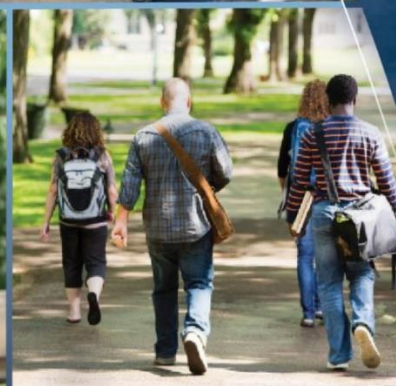




UNIVERSITY OF  
NORTHERN  
COLORADO



# Transportation/Parking and Circulation

MASTER PLAN UPDATE

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## Introduction

### *Background*

University of Northern Colorado (UNC) initiated this update to the Transportation/Parking and Circulation component of UNC's Campus Facilities Master Plan in response to recent construction of the Campus Commons, the anticipated opening of the College of Osteopathic Medicine to the Bishop-Lehr Building on the West Campus, and the projected growth of the campus population.

The Campus Facilities Master Plan was last updated in 2007. The new Campus Commons is being constructed on the former site of the 216-space surface parking lot immediately south of the University Center.

The Campus Commons, anticipated to open in Spring 2019, will be the new home for University Admissions counselors, New Student Orientation, Financial Aid, Registrar, Bursar, and Alumni Relations. The Campus Commons will also provide information for campus visitors; serve as the starting point for campus tours; and feature an art gallery, 600-seat performance venue, 400-seat multi-use auditorium, ticketing office, and student-run cafe. It is anticipated that the Campus Commons will attract approximately 450 visitors daily.

### *Purpose*

The purpose of this document is to present a set of near-term (one to two years), mid-term (three to five years), and long-range (five+ years) recommendations for the Campus Transportation/Parking and Circulation System. The updated plan is to function as the reference document and implementation framework for future parking strategies and transportation options on campus.

### *Report Organization*

This report is divided into five sections. The first section, **Campus Outreach**, details the four-stage collaborative outreach effort used to develop the Master Plan. The second section, **On-Campus Parking and Circulation**, outlines the current and future on-campus parking and circulation challenges and outlines five alternative mobility scenarios to address these challenges. The third section, **Off-Campus Circulation**, evaluates the existing and future off-campus traffic circulation issues and potential for the City of Greeley's public streets serving the campus. The fourth section, **Transportation Demand Management (TDM)**, presents a set of potential strategies and policies aimed at reducing and redistributing both on- and off-campus travel demand. The final section, **Recommendations and Potential Actions**, outlines the Master Plan's specific recommendations with a near-term and long-range action plan developed in collaboration with the project steering committee.



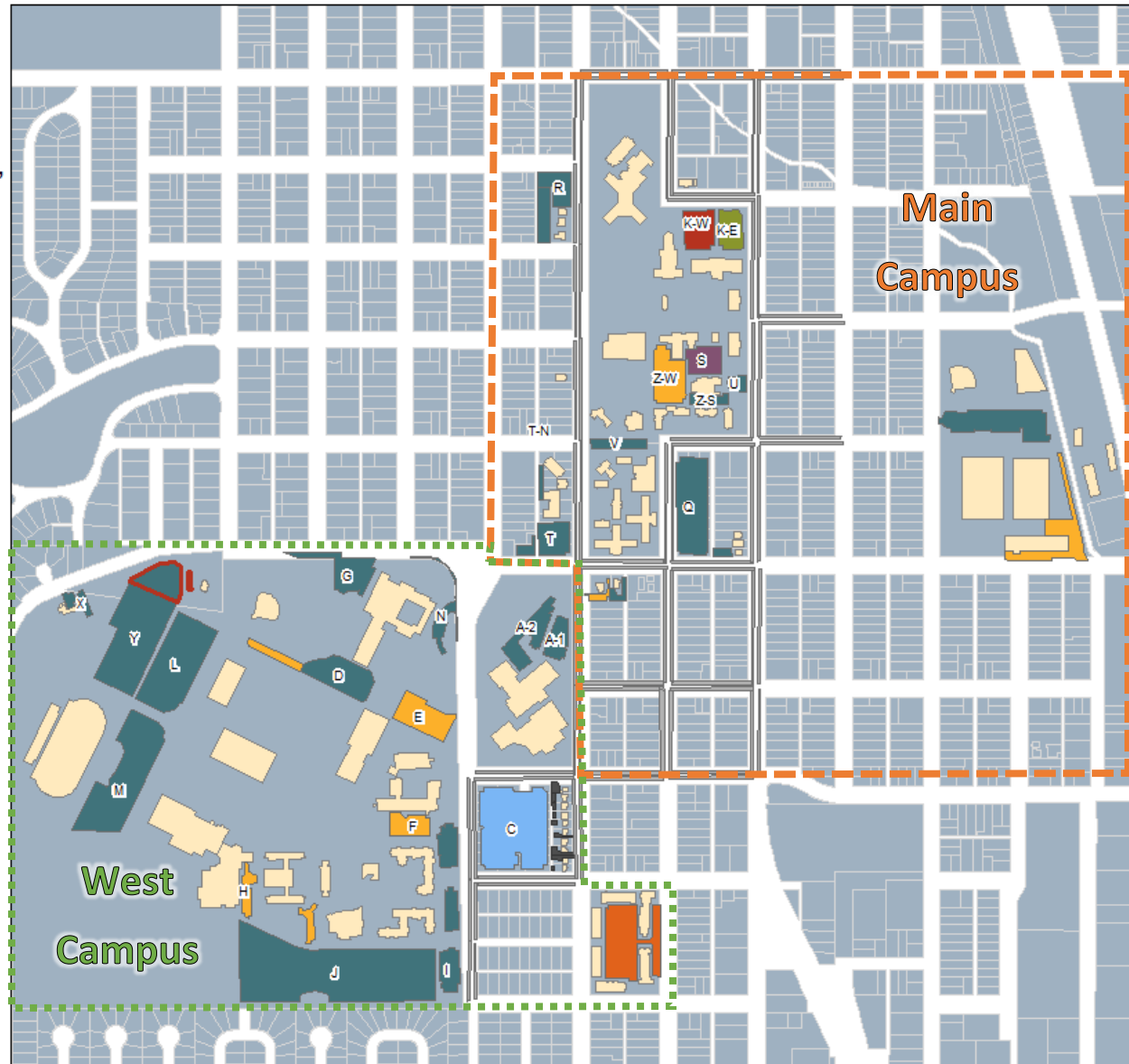
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## Transportation, Parking, and Circulation Master Plan

### MAP KEY

#### Existing Permit Structure

- Arlington Park Apartments
- Faculty/Staff - FS, CK, GA
- Reserved - CK Only
- Reserved - BK and CK Only
- Students & Faculty/Staff
- Students & Faculty/Staff Commuter
- Students & Faculty/Staff Day Only
- On-Street
- Parking Facility not Managed by UNC
- Students - ST, BK, GA
- University Building



University of Northern Colorado Campus Study Area

## Campus Outreach

Developing the UNC Transportation/Parking and Circulation Master Plan Update resulted in a collaborative campus outreach effort which involved UNC staff, faculty members, students, and campus stakeholders. This Master Plan Update used a multi-phased engagement strategy which started with stakeholder and focus group sessions, developing an online campus survey, a campus-wide workshop, and active involvement from a project steering committee. The various components of the campus outreach effort are outlined below.

### *Stakeholder and Focus Group Sessions*

Five focus group sessions were held with representatives from the various stakeholder groups responsible for University activities influencing the transportation system. The focus group topics and participants included:

- MOBILITY, PARKING, AND INFRASTRUCTURE – Facility Management, Campus Parking, Campus Police, and the City of Greeley's Public Works Department
- SPECIAL EVENTS – Athletics, College of Performing and Visual Arts, and the University Center
- ADMISSIONS AND PROGRAMS – Admissions, Alumni Relations, College of Natural and Health Sciences, and Montfort College of Business
- ADMINISTRATION, FACULTY, AND STUDENTS – University Administration, Academic Affairs, College of Education and Behavioral Sciences, Student Senate, and Student Rights

The goal of the focus group sessions was for the project team to better understand UNC operations and learn about the key issues and challenges facing the campus transportation system.

### *Online Campus Survey*

A campus access and parking online survey was designed to assess how users perceive the parking and transportation at UNC. This survey was promoted through email, social media, stakeholder meetings, and flyer/handout. The online survey covered a range of topics, including respondent demographics, commuter behavior, and respondent preferences.

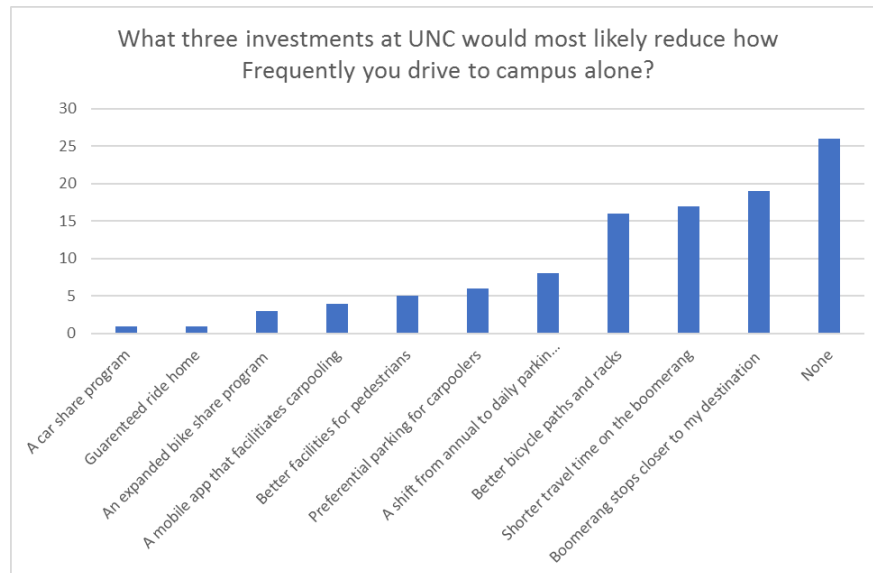
A total of 998 students, faculty, and staff participated in the online survey, which was open for approximately three weeks during March 2018. Most of respondents were staff, undergraduate students, and faculty. Most respondents commute to campus five times a week in a single-occupant vehicle and live 10 miles or less from campus. Additionally, most respondents arrive in the morning between 7:30 – 8:30 AM, depart in the evening between 5:00 – 6:00 PM, and spend most of their time at either West Campus academic facilities or Central

Campus academic facilities. The full results of this survey are shown in the appendix of this report.

### *Campus Workshop*

Approximately 50 people attended a public, campus-wide workshop held at the University Center in April. Participants were asked 1) what three investments at UNC would most likely reduce how frequently you would drive to campus alone and 2) how should UNC prioritize its transportation investments.

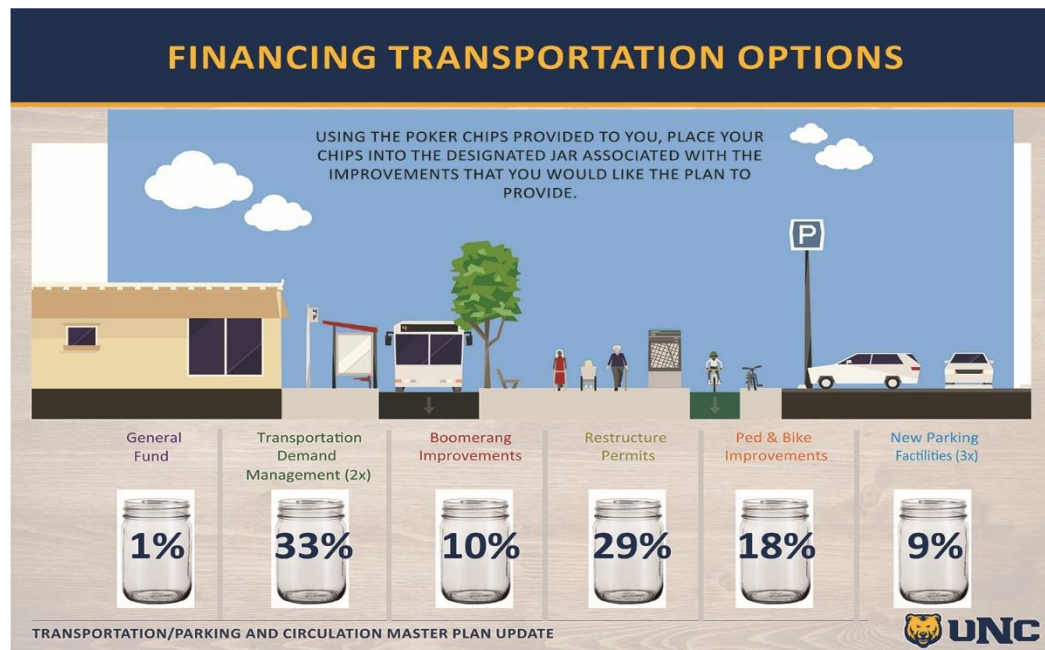
Workshop participants overwhelmingly utilize single-occupant vehicles to access campus. When asked which investments would reduce how often they drove, the highest percentage answer was “Nothing.” This was followed closely by improvements to the Boomerang Shuttle in terms of service frequency and rerouting the service closer to campus destinations.



When asked how UNC should prioritize its investments, participants in the workshop were fiscally prudent. The two-most cited initiatives were 1) advancing TDM practices, which encourages users to change traveling habits and more often choose to travel via walking, bicycling, and transit; and 2) restructuring UNC’s parking permit structure to better encourage system users to utilize more remote parking facilities.

The third-most prioritized investment was improvements to the City and campus walking and bicycling facilities. The least-prioritized solution was adding additional parking, largely due to cost.





### *Project Steering Committee*

A project steering committee comprised of representatives from University Facilities Management, Parking Services, Faculty, Staff, Student body, and the City of Greeley met four times throughout the project to update the analysis, react to the findings, and inform the effort. Steering committee members included:

- Kirk Lechlitter, Facilities Management
- Kevin Robinson, Facilities Management
- Ron Eberhard, Parking Services
- Will Jones, City of Greeley
- Kendyl Kelly, Student Senate
- Malaika Michel-Fuller, Student Senate
- Kristina Burton, Classified Staff Council
- Colleen Fitzpatrick, Faculty Senate
- Shawanna Kimbrough-Hayward, Professional Admin. Staff Council
- Tobias Guzman, Administration

### *Opportunities and Challenges*

Based on the campus outreach efforts, several opportunities and challenges emerged which the Transportation/Parking and Circulation Master Plan should address. These include:

- Removal of 216 parking spaces for constructing the Campus Commons. No replacement or additional parking spaces were planned with the Campus Commons.
- Central and north campus parking facilities are perceived as heavily-utilized while there is general recognition that lots in the west campus are underutilized.
- The Campus Commons will have numerous large-scale special events which will challenge the nearby parking facilities.



- The Boomerang Shuttle is not seen as a mobility asset. The route is limited and frequencies are not conducive to class schedules.
- City on-street parking is free with no time limits on streets adjacent to Campus.
- Parking is restricted on City streets in neighborhoods west of Campus, but not east of Campus.
- Permit fees are perceived as both expensive and inexpensive.
- Visitors to UNC's special events and customers of its business enterprises generate significant parking demand.
- UNC's permit software is limited in its ability to accommodate sophisticated parking management techniques.

### On-Campus Circulation

The on-campus circulation assessment examined current and future parking occupancies and utilization along with transit operations on campus. Five alternative future integrated mobility strategies were then developed to address current and future mobility challenges caused by campus growth.

Existing parking data was used to determine both existing and future parking conditions on campus. A dynamic model, Park+, was used to define how changes in land use (such as the addition of Campus Commons), parking supplies, and various management strategies affect the demands for parking. The model was based largely on two sources of information: existing on-campus building uses and the associated intensities provided by UNC, and existing parking occupancy and utilization data. Parking data was collected in March 2018 between 7:00AM and 4:00PM on an hourly basis every Monday, Tuesday, and Wednesday. This data established baseline conditions for the model by representing a typical day on campus.

The Park+ Model accounted for different parking relationships present on-campus, as shown on the maps on the following pages. For instance, if parking within a specific lot was restricted to a specific permit type, then that relationship was built into the model as restricted parking. Similarly, publicly available parking (visitor or paid hourly and on-street spaces) was left unrestricted indicating any user could utilize that parking supply.

The Park+ Model combined the existing parking occupancy and utilization along with existing building uses and intensities to configure customized results in localized parking generation rates. These rates reflect actual demand conditions and parking behaviors for the individual buildings on the UNC Campus.

The unique parking generation rates predict future parking demands based on land use changes expected to occur on Campus in the near future.

**The Park+ model** evaluates parking data collected in the field, existing land use intensities, parking relationships to surrounding land uses (such as classroom, research facilities, faculty offices, administrative offices, and student services, among others), walking tolerances, and community-specific parking behaviors. As a result, the model can accurately depict occupancies for the parking facilities in the study areas and develop unique parking generation rates for land uses.

The results of the demand model represent how much parking demand is being generated, where it is being generated, and the impacts these demands have on the parking facilities. In turn, this level of analysis provides detailed understanding of the parking behaviors and can inform parking recommendations specific to the unique character of each area of campus.

### Existing Parking Facilities and Their Utilization

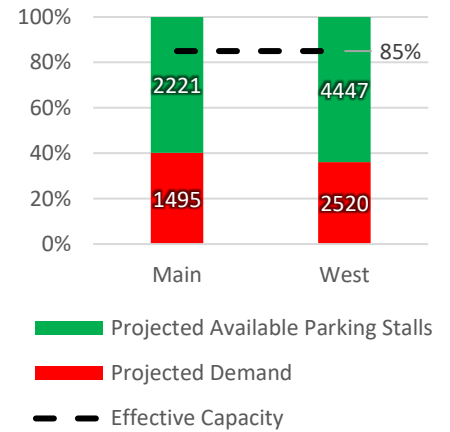
The peak parking hour for the UNC campus occurred at approximately 10:00am on Tuesdays with an overall campus parking system operating occupancy of 60%. This means only 60% of the combined 2,458 on-campus parking spaces and 195 off-campus on-street parking spaces were occupied. Of the roughly 10,248 students, faculty, and staff that comprise the campus population, approximately 5,000 have registered parking permits. With 5,768 parking stalls available on campus, not inclusive of the 900 on-street parking stalls provided publicly around campus that were included in this analysis, that provides a supply of approximately 1.15 parking stalls per permit holder.

Per feedback received throughout the study, the campus environment is perceived to exist on two planes, the Main Campus and the West Campus. While the two areas meet roughly at the intersection of 11<sup>th</sup> Avenue and 20<sup>th</sup> Street, this perceived barrier encourages single-occupant vehicles by students, faculty, and staff over alternatives such as walking, biking, or the Boomerang. To the right is a snapshot of parking availability based on the campus. While this fluctuates throughout the day, during the peak parking hour, the Main Campus is more effectively utilized than the West Campus.

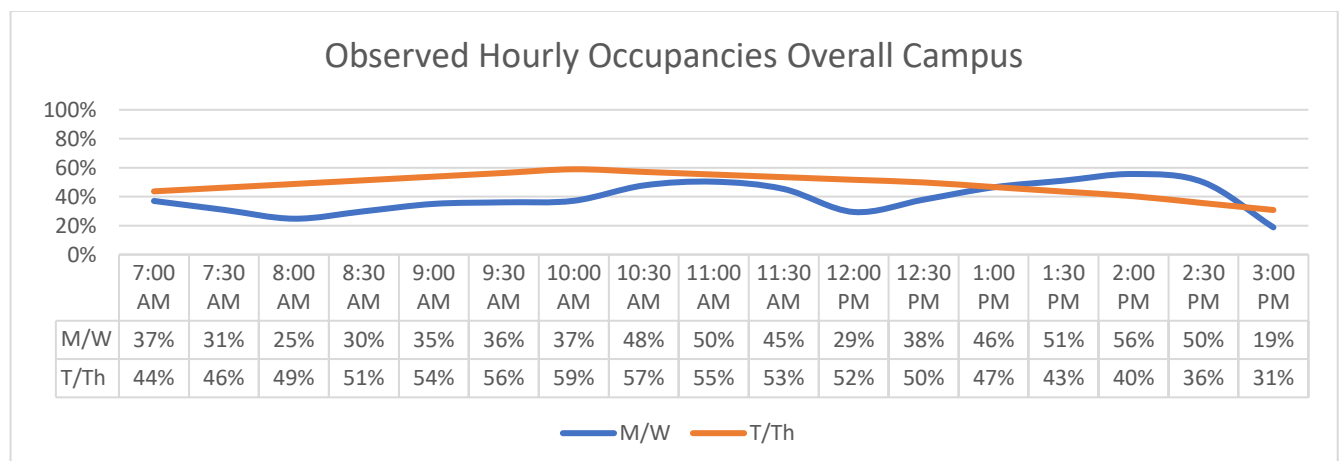
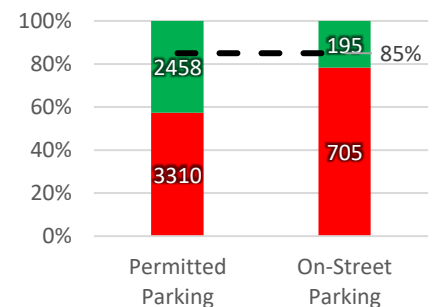
We have also broken out and provided a brief snapshot of on-street parking during the peak hour. On-street parking remains free and unregulated by time restrictions, making it a popular option for individuals accessing campus. These spaces provide for a significant portion of the campus parking demands. There could be a profound impact on campus parking behaviors if the City implements parking management strategies in the area.

