

CAMPUS BICYCLE AND PEDESTRIAN PLAN

October 2011



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1 INTRODUCTION AND BACKGROUND

1.1 Purpose of the Plan

NC State University’s Campus Bicycle and Pedestrian Plan was developed to make the campus more bikeable and walkable through a variety of facility improvement and program development recommendations. The Plan is a master plan of improvements to meet the long-term transportation needs of NC State. But it is also focused on implementation, with specific projects that have been detailed and prioritized. The Campus Bicycle and Pedestrian Plan will be a plan used by multiple campus organizations working together to improve the campus’ transportation system and to achieve the university’s commitment to effective movement for a Pedestrian-Oriented Campus as defined in the Physical Master Plan.

1.2 Campus History and Context

The campus’ Physical Master Plan, *A Campus of Neighborhoods and Paths*, traces the history of growth and development at NC State. Enrollment and facility growth accelerated after the First World War and more so after the Second World War. The first post-war physical master plan was created in 1958, and since that time subsequent plans have further defined and refined the campus vision. A common element of the plans is creating a pedestrian-scaled campus suitable for walking. As growth decentralized from the core, a system of interconnected campus neighborhoods was developed, presenting a host of transportation challenges. The Campus Bicycle and Pedestrian Plan recognizes these challenges and builds on previous efforts to create a campus that is walkable, connected, and multimodal.



Early courtyards and paths.
Source: *A Campus of Neighborhoods and Paths*

1.3 Plan Vision

The project Steering Committee developed a Vision for the Plan to guide development of policies and recommendations for improvements. The Vision of the NC State Campus Bicycle and Pedestrian Plan is to:

- Promote a sustainable campus
- Improve safety and quality of life, and promote health and well-being of the campus population
- Continue improvement of the campus green space environment
- Ensure compliance with the Americans with Disabilities Act (ADA) for campus paths and street facilities
- Improve mobility choices for on- and off campus transportation
- Improve regional connectivity with supporting transit services

1.4 Goals and Objectives

To support the Plan’s Vision, the Steering Committee developed these Goals and Objectives:

- Goal 1: Improve the physical characteristics of the campus
 - Objective 1.1: Improve transit, bicycle, and pedestrian connectivity of campus precincts
 - Objective 1.2: Prioritize improvement projects for existing facilities and amenities, and future construction
 - Objective 1.3: Improve ADA access to all campus facilities
 - Objective 1.4: Simplify campus wayfinding process
 - Objective 1.5: Achieve LEED-Silver ratings for all future buildings
- Goal 2: Focus on the long-term campus transportation system
 - Objective 2.1: Identify the existing mode share, benchmark against other universities
 - Objective 2.2: Identify peer university best practices
 - Objective 2.3: Promote alternative transportation modes
 - Objective 2.4: Reduce the ‘drive-alone’ mode share
 - Objective 2.5: Reduce carbon emissions
 - Objective 2.6: Make the GoPass process easier to sign up and use
- Goal 3: Develop strategies for education and encouragement
 - Objective 3.1: Improve safety and increase enforcement of the ‘rules-of-the-road’
 - Objective 3.2: Develop a culture of bicycling among the campus population
 - Objective 3.3: Foster ‘leadership-by-example’ among campus administration
 - Objective 3.4: Become a League of American Bicycles (LAB) Bicycle-Friendly University (BFU)
 - Objective 3.5: Coordinate with the City of Raleigh and other state government agencies on community and regional bicycle and pedestrian programs

1.5 Outreach Activities

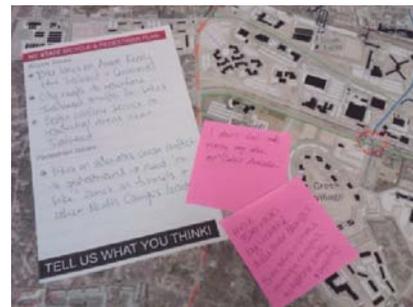
The Campus Bicycle and Pedestrian Plan was developed over the course of approximately eight months with the input of many members of NC State community. This input was critical in developing a Plan that is customized to the campus’ needs, effective at meeting the needs of all transportation system users, and sustainable over the long term. The major outreach efforts are summarized below.

