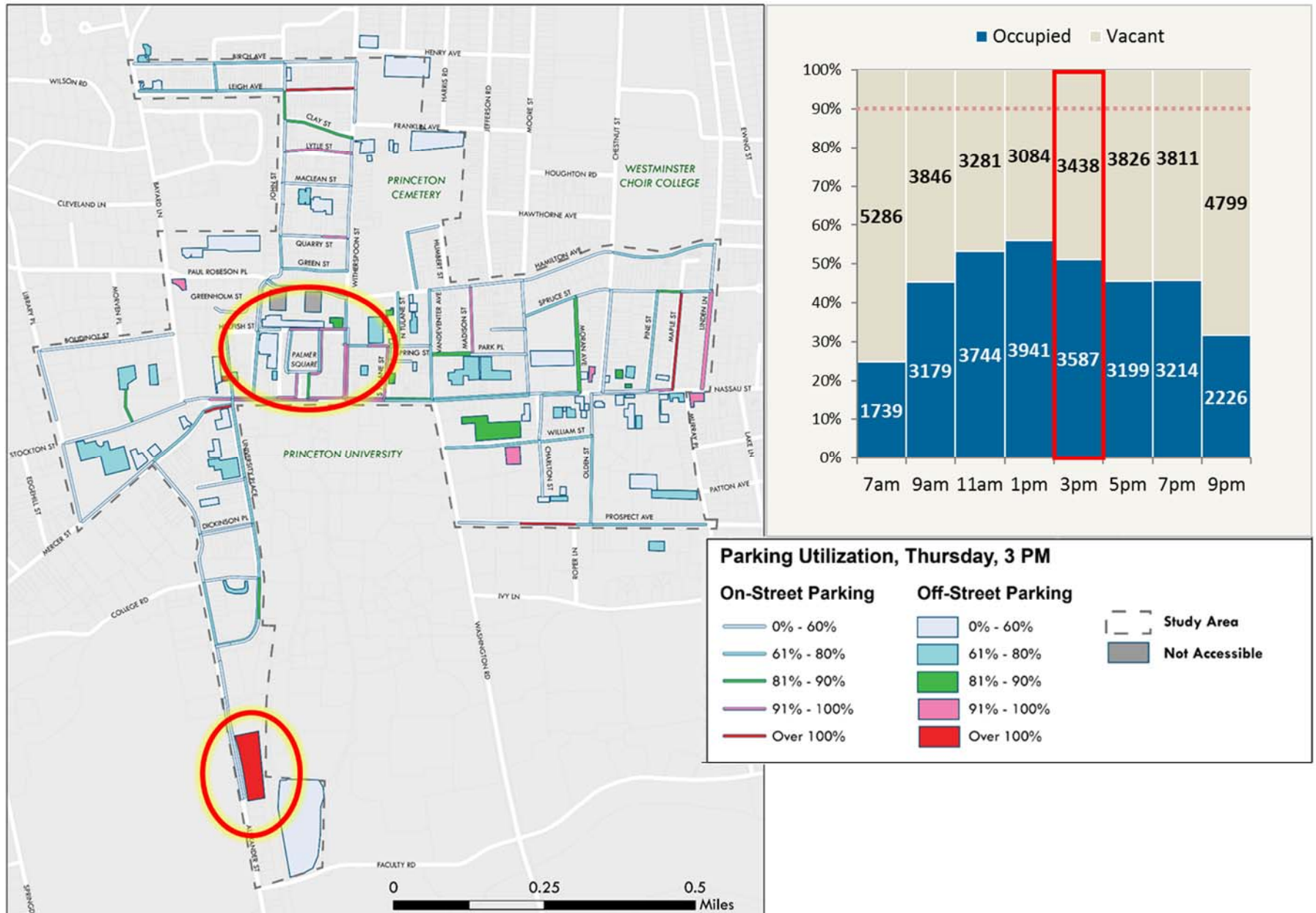
Off-Street Parking



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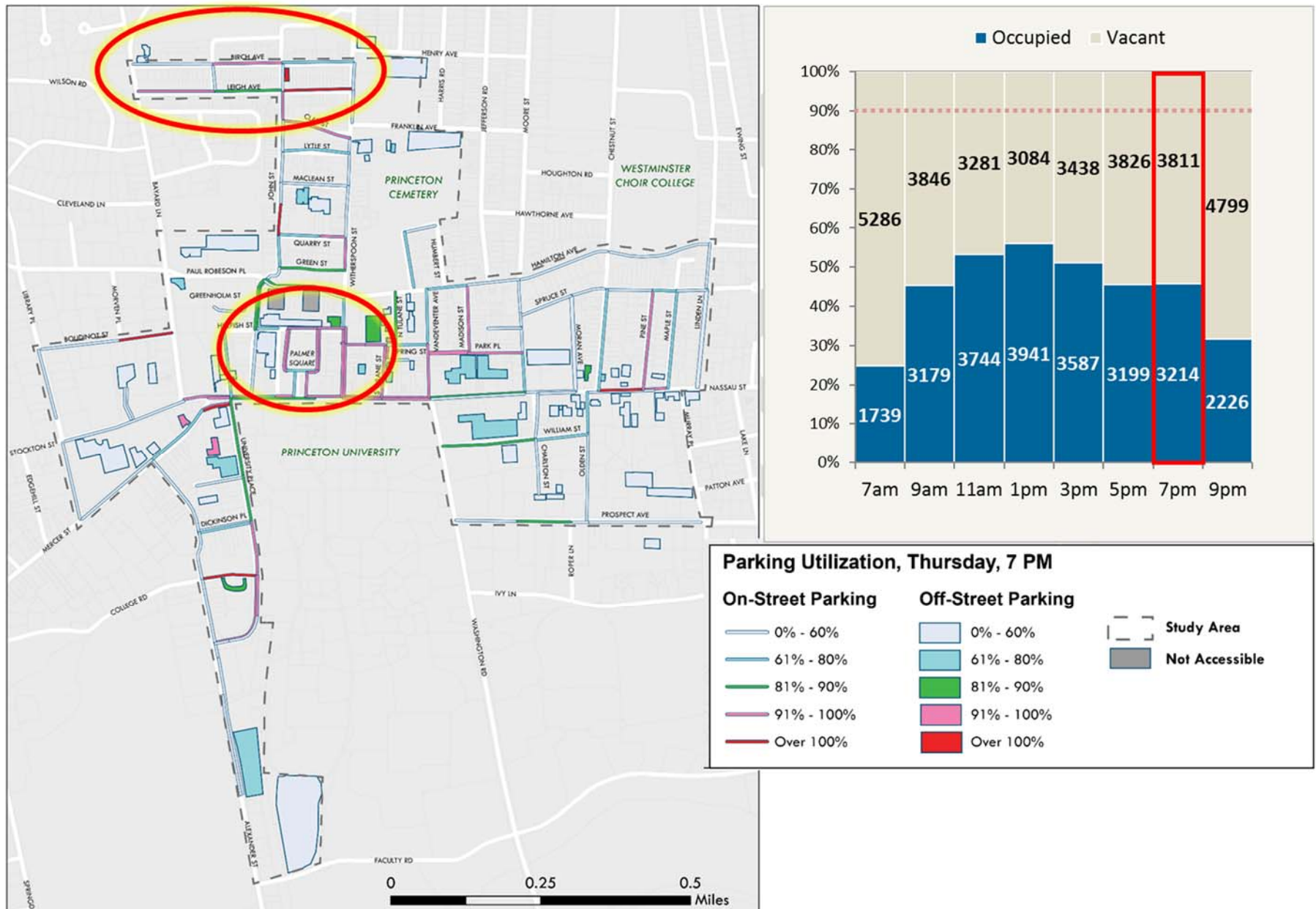
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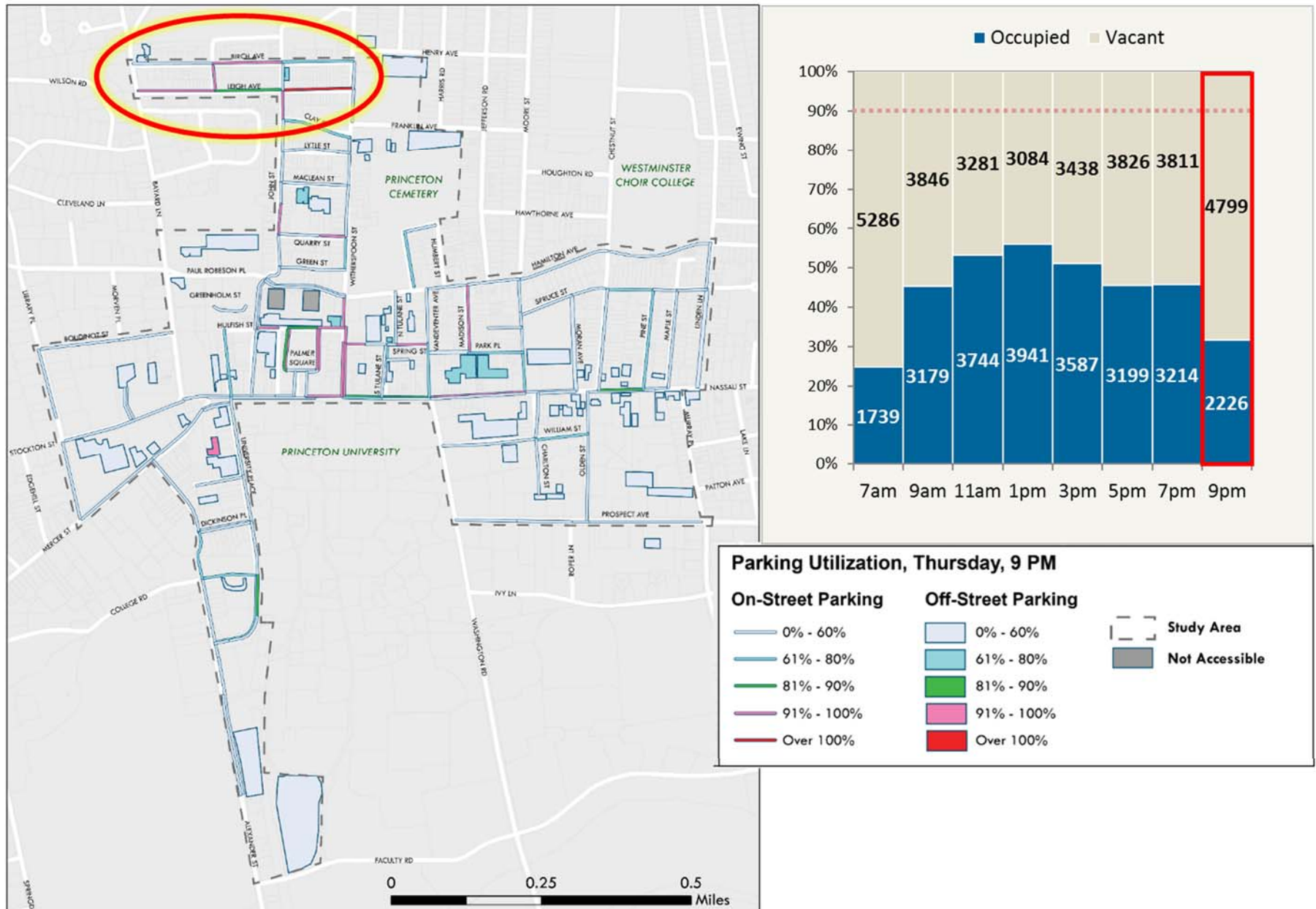
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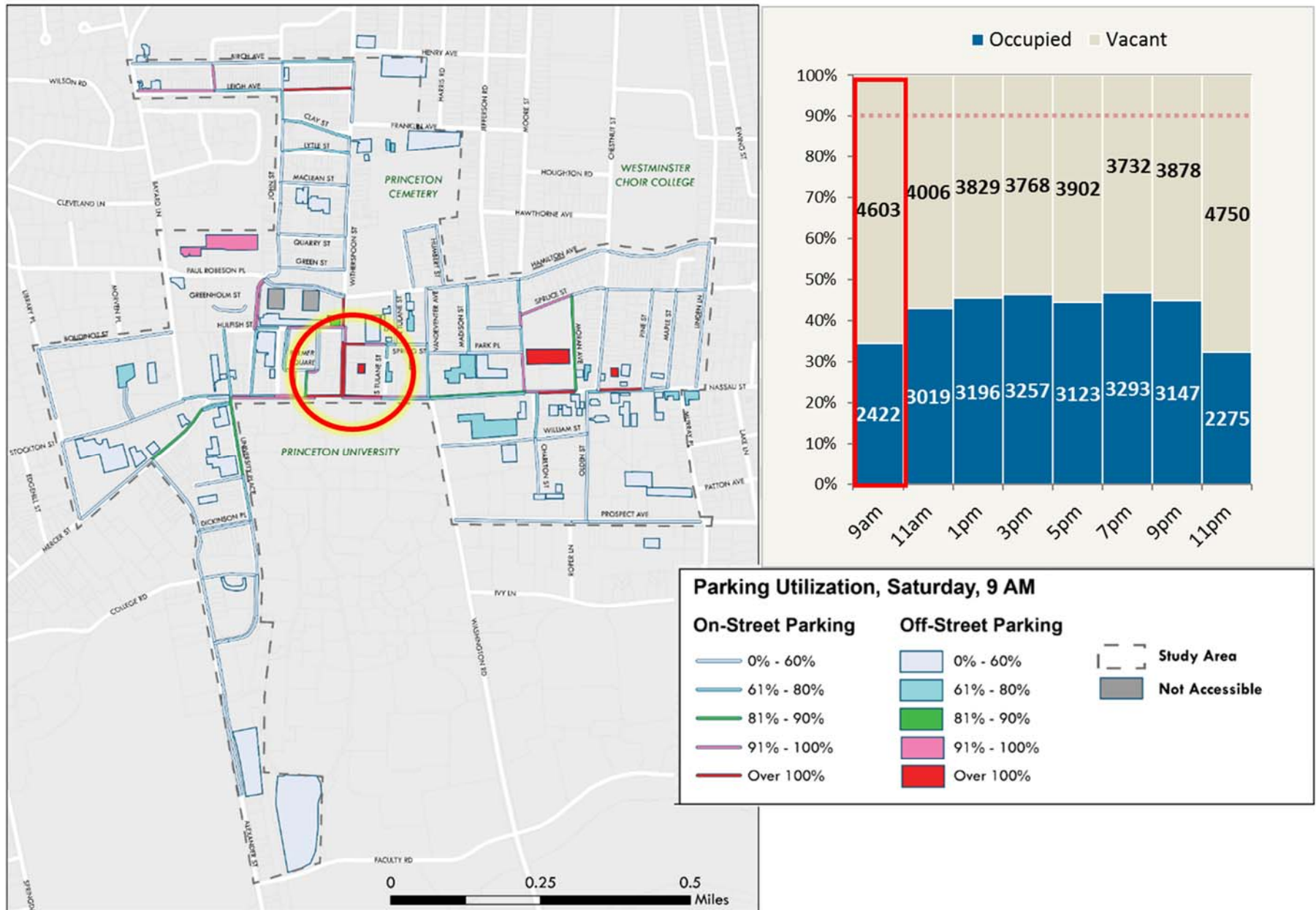
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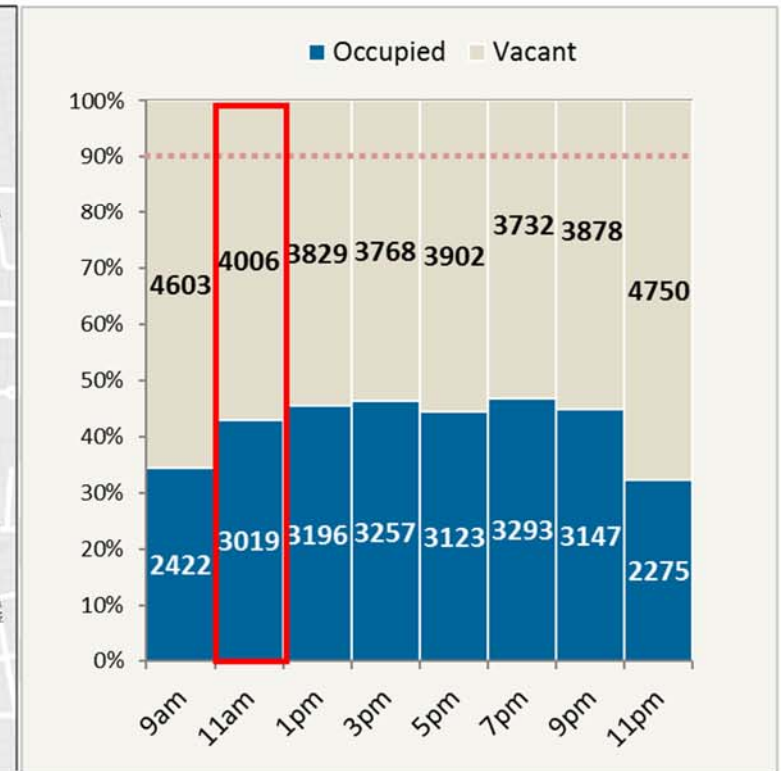
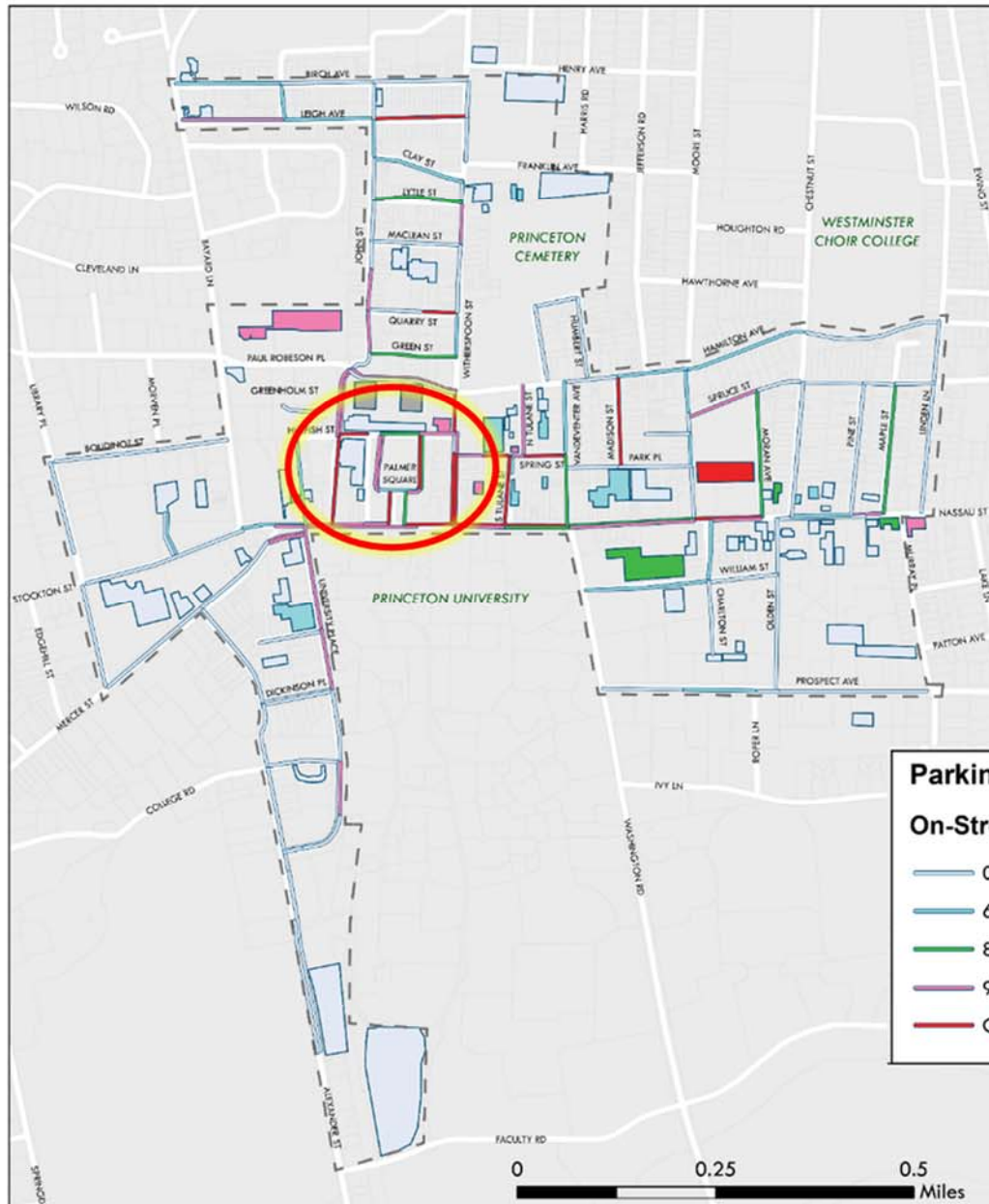
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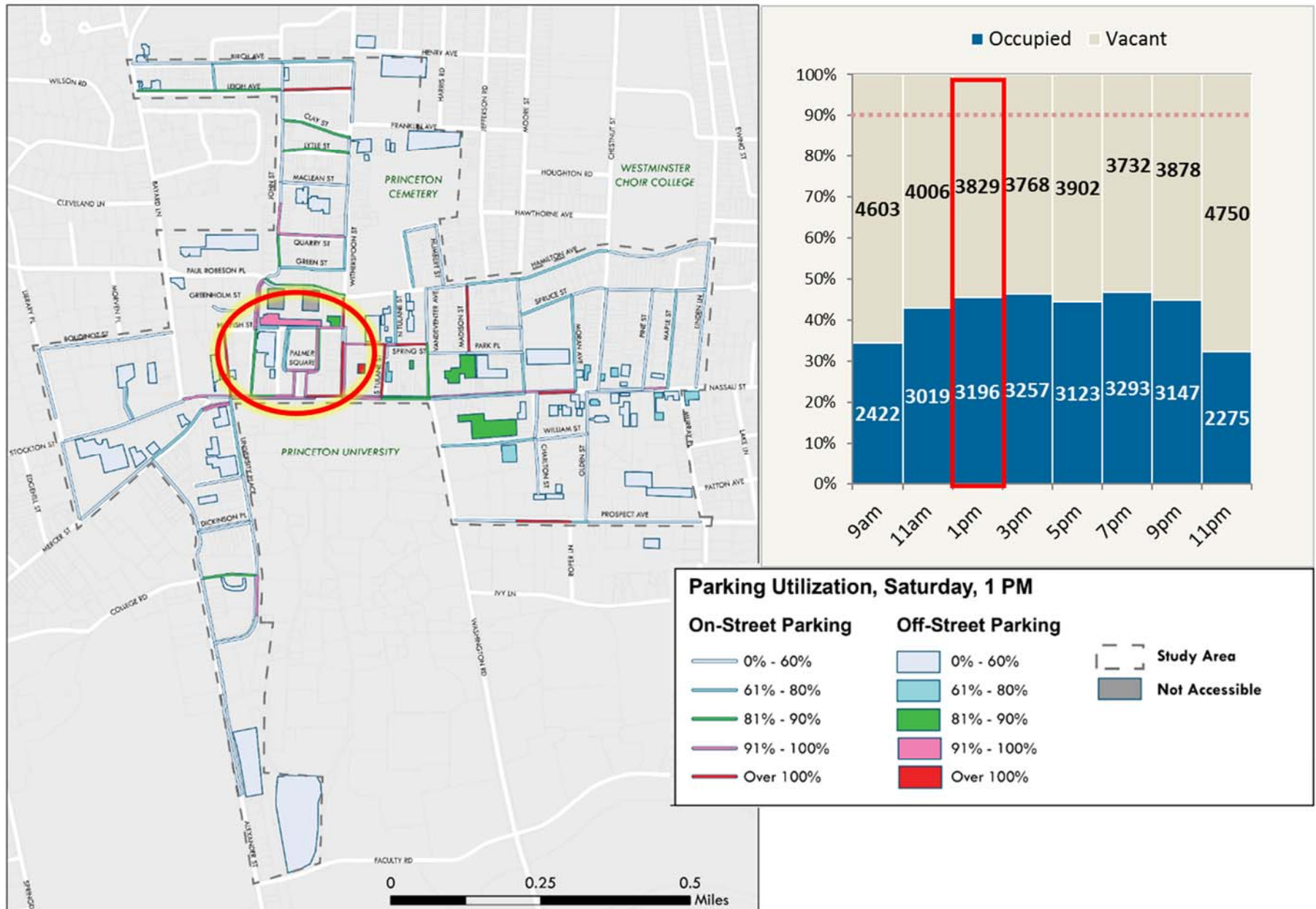