The graph below demonstrates how overall parking utilization fluctuates throughout the day based on the schedule block of Monday/Wednesday versus Tuesday/Thursday.

### Observed Parking Conditions by Area of Campus, Peak Hour



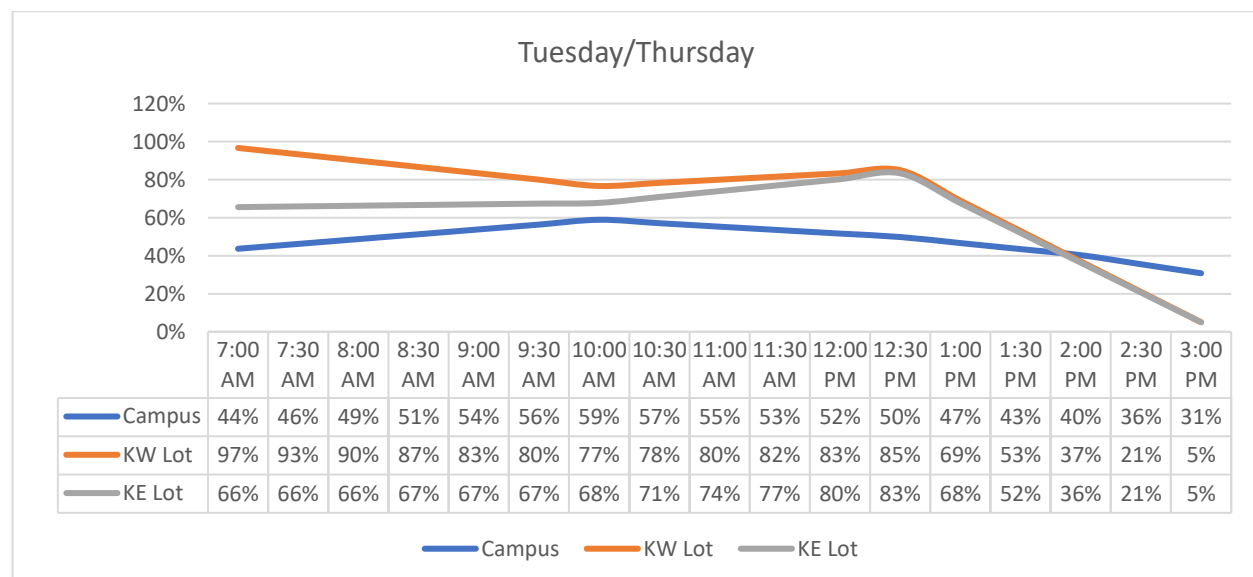
### On-Street vs. Off-Street Observed Parking Conditions, Peak Hour



Utilization was also analyzed based on the permit type to demonstrate how parking supplies are utilized and where the system may be experiencing a parking surplus or shortage. The table below provides a snapshot of parking utilization based on the current permit structure utilized by UNC Parking Services.

<i>Permit Type</i>	<b>Supply</b>	<b>Observed Demand</b>	<b>Surplus</b>	<b>Occupancy</b>
<i>Students &amp; Faculty/Staff</i>	4054	2443	1611	60%
<i>Faculty/Staff - FS, CK, GA</i>	573	355	218	62%
<i>Students &amp; Faculty/Staff (no overnight parking)</i>	399	187	212	47%
<i>Arlington Park Apartments</i>	338	86	252	25%
<i>Students - ST, SK, GA</i>	70	57	13	81%
<i>Reserved - CK Only</i>	132	101	31	77%
<i>Reserved - SK and CK Only</i>	90	61	29	68%
<i>Commuter Students Only</i>	112	20	92	18%
<i>On-Street</i>	900	705	195	78%
<b>TOTAL</b>	6668	4015	2653	60%

While the overall parking system peaked at 10:00am during the Tuesday/Thursday schedule, individual parking facilities peak at various times throughout the day. For instance, the K West (KW) Lot peaks at approximately 97% during the Tuesday/Thursday early morning schedule and fluctuates throughout the day before significantly decreasing in the afternoon. However, the K East Lot is 66% occupied in the morning, peaks midday at 83% during the Tuesday/Thursday schedule, and decreases in the afternoon. The graph and summary tables below provide an hourly comparison of these two lots to the total parking system throughout the day.



During the peak hour and throughout the day, the highest occupancies were observed to occur in the City of Greeley's on-street parking spaces off campus. On-street spaces are free and without time limits, making the on-street parking an attractive alternative to on-campus parking for UNC students and staff. The use of on-street parking as a preferred option was reinforced by the stakeholder feedback indicating preferences for free, conveniently-located spaces.

Although the overall parking system was observed to operate below effective capacity during the peak hour, several parking facilities were experiencing overutilization. The heat map on the following page shows the I, Z South, and U Lots, which are all permitted for mixed student and faculty/staff parking operating were at or near capacity. A detailed listing of occupancies during the peak hour of observations is provided as appendix at the end of this report.

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

"Parking 101: A Parking Primer: A Publication of the International Parking Institute", International Parking Institute, 2015



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## Transportation, Parking, and Circulation Master Plan

### MAP KEY

Observed Peak Conditions

Tuesday, 10:00 AM

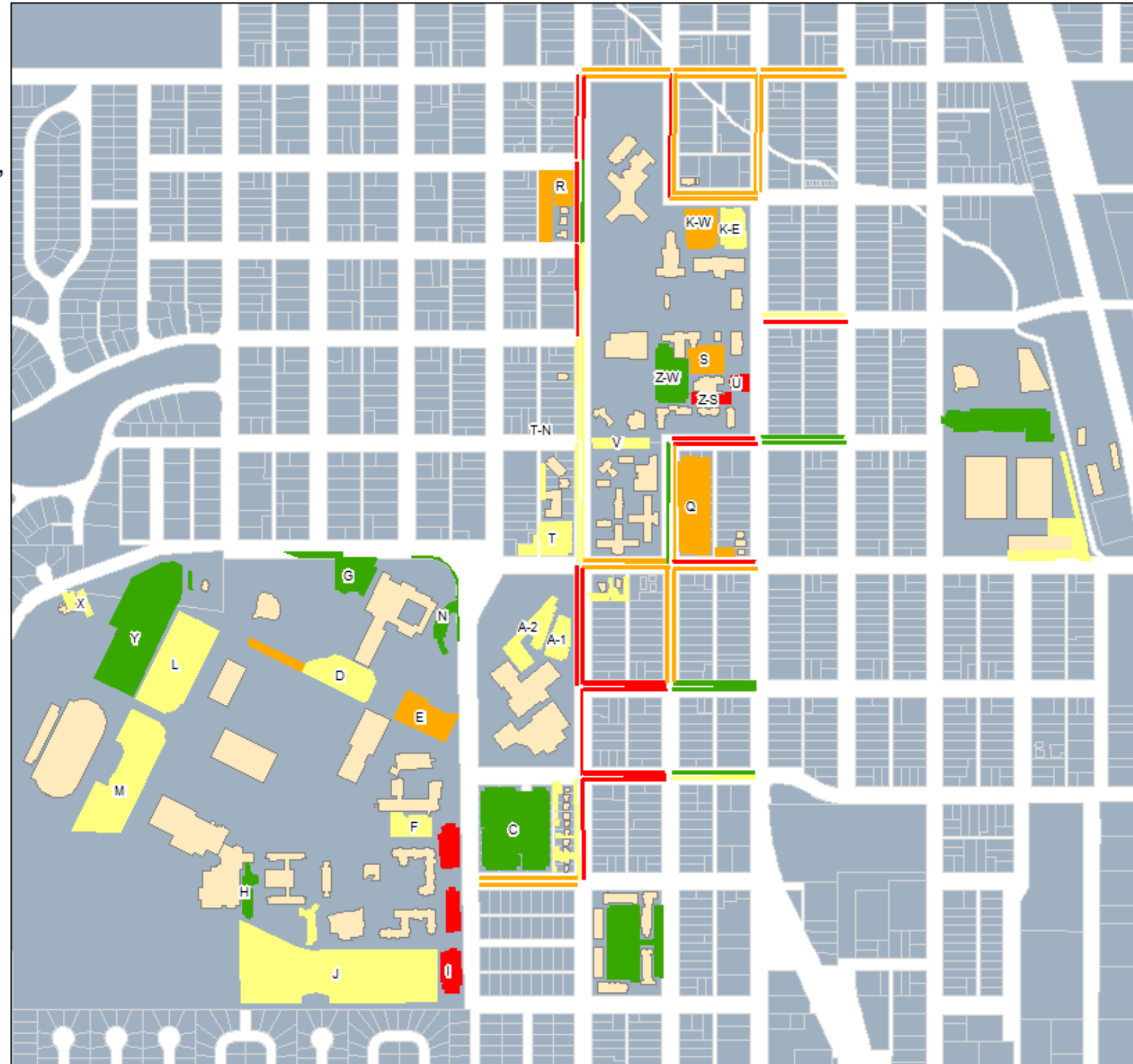
0 - 50 %

50 - 75 %

75 - 85 %

85+ %

University Building



The existing parking analysis demonstrates there is sufficient existing parking supply on the UNC Campus to accommodate current parking demands; however, users are frustrated because they do not find it to be conveniently located near their destination.

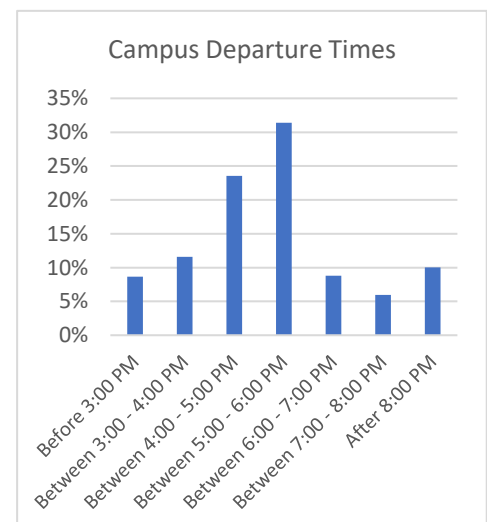
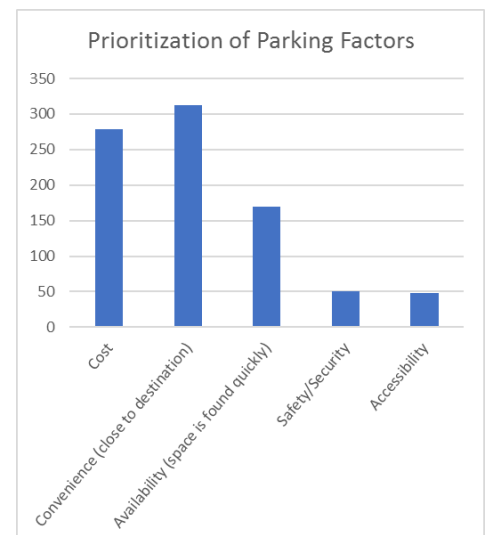
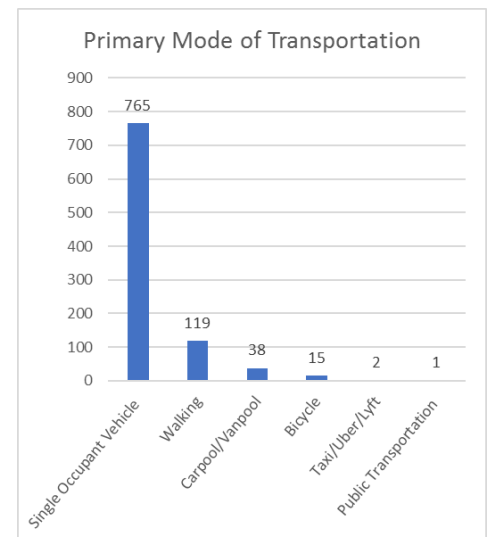
This lack of convenient parking has created a perception that parking is not available on campus and that more parking is needed at the convenient parking locations. The current permitting and pricing structure on campus is not effectively managing the parking demand on campus.

### Existing Transit Operations

The City of Greeley operates the Boomerang Transit Shuttle on the UNC Campus. The goal of the shuttle is to support the parking program by interconnecting the campus and making remote parking areas more accessible to the central part of campus.

The Boomerang Shuttle runs daily between the hours of 7:45 AM and 2:30 PM on Tuesday and Thursday and 3:30 PM on Monday, Wednesday, and Friday. The shuttle runs approximately every 10 minutes on Tuesday and Thursday and up to every seven minutes on Monday, Wednesday, and Friday. The shuttle is funded by student fees.

Boomerang is under performing. Its ridership averages around 400 riders a day. The route is inefficient for moving people between classes and ends service before the majority of faculty, staff, and students leave campus. Consideration should be given to rerouting the Boomerang or adding an additional campus route to reduce travel time and increase the area of campus covered within a three-minute walk to transit.





### *Future Parking and Transit Scenarios*

Five scenarios were developed using the Park+ modeling platform. The intent of these scenarios was to evaluate a range of future parking demands and behaviors and use that information to inform potential parking management strategies appropriate for the UNC Campus. Each scenario takes into consideration the future development planned for the campus, including the Campus Commons and the first year of the College of Osteopathic Medicine.

Future growth will generate an additional parking demand of approximately 421 total vehicles during the peak hour, 10:00 AM Tuesday and Thursdays. Of the 421 additional vehicles on Campus, 311 are attributed to Campus Commons and 110 are attributed to the Osteopathic Medical School. While vehicles related to the Osteopathic Medical School are projected to remain restricted in the G Lot, the Campus Commons will generate a wide range of parking impacts throughout the day and week depending on the special events planned for the facility.

The Osteopathic Medical School is anticipated to have 25 faculty members and a programming of 0.3 faculty members per student in Year 1. In Year 2, it is assumed the mix of teaching and office space remains constant, but five additional faculty members and an increased enrollment ratio of 0.2 faculty per student was assumed, increasing the parking demand by 73 vehicles. Increases in parking demand for peak hours in Years 3 and beyond are nominal based on the program's structuring and placement of students in off-site facilities.

Given the unknown variables of the implementing the Osteopathic Medical School, only the program's first-year impacts are used for future parking system modeling. However, it is recommended that the school's sponsoring organization provide investments in UNC's parking and transportation system to offset the impacts of their activities. Such an investment may be structured as ongoing fees supporting TDM and transit services, or investment in additional parking supply on campus for the Osteopathic Medical School's use.

The five scenarios examined are summarized in the following pages.

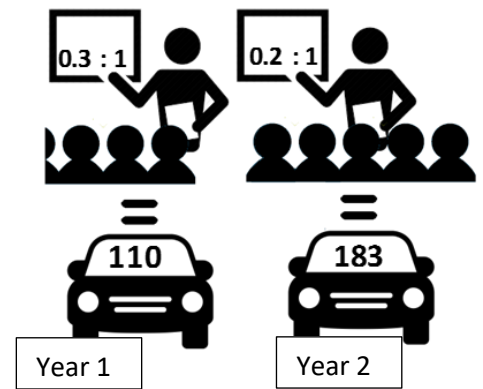
**Scenario 1.** Status quo, no new parking, no change in permitting structure, no change to Boomerang service.

**Scenario 2.** Status quo with 348 new parking spaces at C Lot.

**Scenario 3.** No new parking supply, permit structure reallocated, limited improvements to the Boomerang Service.

**Scenario 4.** 126 additional parking spaces at Q Lot, permit structure reallocated, and moderate improvements to the Boomerang service.

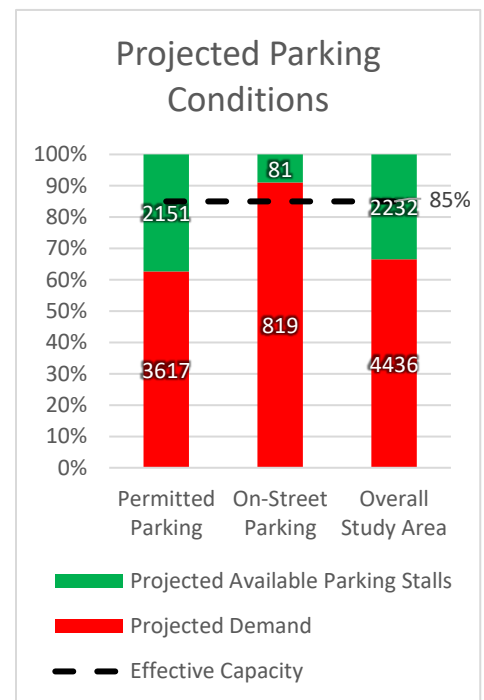
**Scenario 5.** 100 additional parking spaces near N Lot, no change in permitting structure, and no change to Boomerang service.



### Scenario 1. Maintain Status Quo

The first scenario evaluates a status quo approach to UNC's parking and mobility programs and policies into the future. This correlates to no additional parking on campus and no changes to the Boomerang shuttle. Aside from designating the G Lot for use by the Osteopathic Medical School, no other changes were assumed to existing parking management or permit allocation structure.

The analysis is summarized in the map on the following page and the chart to the right. Overall the parking utilization in the peak hour is up from today's 60% to 67% in this future scenario. There is sufficient existing parking supply within campus to accommodate the additional parking demands projected from the Campus Commons and addition of the Osteopathic Medical School. However, without changes to UNC's parking management and permit allocation practices, the perception of UNC's parking supply shortage will be exacerbated since more facilities will exceed the 85% threshold of their individual capacities. These lots are the C, D, G, I, U, V, Z South, and A1 Lots. Currently, only the I, Z South, and U Lots are at this threshold.





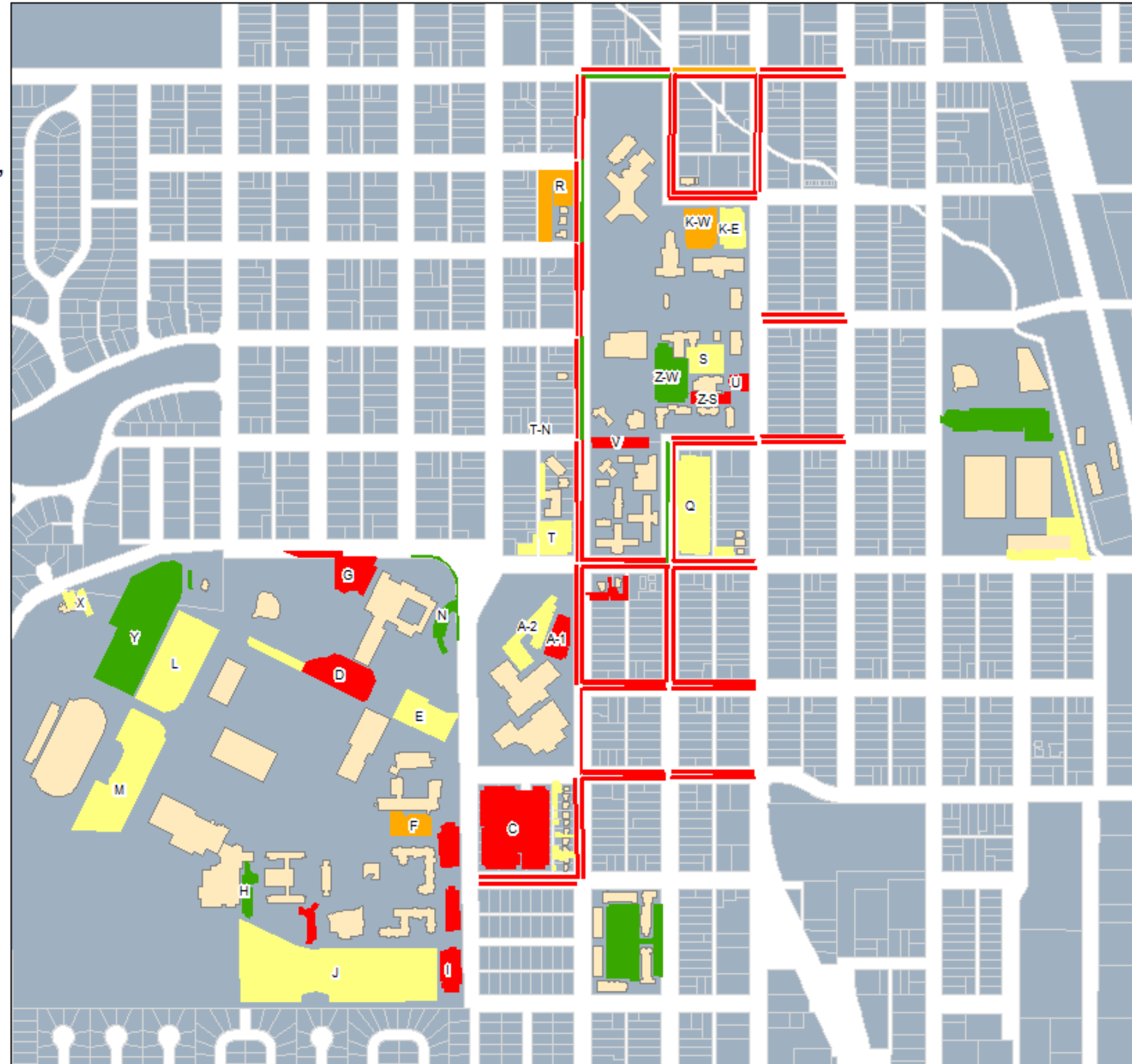
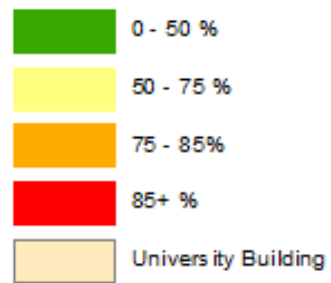
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## Transportation, Parking, and Circulation Master Plan

### MAP KEY

Future  
Programming and  
Campus  
Development

Tuesday, 10:00 AM



### Scenario 2. Maintain Status Quo with New Parking Supply

Scenario 2, like Scenario 1, retains the status quo in terms of UNC's parking permitting structure and the Boomerang shuttle. However, Scenario 2 adds a 300 additional parking spaces to C Lot, which is currently a 399-space surface parking lot. The resulting parking facility would convert the surface lot into a 699-space garage.