Steering Committee

A Steering Committee made up of faculty, staff, students and representatives of various campus organizations guided development of the Campus Bicycle and Pedestrian Plan. The Committee met three times over the course of eight months to develop the vision, goals and objectives of the Plan; assist in plan outreach activities; identify needs, deficiencies, and opportunities on campus for bicycle and pedestrian improvements; and review Plan concepts and recommendations.

Campus Events

In order to receive input and feedback from the broader campus population, two campus outreach events were held in October 2010. On October 13, a booth was set up on the Brickyard, and on October 19 a booth was set up on Centennial Campus as part of the NC State “Focus on Fitness” event. At both of these events, faculty, staff, students, and visitors were able to view maps of existing bicycle and pedestrian facilities, make comments on needs and deficiencies, and document ideas for improvements. All of the comments received are summarized in Appendix 1.



Campus Survey

A campus-wide survey was distributed in September and October 2010 to gauge current travel patterns, determine attitudes about bicycle and pedestrian travel on campus, and solicit ideas for improvements. Over 1,300 members of the NC State community responded to the survey. Summary results are shown in Section 2.2 and the full results are detailed in Appendix 2.

1.6 Background Resources

The Campus Bicycle and Pedestrian Plan was not developed in isolation – many other plans, documents, and resources were consulted as part of the plan development process. Some of the key companion resources are:

- NC State University Physical Master Plan: *A Campus of Neighborhoods and Paths* (2007)
- City of Raleigh, *Bicycle Transportation Plan* (April 2009)
- City of Raleigh, *Capital Area Greenway System* map
- North Carolina State University Transportation Demand Management Plan (June 2010)
- Various NC State capital improvement project documents
- Ongoing work of the Physical Environment Committee and Campus Environmental Sustainability Team (CEST)



2 EXISTING CONDITIONS: WHERE WE ARE

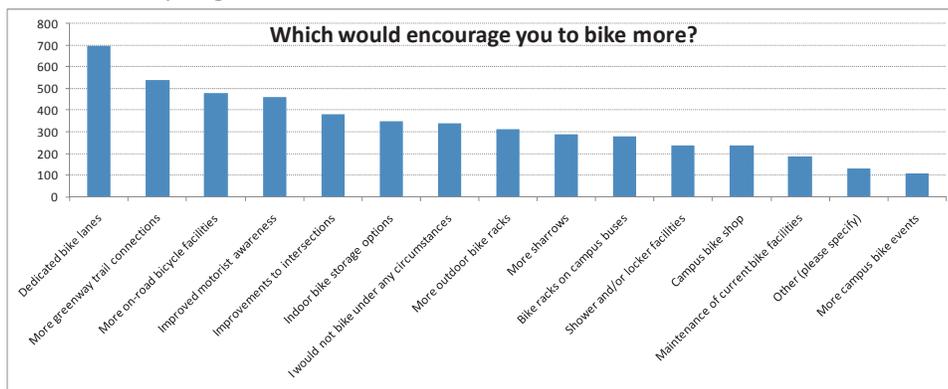
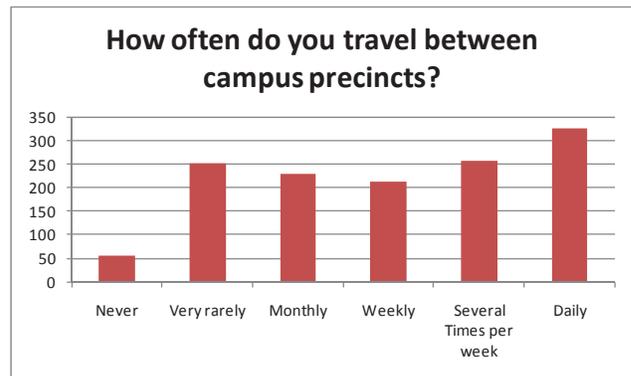
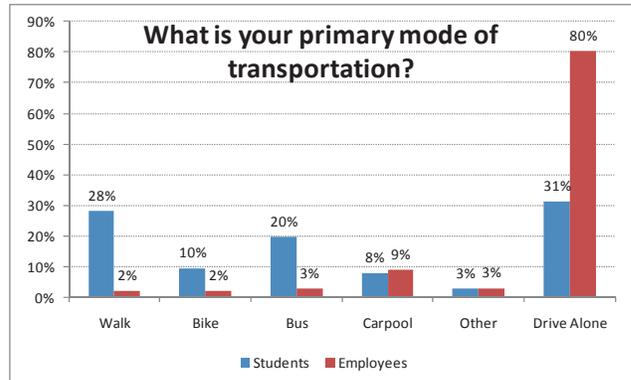
2.1 Introduction