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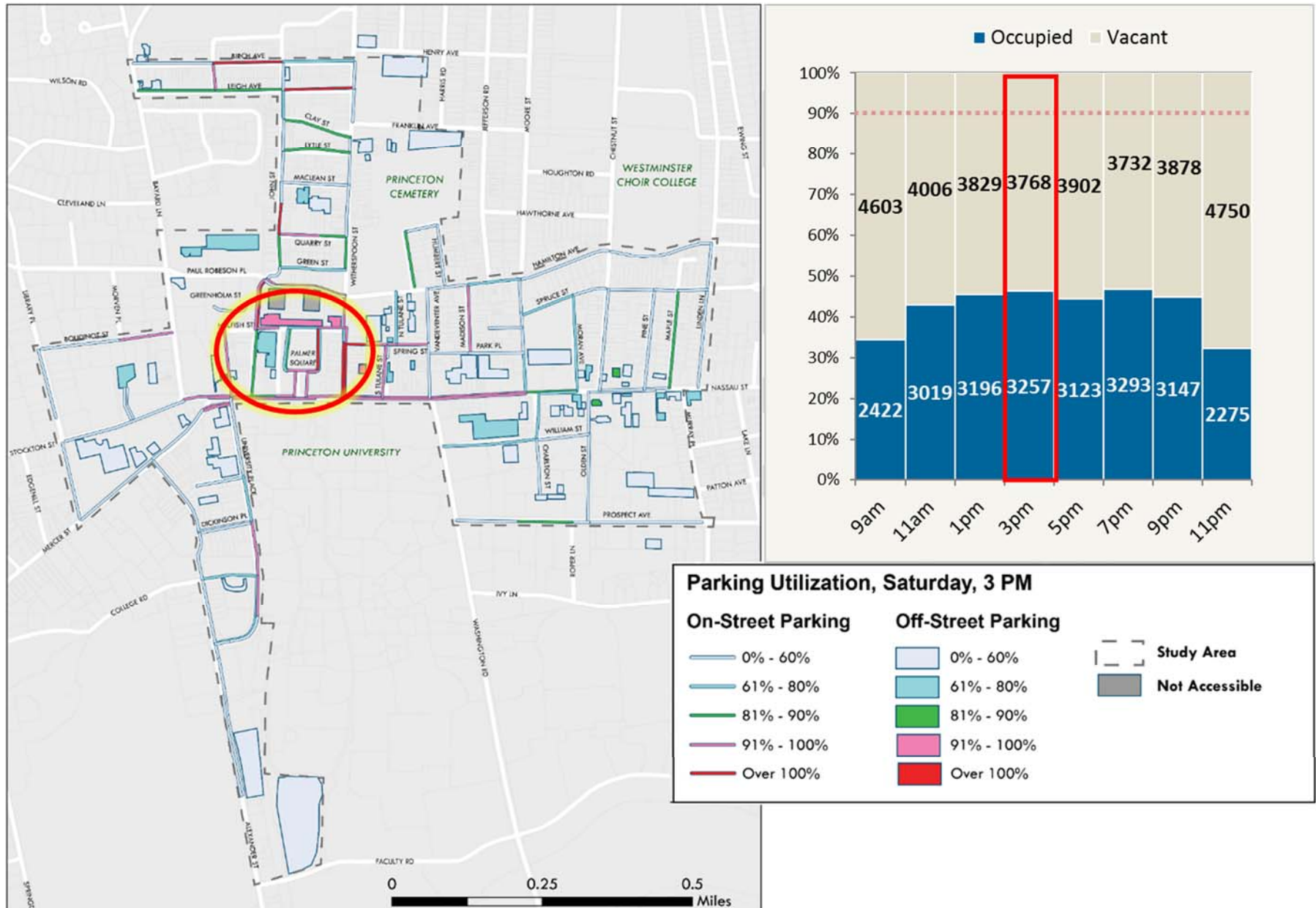
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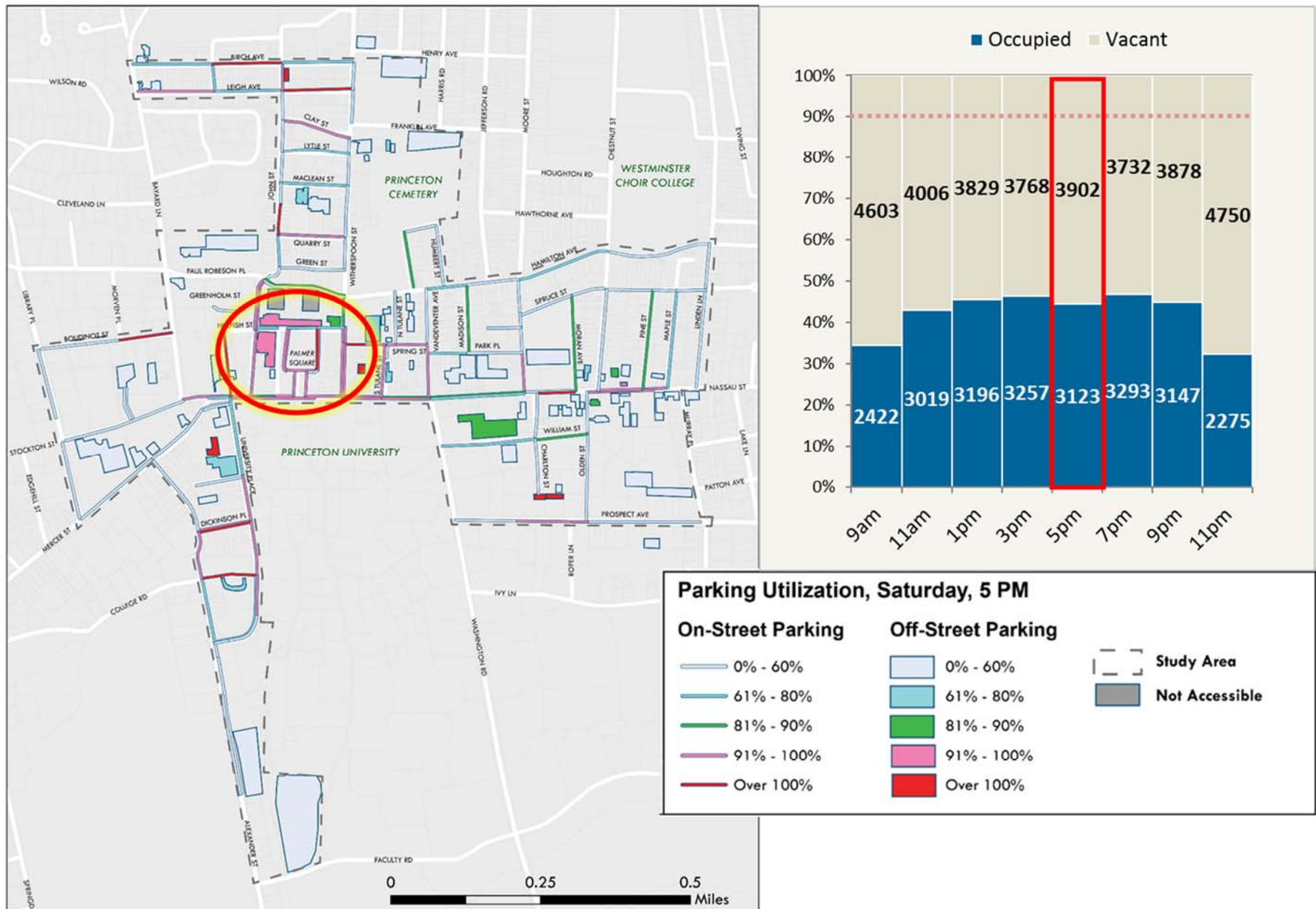
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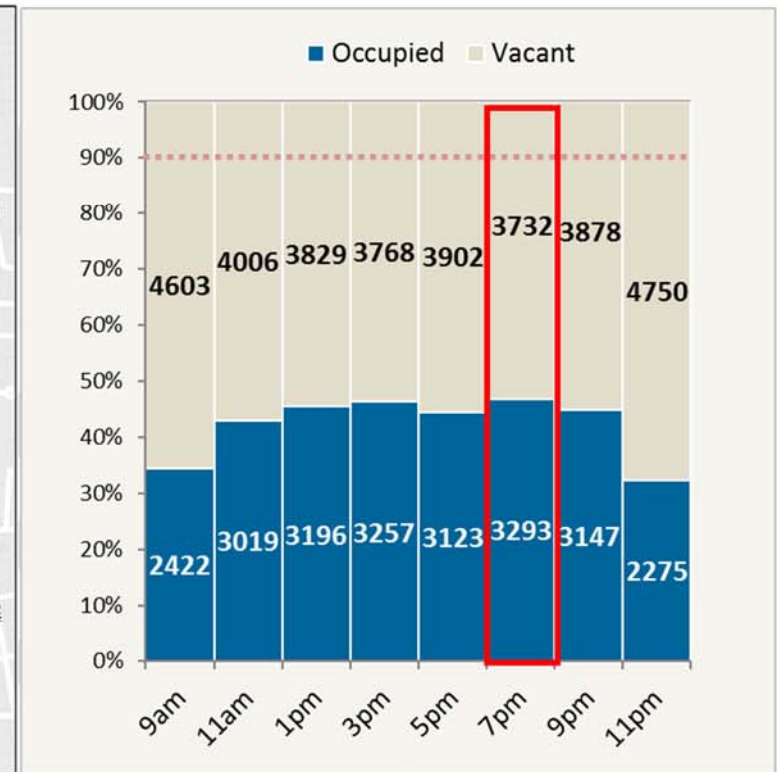
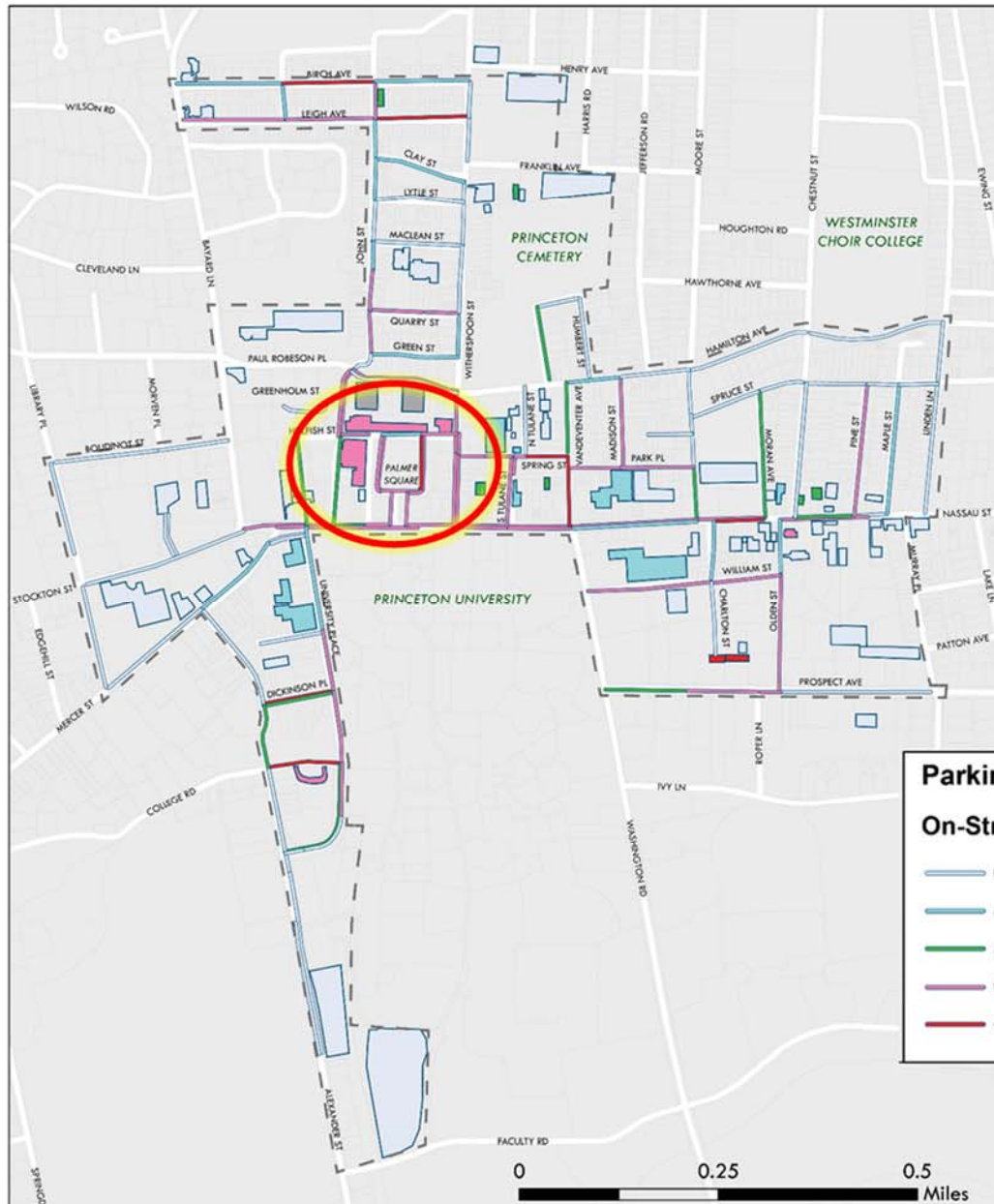
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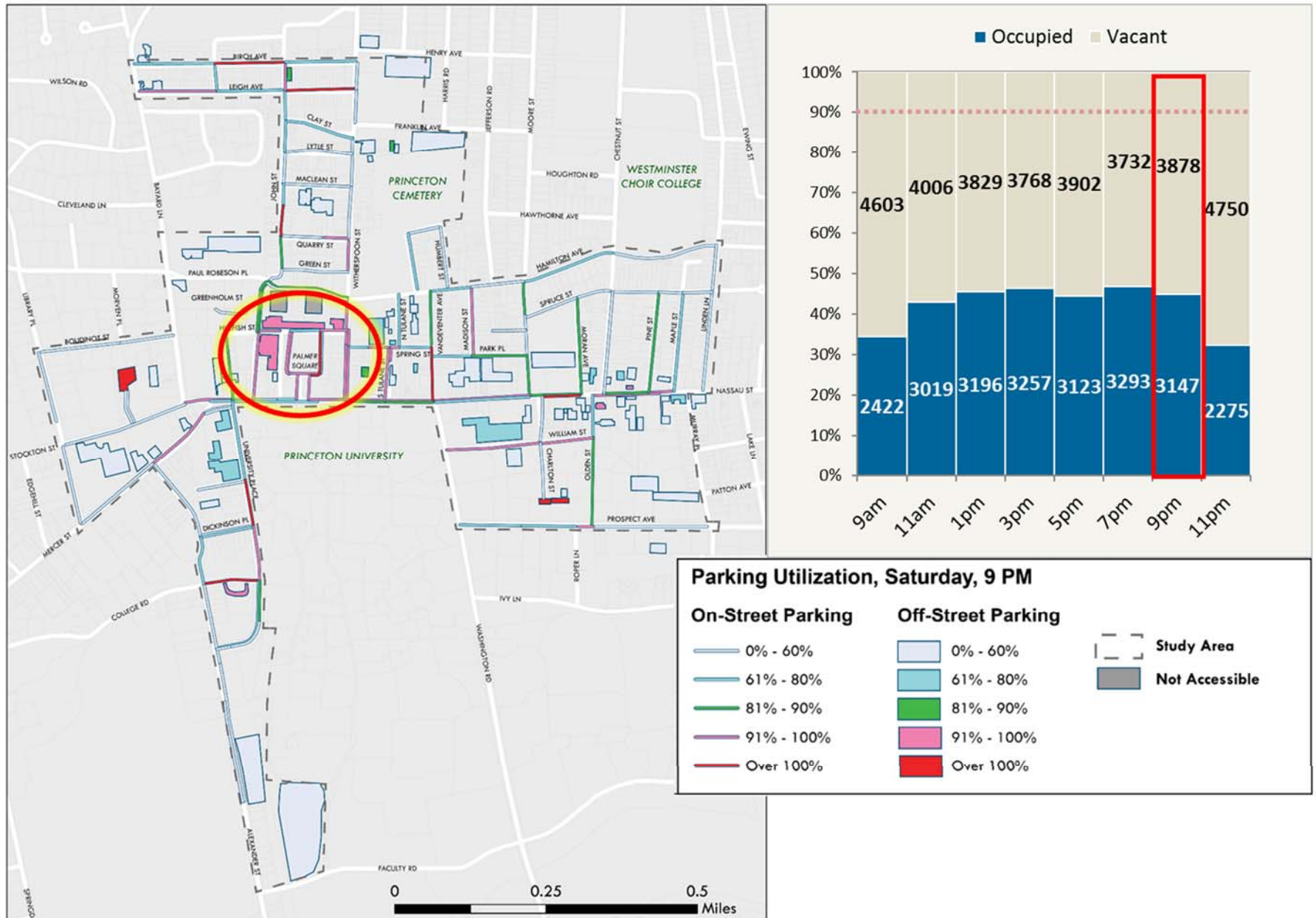
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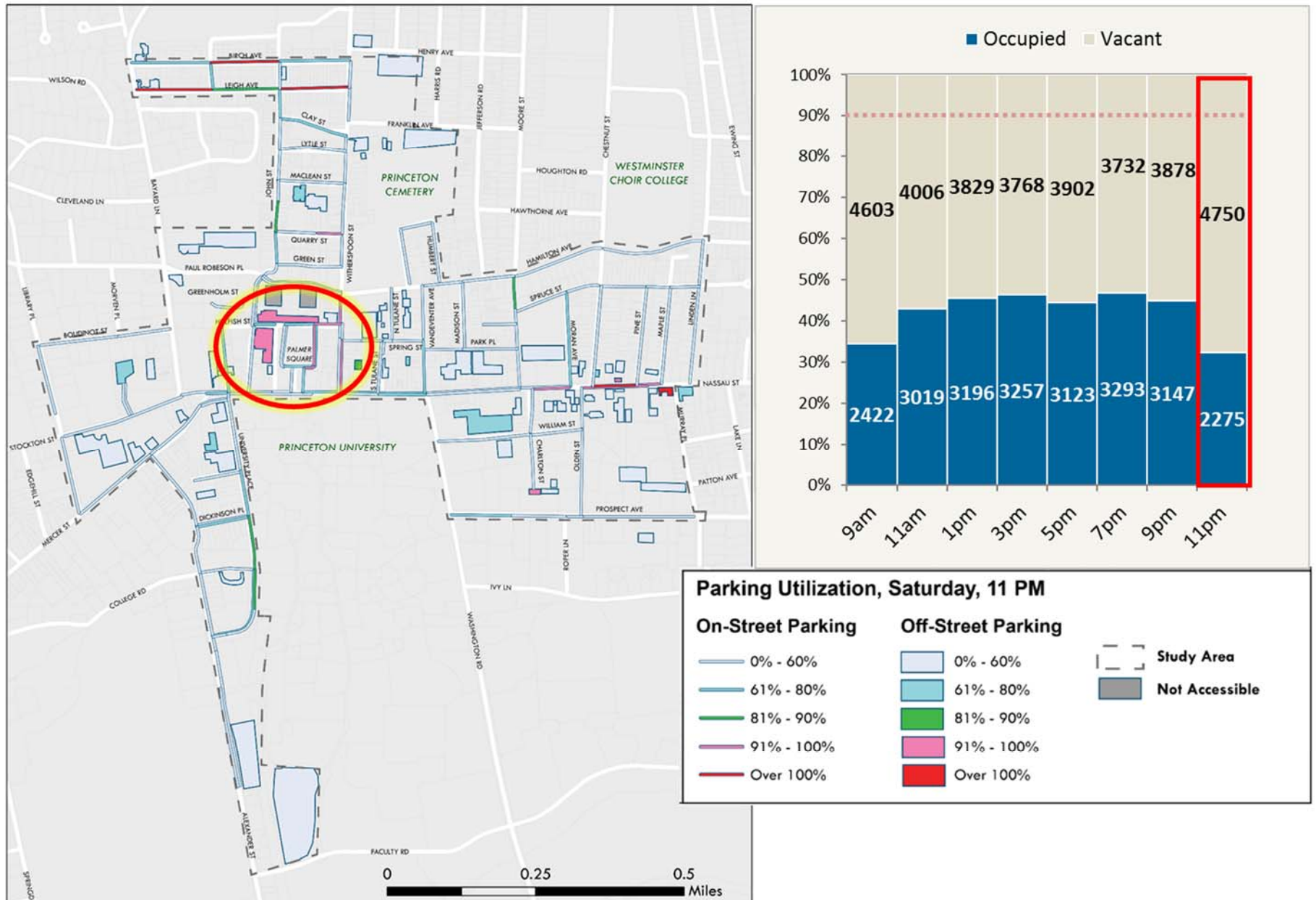
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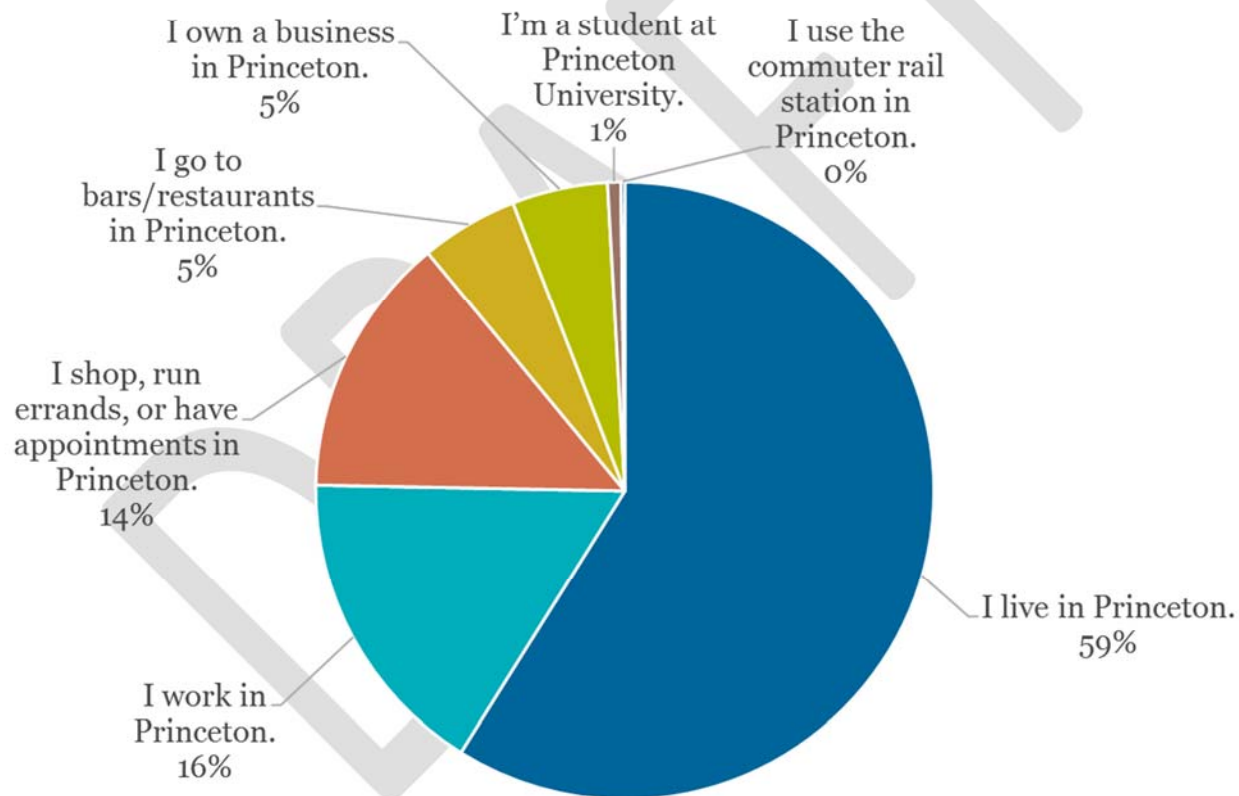