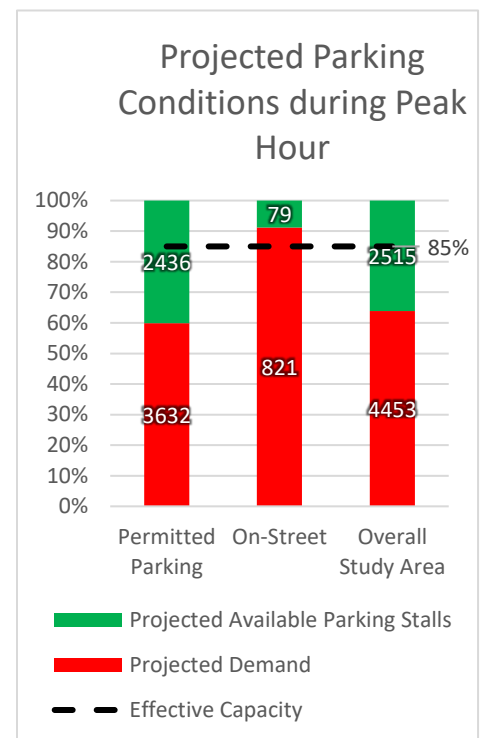
The C Lot was evaluated for expansion because it is central to campus and adjacent to the Campus Commons. The intent of this evaluation was to determine how effectively additional spaces added to C Lot will mitigate the surrounding parking demands.

The built-out C Lot garage absorbs a significant portion of the increased demand within the immediate area and reduces UNC's projected future parking facility use from the status quo's 67% to 64%. The C Lot garage is projected to alleviate demands for faculty parking lots near Ross Hall and McKee Hall. These impacts are shown in the map on the following page. Summary tables by permit type for each future scenario are shown in the appendix of this report.

At an estimated cost of \$24,000 per space, a 699-space parking structure would require an approximate investment of \$16,776,000. Ongoing operational and maintenance costs are estimated at \$500 per space per year, or \$349,500 in total. Investing in structured parking is usually when all other resources have been exhausted and parking occupancy on the campus reaches the effective capacity level of 85%.

A new structure built on C Lot may reduce the parking demands in a small radius of campus, but is not effective in balancing demands across the whole campus. Furthermore, the campus-wide occupancy remains low at 67% without the addition as shown in Scenario 1, indicating that there is opportunity to utilize existing resources more effectively before making an investment in structured parking of this magnitude.

Finally, the C Lot garage is projected to be underutilized in this scenario, with a projected occupancy of 50-75%. This further indicates that while the additional 300 spaces will help alleviate some demands, people will prefer to park in other locations around campus that convenient to their destination, on-street, or other facilities on campus. As a result, the other parking facilities throughout campus will be largely unimpacted by additional spaces.





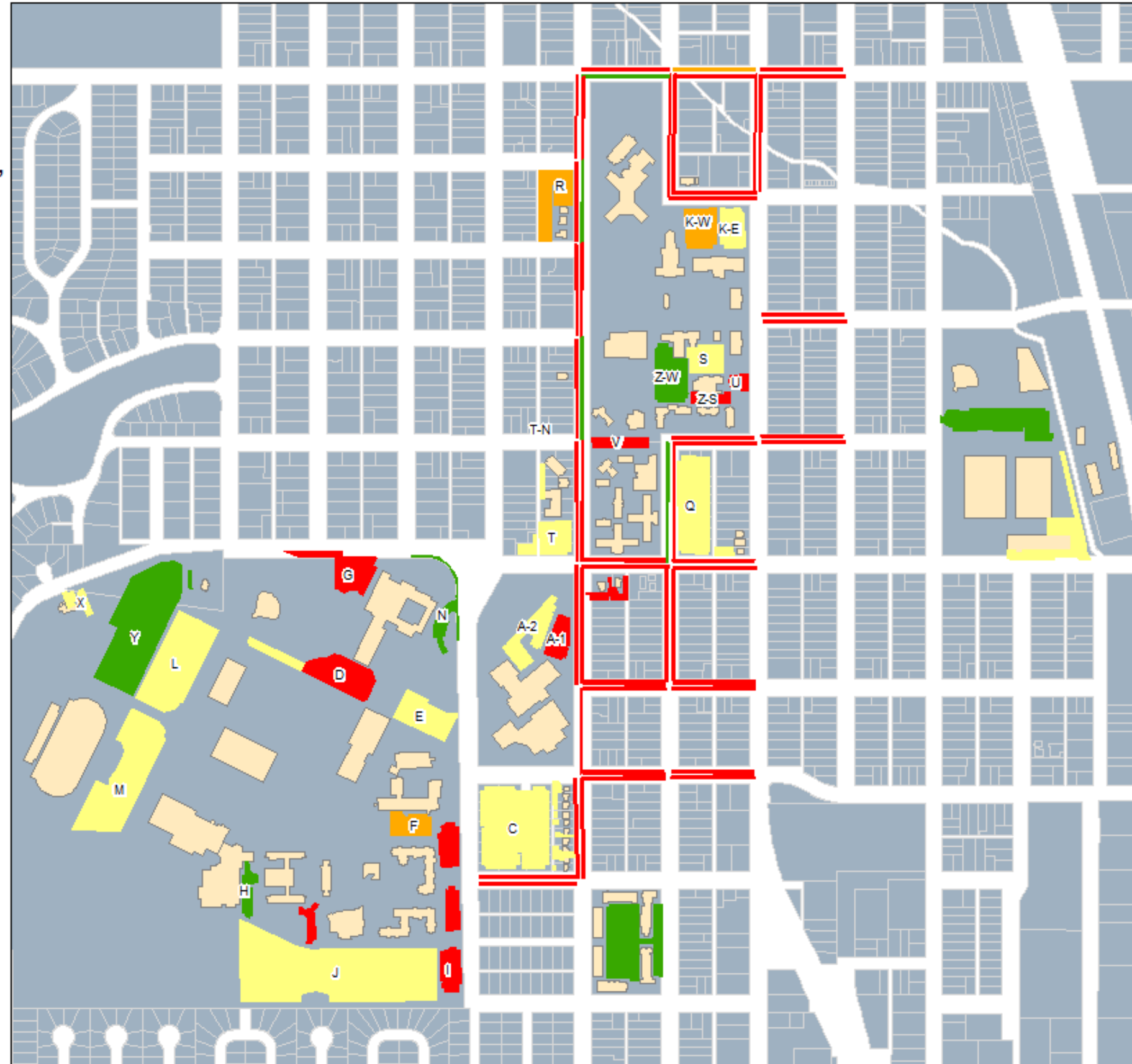
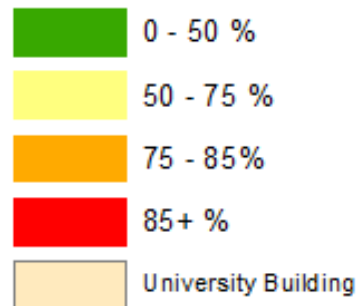
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Transportation, Parking,  
and Circulation  
Master Plan

MAP KEY

C Lot Supply Addition

Tuesday, 10:00 AM



### Scenario 3. Permit Reallocation and Transit Improvements

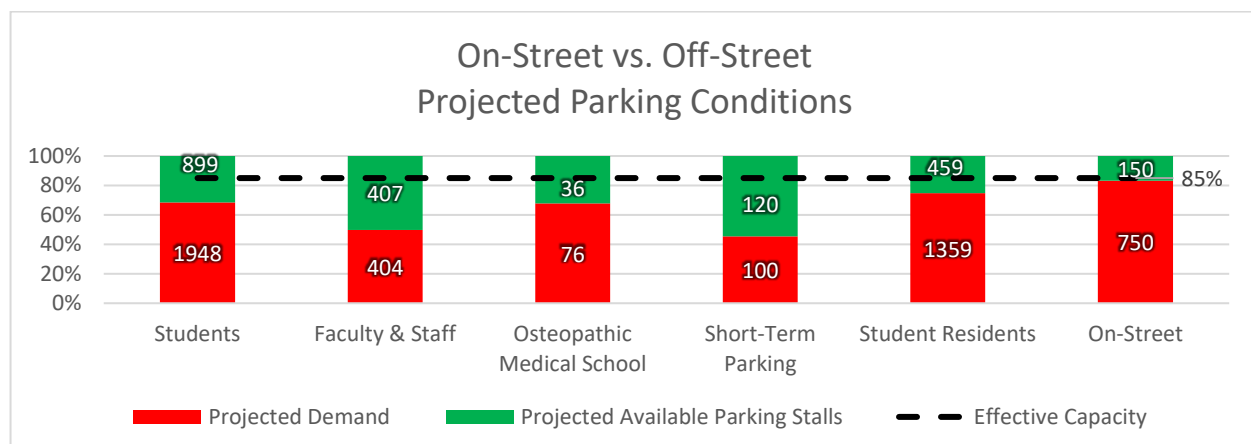
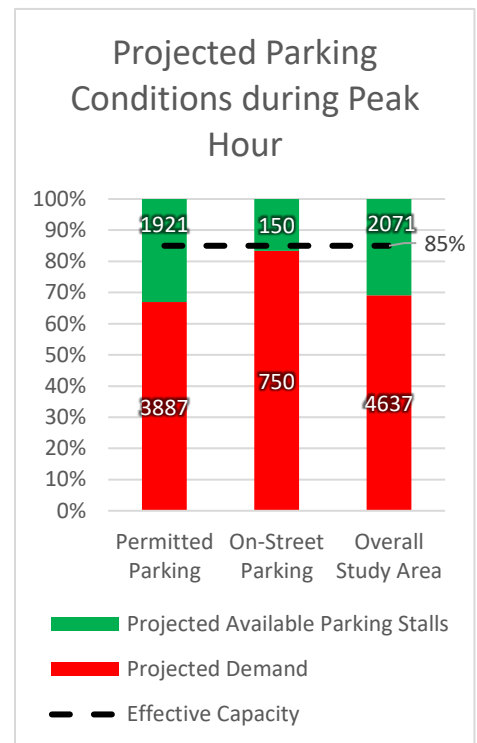
No additional parking supply was included in Scenario 3; however, UNC's parking permits were reallocated. Additionally, the Boomerang's daily service hours were extended to 4:30 PM and frequencies were increased to run every five minutes.

The purpose of the shuttle improvements is to facilitate efficient pedestrian movement on campus and encourage a park once experience for students, faculty, staff, and visitors. The cost of the improved transit operations is expected to cost \$118,000 annually.

Permit restructuring intends to redistribute parking demands and prioritize parking space availability based on the experience desired by the campus community. The permit allocations explored in this scenario prioritize visitors' convenience and restricts students living on campus to specific Resident Hall parking facilities. Some adjustments were also made for permits designated for faculty and staff only or faculty, staff, and students. The "K" permits were removed from the permit structure as resident students are restricted from these facilities, providing increased access for commuters.

The overall campus operating occupancy during the peak hour in this scenario is projected to operate at 69%. While individual facilities do appear "full" (above 85%), no permit type exceeds effective capacity throughout campus. The greatest permit parking use occurs in Resident Student parking facilities at 75%. The remaining permits would continue to operate as "hunting" lots for commuting students, faculty, and staff, projected to operate below 70% occupancy during peak conditions.

In this scenario, the overall system is more balanced. There are no projected underutilized facilities. The highly utilized facilities represent those intended to act as long-term storage lots for student residents. Because these facilities are not intended to provide access that accommodates frequent traffic circulation, they can operate at higher utilization points—for instance 90-95% occupied—while experiencing less reported user frustrations.





MAP KEY

Reallocation of Parking Permits

Tuesday, 10:00 AM

0 - 50 %

50 - 75 %

75 - 85%

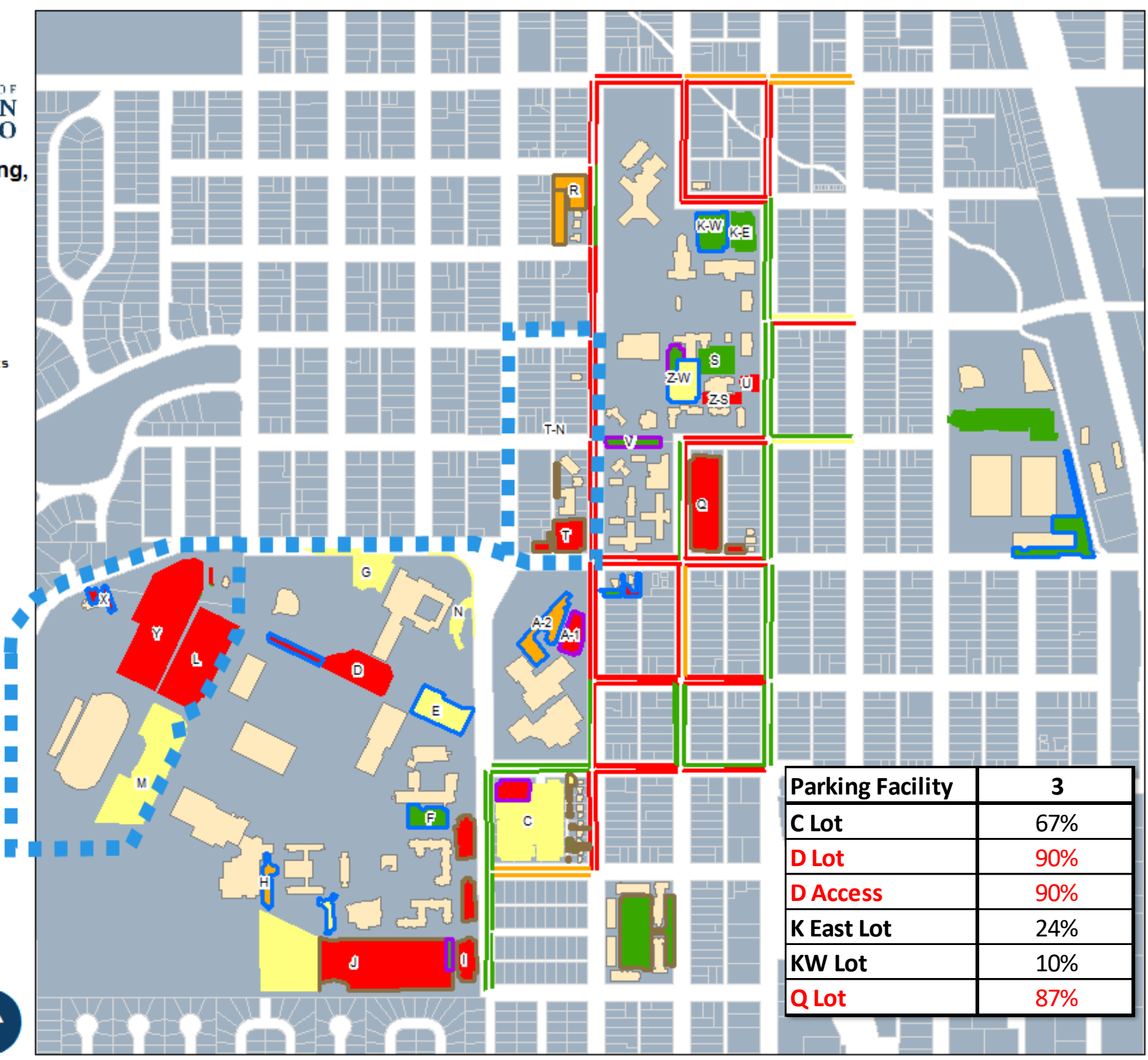
85+ %

Faculty/Staff

Short-Term Parking

Resident Students

University Building



Parking Facility	3
C Lot	67%
D Lot	90%
D Access	90%
K East Lot	24%
KW Lot	10%
Q Lot	87%

#### Scenario 4. Additional Parking Supply & Permit Reallocation

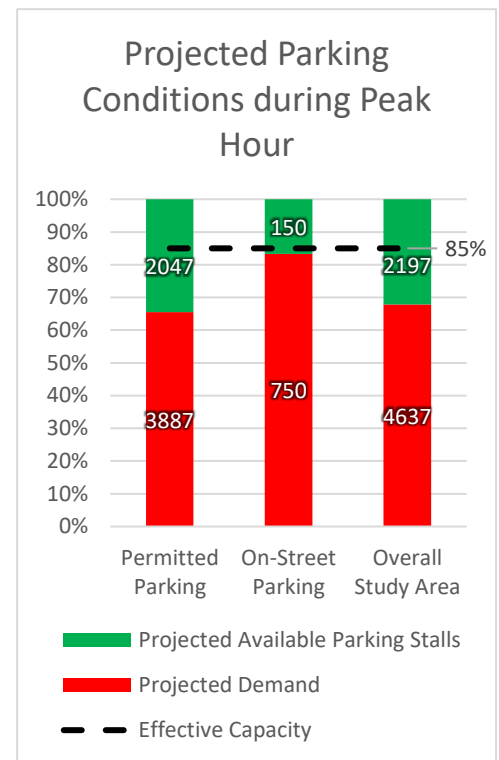
In Scenario 4, the parking supply at the Q Lot was increased to 450 for a net increase of 126 spaces. The improvements to the Boomerang from Scenario 3 were maintained in Scenario 4, with an additional improvement that reroutes the shuttle to 8th street to include a stop at the Q Lot. The cost of the improved transit operations in this scenario is expected to also cost \$118,000 annually.

The additional 126 parking spaces would come in the form of a new parking structure. This structure would be located at the Q Lot because of its central location and reasonable walking distance from the Main Campus.

The total parking supply at the Q Lot was modeled at 450 spaces with 119 spaces as a surface lot and the remaining 331 spaces designed as a parking structure. The anticipated cost for the improvements to the Q Lot is \$8,000,000, of which \$7,944,000 is directly related to the cost of the parking structure. The capital costs for the surface lot is estimated at \$56,000. The maintenance costs for the Q Lot facilities are expected to be \$225,000 annually.

The additional supply on Q Lot efficiently accommodates the demands of the nearby student residents with remaining capacity available. Consideration should be given to accommodate commuting students, faculty, and staff at the expanded Q Lot as well.

While this scenario does alleviate the localized parking demands within the core area of campus, there are still a few lots that exceed 85% occupancies. In this scenario, the overall campus parking utilization in the Tuesday/Thursday peak hour is 68%; a 1% improvement in overall system utilization from Scenario 3.