This section describes the existing bicycle and pedestrian facilities and programs at NC State. The purpose is to provide a context to important social, physical, or programmatic elements of mobility and incorporate them into development of this plan.

2.2 Survey Results

An email invitation was sent to a random sample of 5,000 individuals to participate in an online survey of bicycle and pedestrian conditions at NC State University. The survey remained open for four weeks between October 6 and November 4, 2010, and received survey responses from 1,336 individuals, of which 54% were employees and 45% were students. Full survey results are included in Appendix 2. Key findings include:

- A majority of respondents currently drive alone to campus (54%), while a smaller percentage choose to walk (14% - including 8% who are resident students), bike (6%) or ride transit (11%). While nearly one-third of students typically drive alone to campus, approximately 80 percent of faculty and staff drive alone.
- Many respondents indicate that they travel between campus precincts (such as Centennial Campus, or Centennial Biomedical Campus) several times per week (19%) or even daily (24%).
- A majority of respondents indicated dedicated bicycle lanes (52%) and more greenway trail connections (40%) would encourage them to bicycle more frequently.
- Ninety percent of respondents consider the campus safe for walking, but over half do not feel the campus is safe for bicycling.



2.3 Public Outreach Results

At the beginning of this study (October 2010) two campus outreach events were held to solicit public comments and identify key locations or corridors for further study. The first event took place on the NC State Brickyard on October 13th, and the second was held on October 19th on the Centennial Campus in conjunction with the annual “Focus on Fitness” event. Individuals were asked to indicate locations on or off campus that needed a bicycle or pedestrian improvement (e.g. bicycle lanes or sharrows, sidewalk or multi-use path connections, bicycle racks, lockers, or shower facilities). Individuals were also asked to submit general improvement comments that did not relate to specific campus locations. A full list of public comments received during these events is contained Appendix 1. Some findings include:

- General confusion on whether bicyclists should ride on sidewalks or roadways;
- Need for bicycle dismount zones, including at tunnels and the Brickyard (during certain times);
- Requests for covered bicycle racks, lockers, stair troughs, showers, repair stations and other amenities for specific locations;
- Requests for bicycle racks on the front of Wolfline buses, especially for routes connecting to the CBC and Centennial campuses;
- Utility manhole covers that are not flush with the roadway pavement or sidewalk are problematic;
- Strong desire for connecting existing sidewalks and multi-use paths that have dead ends;
- Need for alternative routes other than the Western Blvd / Avent Ferry / Morrill Dr intersection.

2.4 Campus Demographics

North Carolina State University has the largest enrollment of students of the 17 UNC system schools, and is continuing to grow (see Table 1). The current campus population, including students, staff, and faculty is approaching 40,000, excluding Distance Education students (7,774 in 2010) who do not attend classes on campus. NC State functions much like a small city during the academic year, and efficient mobility across campus is important to everyday operations.