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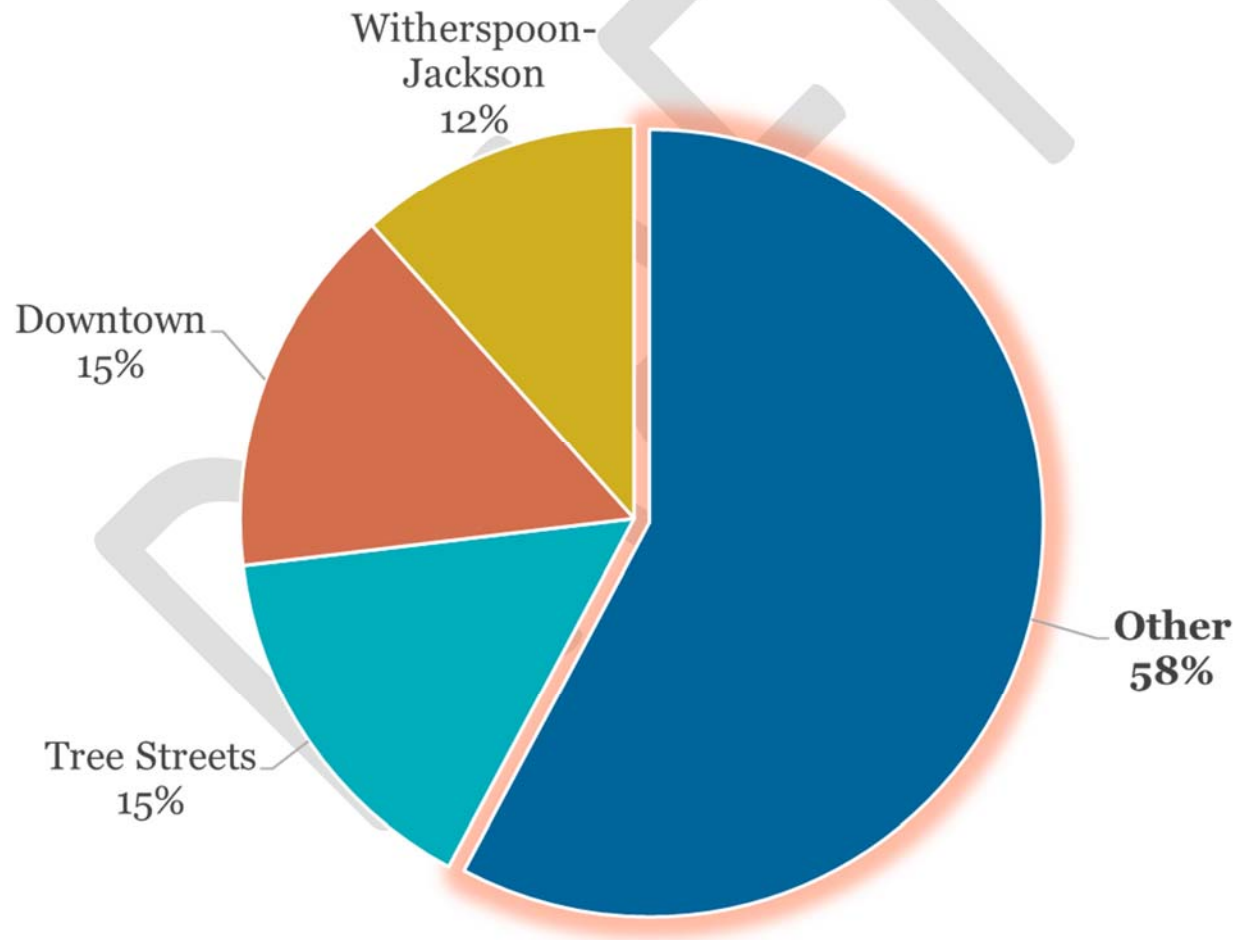


ANNOTATED ONLINE SURVEY RESULTS

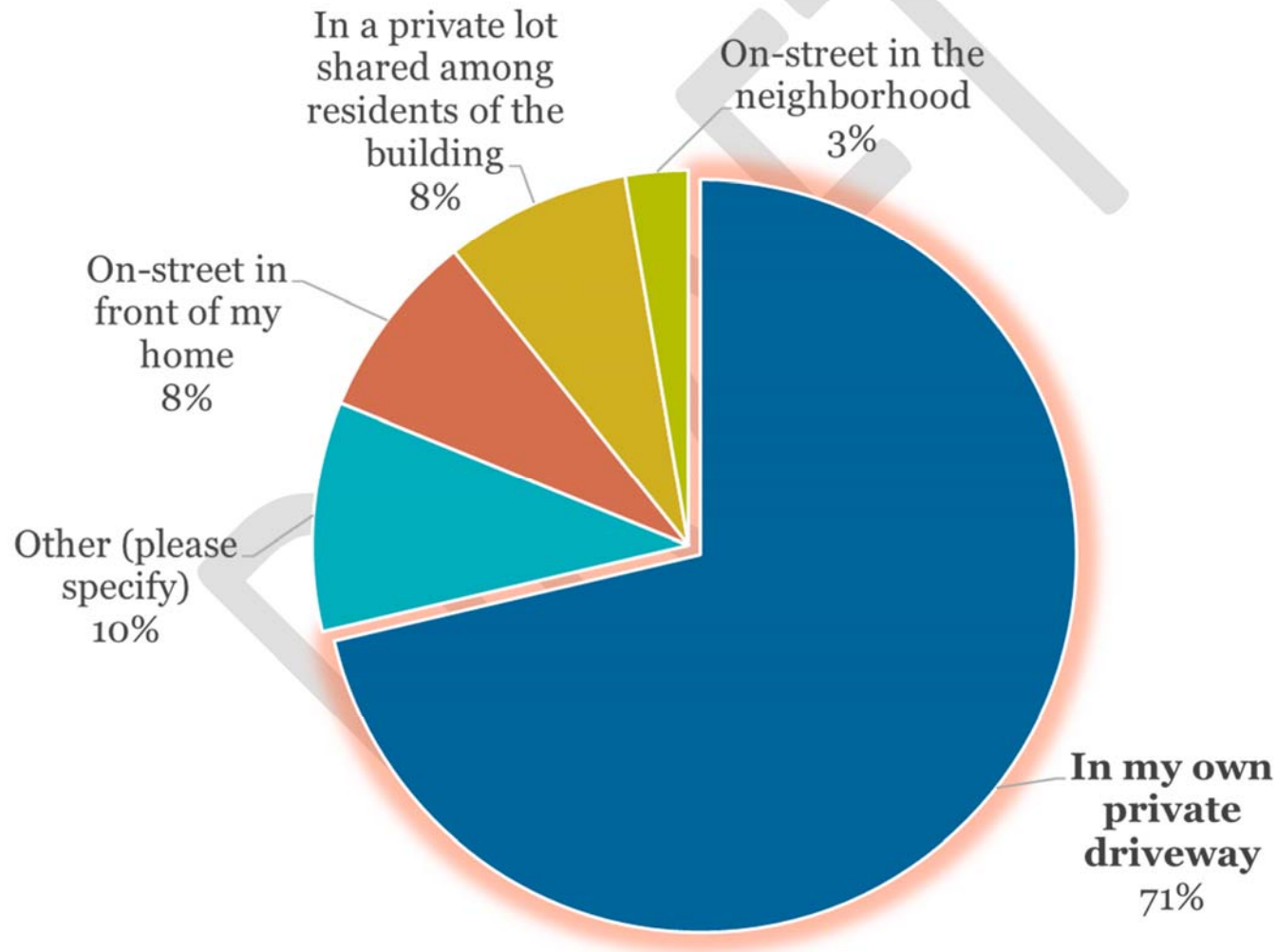
WHAT IS YOUR PRIMARY CONNECTION TO DOWNTOWN PRINCETON?



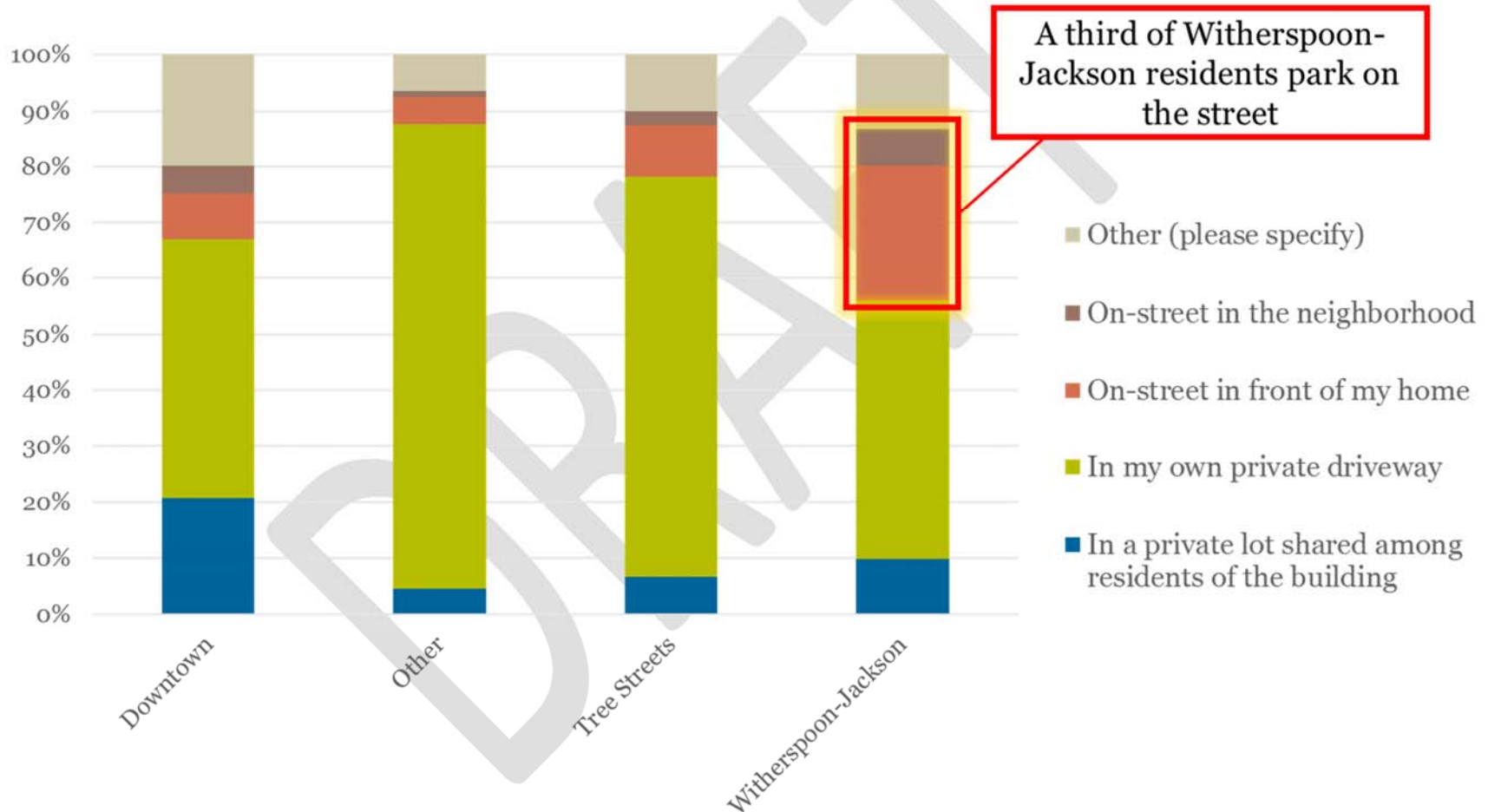
RESIDENTS – WHICH NEIGHBORHOOD DO YOU LIVE IN?



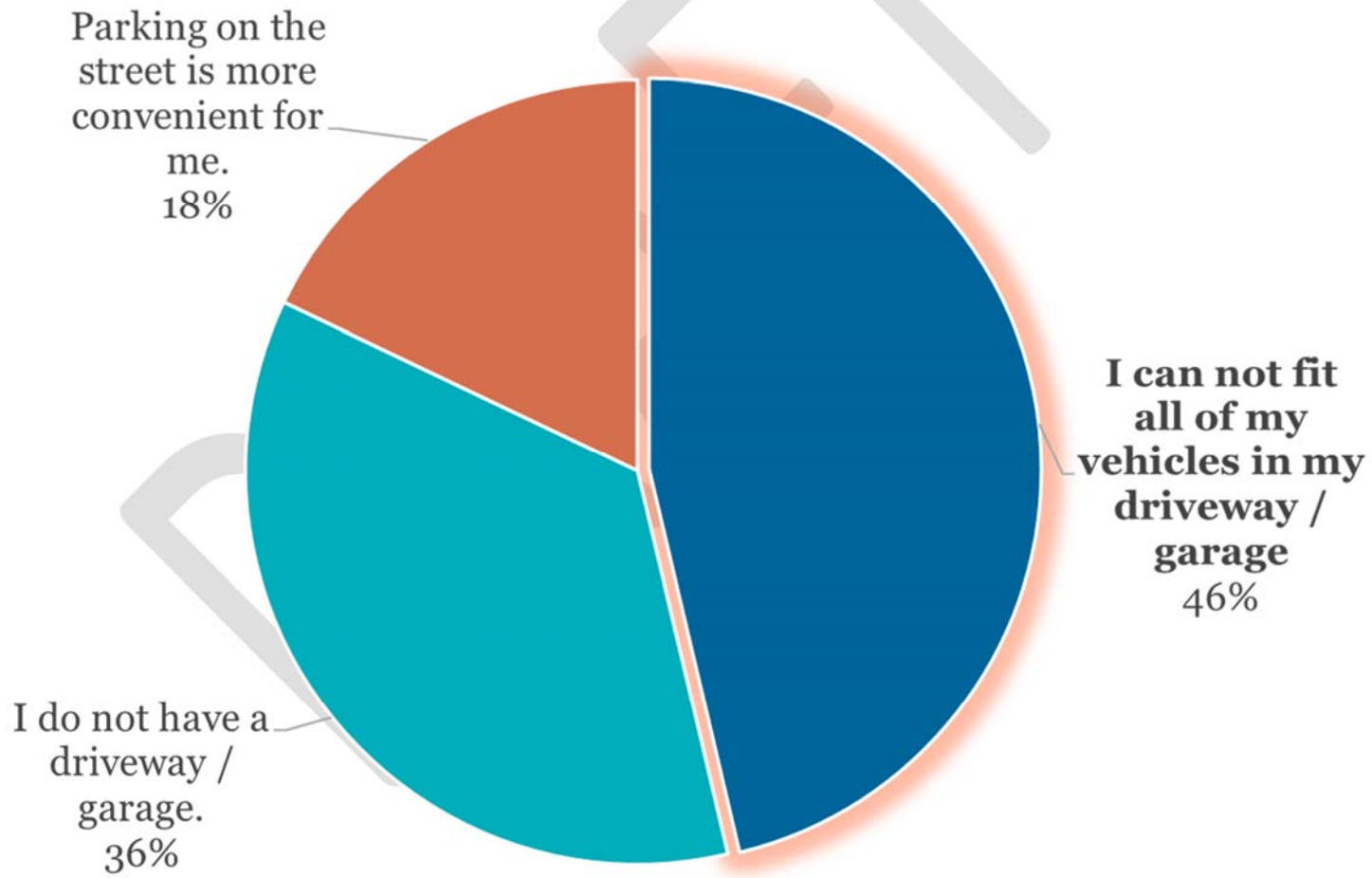
RESIDENTS – WHERE DO YOU TYPICALLY PARK IN YOUR NEIGHBORHOOD?