Transportation, Parking,  
and Circulation  
Master Plan

MAP KEY

Q Lot Supply Addition with TDM

Tuesday, 10:00 AM

0 - 50 %

50 - 75 %

75 - 85 %

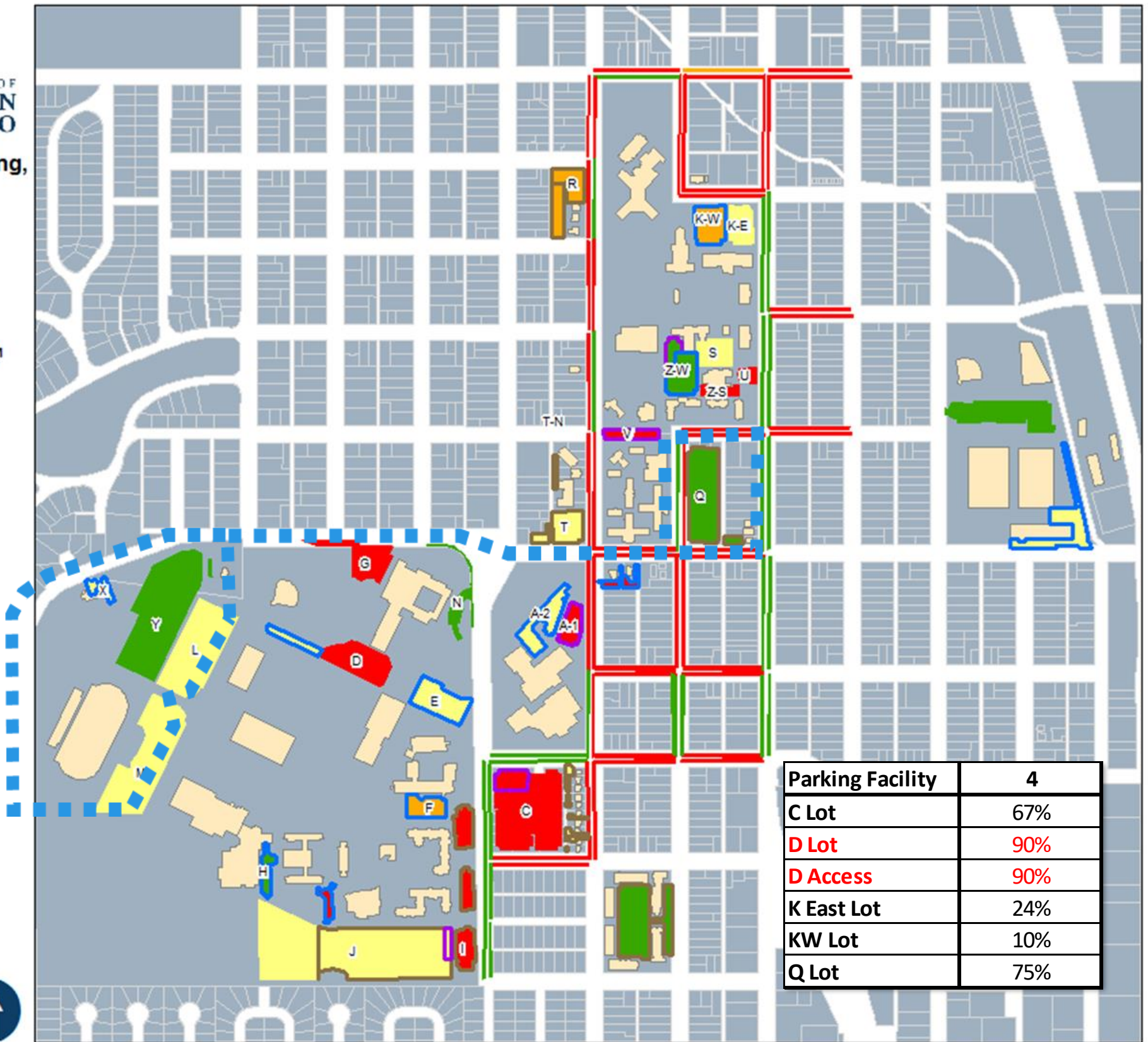
85+ %

Faculty/Staff

Short-Term Parking

Resident Students

University Building



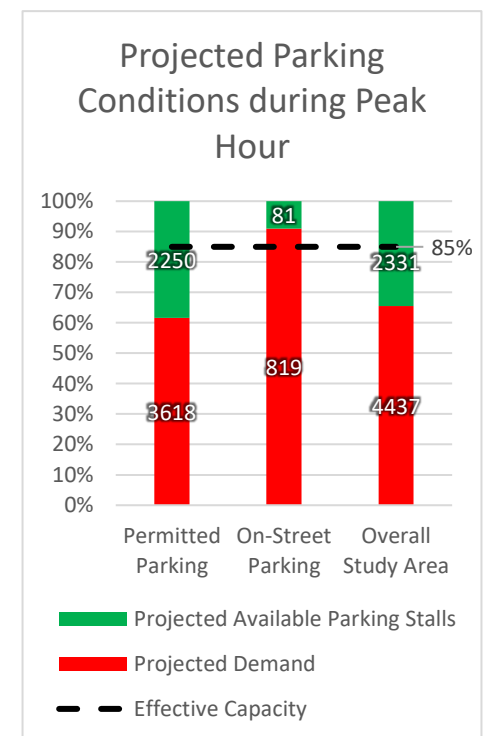
### Scenario 5. New Surface Lot

In Scenario 5, an additional supply of 100 parking spaces was added to the open space north of McKee Hall and southwest of the N Lot. No changes are assumed to UNC's parking permit allocations. The Boomerang shuttle will also remain unchanged from its current operations in this scenario.

The new 100-space surface lot was included as another mixed-use permit facility serving students, faculty, and staff. The location was chosen based on recent site exploration, its central location to campus, and its proximity to the University Center and Campus Commons.

The approximate cost for the surface lot at this location is \$700,000, or \$7,000 per space for a 100-space facility. Annual operating and maintenance costs are estimated at \$50,000, or \$500 per space per year.

The overall campus parking utilization with this alternative is projected at 66%. This option alleviates demands on the D Lot and provides opportunity to accommodate future parking demand increases for the Osteopathic Medical School's growth. However, continuing the current parking permit allocation structure causes this solution to have little impact on the overall parking system's perceived operating efficiency.







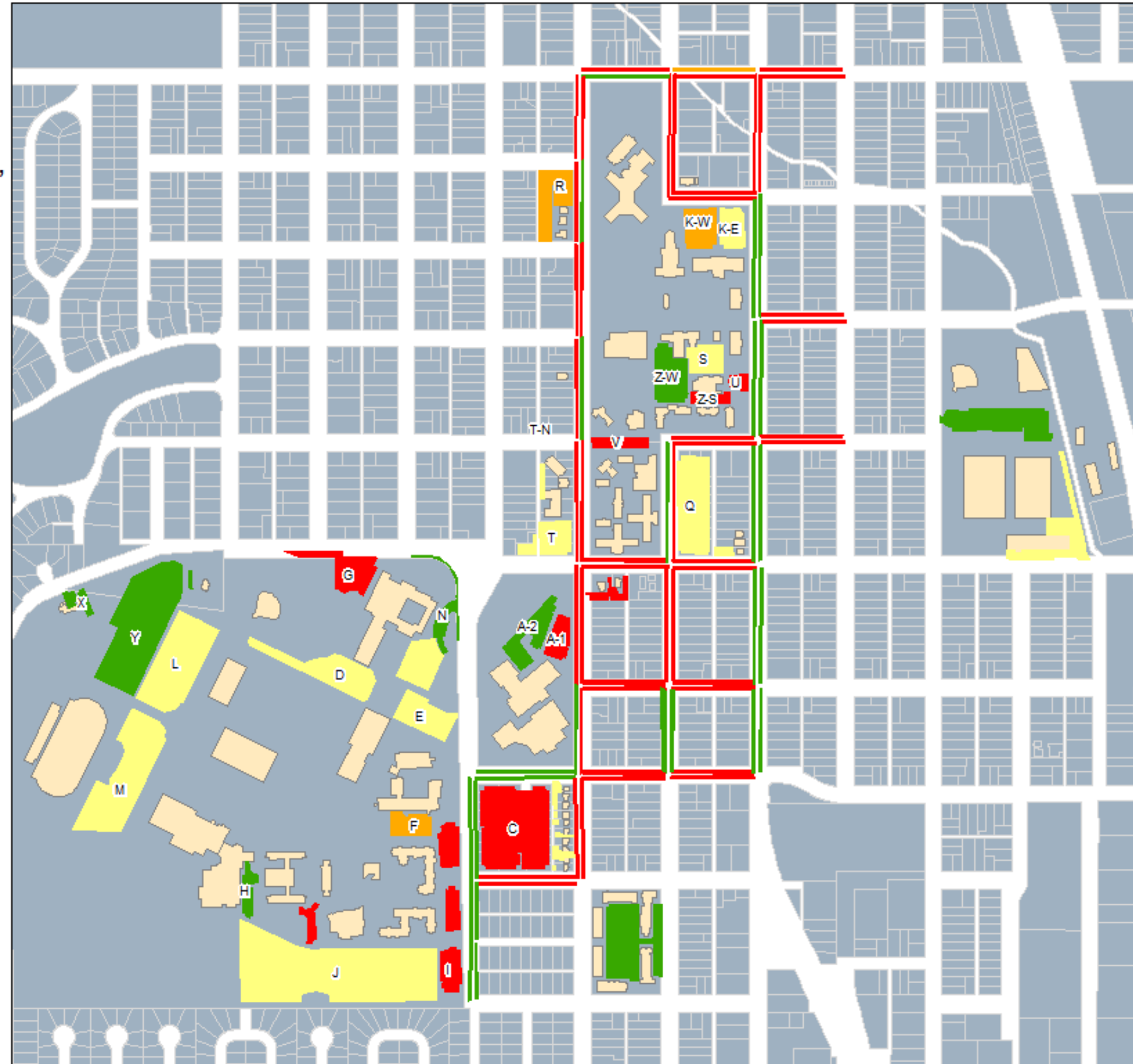
## Transportation, Parking, and Circulation Master Plan

### MAP KEY

New West Campus Surface Lot

Tuesday, 10:00 AM

- 0 - 50 %
- 50 - 75 %
- 75 - 85%
- 85+ %
- University Building



### Future Scenario Assessment

The five alternative transportation scenarios developed for this effort were used to evaluate a range of solutions for future campus transportation challenges. It was not anticipated that a single scenario, in its entirety, would be implemented. A set of both near-term and long-range recommended actions would be developed from the best aspects of each scenario. The summary below evaluates each scenario from a range of perspectives heard in the Campus Outreach effort.

**System Capacity** - In terms of reducing occupancies, Scenario 2, which adds 300 parking spaces within a \$16 million-dollar garage, is the most successful. However, Scenario 5, which adds 100 surface parking spaces north of McKee Hall is the most cost-effective scenario which adds parking capacity. The addition of the surface lot provides a 1% improvement to the overall parking capacity. The cost of this facility is estimated at \$700,000.

Scenarios 2's 300 additional parking spaces reduces the overall campus parking occupancy by 3%. While this option provides the greatest increase in overall parking capacity, it comes at a cost of approximately \$16,776,000 and nearly \$350,000 annually.

Scenario	Peak Hour System Occupancy	Met Parking Demand	Additional Costs (Capital/Maintenance)	Additional Annual Transit Operations Costs
Existing Peak Hour	60%	4,015	Unchanged	Unchanged
Scenario 1	67%	4,436	Unchanged	Unchanged
Scenario 2	64%	4,453	\$16,776,000 / 349,500	Unchanged
Scenario 3	69%	4,637	Unchanged	\$118,000
Scenario 4	68%	4,637	\$8,000,000 / 225,000	\$118,000
Scenario 5	66%	4,437	\$700,000 / 30,000	Unchanged

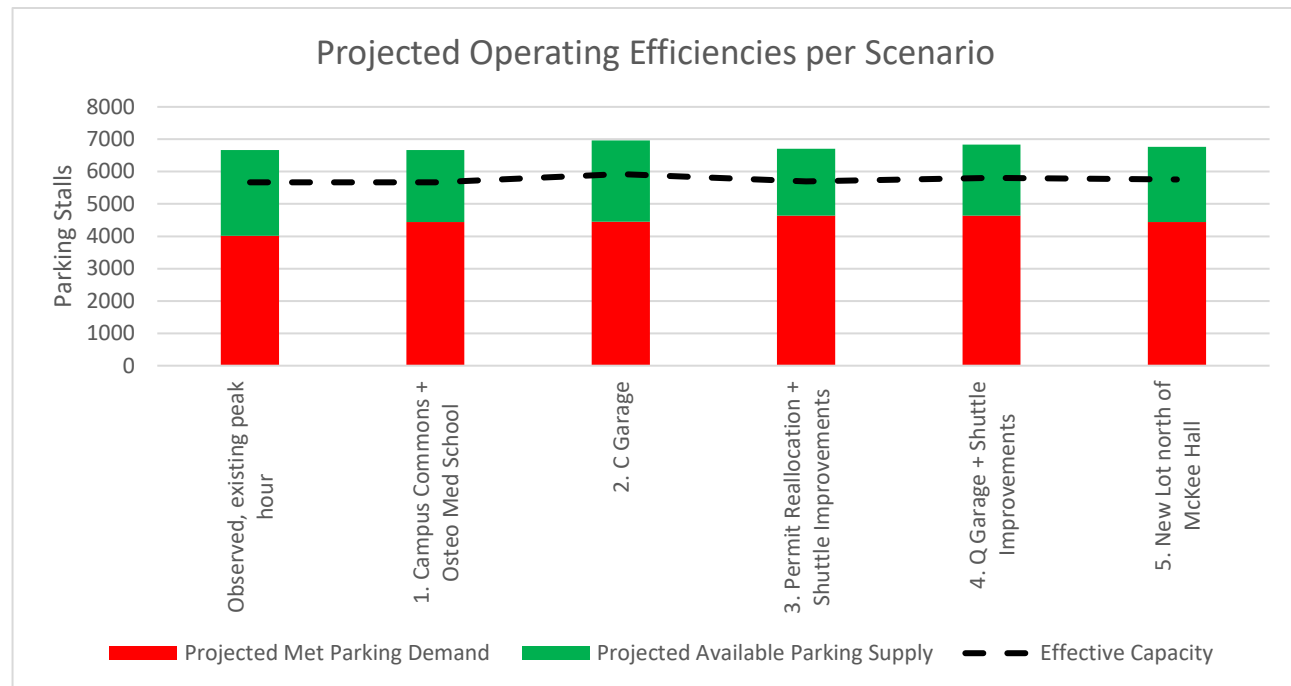
### Pros and Cons

	Pros	Cons
Scenario 1 Status Quo	<i>Allows the campus to save money while still accommodating growth</i>	<i>Planned growth will be accommodated, but problems will get worse as campus expands. The commuting and circulating culture will not be incentivized to change; therefore, people will continue to compete to park as close as they can to their desired building, rather than taking alternative forms of transportation to move about campus</i>
Scenario 2 Maintain Status Quo with New Parking Supply at C Lot	<i>Provides additional parking supply at a premium location for events at the Campus Commons and University Center</i>	<i>Significant financial investment without any significant impact to balancing parking demands and circulation</i>
Scenario 3 Permit Reallocation	<i>Reduces the number of vehicles circulating campus throughout the day, increasing pedestrian and cyclist safety.</i>	<i>Requires a large cultural shift to encourage people to park in one location all day while on campus and utilize other modes of transportation to move about campus. Also requires education and communication as the changes to the permit structure are implemented</i>



Scenario 4 Permit Reallocation with Additional Parking Supply at Q Lot	<i>Additional supply at the Q Lot is projected to accommodate a higher number of students, faculty, and staff on a typical day on Campus than alternative locations such as the C Lot or near the football fields.</i>	<i>Structured parking at any location is a significant investment. Although the number of vehicles accommodated is slightly higher than alternative locations during a typical day on campus, this location is anticipated to provide little relief for parking demands during special events.</i>
Scenario 5 New Lot north of McKee Hall	<i>Provides immediate relief of parking demands in the area of McKee Hall, Campus Commons, and University Center</i>	<i>Using a permit price of \$285, the current rate charged for a student “hunting” permit, the proposed 100-space surface lot is not anticipated to generate enough revenue to cover its annual operating and maintenance costs, nor provide any return on its initial investment.</i>

*System Utilization* - Scenario 3 increased campus-wide system utilization to 69%. While this scenario accommodates the most parking demand and distributes demand more evenly throughout Campus Scenario 3 provides improvements to the Boomerang shuttle system, which allows more efficient use of the parking supply, and reallocates parking permits to redistribute parking demand on campus.



*System Flexibility and Special Events* – From a resource management perspective, it is recommended that UNC focus on reallocating its parking permits structure along with a cost-effective investment to redistribute transportation and parking demands via improvements to the Boomerang shuttle as depicted in Scenario 3. However, with Campus Commons opening, it is practical to provide limited additional parking capacity near Campus Commons.

The additional 100-space surface parking lot illustrated in Scenario 5 provides a flexible solution where special event parking needs can be immediately accommodated near-term and more sustainable long-term parking and mobility strategies can evolve as permit reallocation occurs and Boomerang Shuttle Service refinements are implemented.

## Off-Campus Traffic Circulation

### *Traffic Operations*

Current and future analysis of the City of Greeley's street network serving UNC was conducted to ensure UNC's existing and future parking and mobility services work with the City's street network.

21 intersections serving the campus were evaluated for efficient traffic operations and pedestrian and bicycle safety.

Existing traffic operations evaluations were based on peak hour traffic counts collected in February 2018. Future traffic volumes were calculated based on an estimated future student enrollment increase from 12,260 students to 15,000 students. This equates to an annual growth rate of approximately 1.7% from 2018 to 2030 and approximately 2.9% from 2018 to 2025. Expected traffic volumes from the Campus Commons development and renovation of the Bishop-Lehr building were also included in future traffic volumes. The tables on the following pages highlight the operation and queuing analysis. The complete transportation analysis for the Master Plan is documented in the appendix of this report.

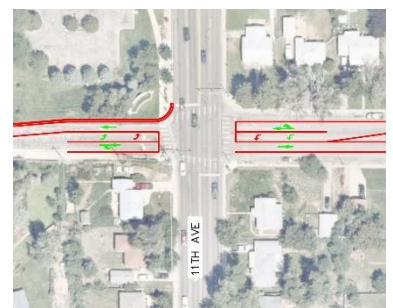
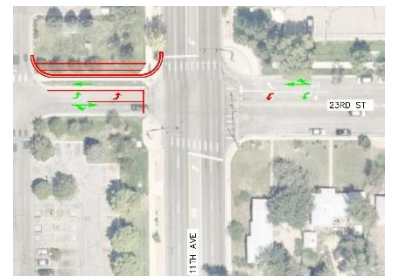
### *Recommendations*

This traffic operational assessment examines each intersections' existing and future levels of service (LOS) and queuing. All study area intersections currently operate acceptably during the morning and afternoon peak hours with an exception of the 19<sup>th</sup> Street and 8<sup>th</sup> Avenue intersection. The eastbound and westbound approaches at the intersection of 19<sup>th</sup> Street and 8<sup>th</sup> Avenue currently operate with an LOS F during the morning and afternoon peak hours.

To resolve this operational deficiency, it is recommended that the eastbound, westbound, and southbound approaches of the 19<sup>th</sup> Street and 8<sup>th</sup> Avenue intersection provide designated left-turn lanes with 100 feet of storage. With this improvement, this intersection is expected to operate acceptably during the peak hours throughout the 2030 horizon.

Three intersections also need geometric improvements to ensure safe operations for motorists, pedestrians, and bicyclists. First, the northbound left-turn lane at the intersection of 16<sup>th</sup> Street and 9<sup>th</sup> Avenue should be extended to provide 100 feet of storage. The westbound left-turn lane at the intersection of 16<sup>th</sup> Street and 8<sup>th</sup> Avenue should be extended to provide 125 feet of storage.

Additionally, the eastbound and westbound approaches of both the intersections of 23<sup>rd</sup> Street and 11<sup>th</sup> Avenue and 24<sup>th</sup> Street and 11<sup>th</sup> Avenue should be reconfigured to provide a left-turn lane and a shared through/right-turn lanes. This improvement would convert existing lane configurations and widen the west leg of this intersection. These improvements eliminate designated right-turn lanes while maintaining equivalent approach lanes.