Table 1: Recent Enrollment Trend

	2010	2009	2008	2007	2006	2005	2004	2003	2002
Students	30,831	30,568	30,109	29,359	28,857	28,137	28,181	28,192	28,008
Employees	9,009	8,982	9,262	9,096	8,885	8,682	8,467	8,375	8,119
Total Population	39,840	39,550	39,371	38,455	37,742	36,819	36,648	36,567	36,127

Data Source: North Carolina State University Office of Planning & Analysis. Student estimates exclude Distance Education (D.E.). Employee estimates exclude extension staff, contract employees and hourly temporary employees, but include employees at Lake Wheeler Rd sites.

Populations

One purpose of the Campus Bicycle and Pedestrian Plan is to limit barriers that may discourage use of alternative modes of transportation, whether commuting to/from campus or between campus precincts during the day. The campus population has differing commuting patterns depending on if they are resident or commuter students, or different kinds of employees.

Resident students are by definition already living on campus and do not commute to campus each day. Although some are fortunate enough to store their vehicle on campus, resident students primarily walk, bike, or ride the bus as they travel between campus precincts.

Commuter students constitute the largest population group and commute to campus during the week depending upon individual class schedules. The distance from campus combined with whether their off campus apartment is serviced by a transit or shuttle are key determinants as to whether these students choose to drive.

Employees routinely commute to campus each workday, and demand the highest level of convenience and flexibility from their transportation mode. This Plan is intended to limit barriers that may discourage employees from walking or biking from their homes as well as to/from campus meetings throughout the day.

Mode-split

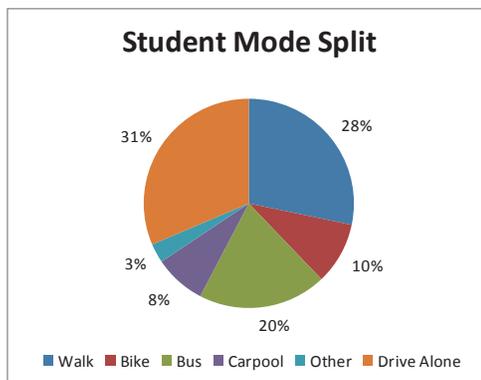
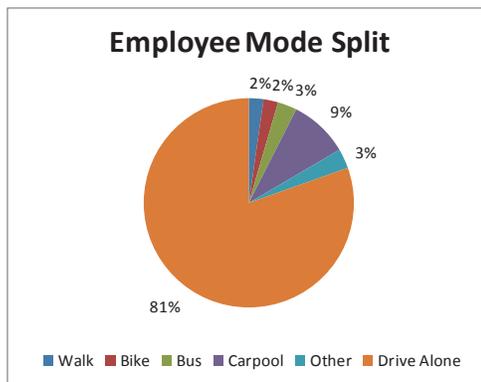
Commuter mode split is a measure of how the campus population chooses to travel, split among the varying modes of transportation (automobile, transit, bicycling, or walking). Urban campuses with adjacent residential neighborhoods or student apartment complexes display a higher mode split for walking and biking. A robust transit system will likewise increase the mode split for riding the bus or train.

Results from the commuter survey are typical for an urban setting campus, with relatively large proportions of students choosing to walk (28%), bike (10%), or ride transit (20%) because it is convenient or cost-effective. The employee mode split, however, indicates much lower proportions for these alternative modes (2-3% for each), which are typical for employees that value the flexibility and independence offered by their personal vehicle.

Where Employees and Students Live (Geocoding Analysis)

The NC State University Transportation Department provided a database of student and employee residential addresses for the purpose of identifying possible biking or walking markets. The database included latitude/longitude coordinates for mapping purposes. Figure 1 displays the geocoding analysis map from this exercise, centered on the NC State University campuses. Key residential locations include the following, which are displayed in Figure 1 as black-dashed lines:

- North of Hillsborough Street, within 1-mile of North Campus (360 individuals).
- Southwest of Western Blvd, within 2-miles of Central Campus (2,400 individuals).
- South of Centennial Campus, across I-40, within 2-miles of Centennial Campus (820 individuals).