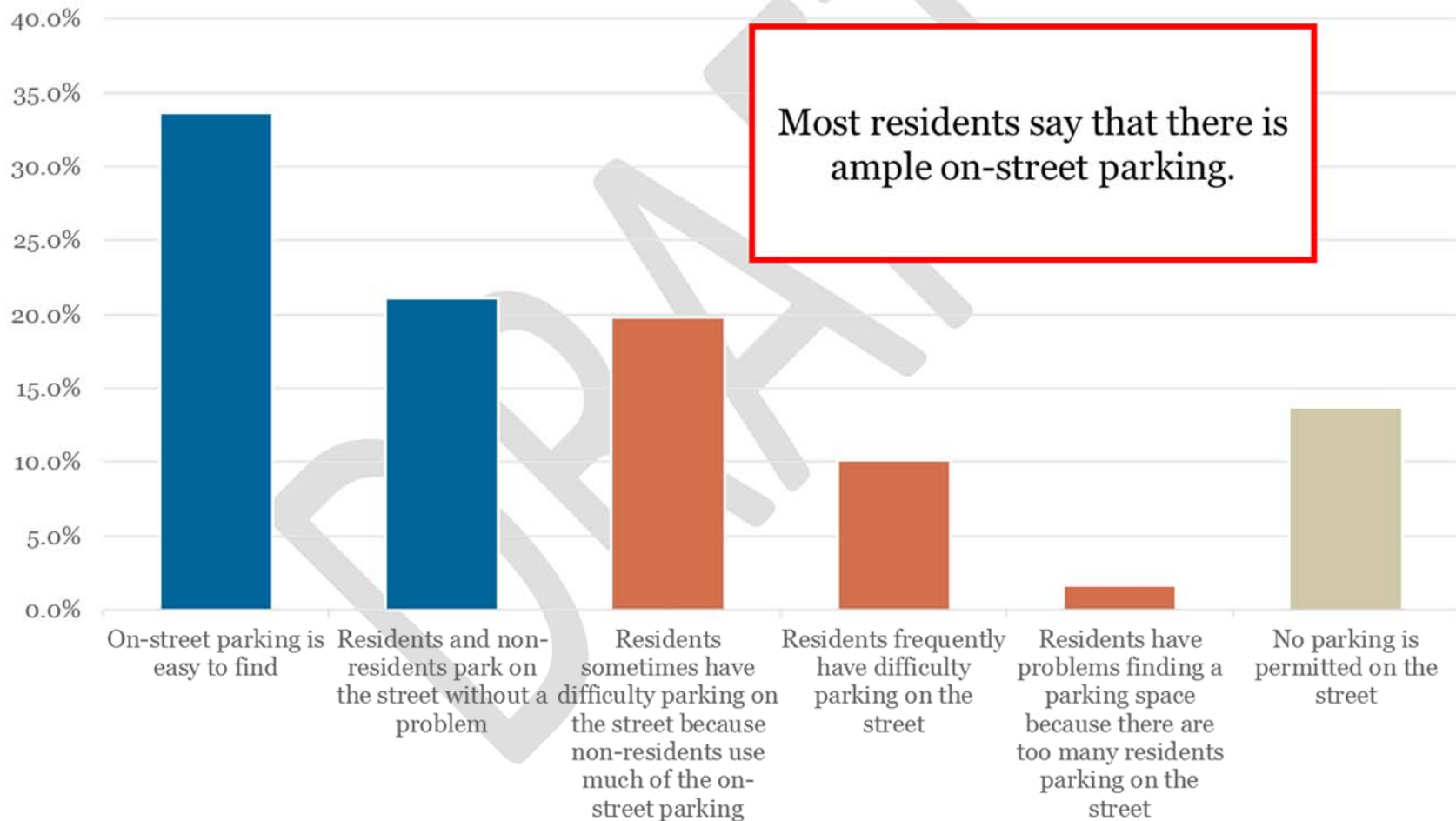
RESIDENTS – WHERE DO YOU TYPICALLY PARK IN YOUR NEIGHBORHOOD?



RESIDENTS – IF YOU PARK ON THE STREET, WHY DO YOU DO SO?



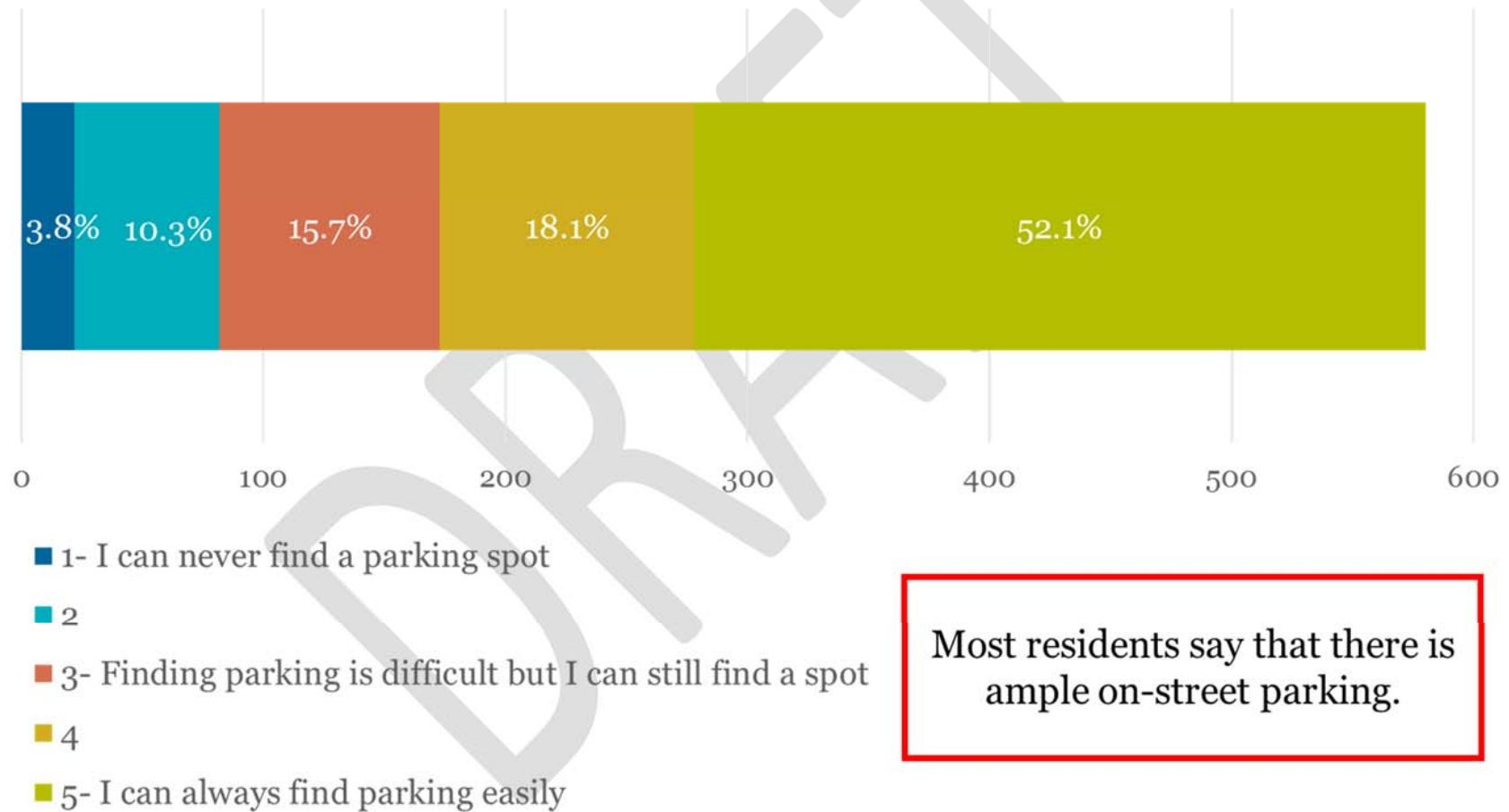
RESIDENTS – PLEASE DESCRIBE THE ON-STREET PARKING CONDITIONS IN YOUR NEIGHBORHOOD



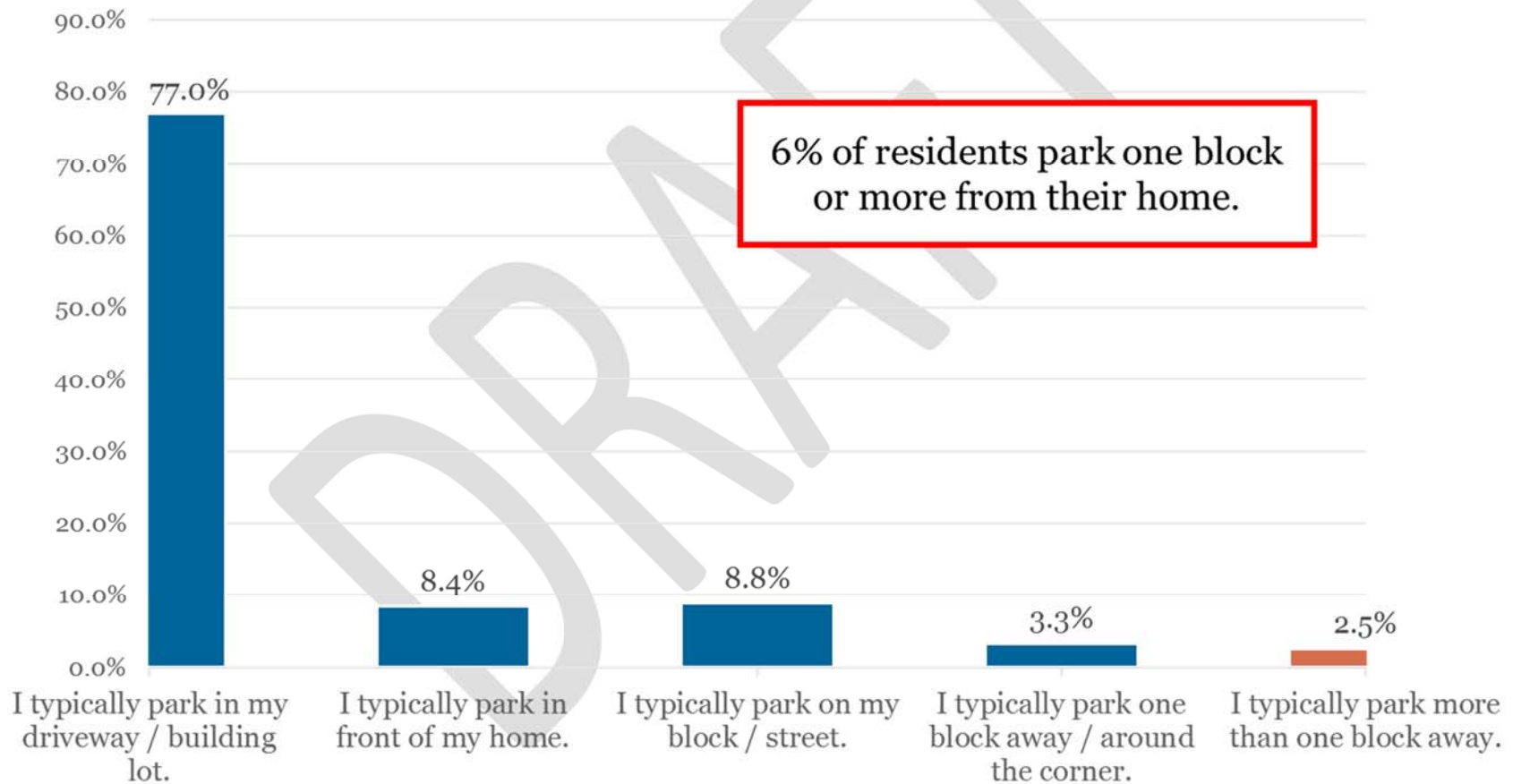
RESIDENTS – PLEASE DESCRIBE THE ON-STREET PARKING CONDITIONS IN YOUR NEIGHBORHOOD



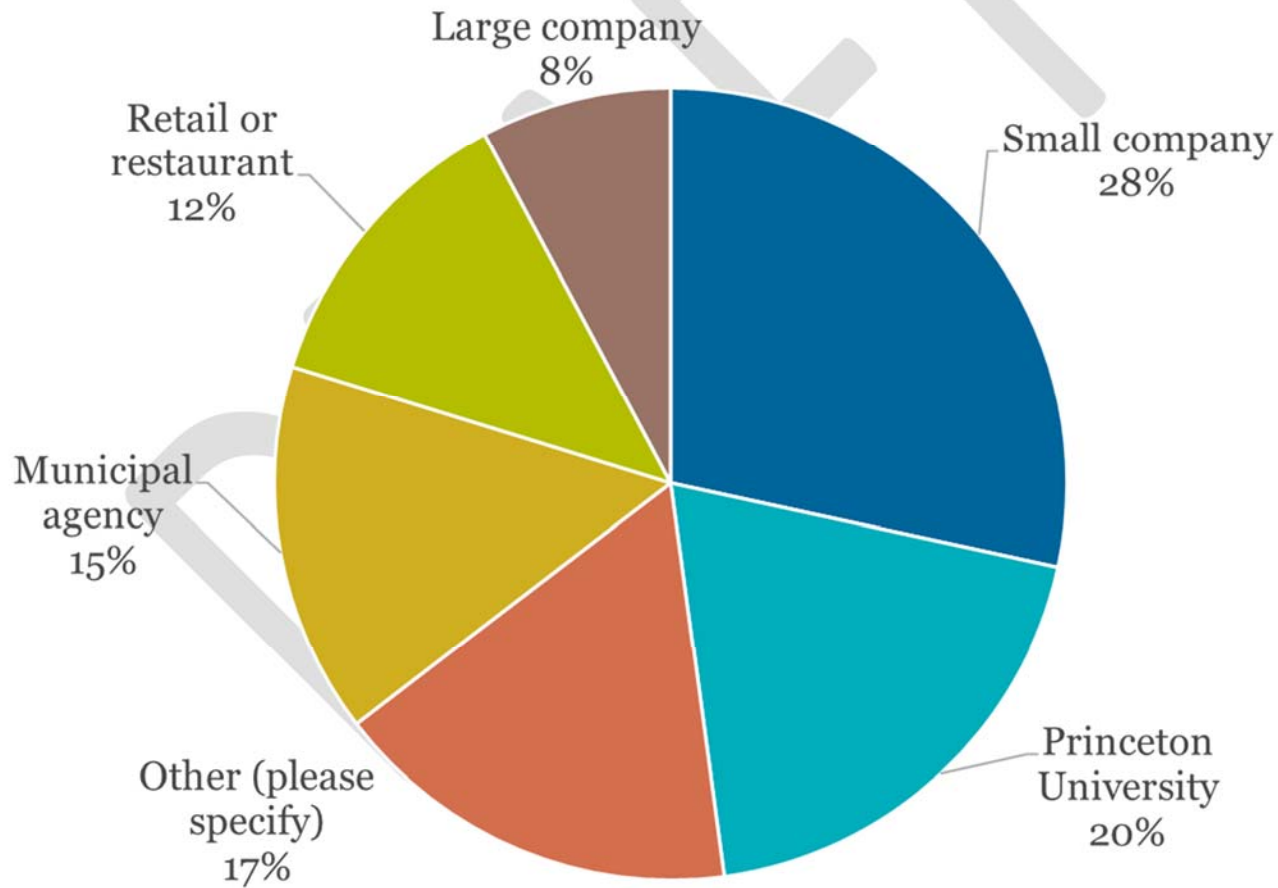
RESIDENTS – HOW HARD IS IT TYPICALLY TO FIND PARKING ON YOUR STREET?



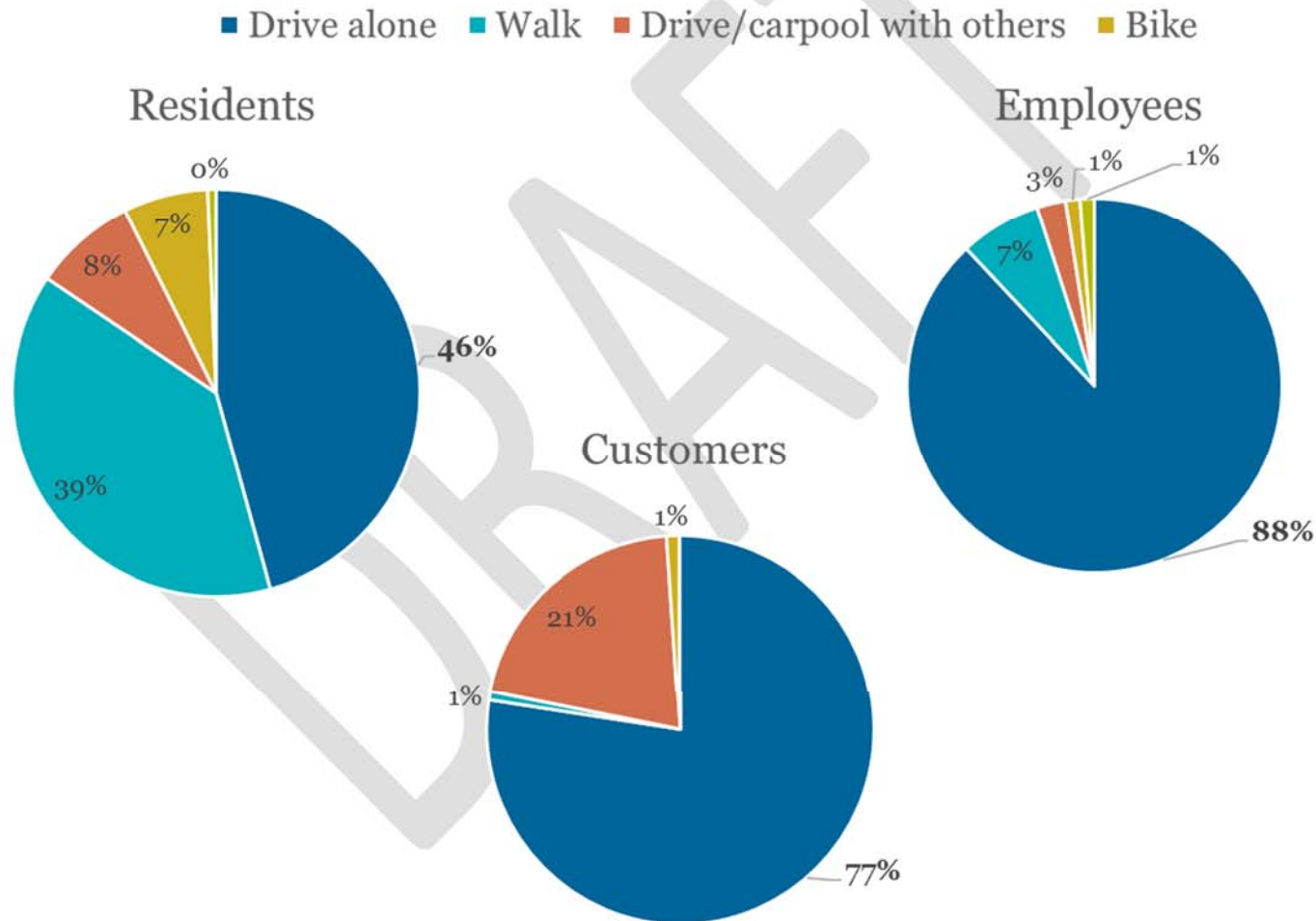
RESIDENTS – HOW FAR DO YOU TYPICALLY PARK FROM YOUR RESIDENCE?