Intersection	Movement	Existing		Future 15,000 Student Population Scenario (2030)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
		LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
16 <sup>th</sup> Street and 10 <sup>th</sup> Avenue (#1)	Overall	A 7.0	10.3 B	7.2 A	11.0 B
16 <sup>th</sup> Street and 9 <sup>th</sup> Avenue (#2)	Overall	3.2 A	7.8 A	3.4 A	5.1 A
16 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#3)	Overall	24.1 C	26.0 C	26.9 C	39.2 D
17 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#4)	Overall	4.2 A	5.5 A	6.4 A	7.6 A
18 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#5)	Overall	7.4 A	7.1 A	7.4 A	6.6 A
19 <sup>th</sup> Street and 10 <sup>th</sup> Avenue (#6)	Northbound Left	7.6 A	7.6 A	7.7 A	7.7 A
	Eastbound Approach	11.7 B	11.3 B	12.8 B	12.2 B
	Westbound Approach	12.1 B	12.7 B	13.2 B	13.8 B
	Southbound Left	7.6 A	7.8 A	7.7 A	7.9 A
19 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#7)	Northbound Left	8.6 A	10.4 B	9.1 A	11.7 B
	Eastbound Approach	22.3 C	66.0 F	37.1 E	286.8 F
	Westbound Approach	25.9 D	50.6 F	53.8 F	178.3 F
	Southbound Left	9.5 A	9.4 A	10.3 B	10.2 B
19 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#7) Improved  Improvement: Left Turn Lanes on all Approaches Two Stage Left Turn	Northbound Left	8.6 A	10.4 B	9.1 A	11.7 B
	Eastbound Left	17.8 C	28.8 D	22.0 C	45.6 E
	Eastbound Through/Right	13.9 B	14.5 B	16.4 C	16.8 C
	Westbound Left	22.3 C	24.2 C	30.9 D	35.0 E
	Westbound Through/Right	12.7 B	14.4 B	14.2 B	16.3 C
	Southbound Left	9.5 A	9.4 A	10.3 B	10.2 B
Reservoir Road and 17 <sup>th</sup> Avenue (#8)	Northbound Left	19.4 C	23.4 C	29.2 D	45.8 E
	Northbound Right	11.5 B	10.0 B	13.4 B	10.6 B
	Westbound Left	8.9 A	8.3 A	9.7 A	8.7 A
Reservoir Road Access (#9)	Northbound Approach	12.8 B	11.7 B	14.9 B	13.0 B
	Westbound Left	9.2 A	8.4 A	10.1 B	8.8 A
20 <sup>th</sup> Street and 14 <sup>th</sup> Avenue (#10)	Overall	17.7 B	22.6 C	22.2 C	24.3 C
20 <sup>th</sup> Street and 11 <sup>th</sup> Avenue (#11)	Overall	21.0 C	24.9 C	23.5 C	24.1 C

Intersection	Movement	Existing		Future 15,000 Student Population Scenario (2030)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
		LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
20 <sup>th</sup> Street and 10 <sup>th</sup> Avenue (#12)	Overall	41.9 D	30.9 C	40.9 D	31.0 C
20 <sup>th</sup> Street and 9 <sup>th</sup> Avenue (#13)	Northbound Left/Through	19.9 C	19.2 C	29.8 D	27.7 D
	Northbound Right	9.4 A	9.8 A	9.7 A	10.3 B
	Eastbound Left	8.2 A	8.0 A	8.6 A	8.2 A
	Westbound Left	7.6 A	7.8 A	7.8 A	8.0 A
	Southbound Left/Through	19.6 C	17.1 C	29.5 D	22.5 C
	Southbound Right	10.3 B	10.8 B	11.1 B	11.8 B
20 <sup>th</sup> Street and 8 <sup>th</sup> Avenue (#14)	Overall	10.2 B	9.2 A	10.8 B	10.2 B
22 <sup>nd</sup> Street and 11 <sup>th</sup> Avenue (#15)	Overall	4.4 A	5.1 A	5.1 A	7.6 A
22 <sup>nd</sup> Street and 10 <sup>th</sup> Avenue (#16)	Overall	8.3 A	9.3 A	9.1 A	10.5 B
	Northbound Approach	8.3 A	9.0 A	9.0 A	10.2 B
	Eastbound Left	8.7 A	9.1 A	9.1 A	9.8 A
	Eastbound Through/Right	8.2 A	9.0 A	8.8 A	10.0 A
	Westbound Left	8.6 A	9.4 A	9.1 A	10.1 B
	Westbound Through/Right	8.5 A	9.2 A	9.3 A	10.3 B
	Southbound Approach	8.2 A	9.6 A	9.0 A	11.2 B
21 <sup>st</sup> Street and 17 <sup>th</sup> Avenue (#17)	Westbound Left	10.9 B	10.4 B	11.8 B	11.0 B
	Westbound Right	9.5 A	9.2 A	9.8 A	9.5 A
	Southbound Left	7.9 A	7.6 A	8.1 A	7.7 A
23 <sup>rd</sup> Street and 11 <sup>th</sup> Avenue (#18)	Overall	7.4 A	22.3 C	6.7 A	11.0 B
23 <sup>rd</sup> Street-Road and 11 <sup>th</sup> Avenue (#19)	Northbound Left	8.4 A	10.7 B	8.8 A	12.9 B
	Westbound Approach	18.8 C	19.0 C	29.1 D	28.0 D
24 <sup>th</sup> Street and 11 <sup>th</sup> Avenue (#20)	Overall	6.6 A	6.7 A	9.5 A	8.5 A
23 <sup>rd</sup> Street and 10 <sup>th</sup> Avenue (#21)	Northbound Left	7.5 A	7.8 A	7.5 A	7.9 A
	Eastbound Approach	11.4 B	14.6 B	13.0 B	19.2 C
	Westbound Approach	11.1 B	13.9 B	12.4 B	16.4 C
	Southbound Left	7.6 A	7.6 A	7.6 A	7.7 A



Intersection Turn Lane	Existing Turn Lane Length (feet)	2030 Calculated Queue (feet)	2030 Recommended Length (feet)
<b>16<sup>th</sup> St &amp; 10<sup>th</sup> Ave (#1)</b>			
Northbound Left	100'	32'	100'
Southbound Left	125'	31'	125'
Southbound Right	50'	24'	50'
<b>16<sup>th</sup> St &amp; 9<sup>th</sup> Ave (#2)</b>			
Northbound Left	50'	94'	<b>100'</b>
Southbound Right	100'	25'	100'
<b>16<sup>th</sup> St &amp; 8<sup>th</sup> Ave (#3)</b>			
Eastbound Left	100'	130'	<b>125'</b>
Eastbound Right	C	25'	C
Westbound Left	100'	39'	100'
Northbound Left	100' TWLTL	285'	100' TWLTL
Southbound Left	75'	39'	75'
<b>17<sup>th</sup> St &amp; 8<sup>th</sup> Ave (#4)</b>			
Northbound Left	100' TWLTL	25'	100' TWLTL
Southbound Left	100' TWLTL	25'	100' TWLTL
Southbound Right	50'	25'	50'
<b>18<sup>th</sup> St &amp; 8<sup>th</sup> Ave (#5)</b>			
Westbound Left	100' TWLTL	120'	100' TWLTL
Westbound Right	C	28'	C
Southbound Left	100'	45'	100'
<b>19<sup>th</sup> St &amp; 8<sup>th</sup> Ave (#7)</b>			
Northbound Left	100' TWLTL	25'	100' TWLTL
Southbound Left	DNE	25'	<b>100'</b>
Eastbound Left	DNE	25'	<b>100'</b>
Westbound Left	DNE	25'	<b>100'</b>
<b>Reservoir Rd &amp; 17<sup>th</sup> Ave (#8)</b>			
Westbound Left	C	25'	C
Northbound Left	C	85'	C
Northbound Right	75 TWLTL	30'	75 TWLTL
<b>Reservoir Road Access (#9)</b>			
Westbound Left	75' TWLTL	25'	75' TWLTL
<b>20<sup>th</sup> St &amp; 14<sup>th</sup> Ave (#10)</b>			
Eastbound Left	100' TWLTL	53'	100' TWLTL
Eastbound Right	C	25'	C
Westbound Left	100' TWLTL	98'	100' TWLTL
Westbound Right	100'	25'	100'
Northbound Left	200'	105'	200'
Northbound Right	C	25'	C
Southbound Left	125' TWLTL	111'	125' TWLTL
Southbound Right	125'	32'	125'
<b>20<sup>th</sup> St &amp; 11<sup>th</sup> Ave (#11)</b>			
Eastbound Left	125' TWLTL	61'	125' TWLTL
Eastbound Right	125'	97'	125'
Westbound Left	100' TWLTL	93'	100' TWLTL
Westbound Right	100'	FREE	100'
Northbound Left	125' TWLTL	198'	125' TWLTL
Southbound Left	75'	52'	75'
Southbound Right	75'	25'	75'
<b>20<sup>th</sup> St &amp; 10<sup>th</sup> Ave (#12)</b>			



<b>Intersection Turn Lane</b>	<b>Existing Turn Lane Length (feet)</b>	<b>2030 Calculated Queue (feet)</b>	<b>2030 Recommended Length (feet)</b>
Eastbound Left	100' TWLTL	48'	100' TWLTL
Eastbound Right	C	94'	C
Westbound Left	100' TWLTL	47'	100' TWLTL
Northbound Left	100'	57'	100'
Southbound Left	75'	33'	75'
Southbound Right	75'	68'	75'
<b>20<sup>th</sup> St &amp; 9<sup>th</sup> Ave (#13)</b>			
Eastbound Left	100' TWLTL	25'	100' TWLTL
Westbound Left	100' TWLTL	25'	100' TWLTL
Northbound Right	100'	25'	100'
Southbound Right	100'	25'	100'
<b>20<sup>th</sup> St &amp; 8<sup>th</sup> Ave (#14)</b>			
Eastbound Left	100' TWLTL	137'	100' TWLTL
Westbound Left	100'	25'	100'
Northbound Left	100'	46'	100'
Southbound Left	100' TWLTL	25'	100' TWLTL
<b>22<sup>nd</sup> St &amp; 11<sup>th</sup> Ave (#15)</b>			
Westbound Left	100' TWLTL	78'	100' TWLTL
Westbound Right	C	30'	C
Southbound Left	125'	33'	125'
<b>22<sup>nd</sup> St &amp; 10<sup>th</sup> Ave (#16)</b>			
Eastbound Left	100' TWLTL	25'	100' TWLTL
Westbound Left	100' TWLTL	25'	100' TWLTL
<b>Alles Drive &amp; 17<sup>th</sup> Ave (#17)</b>			
Westbound Left	C	25'	C
Westbound Right	C	25'	C
<b>23<sup>rd</sup> St &amp; 11<sup>th</sup> Ave (#18)</b>			
Westbound Right	100'	25'	100'
Northbound Left	100'	25'	100'
Southbound Left	125'	26'	125'
<b>22<sup>nd</sup> St-Rd &amp; 11<sup>th</sup> Ave (#19)</b>			
Northbound Left	75'	25'	75'
<b>24<sup>th</sup> St &amp; 11<sup>th</sup> Ave (#20)</b>			
Eastbound Right	100'	45'	100'
Westbound Right	100'	25'	100'

## TDM

### *Introduction: What is TDM?*

TDM is a set of strategies and policies that reduces or redistributes travel demand. The underlying goal of TDM is to reduce single-occupant vehicle travel during peak travel periods by optimizing the use of existing infrastructure. TDM focuses on changing travel behavior through strategies and policies such as carpooling, ride-sharing, and providing education and incentives for other modes of transportation such as transit, bicycling, or walking. The resulting modal shifts affect the demand for space in both roadways and parking facilities. At UNC, there is an opportunity to better serve more students, visitors, faculty, and staff through shifting the current demand for existing resources, such as parking spaces and roadway capacity. As travel behavior and consequently the demand for resources shifts, UNC's transportation goals of reducing and redistributing demand for parking at certain times and locations can be better met.

The recommendations and impacts on travel behavior are described for each TDM strategy listed in the index below.

### *Parking Permit Reallocation Strategies*

Parking permit reallocation strategies are recommendations that alter the structure, distribution, and pricing of parking permits for students, faculty, and staff. These recommendations do not change the supply of parking, but rather alter the permitting system in such a way that influences demand. This category consists of the following three recommendations:

- Create a permit system with a hierarchy of prices based on the convenience of a lot.
- Create a permit system that associates permits with specific lots.
- Transition from an annual permit system to a daily permit system.

### *Provide a Hierarchy of Permit Prices*

Currently, all parking lots on the UNC Campus are set at the same price, except for the K and Y lots, despite variation in levels of convenience and demand. Access to higher demand and more convenient lots is determined on a first come, first serve basis. This recommendation would create a permit system where high-demand lots are priced accordingly. This recommendation does not necessarily mean an increase in the cost of parking; implementing this recommendation means permits could still be priced such that average permit prices remains the same if UNC decides to not increase parking pricing. It is recommended that permit prices be adjusted periodically—at most each semester or annually—to maintain consistency and transparency, and to ensure that prices accurately reflect the most recent shifts in demand.

*Impact on travel behavior* - Parking permit prices should be set so that the price achieves the space availability target. By adjusting rates periodically, up when and where demand is high and down when and where demand is low, UNC can better distribute demand and maximize use of its parking facilities. This will grant UNC better control over who is parking in which lots and the potential occupancy of each lot, translating to greater assurance for users that there will be an available parking space. Establishing a demand-based management system with the parking permits, as described in this recommendation, will also facilitate a long-term transition to daily pricing.

#### Assign Permits to Specific Parking Lots

To effectively implement hierarchical permit parking, it is necessary to link parking permits to specific lots. Currently, when parking permits are purchased, they are valid in all student or faculty/staff lots respectively, with the exception of the K and Y lots. With this recommendation, students, faculty, or staff purchase a parking permit that is only valid in one or a select few parking lots.

The initial recommendation is to establish a student resident parking permit where students living on campus would be restricted to park in residential parking lots.

*Impact on travel behavior* - This recommended permit structure has a number of benefits. It allows for implementing a range of permit prices, allowing lots to be priced according to convenience and demand. It increases assurance of finding a spot in a particular lot, reduces miles traveled and congestion resulting from circling or traveling to a different lot due to lack of parking, reduces emissions, and decreases potential conflicts associated with searching for parking.

#### Infrastructure

Recommendations to the infrastructure on campus include wayfinding signs for parking, preferential parking spaces, and bicycle and pedestrian infrastructure. These capital projects help facilitate circulation on campus, inform mode choice, and provide incentives for more sustainable transportation options.

#### Parking Wayfinding Signage

To improve users navigation to and through parking lots and help distribute demand, UNC should create an intuitive, consistent, highly-visible wayfinding program that consists of branding, sign locations, and sign content. These signs can also include dynamic content such as real-time cost and parking availability information to help drivers easily find available parking spaces at a price they are willing to pay. Signs should be placed outside key routes at decision-making points at which drivers might begin thinking about how to park. Signage should get more specific about facilities, availability, and prices closer to campus and/or near



major facilities. Ultimately, signs at the entrance to parking lots should contain dynamic information including cost and availability.

Currently, UNC has minimal wayfinding signage associated with parking lots. Existing signs are generally either small and difficult to identify from a vehicle or they do not include information about what parts of campus they serve. Finally, signage does not provide information on price and availability of spaces. This might be particularly helpful to event attendees, given the potential for the closest facilities to fill up even before the start time of a major event and these users' potential unfamiliarity with campus.

The existing parking facility nomenclature currently has no ties to the parking permit allocation system nor provides association to an area of campus. Lots are currently designated by a letter, for example the Y Lot, or sometimes combined with a directional indication, such as the KW Lot for the west portion of the two facilities at the K Lots. As often reported during the data collection process, many students, faculty, staff and visitors do not know parking facilities by their assigned names, rather identify parking facilities by the land use they associated with their use. Such association can be both beneficial in terms of ease of locating a facility by those familiar with the land uses on campus, and detrimental in terms of the mental association of parking to land use that encourages individuals to move their vehicles to the "appropriate" facility for the land use they are accessing.

***Impact on travel behavior*** - A network of wayfinding signs for parking lots can help drivers more quickly and efficiently find parking facilities that meet their needs. This reduces drivers cruising for available parking, which reduces potential conflicts between motorists and other drivers, bicyclists, and pedestrians, in addition to reducing carbon emissions. Effective wayfinding signage can especially improve visitors' experience by reducing the confusion and inefficiency associated with looking for parking near a specific part of campus.

Parking facilities should be signed in a manner that easily identifies the appropriate users for the facility to drivers in the right-of-way before they enter the facility. Parking efficiencies and reduced traffic circulation are maximized through the use of color coding, consistent language, and use dynamic components to convey availability and/or applicable pricing.

#### *Preferential Parking for Motorcycles and Carpoolers*

UNC can designate preferential spaces for motorcycles and carpoolers. These designated spots should be located in each of the lots in the parking permit system in locations that have the highest demand due to their proximity to key destinations. UNC should monitor use of these spaces and adjust supply and location as needed based on demand patterns.





***Impact on travel behavior*** - Both carpoolers and motorcyclists are preferred users because they take up less space in parking lots, reduce emissions, and reduce congestion. By providing preferred parking for these modes and increasing convenience for these users, UNC is encouraging users to carpool or arrive by motorcycle. An increase in carpooling will help manage parking demand and supply. This strategy allows UNC to influence mode choice and incentivize travel behavior that reduces parking demand.

### *Bicycle and Pedestrian Infrastructure*

Enhancing facilities for bicyclists and pedestrians is important to improving the overall transportation infrastructure. Bicycle and pedestrian facilities include multi-use paths, safe crossing treatments, on-street bicycle facilities, and bicycle parking.

Multi-use paths provide a space for bicyclists and pedestrians that is separate from motor vehicles. This network also connects bicyclists and pedestrians between key access points at the edge of campus to destinations within Campus, and along parts of Campus where there are no roadways. The current network of paths should be evaluated to determine level of use, frequency of conflicts between bicyclists and pedestrians, and compliance with the laws of the roadways or facilities. Locations and feasibility for additional paths should be considered where there are existing desire lines, a high volume of bicyclists and pedestrians, or insufficient sidewalks or on-street bicycle facilities.

In addition to improving bicycle and pedestrian facilities on-campus, UNC should work with the City of Greeley to improve off-campus walkways and bikeways. Collaboration is most needed to identify improvements on corridors of concern to the UNC community. Crossings and facilities on 8<sup>th</sup> Avenue, 10<sup>th</sup> Avenue, 11<sup>th</sup> Avenue, and 24<sup>th</sup> Street were all repeatedly identified by the UNC community as barriers to walking and bicycling. Further study of these corridors is necessary to achieve consensus on preferred design solutions and implementation of next steps.

Short- and long-term bicycle parking should be at appropriate locations, in appropriate quantities, and using the preferred type of rack. Bicycle parking locations should be coordinated with the separated path locations so that bicyclists are naturally encouraged to park their bicycles near the edge of the separated path network, rather than bicycling on pedestrian-only facilities closer to building doorways that may result in an increase in bicycle/pedestrian conflicts. Bicycle parking should also be located outside of parking structures to minimize the potential for vehicle-bicyclists conflicts within the parking structures. Short-term bike parking should be provided with bike racks and is most appropriate for locations where visits are shorter than a few hours (such as academic buildings). UNC should collect additional data to determine the bicycle mode share to inform parking supply. Enough bicycle racks should be implemented to provide sufficient bike parking for all bike commuters to



park their bicycles at the same time, plus additional capacity for visitors. Long-term bicycle parking should be covered and secure (with limited access) and is most appropriate for Campus residents. These should be located primarily at residence halls.

***Impact on travel behavior*** - Providing quality and sufficient bicycle and pedestrian facilities is an important way to encourage the use of alternative modes to driving to and through campus. In addition to distance from campus, a lack of comfortable walkways and bikeways is one of the most significant barriers to increasing pedestrian and bicycle mode share to campus. These facilities also promote transit use by providing important connections to bus stops, and reducing the first/last mile challenge. Providing a safe and comfortable place to walk and bicycle is a powerful tool for UNC to manage demand and provide a message to students, faculty, and staff that they support and promote biking, walking, and transit. Paths, sidewalks, bike lanes, and bike parking all lower the barriers to biking, walking, and transit by making these modes safer, more comfortable, and more convenient. Additionally, improved bicycle facilities can help existing programs, such as the Blue Cruiser bike share, to become more accessible.

### *Transit*

Greeley-Evans Transit (GET) currently operates seven routes in Greeley. One of those routes, the Boomerang, serves as a campus shuttle for UNC. The three TDM strategies in this section address opportunities for improving the Boomerang shuttle.

#### *Redesign the Boomerang Route*

The Boomerang currently travels in a one-direction, figure-eight loop with three stops—the Michener Library, Gunther Hall, and Nottingham Field. It takes the Boomerang 10 minutes to travel between Michener Library and Gunther Hall. The stops are spread far apart and do not provide convenient and immediate walking access to a large number of destinations on campus. Given that students only have 15 minutes between classes, the walking distance to and from the bus stop plus the 10-minute travel time makes it challenging for students to use the Boomerang to travel between classes.

Further study should be done to determine a recommended route for the Boomerang shuttle. Considerations to inform a recommended route should include: key destinations that need access, percent of campus within less than a five-minute walk from a transit stop, travel time between stops, frequency necessary to provide access to key destinations within the designated time between classes, and other special interest groups with specific transit needs. For example, feedback heard at the focus groups identified that music school students carrying large instruments require convenient access to transit.

As a part of the evaluation for a new route, a transition from one campus shuttle route to two routes should also be considered. Having multiple routes may provide the most optimal opportunity for increasing transit coverage while reducing in-vehicle travel time.

***Impact on travel behavior*** - By increasing the number of potential transit riders within a short walk (less than five minutes) to transit and decreasing in-vehicle travel time, transit will become a more feasible option and increase the number of transportation options for students, faculty, and staff. These recommended changes provide an alternative to driving that is cost-and time-competitive. Creating a transit system that is convenient for users could influence the purchase of parking permits and decrease the rate of driving between classes. This recommendation is also an important complement to recommendations for changes to the parking permit structure. Ultimately, a more reliable and convenient transit system could decrease driving to and within campus and decrease or shift the demand for parking.