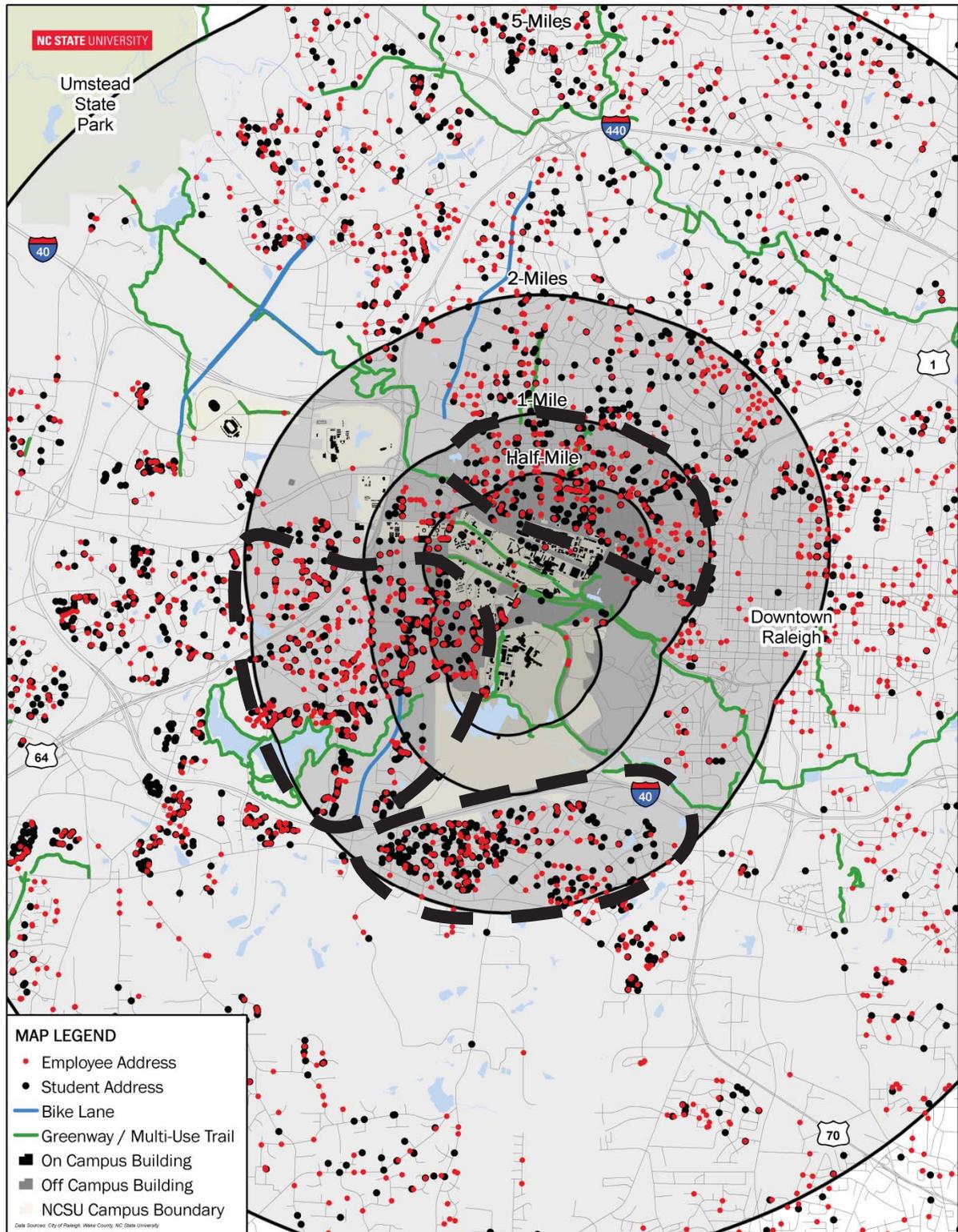


Figure 1: GEOCODING ANALYSIS



2.5 General Roadway Conditions

North Carolina State University is an urban campus surrounded (and in some instances separated) by thoroughfares. Major barriers to campus mobility include railroad tracks and an urban thoroughfare (Western Boulevard) through the center of campus as well as interstate highways to the south (I-40) and west (I-440) of campus. On the positive, the urban location of NC State results in a robust transit system that operates through and near the university, as well as adjacent neighborhood housing for students and employees.