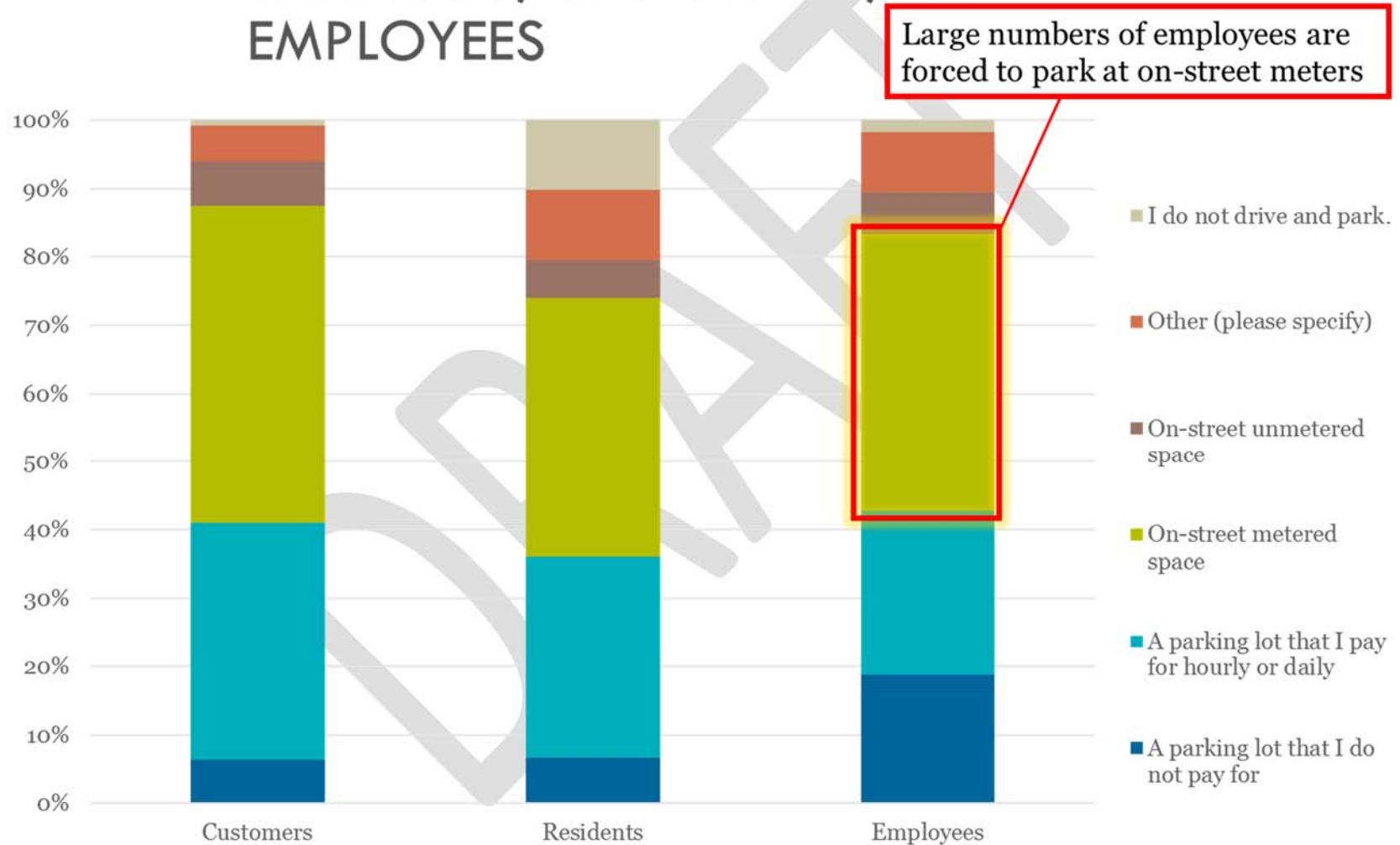
EMPLOYEES – WHAT TYPE OF ORGANIZATION DO YOU WORK FOR?



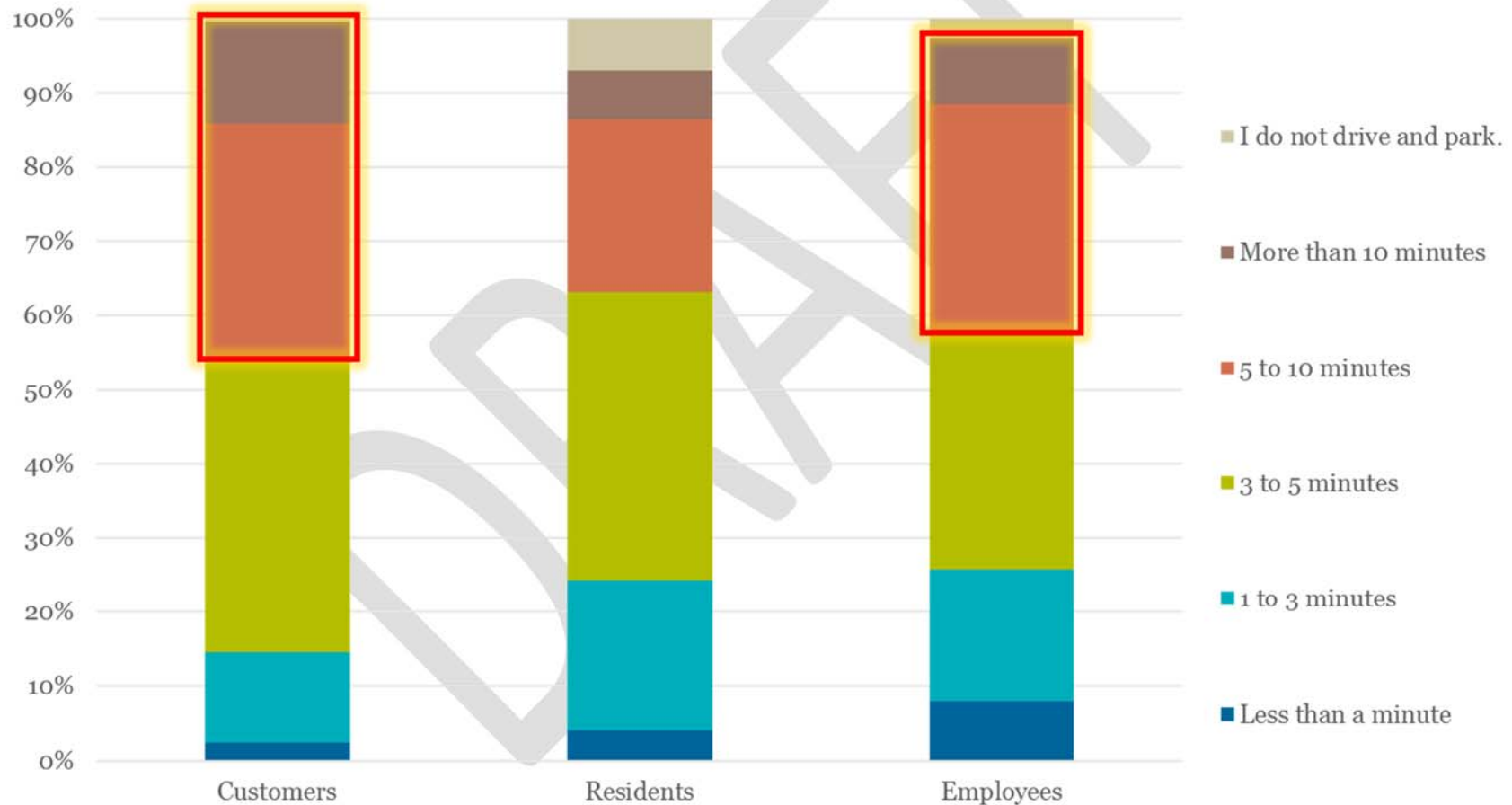
TRAVEL METHOD – RESIDENTS, EMPLOYEES, AND CUSTOMERS



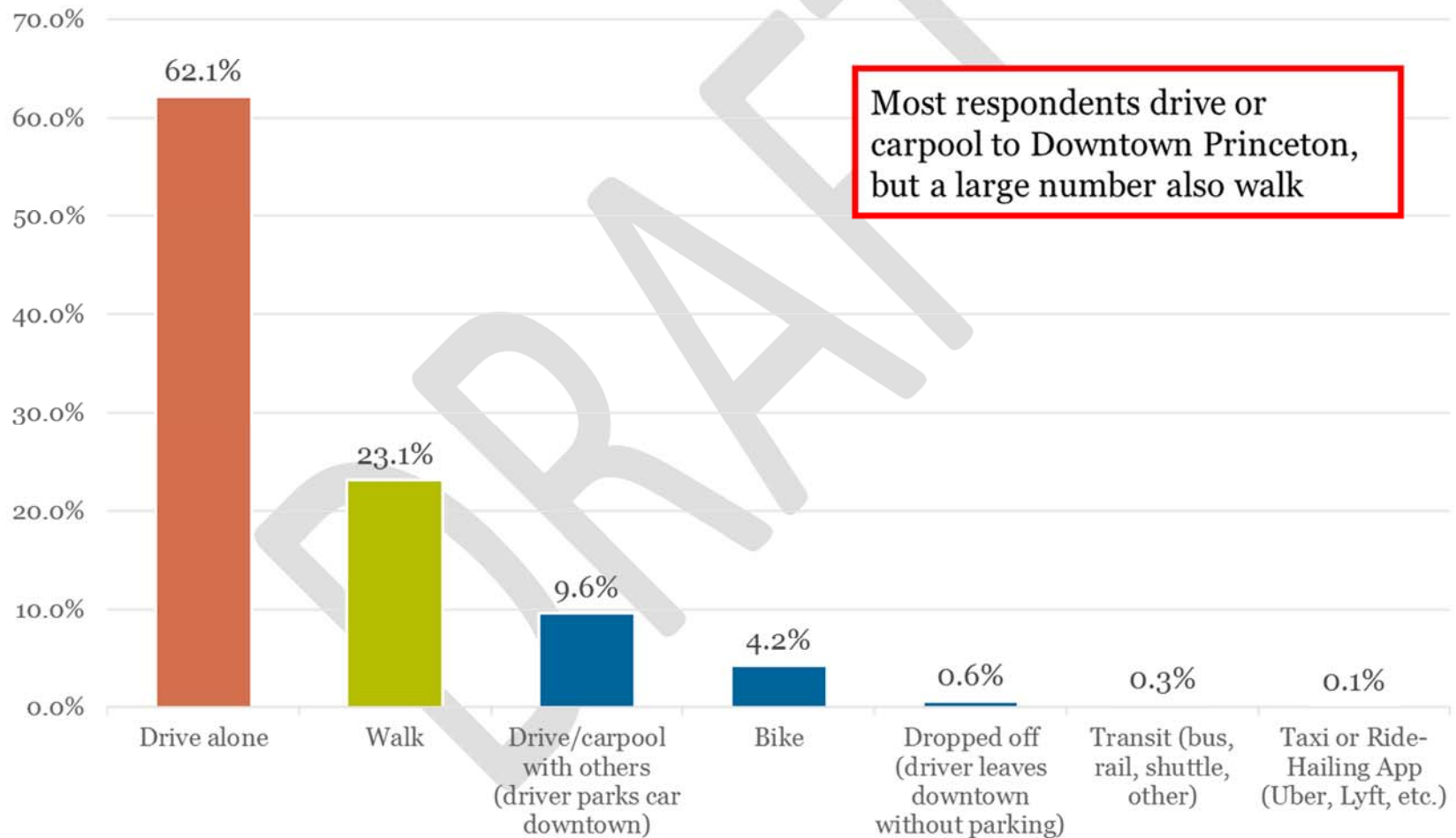
WHERE DO YOU TYPICALLY PARK? – RESIDENTS, CUSTOMERS, AND EMPLOYEES



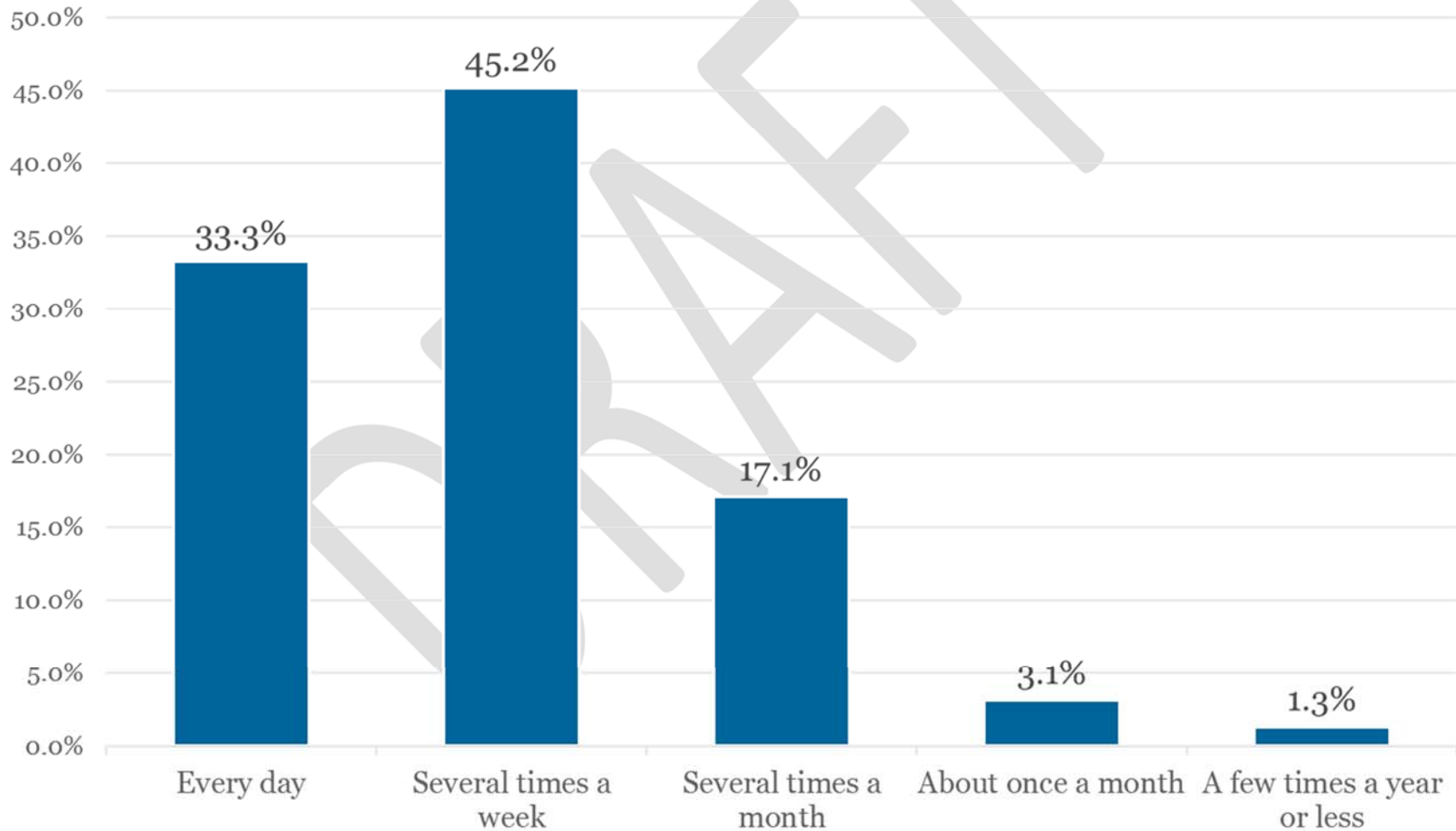
HOW LONG DOES IT TAKE YOU TO FIND A PARKING SPOT DOWNTOWN, ON AVERAGE? – CUSTOMERS, RESIDENTS, EMPLOYEES



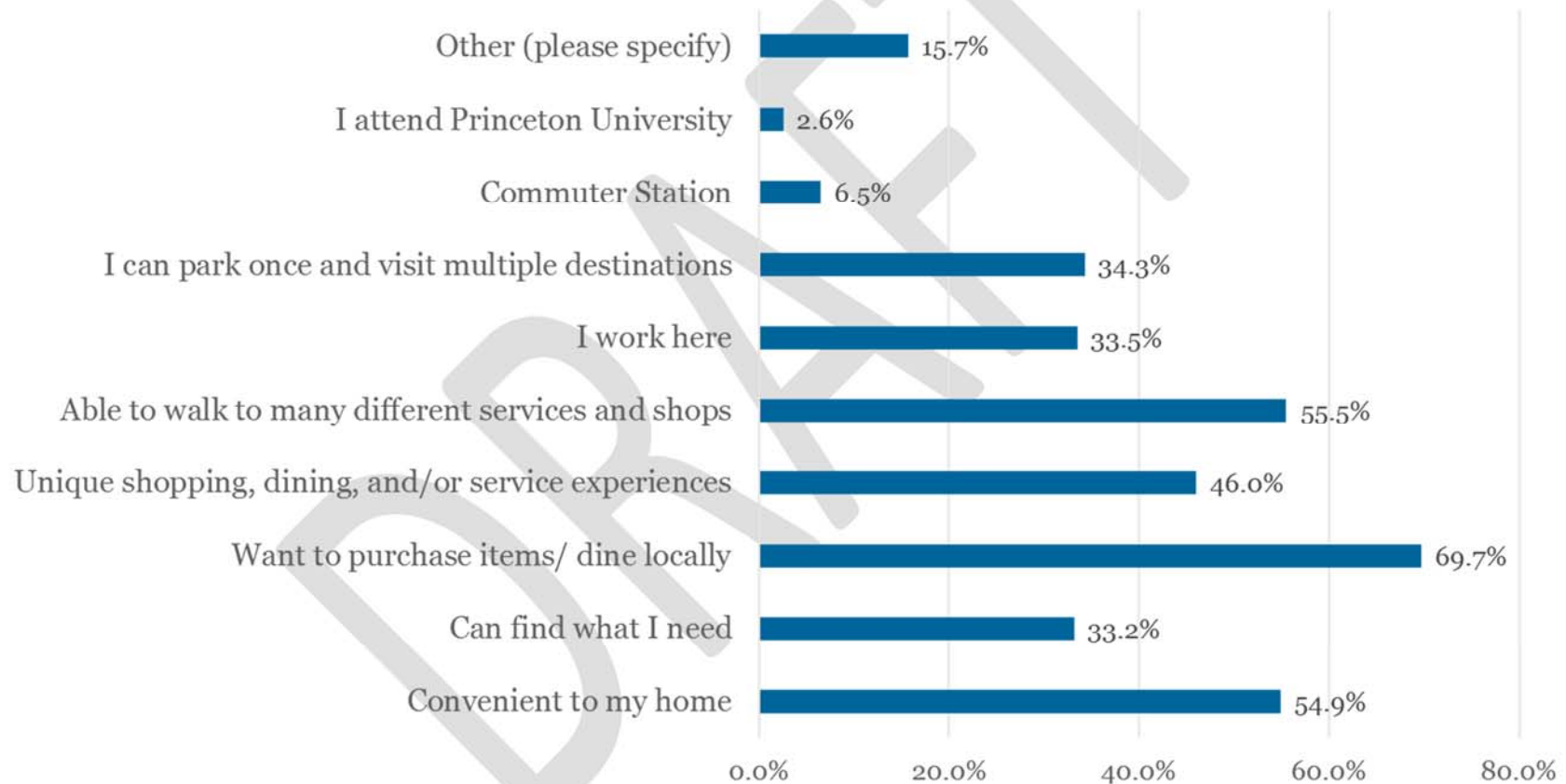
HOW DO YOU TYPICALLY TRAVEL TO DOWNTOWN PRINCETON?



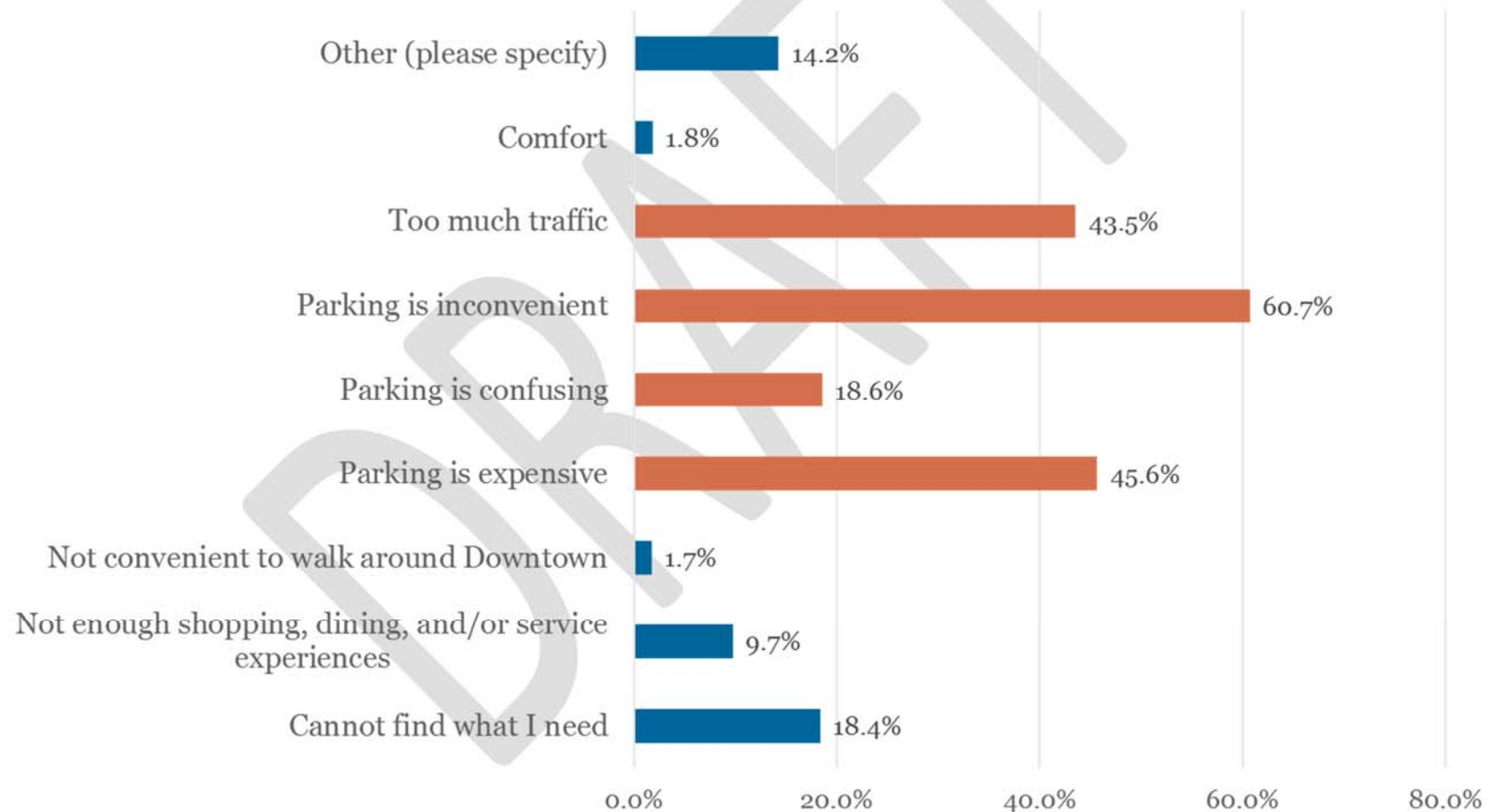
HOW OFTEN DO YOU TRAVEL TO DOWNTOWN PRINCETON?