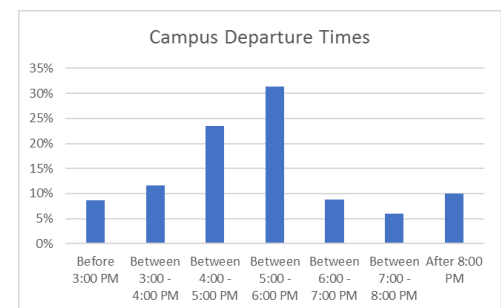
#### *Increase Transit Frequency*

The current headway of the Boomerang during peak times is 10 minutes on Tuesdays and Thursdays; seven minutes on Mondays, Wednesdays, and Fridays; and 20 minutes during off-peak times. Given the current relative ease of driving, it is important that transit users have a minimal wait time to consider transit as a viable and competitive transportation alternative. Students should be able to feasibly use the bus to travel between classes within the 15 minutes allotted. Further study should be performed to determine the increased ridership forecasts and costs of increasing the frequency of the Boomerang during both the peak and off-peak times.

***Impact on travel behavior*** - Like the benefits of rerouting transit, increasing the frequency of transit service allows transit to be a viable alternative to driving. Increased frequency will provide a service that can become more convenient than driving by allowing students to reliably use transit to travel between classes. By enhancing the transit system within campus, this will specifically reduce the demand for parking for those driving and re-parking within campus during the day. This creates additional congestion, potential conflicts, and uneven and unpredictable parking demand. Reducing intra-campus driving trips simplifies parking and allows for the implementation of changes to the parking permit structure.

#### *Extend Service Hours*

The Boomerang operates from 7:42AM to 2:32PM on Tuesdays and Thursday and from 7:45AM to 3:39PM on Mondays, Wednesdays, and Fridays. However, a survey completed in Spring 2018 (results shown in **Figure 1**) revealed that the majority of students leave campus after 4:00PM. For transit to be a viable option for most users, it needs to more comprehensively serve the needs of its users. The service hours of the





Boomerang should be extended to capture more users, such as students with jobs on campus, faculty and staff, events on campus, music students' rehearsal, etc. Further study should be done to determine the most effective service hours as well as the frequency of the Boomerang during extended service hours. This study could also consider the feasibility and cost-effectiveness of on-demand transportation service during off-peak hours.

**Impact on Travel Behavior** - This expansion of transit service hours will allow for more flexibility in one's schedule, making the convenience and reliability of alternative modes more competitive with driving. In extending the service hours, the need for afternoon intra-campus vehicle trips will be reduced as transit becomes a reliable option for returning to one's parked car later in the day. The demand for transit service at different hours should be studied as changes in the parking permit structure are implemented.

### *Bike Share Improvements*

The Blue Cruiser bike program is a free Campus bike rental program provided by Campus Recreation. The goal of the program is "to offer an affordable and environmentally-sustainable form of transportation to students. [The program] strives to provide an alternative to driving and promote bear pride on campus" (UNC website).

The recommendations to further the effectiveness of the program are threefold: increase marketing, offer a more diverse fleet of bikes and accessories, and lengthen bike rental periods.

Increased marketing includes spreading the word and enthusiasm surrounding the program. This can include posters and flyers on how easy it is to rent a bike, bike rental pop-up stations at key destinations, improving the visibility of the program, and making it convenient to test out a bike and enroll. These strategies could be particularly effective at the beginning of each semester as students explore their transportation options.

Apart from the campus recreation mountain bike rentals, the Blue Cruiser bike fleet consists of 100 standard cruiser bikes with a lock, helmet, and front basket option. Options such as panniers or a cargo trailer could be added as rental options. Additionally, the option to add lights could be an important step for improving the safety for those planning to ride at night. Introducing an additional type of bike could reach a broader audience of user types, as different bike styles are more comfortable or familiar for different riders.

The average rental length currently is seven days, hitting the maximum number of allowable days. A longer rental period will improve the program's flexibility and increase overall access to bikes, assuming an adequate fleet size for the demand. One of the notable barriers to the bike share system is the perceived hassle and uncertainty in renting and



returning the bikes. Changing the options for rental terms, or potentially introducing a month- or semester-long rental program could expand the reach of the program.

A long-term recommendation would be to consider a third-generation docked or dockless bike share system that does not require bikes to be checked out through a person but is information technology-based.

**Impact on Travel Behavior-** Creating a culture where bicycling is safe, convenient, and comfortable can help manage demand for car use and parking on campus. Providing a high-quality, reliable bike share program is an important way to introduce people to alternative transportation options on campus and shift culture.

### *Partnerships and Incentives*

This section contains recommendations on providing incentives to encourage non-single-occupant vehicle trips, and potential partnerships with vendors that increase the transportation options on campus to include car share, carpooling, and ride hailing.

### Car Share

The recommendation for implementing a car share program as a TDM strategy is three-part with synergistic benefits. The first part of the recommendation is to create a partnership with a car share provider. There are multiple car share providers, such as Enterprise Car Share, Zipcar, or Car2Go that have different models for pricing structures, parking requirements, and setting geographic constraints. In creating a partnership, UNC and the provider can work together to customize a program most appropriate for the campus and potential users.

The second piece of this recommendation is to provide preferential and reserved parking for the car share vehicles. This could be spread out over multiple parking lots or more consolidated. Zipcar and Enterprise Car Share use designated pick up/drop off parking spaces while Car2Go allows pick up/drop off at any available public parking space within the defined operating area.

The final recommendation within this strategy is to provide discounted memberships or driving credits as incentives to students, faculty, and staff who do not purchase a parking permit.

**Impact on travel behavior -** The shared vehicle model helps optimize existing parking spaces because more users can share the same space. Priority and guaranteed parking spots for car share vehicles can help incentivize the use of these vehicles over privately-owned vehicles by adding convenience and assurance for the start and end of trips.

Car share reduces the need for people to bring their cars to Campus. Car share could reduce demand for parking on Campus by making it possible for those who need a car during the day to commute to Campus via an alternative mode. Car share can also serve students, faculty, or staff who



live off Campus and already walk, bike, or take transit to school or work, but occasionally need a car during their time on Campus or for trips to and from Campus during the work day. Another category of people that car share could cater to is students who live on Campus and only need a car occasionally, or occasionally need a certain type of vehicle for a trip (for instance, an all-wheel drive vehicle). If car share was a reliable option, the need to bring a vehicle to Campus would decrease and thus demand for parking would be reduced.

#### Carpool Matching Providers

Carpool matching providers formalize carpooling, typically for longer, regularly-occurring trips, through a mobile app platform. People who commute from further away in Greeley or from other cities such as Fort Collins are ideal candidates for participating in carpooling and could benefit from having an app that connects them to other users with similar origins/destinations and departure times. UNC should partner with a carpool app provider to provide this service. To most effectively implement and see the benefits of this partnership, UNC should market this service and incorporate it into educational material, commute incentives, and other transportation-related programs. The benefits of partnering with a provider is that most apps can coordinate payments to split fuel costs and can provide a communication platform to maximize potential matches and improve reliability. Waze Carpool is emerging as a reliable matching provider and there are a multitude of other providers that serve specific locations or demographics. This TDM strategy pairs well with preferential parking for carpoolers to further incentivize carpooling.

**Impact on travel behavior** - When people share rides, they optimize transportation resources by increasing vehicle occupancy and decreasing parking demand. This helps relieve congestion, reduce overall vehicle miles traveled, and reduce the demand for parking.

#### Ride Hailing

UNC can partner with a ride hailing provider, such as Uber or Lyft. This public/private partnership can take on various operational models and pricing structures. These can include discounts for faculty/staff when doing work-related trips during the day, late-night service after Greeley-Evans Transit (GET) service hours, or providing access to regional transit (first/last mile solutions). Pricing structures can vary to include partial or full subsidies or only marketing and educational information without financial investment from UNC.

**Impact on travel behavior** - Having a partnership with ride hailing providers will expand transportation options for students, faculty, and staff. By having access to a vehicle at a small fee, students, faculty, and staff may feel less reliant on their personal vehicle, which may influence their decision to purchase a parking permit. To provide viable alternatives to driving alone, it is important to have consistent



transportation services available. Ride hailing providers can also provide on-demand service that serves as a more cost-effective option to supplement GET when demand is lower, such as evenings and weekends, or operate as Guaranteed Ride Home provider.

### *Class Scheduling*

The scheduling of classes, what days in the week they occur, when in the day they occur, and the allowed time between classes has tremendous impact on the UNC's Transportation and Parking infrastructure. Currently, 10:00AM on Tuesday and Thursdays are the busiest times on Campus.

Scheduling classes sensitive to parking capacities overall would minimize the need for large capital investment in parking facilities. Better distributing classes throughout the week and during the day would minimize peaking characteristics and extend the effective capacity of the parking resources and academic facilities.

Extending the time between class would allow students and faculty more time to move between classes and would allow the current walking and bicycling infrastructure and transit services to be more effective mobility partners.

***Impact on travel behavior*** - The time that people arrive to campus and circulate around campus is determined by the University's class schedule. Deliberate scheduling of classes sensitive to parking and transportation resources has the greatest potential in changing the demand of UNC's existing and future parking and transportation infrastructure.

## Recommendations and Action Plan

Stemming from the existing conditions assessments and campus development scenarios, this section provides recommendations and considerations aimed at aligning the current and future operations and management of transportation and parking with the vision and goals for the UNC Campus. The recommended approach integrates the components from Scenario 3 and Scenario 5. Specific initiatives and recommendations presented in this section are separated as follows:

- **Immediate Recommendations** should be implemented within one to two years to provide a foundation for future success.
- **Near-Term Recommendations** are to be implemented in the coming three to five years to address acute transportation and parking challenges.
- **Longer-Term Strategies** deserve additional cross-functional evaluation and review before being considered for implementation.

Transportation, Parking, and Circulation Actions Plan	
Immediate Recommendations (One-Two Years)	
1) Design and Construct a surface parking lot on the open space north of McKee Hall and Southwest of the N Lot.	
2) Restructure Parking Permit Allocation	
- Tie permits to specific parking lots (resident students)	
- Provide a hierarchy of permit prices by convenience	
3) Reevaluate the Boomerang Shuttle Service	
- Possible rerouting, increased frequencies, and extended operations	
4) Update UNC's Parking Wayfinding Program	
5) Evaluate the Feasibility Adjusting UNC's Class Scheduling to Support Transportation and Parking Facility Utilization	
Near-Term Recommendations (Three-Five Years)	
1) Conduct a Campus Walking and Bicycling Audit	
- Intersection safety assessment	
- Crime Prevention through Environmental Design Assessment (CPTED)	
2) Investigate Shared Mobility Opportunities	
- Establish car pool priority parking program	
- Investigate ride hailing partnership	
- Car share partnership	
- Bike share partnership	
3) Evaluate UNC's Permitting Software for More Dynamic Management Techniques	
Longer-Term Strategies (Five+ Years)	
1) Additional parking supply through the development of a parking garage on C lot	
2) Reevaluate parking utilization and update Master Plan	

### *Immediate Recommendations (One to Two Years)*

The following recommendations address UNC's immediate transportation and parking challenges created by UNC's continued enrollment growth, growth in activities at the University Center, constructing the Campus Commons (Spring 2019), and opening the College of Osteopathic Medicine. Specific recommended actions over the next two years include:

- 1) *Construct Additional Parking* – An immediate recommendation is for UNC to advance the design and construction of a surface parking lot on the open space north of McKee Hall and southwest of the N Lot. Scenario 5 evaluated a 100-space parking lot; however, the final number of spaces should be between 50 and 100 spaces as deemed appropriate in the facility design. These additional spaces would benefit UNC in two areas:
  - a. This project, once completed, would provide immediate parking support for the anticipated larger events at the Campus Commons and University Center
  - b. This investment would minimize the parking impacts associated with UNC's planned growth prior to UNC implementing the recommended restructured parking permit program.
- 2) *Restructured Parking Permit Allocation* – To alleviate parking facilities and roadways congestion, reallocating permits in a manner that reduces time spent hunting for available spaces between classes will aid in balancing the demand for parking resources throughout campus, encourage use of alternative travel modes to campus commuters, and allow existing parking facilities to operate at a more effective level before frustration over locating available spaces is experienced.
  - a. Specific consideration should be given to restricting on-campus residents to park at assigned residential parking facilities only. On-campus residents are best suited to utilize alternative modes of travel to circulate around campus.
  - b. Permits for the remaining commuter parking lots on Campus should be priced based on a tiered level of convenience. Differences in price between tiers should be significant (between 10% and 30%) to influence parking demand. The Victoria Transport Policy Institute identified parking pricing has a 10-30% impact on parking utilization. ([VTPI, 2018](#))
- 3) *Reevaluate the Boomerang Shuttle Service* – To help restructure parking permits, evaluating the routing and timing of the Boomerang to increase service efficiency should be a priority within the first two years.



- a. Improvements to the Boomerang Shuttle Service should influence parking behavior and support the restructuring of parking permits by increasing the use of remote parking areas on Campus.
  - b. Routing the shuttle to better connect parking facilities with stops that conveniently serve academic buildings in the northern part of campus and the Campus Commons.
- 4) *Update UNC's Parking Wayfinding Program* – Updating the campus parking wayfinding and sign program will benefit UNC, its visitors, faculty, staff, and students. The parking wayfinding signage is likely the first visual representation of UNC visitors encounter. The updated parking wayfinding program should be implemented concurrently with a restructure to the parking permit allocation. A simplified parking facility nomenclature tied to the parking permit allocation will assist in alleviating congestion in and around Campus parking facilities and roadways. Simple, consistent, and clear vehicular and pedestrian directional information to the campus and within the campus will enhance the on-campus parking experience.
- 5) *Evaluate the Feasibility of Adjusting UNC's Class Scheduling to Support Transportation and Parking Facility Utilization* – The most powerful TDM tool available to UNC to redistributing parking demand is rescheduling classes to better match parking capacity. Current class scheduling generates a Tuesday and Thursday, 10:00 am peak hour (60% utilization) parking demand. Furthermore, parking utilization exceeds 50% between the hours 8:30 am and 12:30 pm on Tuesdays and Thursdays. On Monday, Wednesday, and Fridays, the peak hour parking utilization (56%) occurs at 2:00 pm. Utilization exceeds 50% on Monday, Wednesday, and Friday at 11:00 am and between 1:30 and 2:30 pm.

It is recommended that the University Administration work with Faculty and Facility Management to evaluate the feasibility of rescheduling classes more evenly throughout the day and days of the week to reduce parking demand. Additionally, the administration should evaluate the feasibility of extending the time between classes to allow walking and transit to be more viable mobility choices in circulating throughout campus

#### *Near-Term Recommendations (Three to Five Years)*

The following recommendations address UNC's near-term transportation and parking challenges created by constructing Campus Commons and the planned future Campus programming. To continue supporting growth demands related to the Campus Commons, opening the Osteopathic Medical School, and the projected increase in student

population, the following are recommended actions over the next three to five years:

- 1) *Conduct a Campus Walking and Bicycling Audit* – Extending pedestrian reach can be a powerful parking management tool. While crash data can provide information on reported vehicle and pedestrian conflicts, a walking audit can help identify unreported environmental concerns that negatively impact the pedestrian and cyclist experience and reduce the use of alternative modes of transportation.
  - a. *Intersection Safety Assessment.* Often complementing walking and bicycling audits, an intersection safety assessment identifies safety issues in the walking and biking environment. Traditionally, intersection safety assessments use historical collision records; however, vague and inaccurate collision data and infrequent collision occurrence highlighted the need for more proactive techniques to evaluate conflict points at each intersection. These intersection safety assessments are an important part of the bicycle and pedestrian audits.
  - b. *CPTED.* In addition to the safety assessments naturally associated with bicycle and pedestrian audits, UNC should also assess the Campus’ walking and bicycling environments from a user’s personal security perspective. Numerous comments documented through the master planning process highlighted concerns associated with walking and bicycling on campus at night. Assessing and improving the campus from a CPTED perspective will increase the number of students, staff, and faculty walking and bicycling throughout campus.
- 2) *Investigate Shared Mobility Opportunities* – Shared mobility reduces parking demand by reducing instances in which individuals use their single-occupant vehicle.
  - a. Convenience to the drivers’ destination was both observed and reported by Campus parking and transportation users as a main priority. By providing spaces in premium locations for the exclusive use of those participating in a registered and otherwise UNC-approved carpool program, participants are provided improved access to the space(s) they desire and at a reduced cost per person.
  - b. A potential ride hailing partnership with a transportation network company such Uber or Lyft, can provide coverage in first/last mile connections for commuting students, faculty, staff, and visitors who wish to use public transportation to access campus, but do not have

convenient means of connecting to existing transit services.

- c. Car share services, such as Enterprise Care Share provided at the University of Denver, Zipcar! found at Colorado State University, or eGo at the University of Colorado Boulder Campus, provide commuters with the ease of mind that they can come and go should need arise will likely increase transit ridership and reduce on-campus parking demand. Care share also provides a convenient, and often more cost-effective, option for those who choose to be without a personal vehicle, while not inhibiting their ability to run errands around town, visit home, or get away for the weekend.
- d. Bike share provides students, faculty, and staff an efficient and fun option to move throughout campus. With docks located throughout the City, or by using dockless bikeshare, an individual's mobility is extended to short commutes for both commuters and student residents who may work off campus. An emerging and popular trend, like dockless bike shares, is the dockless, shared electric scooter. For many communities e-scooters entered the market unexpectedly and without sufficient supplies to meet demand. While early attempts to introduce this particular mode of transportation struggled, areas such as Portland have seen early success in pilot programs where communities work directly with providers.

- 3) *Evaluate UNC's Permitting Software for More Dynamic Management Techniques* – Upgrading UNC's parking access and revenue control software (PARCS) to a platform that enables Parking Services to track metrics such as user type and actual permit usage, will inform future decisions on how to most efficiently allocate parking supplies, price daily and permitted parking, and contribute to demand-based pricing and other data-driven parking and TDM strategies.

#### *Longer-Term Strategies*

- 1) *Additional Parking Supply* – As the Campus continues to grow in population and with potential increases in the frequency and size of events held at the Campus Commons and University Center, developing the C Lot to structured parking should be considered.
  - a. As peak hour occupancies on Campus reach 85% utilized and the impacts of increased investment in TDM plateau, developing additional parking supplies may be necessary to accommodate future parking demands on campus. Investing in a 699-space parking structure estimated at over \$16.7 million, or roughly \$55,920 per added space

to the C Lot, it is recommended that this strategy be considered only after the above recommendations have been implemented, their impacts realized, and the overall campus utilization remains above 85% occupied during peak periods.

- b. Location of additional parking supplies should consider the potential reach of the supply in terms of land uses. This can be accomplished both in its proximity to demand generating land uses and/or through connecting the shuttle service. Due to its central location and immediate access to what is anticipated to be a high parking demand generating land use, Campus Commons, the C Lot should be prioritized for consideration, assuming all other Campus characteristics remain constant.

- 2) *Reevaluate Parking Utilization and Update Master Plan* – Parking behaviors will adapt as strategies are implemented and UNC continues to grow and develop. Emerging technologies will change the way commuters access and travel throughout the Campus. Five years may not seem like a significant period of time; however, as demonstrated by the rapid adoption rates of Uber, Lyft, and the shared economy, travel preferences can change quickly. Evaluating the Master Plan impacts on Campus parking, transportation, and circulation should be conducted to inform updates to the Master Plan.