Major Circulation Patterns – East to West

Western Boulevard and Hillsborough Street (NC-54) are the most heavily utilized roadways near the university based on NCDOT Average Daily Traffic (ADT) counts (Figure 2). Western Boulevard functions as a 4-lane median-divided arterial traveling along the southern boundary of NC State’s Central Campus. Western Boulevard connects downtown Raleigh with the I-440 beltline and is heavily utilized by vehicles during the AM and PM peak hours. Western Boulevard, because of its width and heavy traffic volumes, also functions as a barrier between campus precincts, especially for bicyclists and pedestrians.

Hillsborough Street functions as a 2-4 lane arterial traveling along the northern boundary of NC State’s North Campus. Despite connecting downtown Raleigh with the I-440 beltline in the same manner as Western Boulevard, Hillsborough Street carries approximately half of the daily traffic volume as Western Boulevard. A half-mile section of the street adjacent to the university has been redesigned with roundabouts, an urban-style median, on street parking, and improved pedestrian lighting, sidewalks and crossings. Ultimately the entire Hillsborough Street corridor will match this “complete street” design.

The Centennial Biomedical Campus (CBC) is separated from the traditional, historic campus by approximately two miles along Hillsborough Street. A series of semi-connected local streets also connects the two campuses, however not in a direct or efficient manner.

Major Circulation Patterns – North to South

Several physical barriers impede vehicular, bicycle, and pedestrian travel between the north and central campuses. These barriers include Miller Fields, Rocky Branch Creek, and Railroad tracks (including a fenced right-of-way). Miller Fields is a fenced campus recreation facility located between Dan Allen Drive and Morrill Drive near the Carmichael Gymnasium. Rocky Branch Creek flows west to east along the northern edge of Miller Fields, and supports a multi-use trail in the same direction. The railroad right-of-way is operated by the Norfolk-Southern railroad company. Three roadways cross these railroad tracks and are separated by approximately 0.5 mile:

- Gorman Street
- Dan Allen Drive
- Pullen Road

There are three additional pedestrian tunnels that connect North and Central Campus. All three tunnels are located between the Dan Allen Drive underpass and Pullen Road overpass. There is no access over/under the fenced railroad tracks between Gorman Street and Dan Allen Drive.

From a broader campus-to-campus perspective, the two major roadway connections between North Campus and Centennial Campus are Avent Ferry Road and Varsity Drive. Avent Ferry Road functions as a 4-5 lane arterial that carries more daily vehicles than Hillsborough Street. Varsity Drive functions primarily as a 2-lane local collector street.

Traffic Volumes and Congestion

The North Carolina Department of Transportation (NCDOT) Traffic Survey Group collects daily traffic volume data for many state-maintained roadways (http://www.ncdot.org/doh/preconstruct/tpb/traffic_survey/). The data collected represents the Average Annual Daily Traffic (AADT) volume. Figure 2 displays the AADT values for the university area. Each location is proportional in size based on the count value (displayed on top of each point). Roadways with the highest current average daily traffic include:

- Western Boulevard (36,000 vehicles per day)
- Avent Ferry Road (24,000)
- Hillsborough Street (22,000)
- Gorman Street (16,000)
- Dan Allen Drive (11,000)