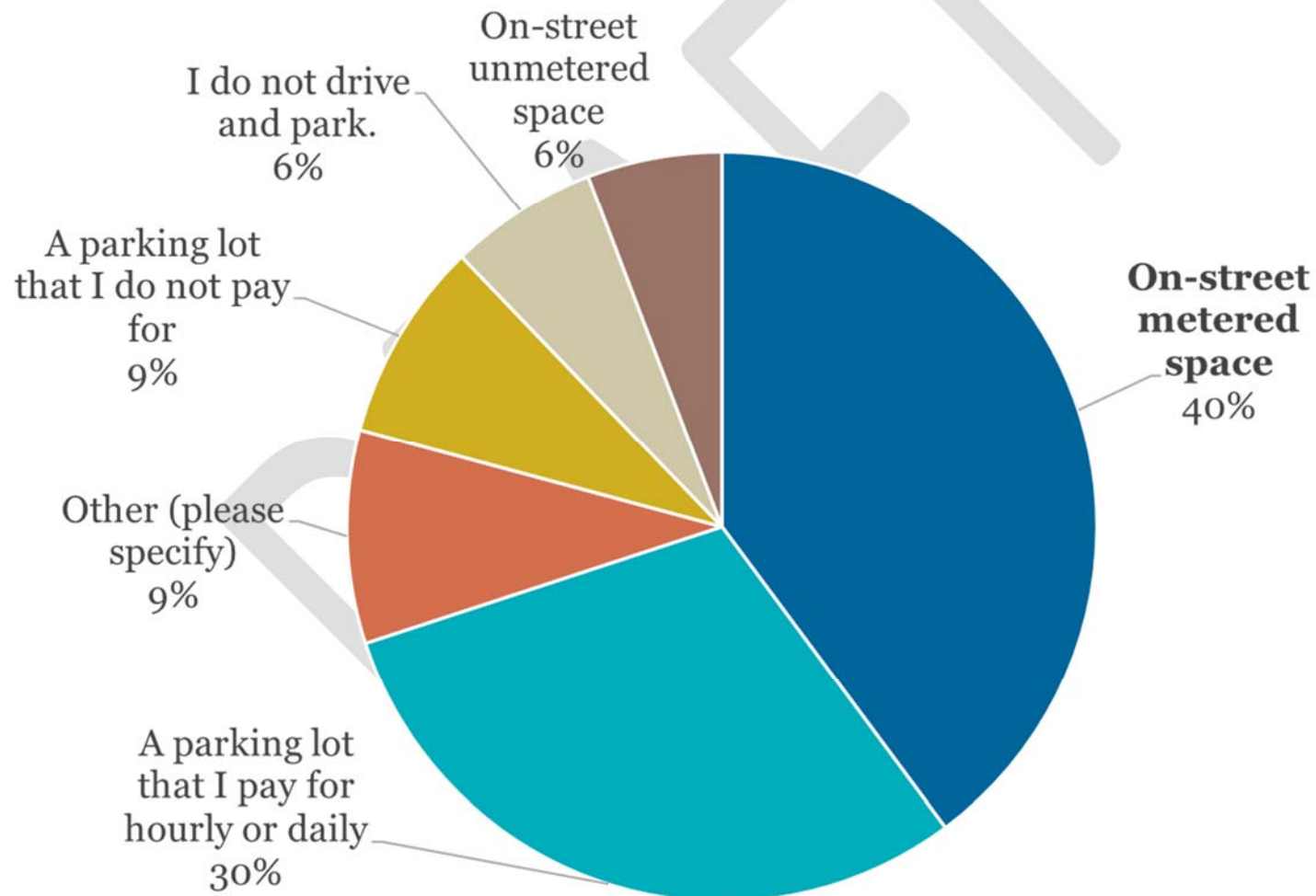
WHY DO YOU TRAVEL TO DOWNTOWN PRINCETON? (CHECK ALL THAT APPLY)



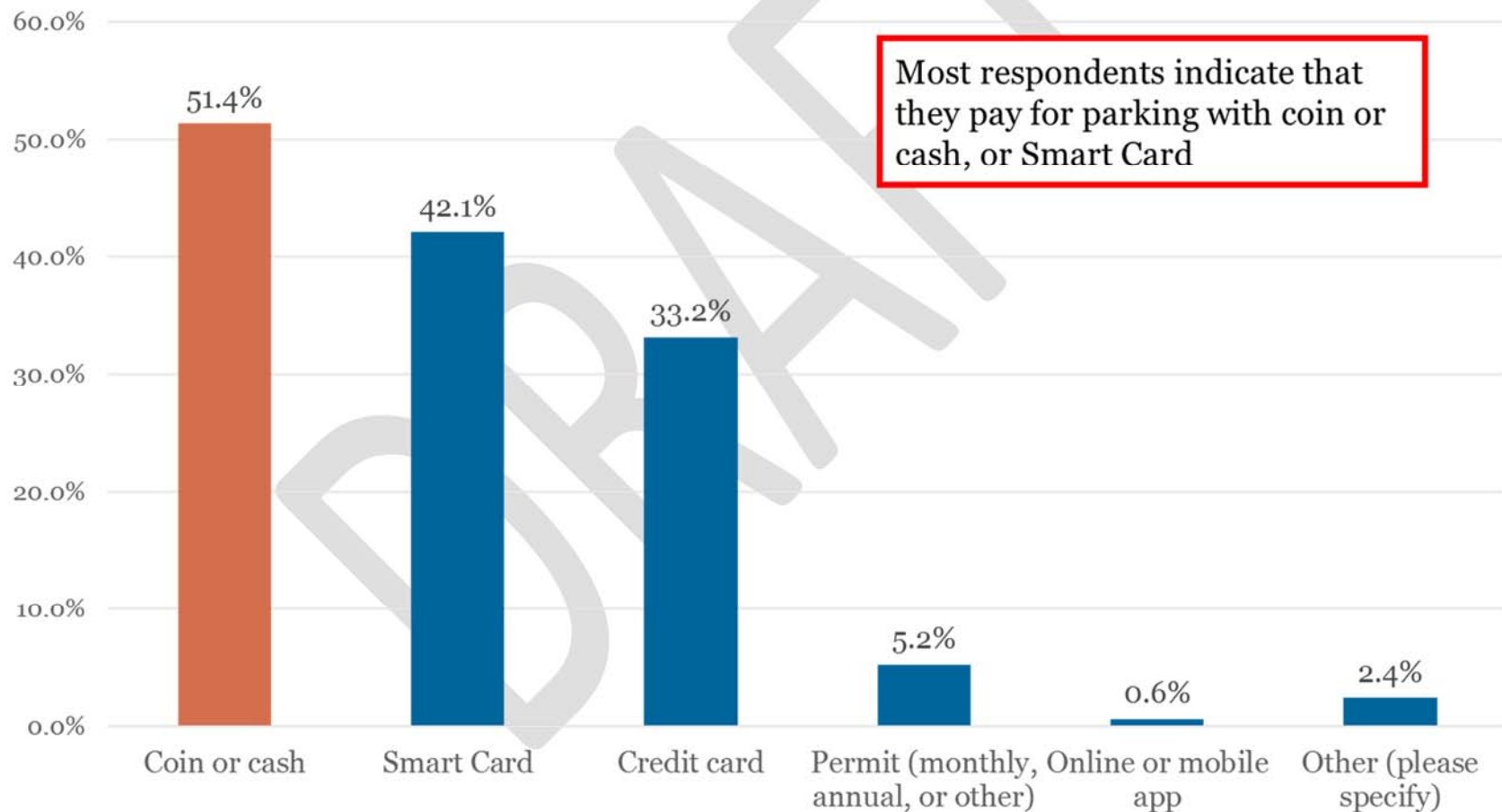
WHY DO YOU NOT TRAVEL TO DOWNTOWN PRINCETON? (CHECK ALL THAT APPLY)



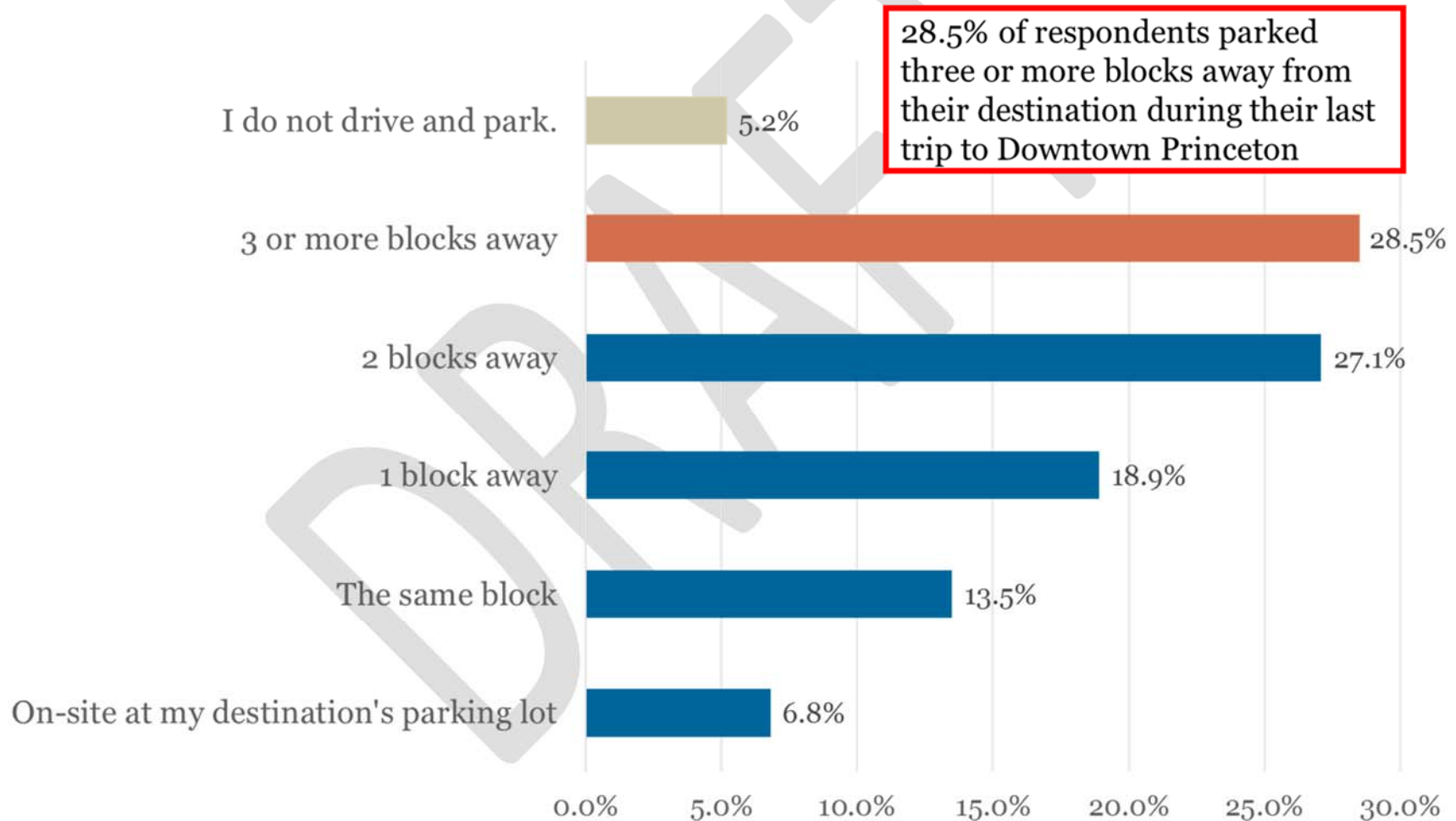
WHERE DO YOU TYPICALLY PARK IN DOWNTOWN PRINCETON?



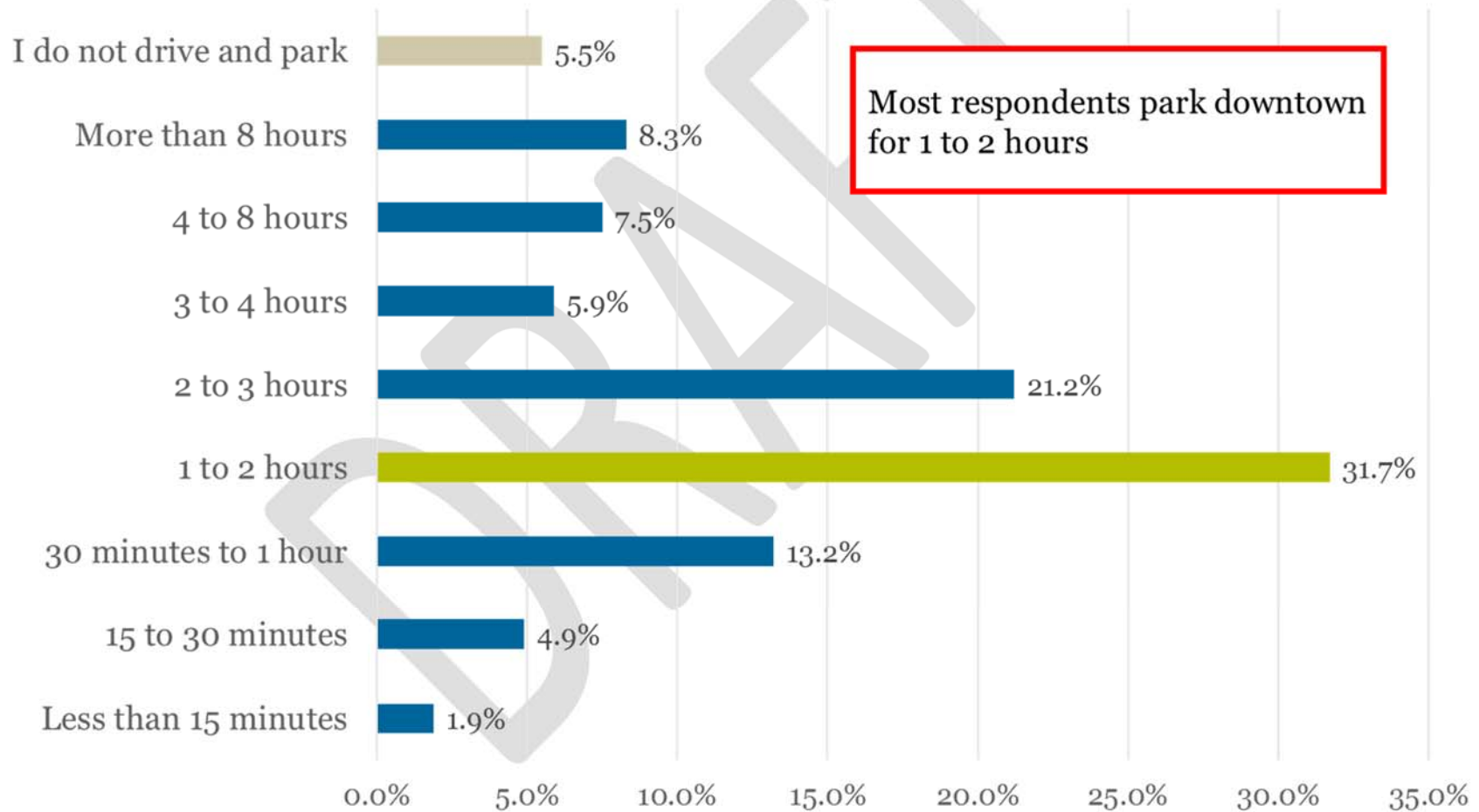
IF YOU PAY FOR PARKING, HOW DO YOU USUALLY PAY? (CHECK ALL THAT APPLY)



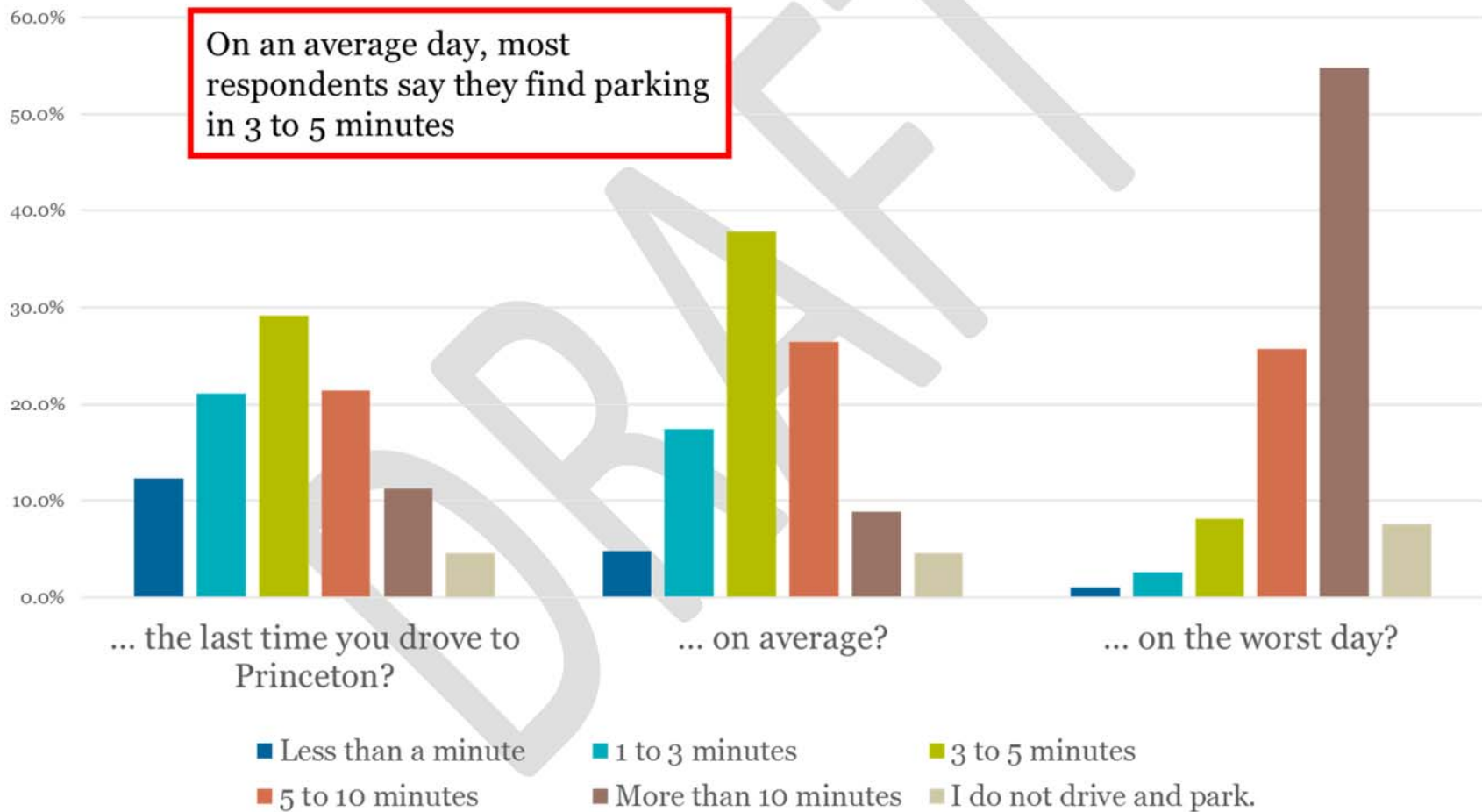
HOW FAR AWAY DID YOU PARK FROM YOUR FINAL DESTINATION THE LAST TIME YOU PARKED IN DOWNTOWN PRINCETON?