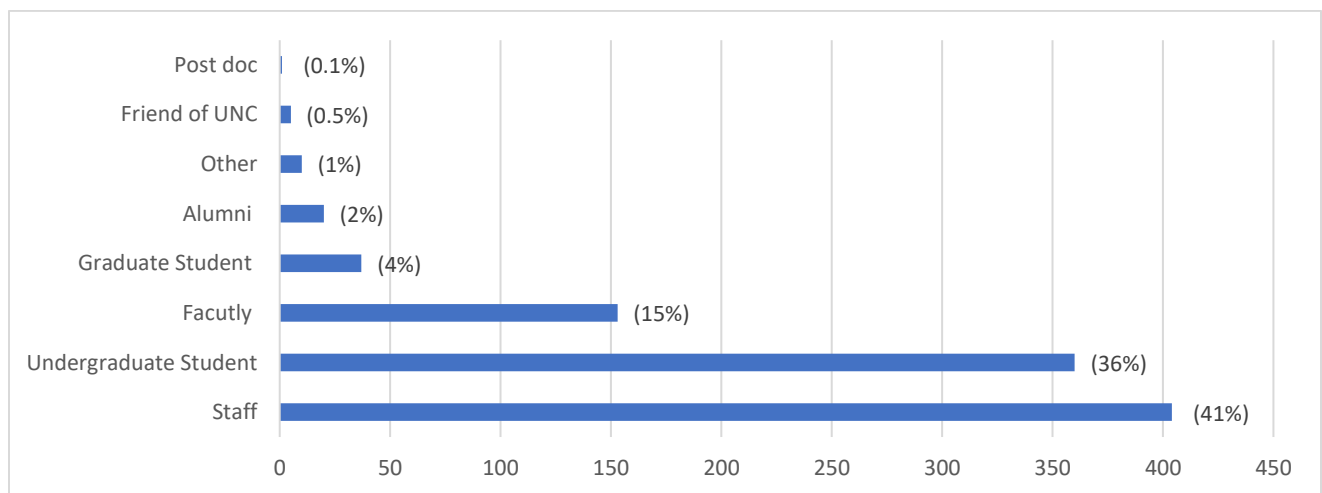
## Appendix A – Campus Survey Results

### Online Survey Findings

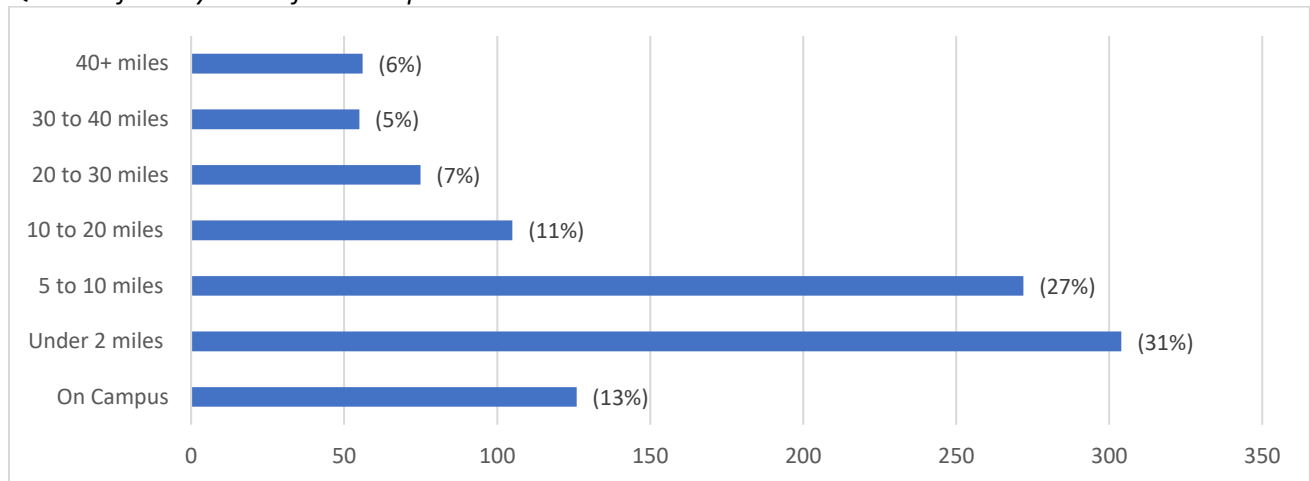
998 students, faculty, and staff participated in an online survey. The online survey was open for approximately three weeks in March 2018.

The survey was designed to assess parking related to UNC's Transportation, Parking, and Circulation Master Plan. This survey was promoted through email, social media, stakeholder meetings, and via flyer/handout. The online survey covered a range of topics, including respondent demographics, commuter behavior, and respondent preferences. Survey results are shown on the following pages:

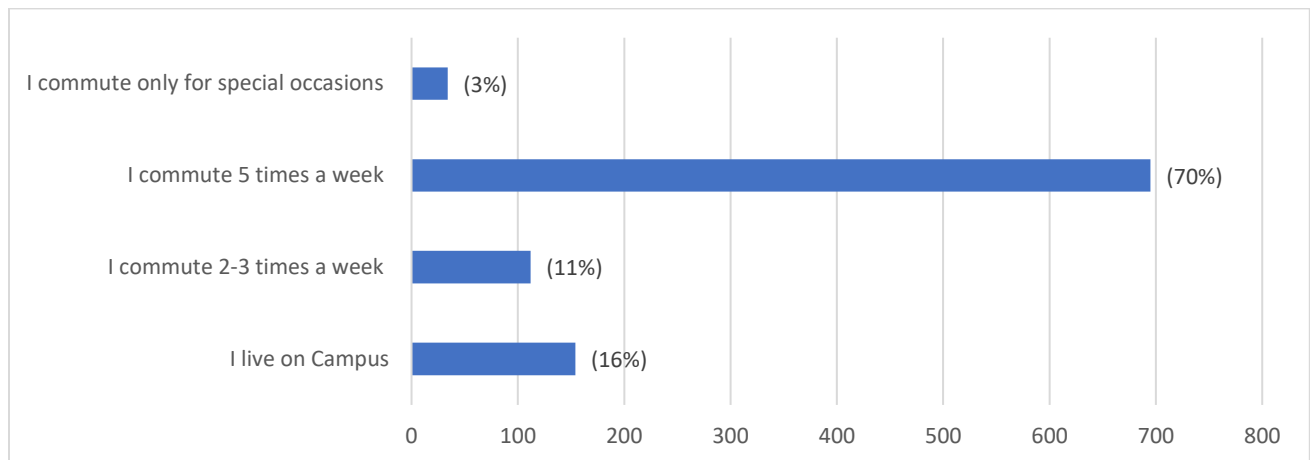
*Q1: What is your current affiliation with the University of Northern Colorado?*



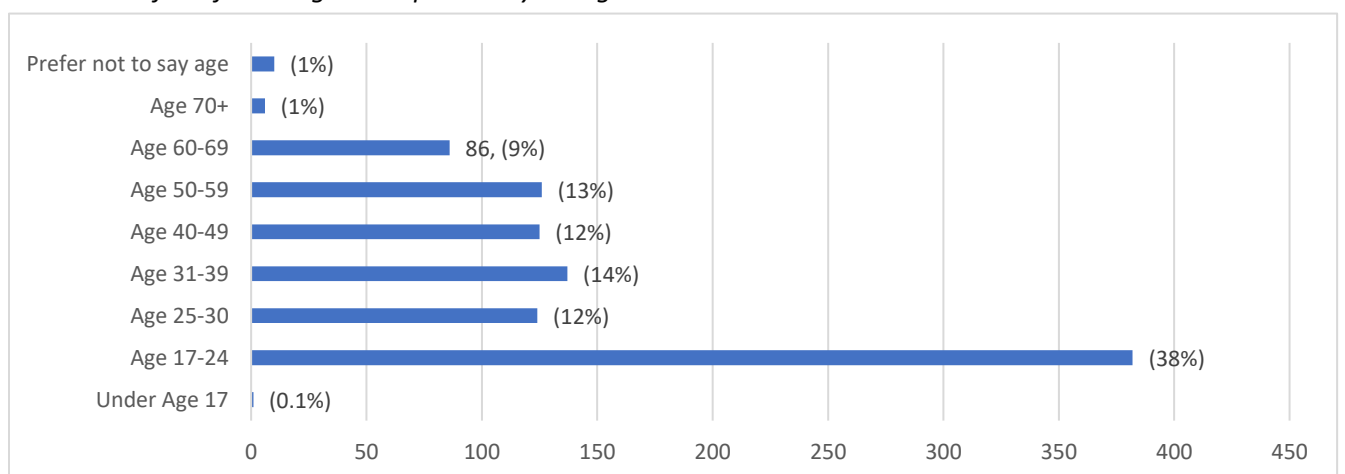
**Q2: How far do you live from campus?**



**Q3: Please select the answer that most accurately describes you:**

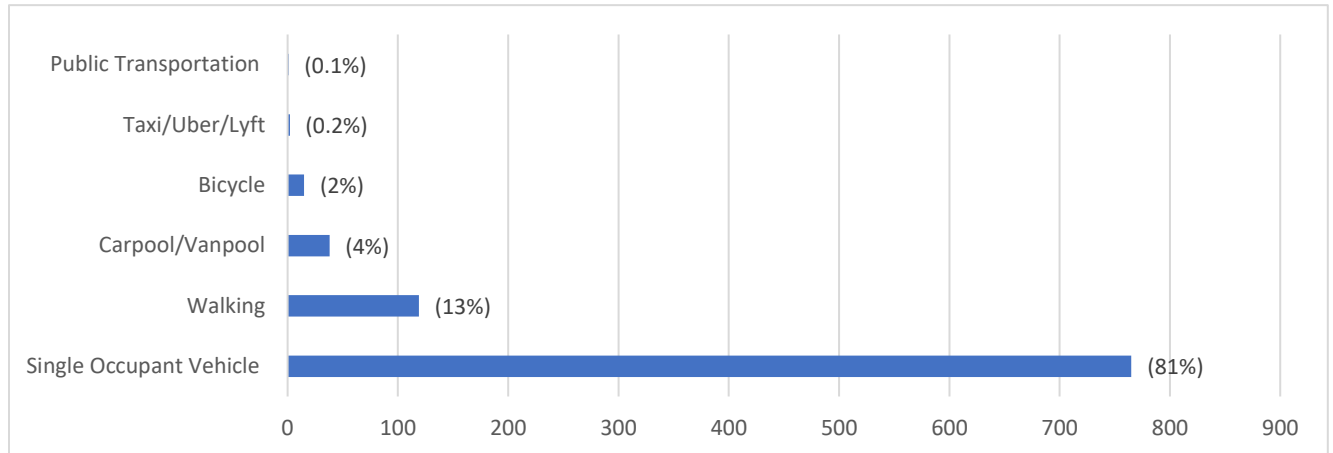


**Q4: Which of the following best represents your age?**

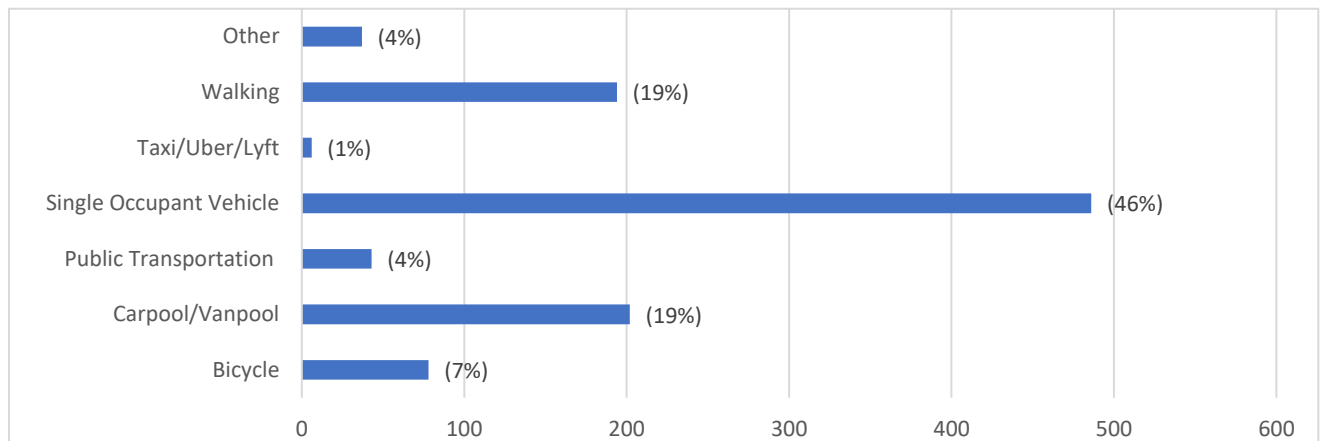




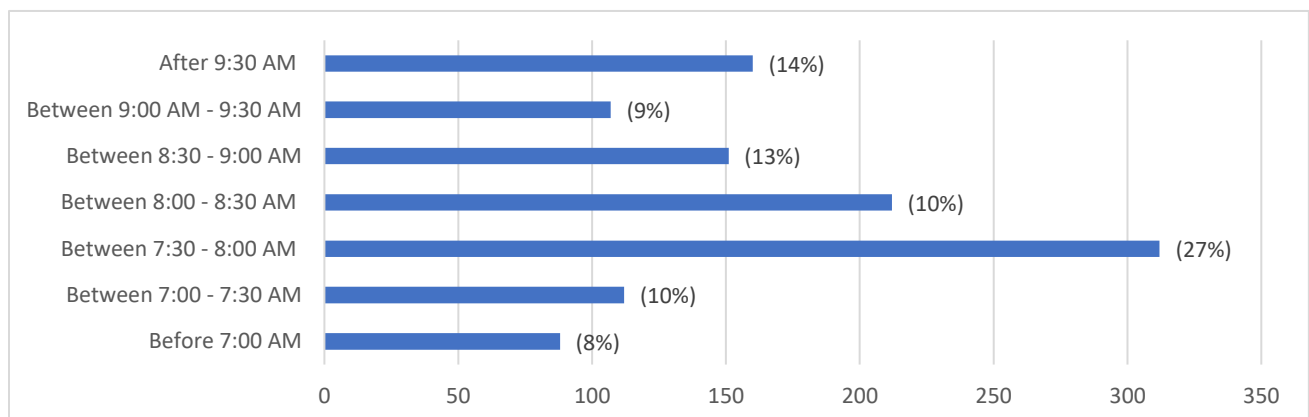
**Q5: What is your primary, or most frequently used, mode of transportation to reach campus?**



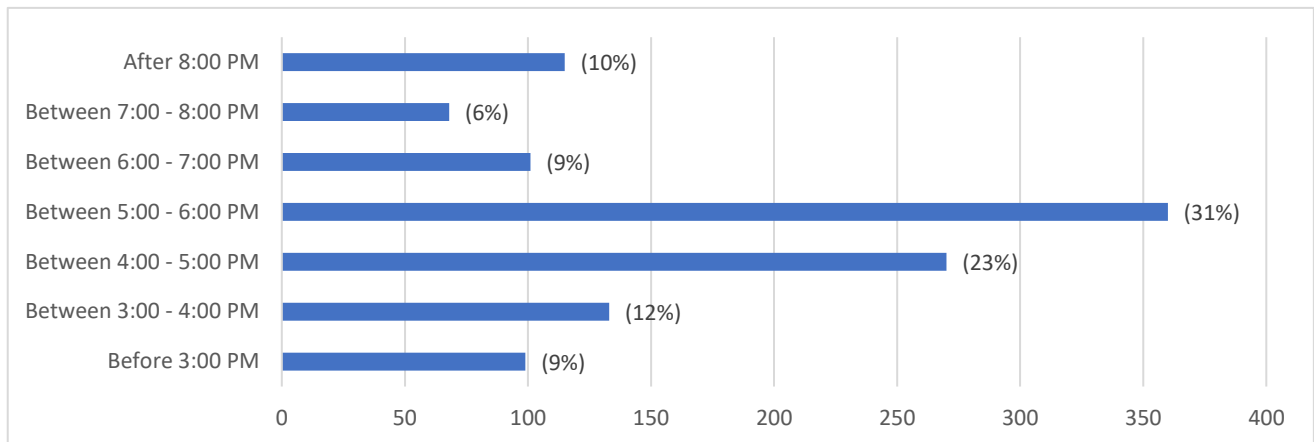
**Q6: What secondary mode(s) of transportation do you use to commute to and from campus?**



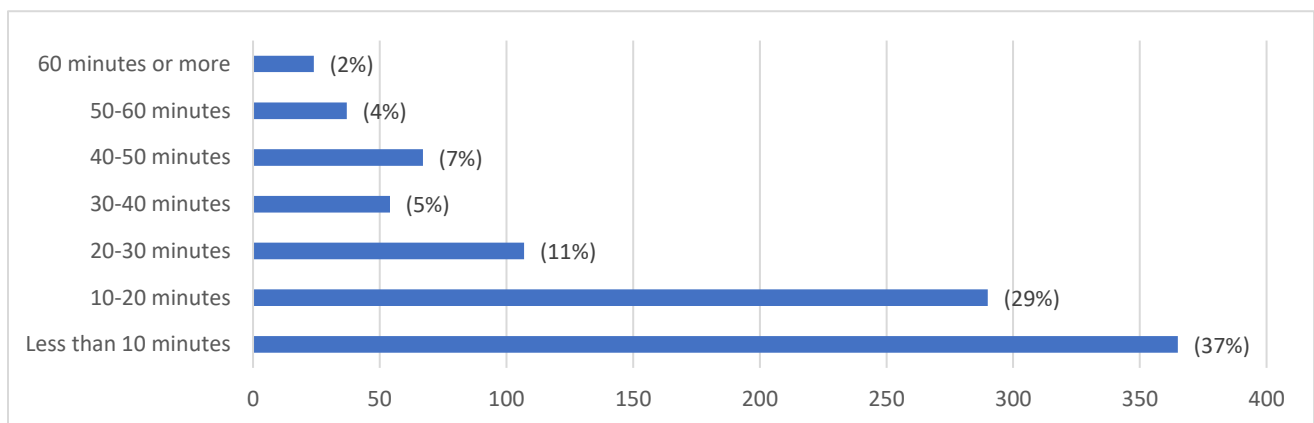
**Q7: What time do you usually arrive on campus in the morning?**



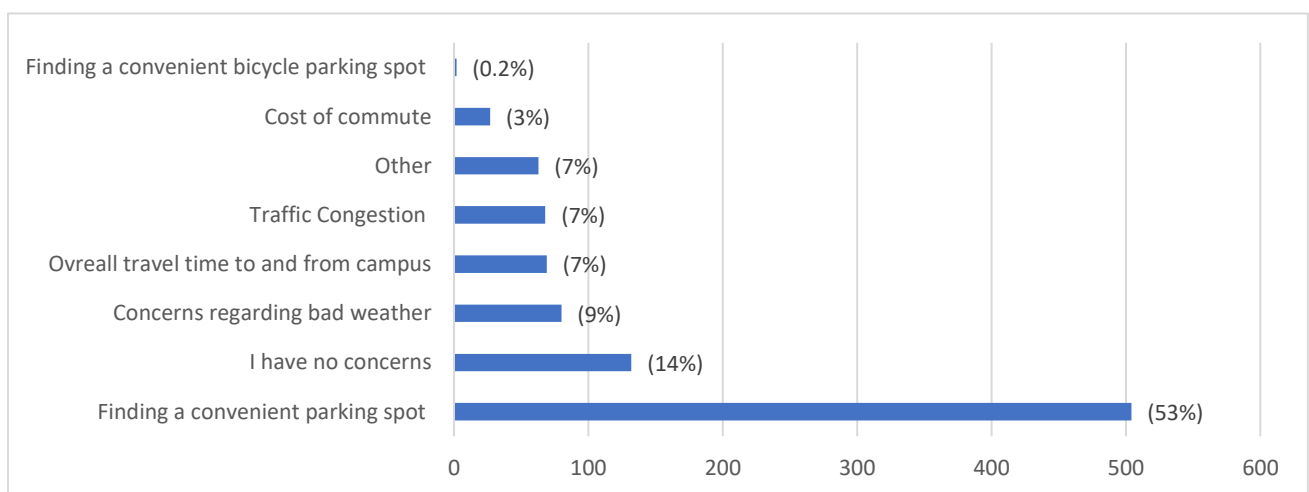
**Q8: What time do you usually leave campus in the afternoon/evening?**



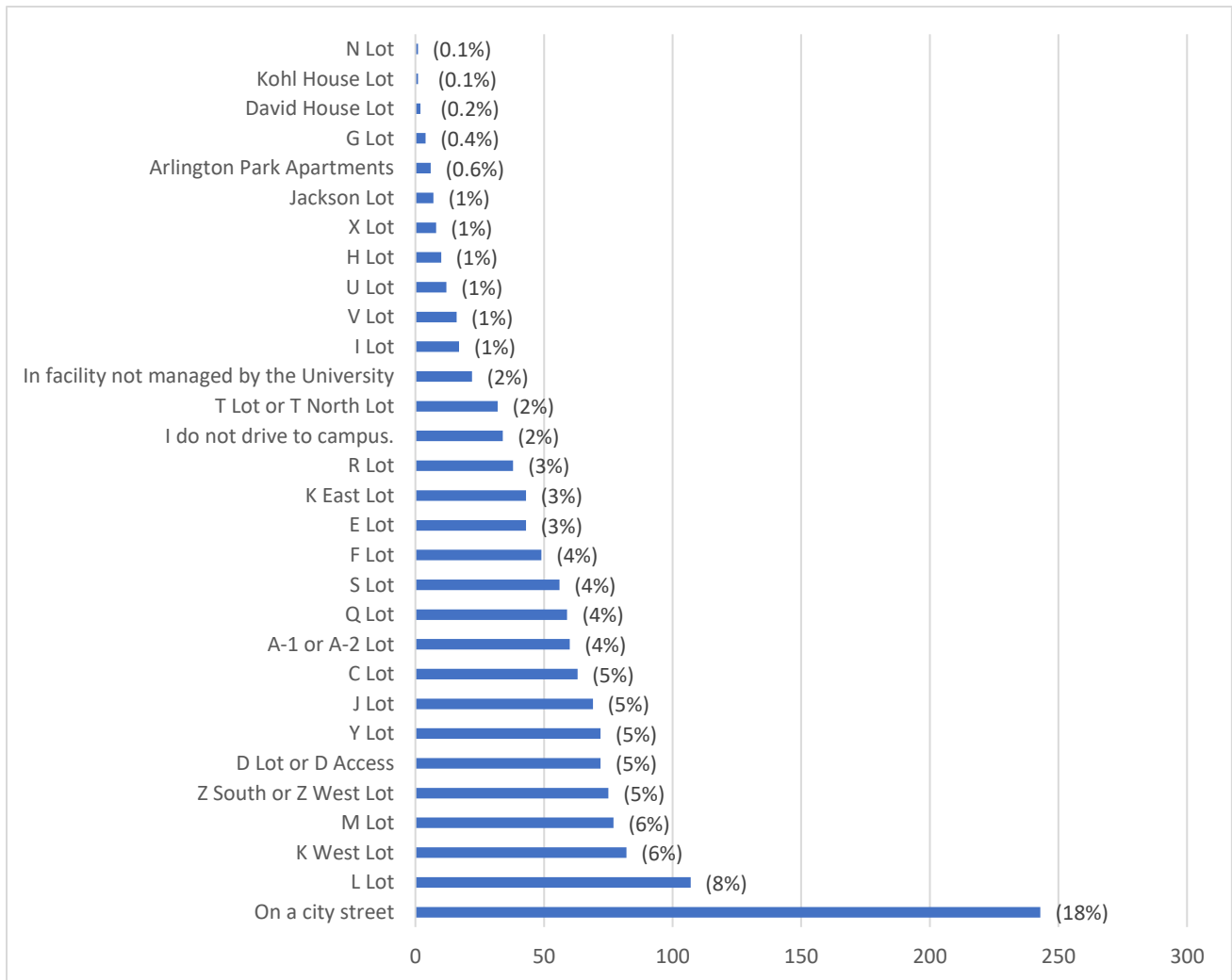
**Q9: How long does your typical, one-way commute take TO campus?**