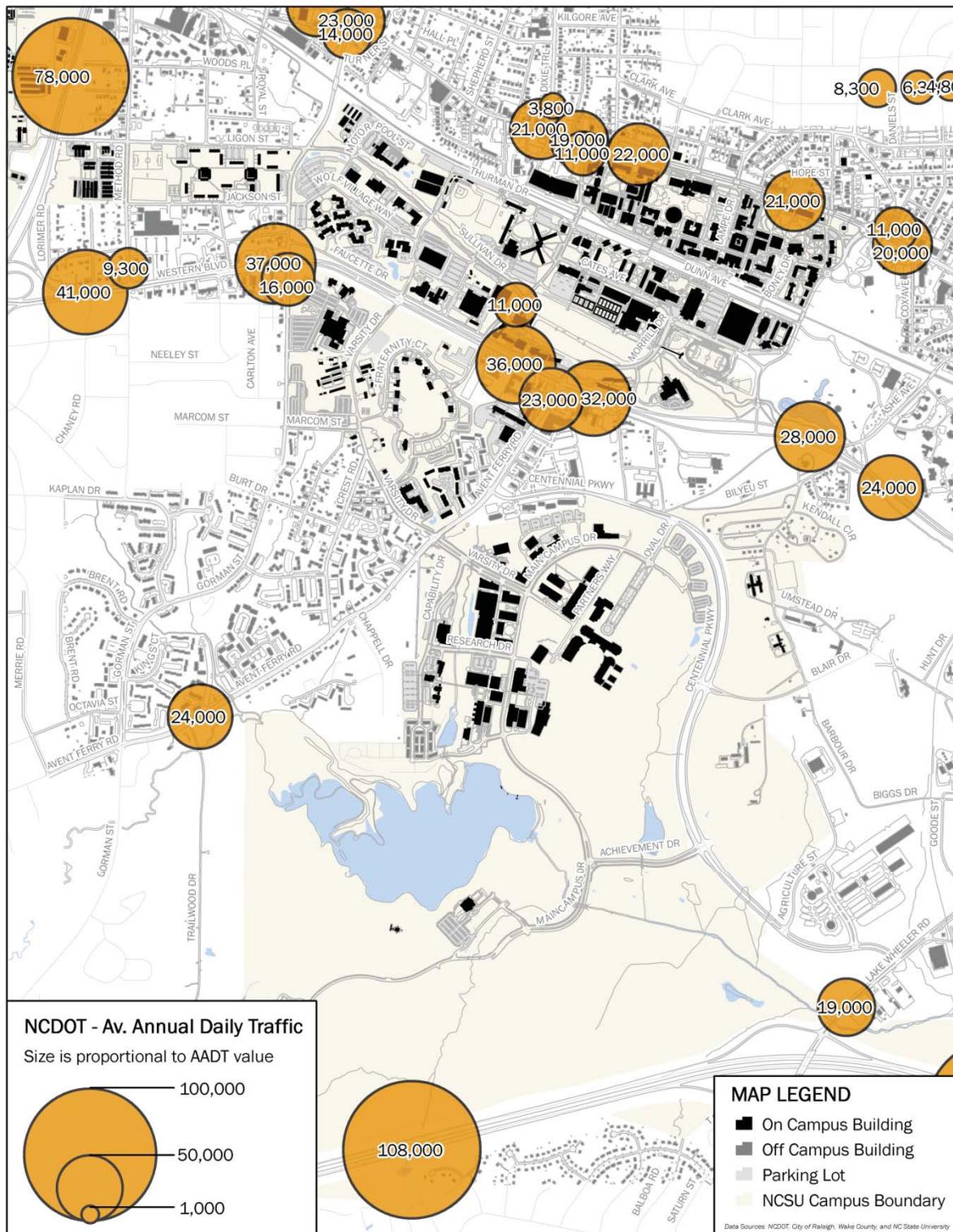


Figure 2: EXISTING TRAFFIC VOLUMES (2009)



Periods of traffic congestion on city streets near the university is irregular. The high number of connected streets that form a quasi-grid system supports the existing traffic flow during peak periods. The number of traffic control signals along NCDOT roadways control vehicle speeds and allow for safe pedestrian crossings, if not somewhat uncomfortable on some busier roads.