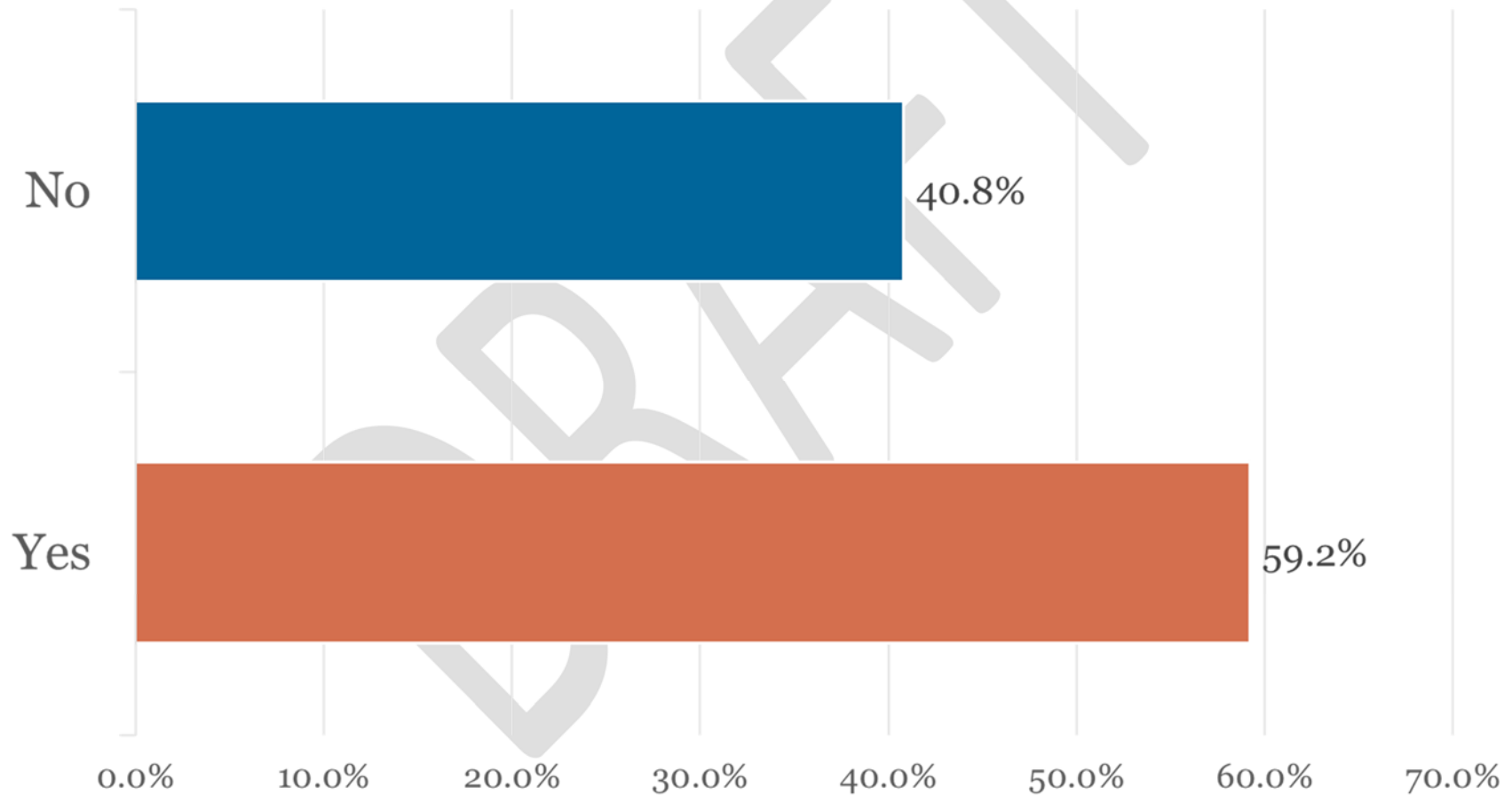
HOW LONG DO YOU TYPICALLY PARK IN DOWNTOWN PRINCETON?



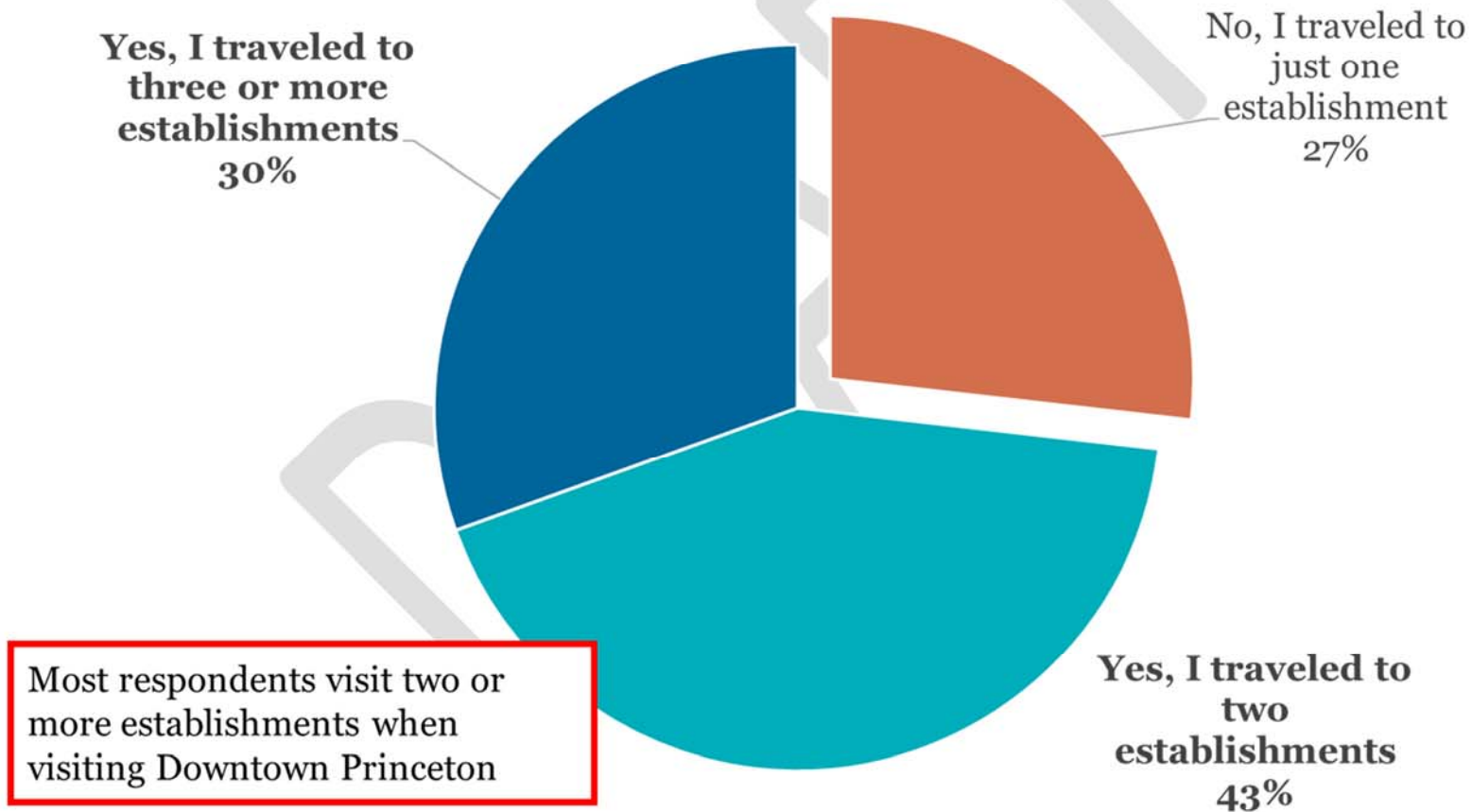
HOW LONG DOES IT TAKE YOU TO FIND A PARKING SPOT DOWNTOWN?



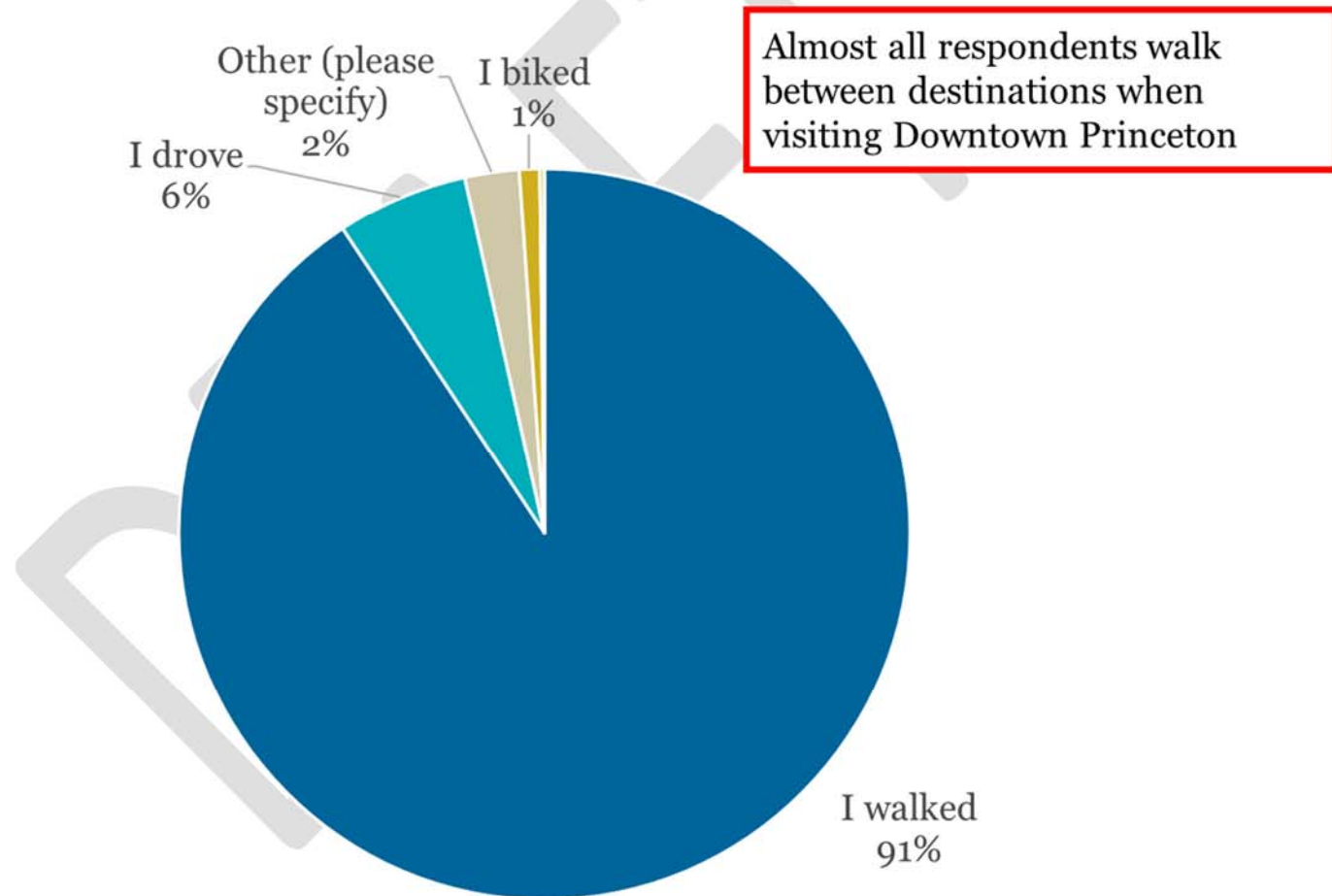
HAVE YOU EVER NOT FOUND PARKING AND LEFT DOWNTOWN PRINCETON?



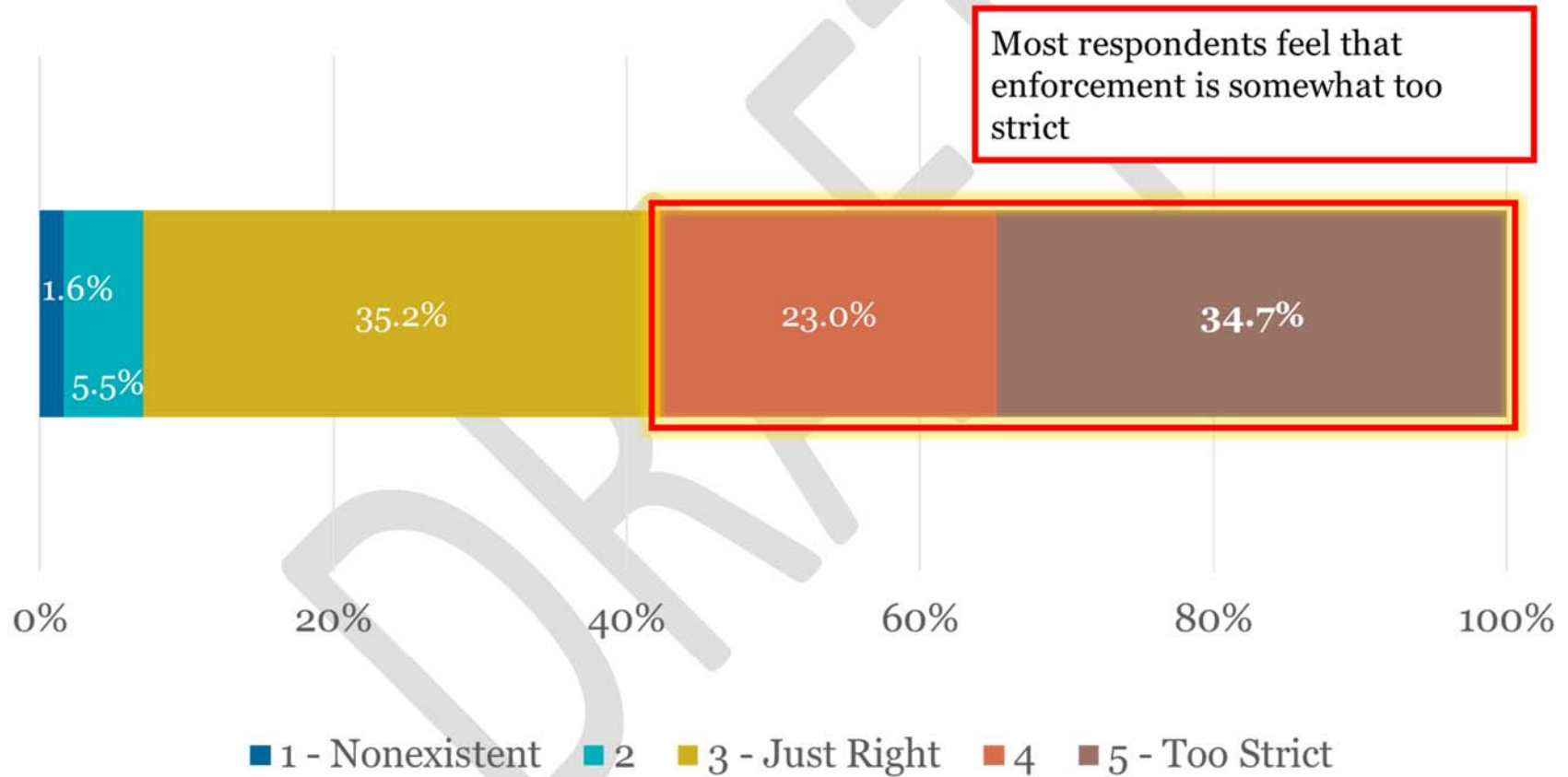
DID YOU VISIT MULTIPLE ESTABLISHMENTS DURING YOUR LAST VISIT TO DOWNTOWN PRINCETON?



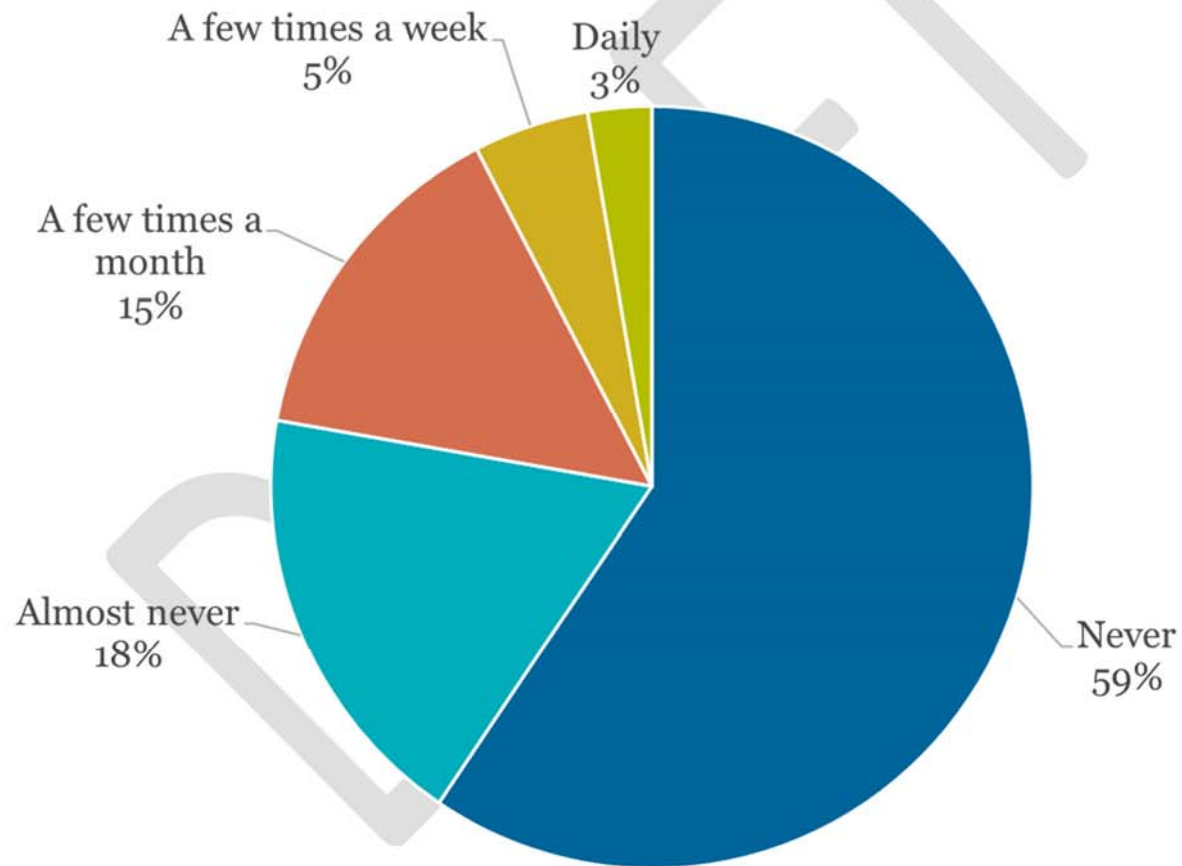
HOW DO YOU TRAVEL BETWEEN ESTABLISHMENTS WITHIN DOWNTOWN PRINCETON?



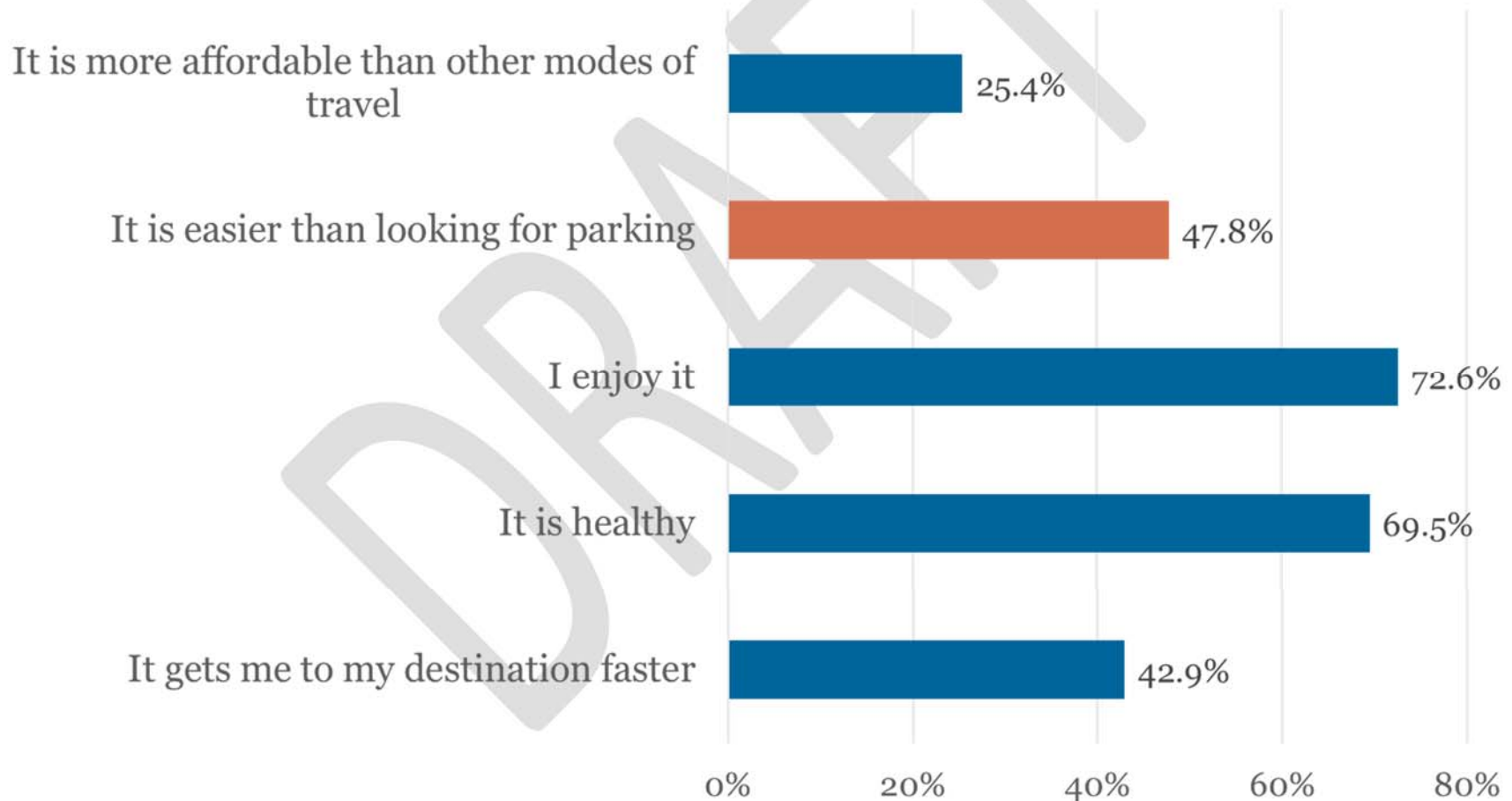
PARKING ENFORCEMENT IN PRINCETON IS...