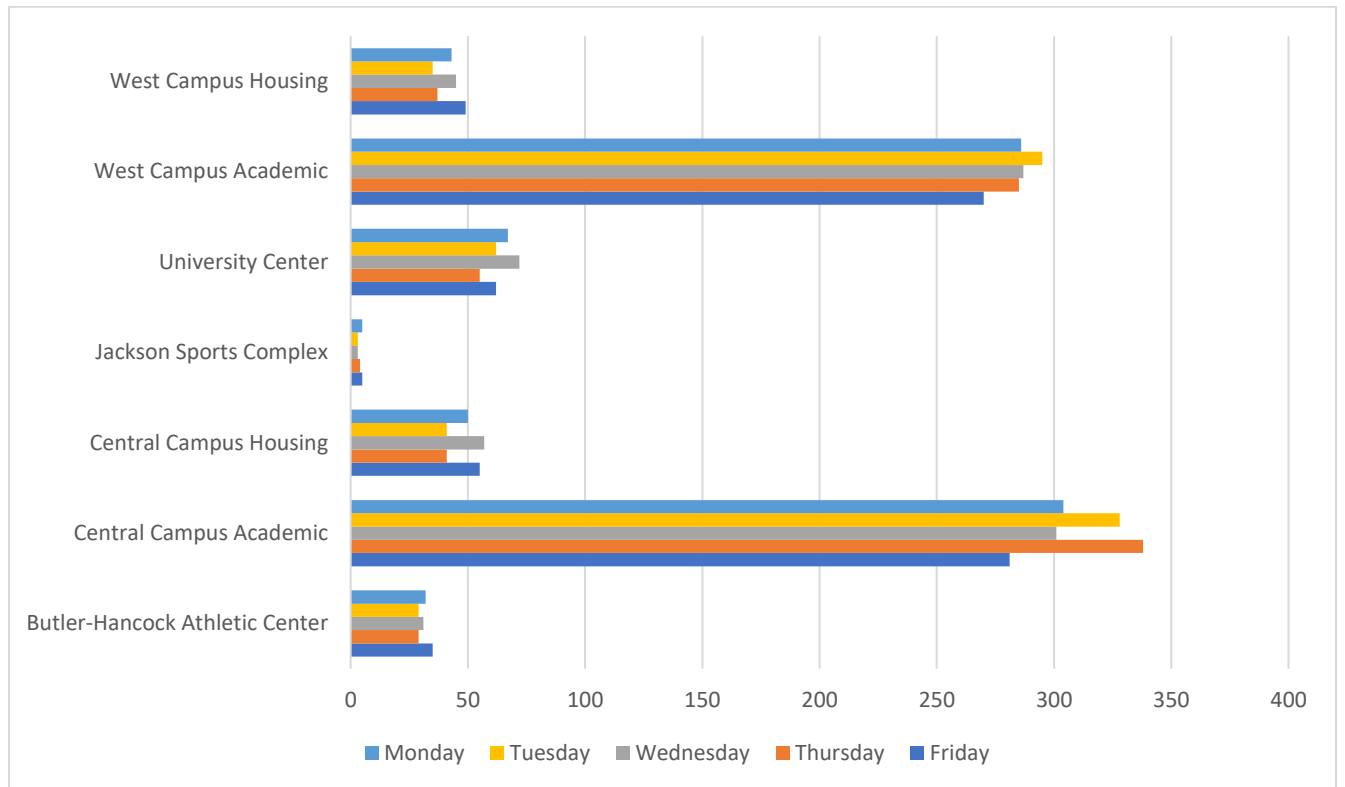
**Q10: What concerns you the most about your current commute?**



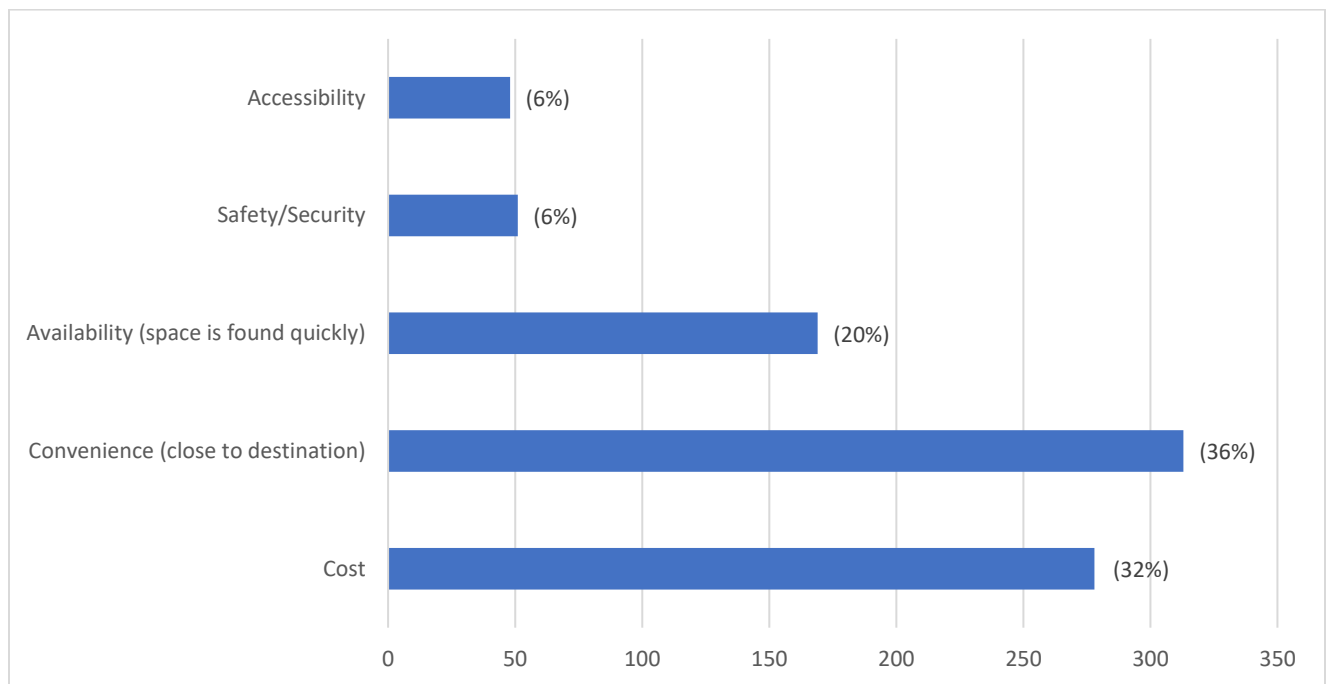
*Q11: When you drive to campus, where do you typically park?*



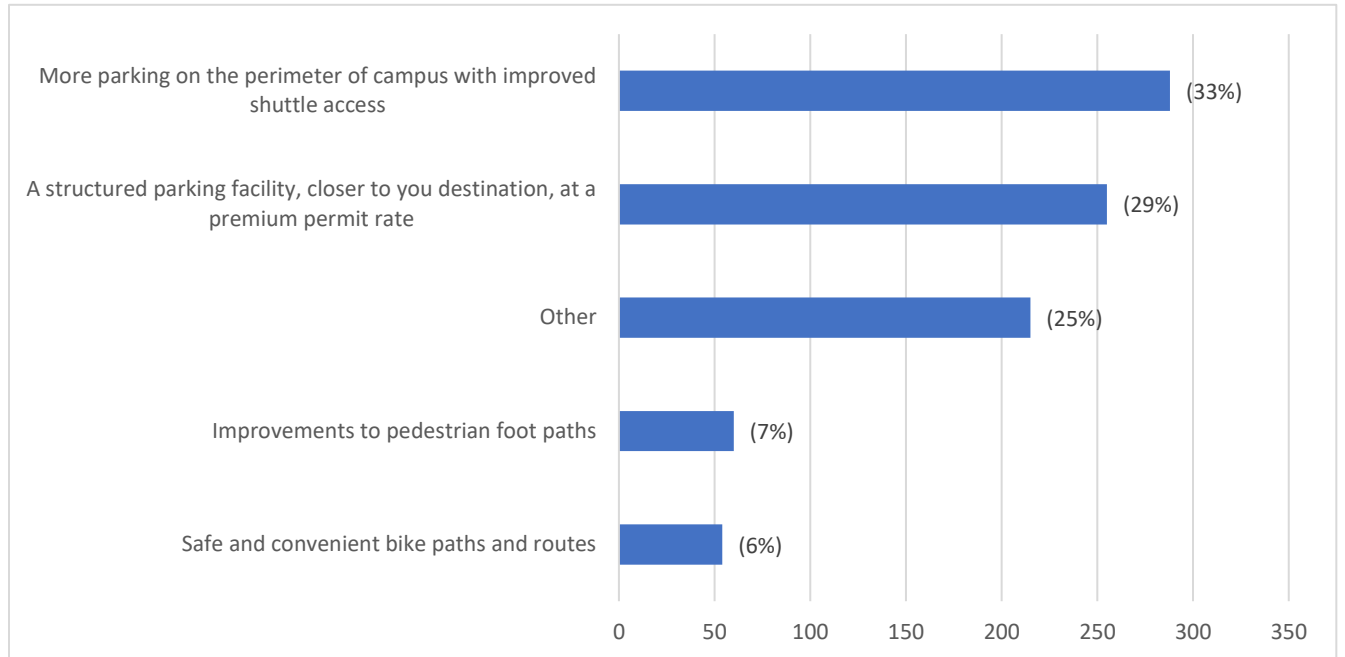
*Q12: What part of campus do you spend most of your time?*



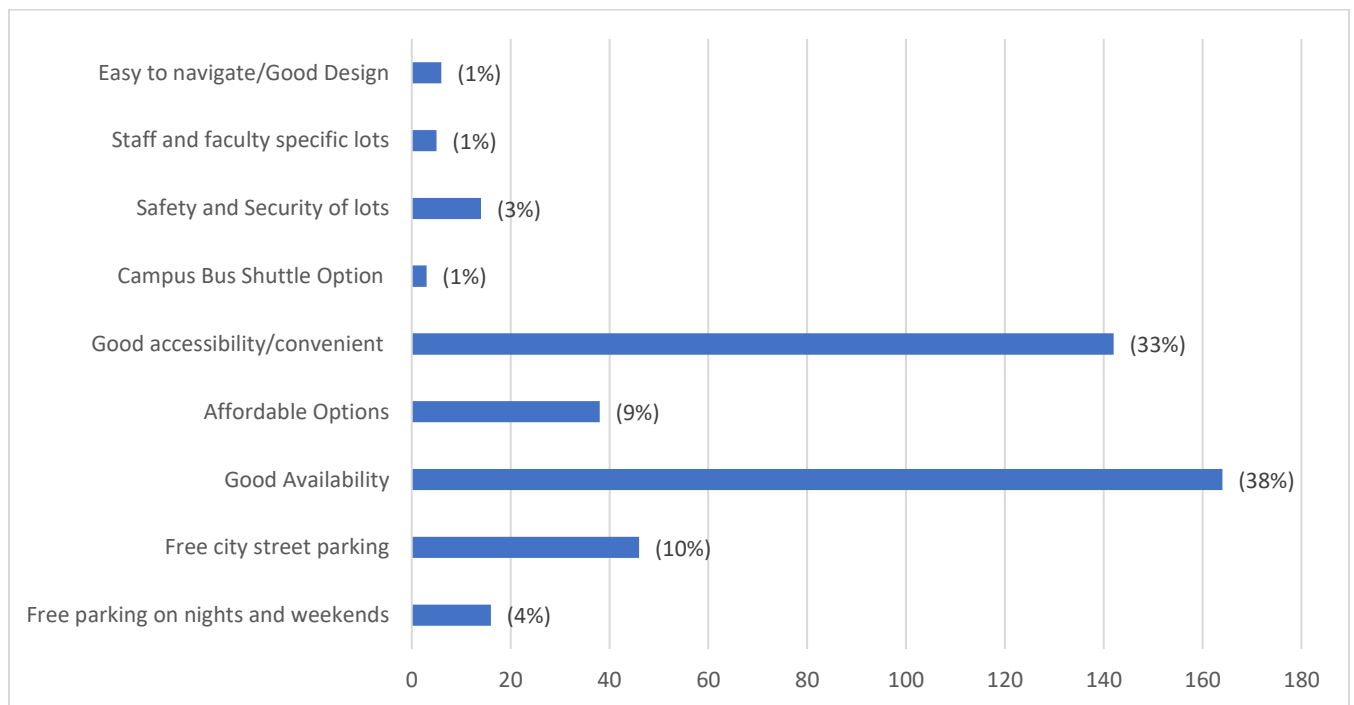
*Q13: When choosing a parking option, which of the following is the most important to you?*



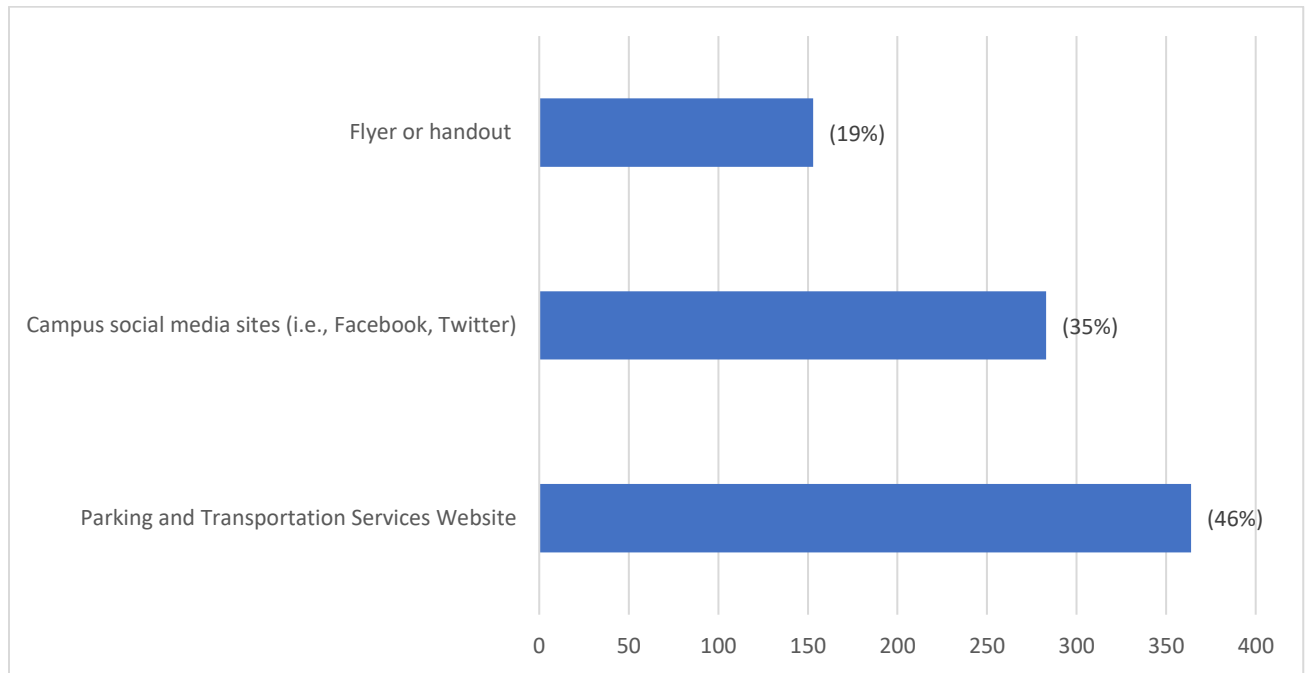
**Q14: Please indicate the alternatives in which you would like to see at UNC?**



**Q15: What do you like most about the current parking at UNC?**



*Q16: Please indicate your preferred method(s) of accessing information and news regarding parking and transportation at the University of Northern Colorado campus. Please select all that apply.*





## Appendix B – LPR Parking Survey

Name	Capacity	10 AM Count	10 AM Occupancy
10th Avenue NB 16th-17th	14	14	100%
10th Avenue NB 17th-18th	28	13	46%
10th Avenue NB 18th-Crandford	34	18	53%
10th Avenue NB 19th-20th	28	17	60%
10th Avenue NB 20th-21st	22	21	95%
10th Avenue NB 21st-22nd	14	13	93%
10th Avenue NB 22nd-23rd	20	20	100%
10th Avenue NB Cranford-19th	28	17	60%
10th Avenue SB 16th-17th	13	13	100%
10th Avenue SB 17th-18th	16	16	100%
10th Avenue SB 18th-Crandford	12	11	92%
10th Avenue SB 19th-20th	10	6	60%
10th Avenue SB 20th-21st	21	21	100%
10th Avenue SB 22nd-23rd	20	14	70%
10th Avenue SB Cranford-19th	13	8	60%
16th Street EB 7th-8th	26	22	85%
16th Street EB 8th-9th	8	7	85%
16th Street EB 9th-10th	26	22	85%
16th Street WB 7th-8th	26	22	85%
16th Street WB 8th-9th	15	13	85%
16th Street WB 9th-10th	28	24	85%
17th Street EB 8th-9th	4	3	85%
17th Street WB 8th-9th	6	5	85%
18th Street EB 7th-8th	11	11	100%
18th Street EB 7th-8th	21	10	48%
18th Street WB 7th-8th	14	10	71%
18th Street WB 7th-8th	24	12	50%
19th Street EB 8th-9th	15	15	100%
19th Street WB 8th-9th	28	28	100%
20th Street EB 8th-9th	10	8	80%
20th Street EB 9th-10th	16	14	85%
20th Street WB 8th-9th	11	10	91%
20th Street WB 9th-10th	18	15	85%
21st Street EB 8th-9th	11	5	45%
21st Street EB 9th-10th	14	14	100%
21st Street WB 8th-9th	14	7	50%
21st Street WB 9th-10th	14	12	86%
22nd Street EB 8th-9th	6	4	67%
22nd Street EB 9th-10th	14	12	87%
22nd Street WB 8th-9th	7	2	29%
22nd Street WB 9th-10th	17	17	100%
23rd Street WB 10th-11th	17	14	85%

23rd Street WB 10th-11th	26	22	85%
8th Avenue SB 16th-17th	12	10	85%
8th Avenue SB 16th-17th	12	10	85%
9th Avenue NB 19th-20th	16	14	85%
9th Avenue NB 20th-21st	22	19	85%
9th Avenue SB 19th-20th	20	1	5%
9th Avenue SB 20th-21st	20	16	80%
9th Street NB 16th-17th	18	15	85%
9th Street SB 16th-17th	40	38	95%
A-1 Lot	66	49	74%
A-2 Lot	100	64	64%
Arlington Park Apartments Lot	338	86	25%
C Lot	399	187	47%
D Access	32	26	81%
D Lot	199	138	69%
Davis House Lot	10	7	74%
E Lot	149	119	80%
F Lot	78	57	73%
G Lot	112	14	13%
H Lot	38	15	39%
I Lot	209	196	94%
J Lot	1070	742	69%
Jackson Lot	173	4	2%
K East Lot	90	61	68%
Kiel House Lot	3	2	74%
Kohl House Lot	6	4	74%
KW Lot	132	101	77%
L Lot	392	289	74%
M Lot	415	227	55%
N Lot	33	2	6%
Parsons Motor Pool	112	58	52%
Q Lot	324	270	83%
R Lots	146	116	79%
S Lot	70	57	81%
T Lots	120	72	60%
T North Lot	10	6	60%
Turner Drive	12	9	74%
U Lot	25	24	94%
V Lot	69	41	60%
X Lot	21	13	62%
Y Lot	532	142	27%
Y Lot-Commuters	112	20	18%
Z South Lot	32	30	94%
Z West Lot	142	64	45%

## Appendix C – Traffic Analysis Support Tables