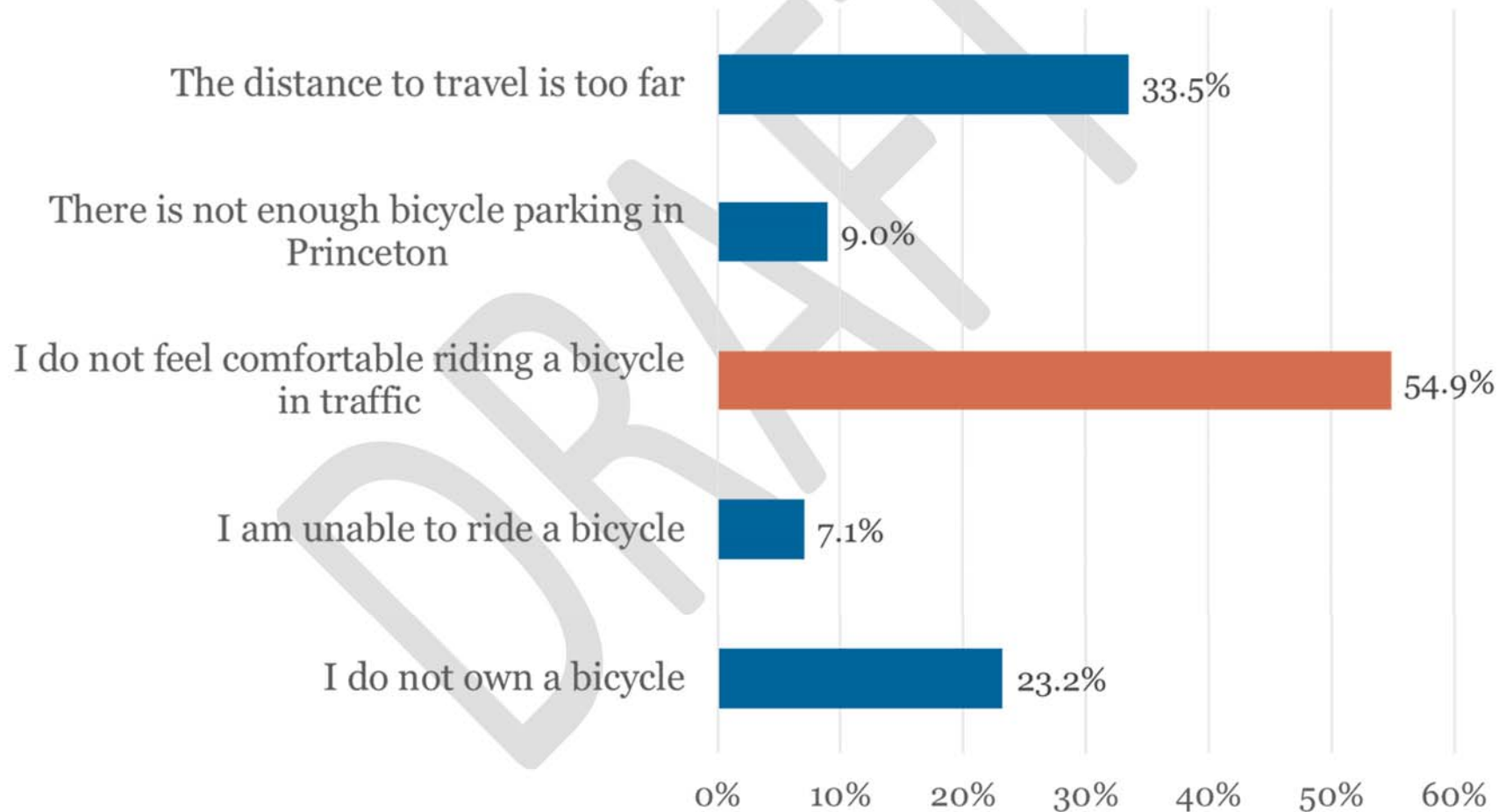
HOW OFTEN DO YOU BIKE TO, FROM, OR WITHIN PRINCETON?



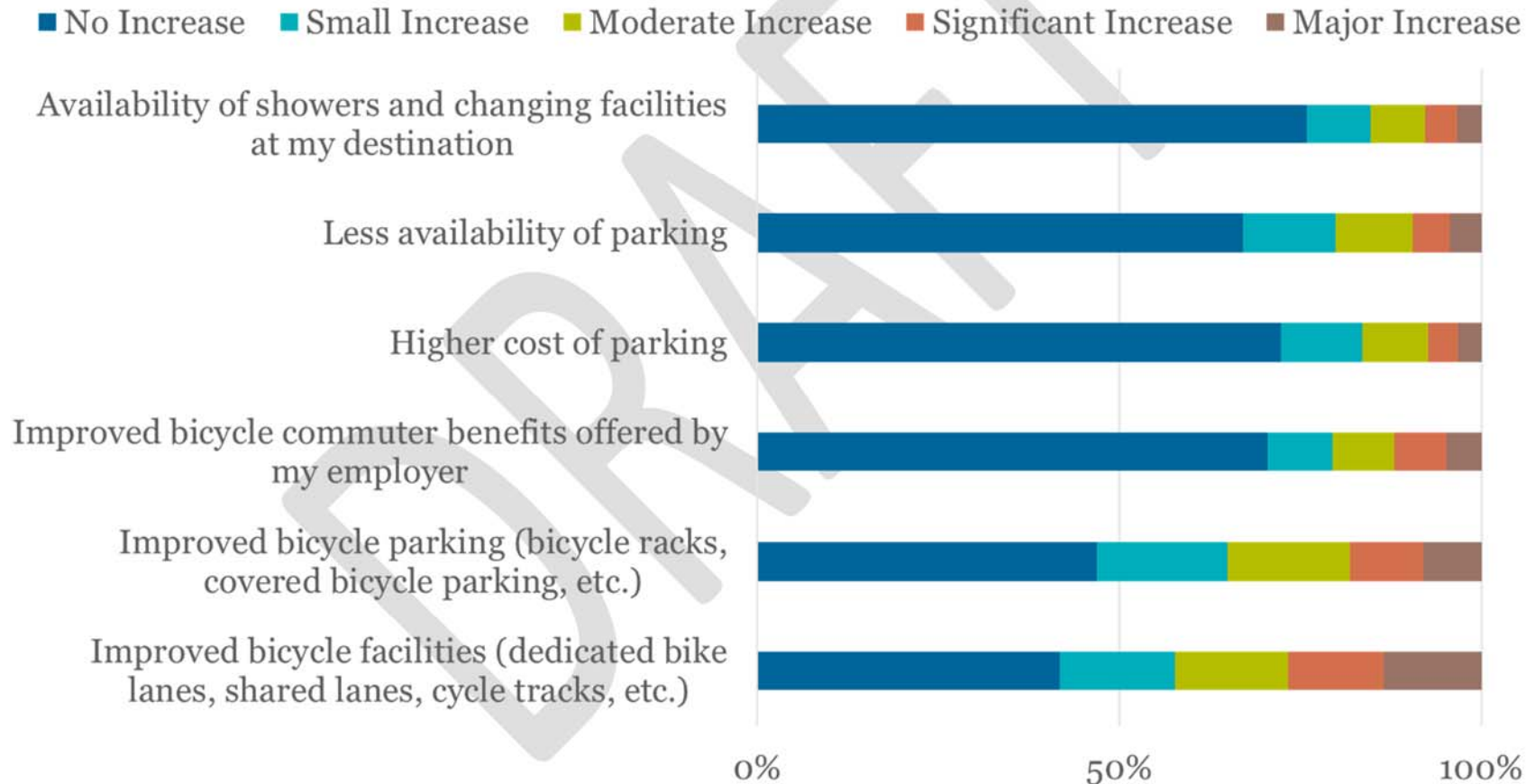
IF YOU DO BIKE IN PRINCETON, WHY DO YOU DO SO? (CHECK ALL THAT APPLY)



IF YOU DO NOT BIKE IN PRINCETON, WHY NOT? (CHECK ALL THAT APPLY)

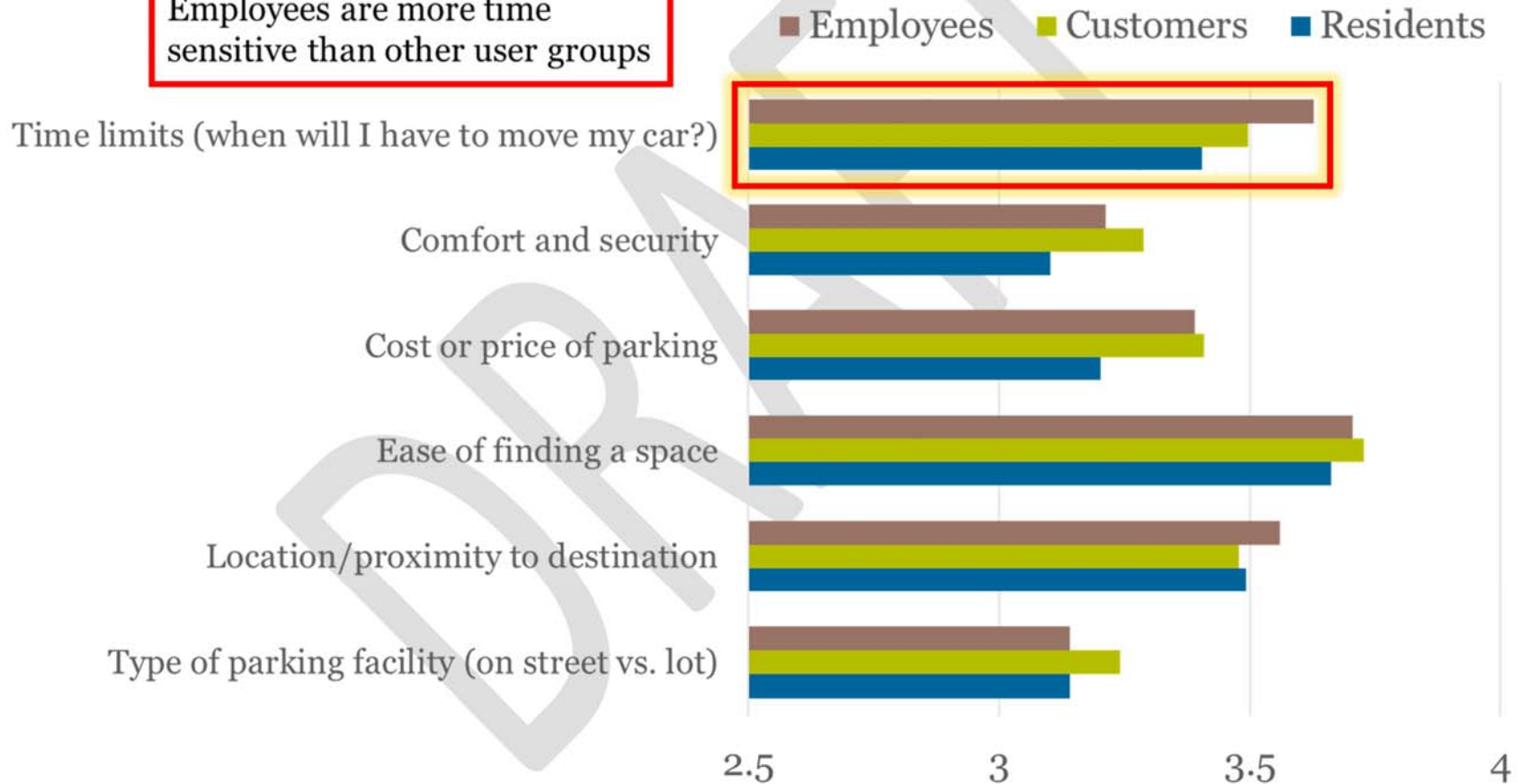


HOW MUCH WOULD THE FOLLOWING POLICIES INCREASE HOW OFTEN YOU BIKE?

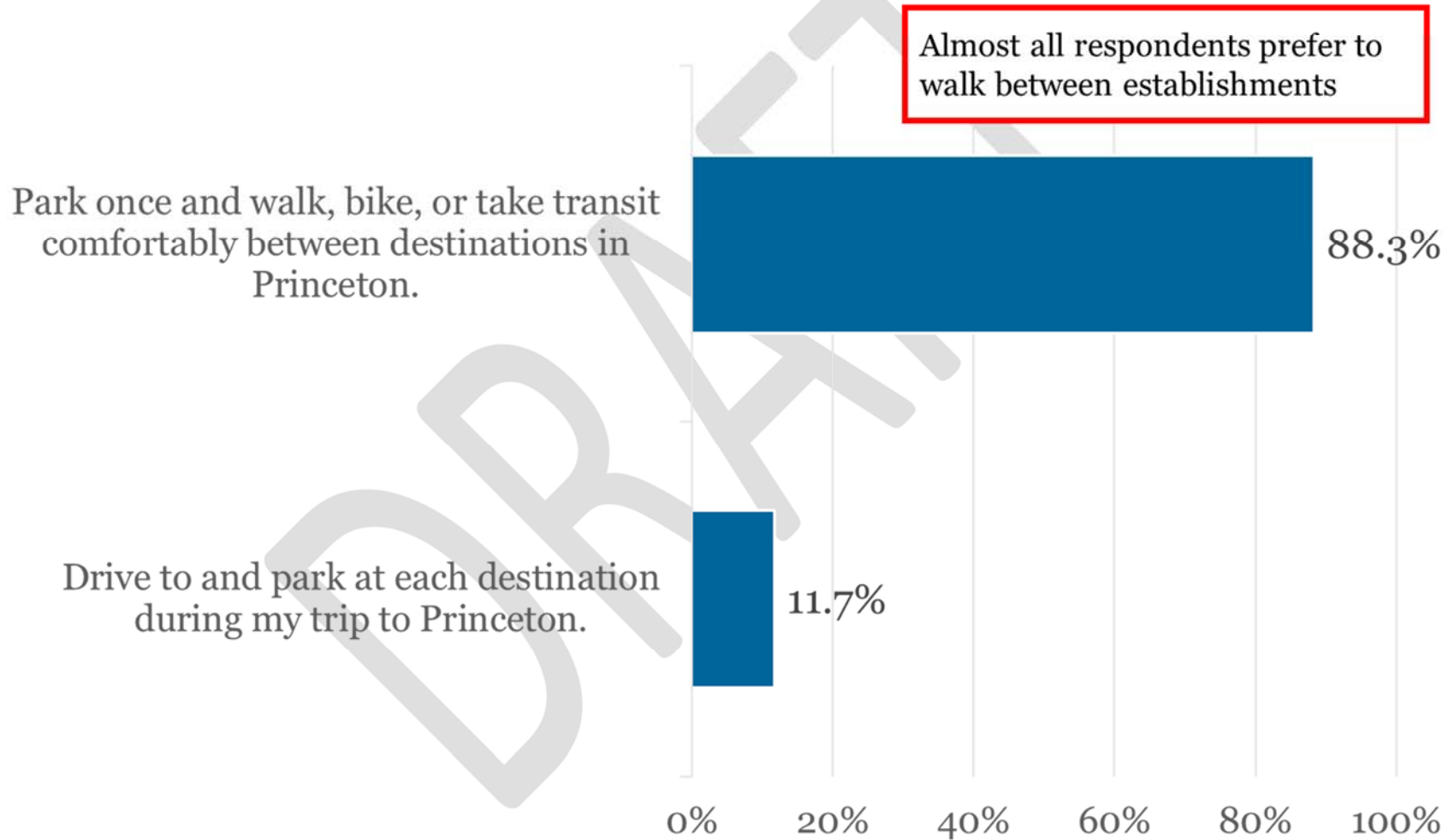


PLEASE RATE THE IMPORTANCE OF THE FOLLOWING
FACTORS IN DETERMINING WHERE YOU CHOOSE TO
PARK (1 – NOT IMPORTANT, 5 – MOST IMPORTANT)

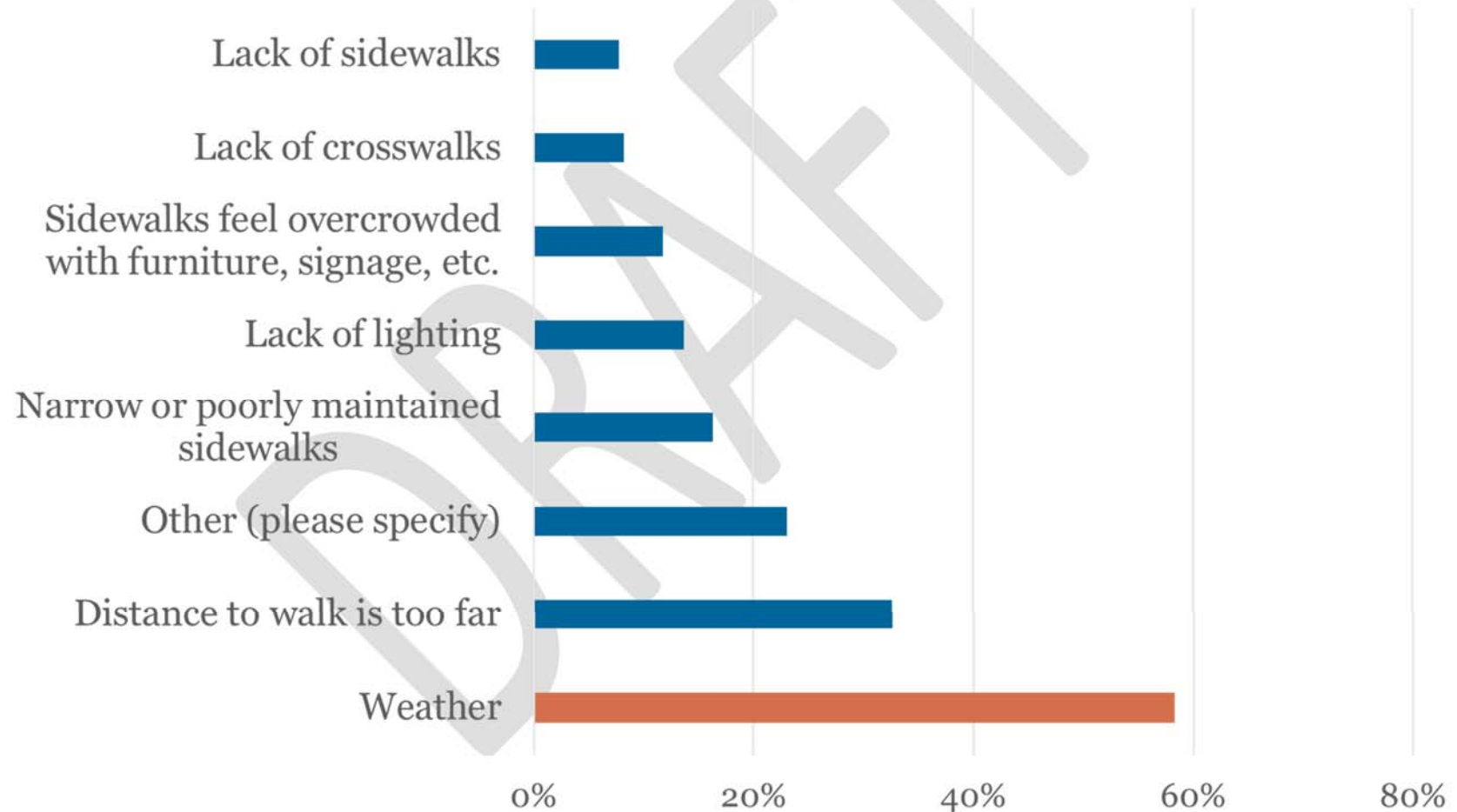
Employees are more time
sensitive than other user groups



I WOULD RATHER...



WHAT FACTORS LIMIT YOUR WILLINGNESS TO WALK TO AND WITHIN DOWNTOWN PRINCETON? (CHECK ALL THAT APPLY)



HOW WOULD THE FOLLOWING IMPROVEMENTS IMPACT YOUR PARKING EXPERIENCE AND THE OVERALL QUALITY OF PRINCETON? (1 – DETRIMENTAL, 5 – SIGNIFICANT BENEFIT)