Traffic congestion on narrow campus streets (such as Stinson Drive, Dan Allen Drive, and Cates Avenue) is regular and frequent, relating to the class schedule. Fortunately campus street speed limits are typically 25 mph, except for North Campus streets, which are 15 mph. Three traffic control gates restrict through-traffic between 7 am and 5 pm on North Campus. The system allows for gate card access for employee parking permit holders, however irregular traffic congestion occurs some mornings.

Safety Issues

Collision data for bicycle and pedestrians in the campus area has been collected and analyzed over the last couple of years by several agencies. Data from these recent studies is presented below.

Pedestrian/Traffic Safety Study for NC State (2009)

The North Carolina State University Transportation Department conducted a pedestrian study of the Western Boulevard corridor, between Gorman Street and Pullen Road, in 2009. A five-year period of pedestrian/vehicular collisions was analyzed, and is summarized in Table 2 below.

Table 2: Traffic Collisions by Type (2003-2008), Western Blvd Corridor

Type	Number	%
Angle	77	14.2%
Animal	6	1.1%
Backing Up	3	0.6%
Fixed Object	6	1.1%
Head On	2	0.4%
Left Turn, Different Roadway	11	2.0%
Left Turn, Same Roadway	13	2.4%
Other Collision with Vehicle	2	0.4%
Other Non-Collision	2	0.4%
Overturn / Rollover	2	0.4%
Parked Motor Vehicle	2	0.4%
Pedalcyclists	2	0.4%
Pedestrian	8	1.5%
Ran Off Road – Left	6	1.1%
Ran Off Road – Right	5	0.9%
Rear End, Slow or Stop	303	56.0%
Rear End, Turn	2	0.4%
Right Turn, Different Roadway	6	1.1%
Right Turn, Same Roadway	8	1.5%
Sideswipe, Same Direction	75	13.9%
TOTAL	541	

Data Source: 2009 Pedestrian / Traffic Safety Study

Recommendations from this study included three long-term and three short-term options for Western Boulevard:

Long-Term Recommendations

1. Construct a pedestrian tunnel under Western Boulevard to separate pedestrians and vehicles; or
2. Construct a pedestrian bridge over Western Boulevard to separate pedestrians and vehicles; or
3. Construct a decorative fence within the median of Western Boulevard to prevent mid-block crossings

Short-Term Recommendations

1. Prohibit right-turn-on-red for all approaches to Avent Ferry Rd and Dan Allen Drive;
2. Lower the posted speed limit on Western Boulevard to 35 mph between Pullen Road and Gorman Street;
3. Provide conflict-free pedestrian phases on traffic signals at Avent Ferry Road and Dan Allen Drive

City of Raleigh Bicycle Transportation Plan (2009)

Bicycle and pedestrian collisions were also assessed by the City of Raleigh for the 2009 Bicycle Transportation Plan. For the entire City of Raleigh, the top nine intersections and the top 20 roadways for repeated bicycle collisions between 2000-2006 are displayed in Tables 3 and 4 below. Roadways that are adjacent to NC State are displayed in yellow.

Table 3: Top Intersections for Repeated Bicycle Collisions (2000-2006)

Roadway	Cross Street	# of Collisions
Avent Ferry Rd	Trailwood Dr	6
Hillsborough St	Enterprise St	4
Dan Allen Dr	Cates Ave	4
Avent Ferry Rd	Western Blvd	3
Hillsborough St	Oberlin Rd	3
Hillsborough St	Blue Ridge Rd	3
Edenton St	Pettigrew St	3
Falls of Neuse Rd	Newton Rd	3
Wake Forest Rd	Navajo Dr	3

Data Source: 2009 City of Raleigh Bicycle Transportation Plan

Table 4: Top Roadways for Repeated Bicycle Collisions (2000-2006)

Corridor Name	# of Crashes
Hillsborough St	26
New Bern Ave	16
Avent Ferry Rd	13
Dan Allen Dr	13
Falls of Neuse Rd	12
Six Forks Rd	12
Spring Forest Rd	11
Capital Blvd	10
Rock Quarry Rd	10
Western Blvd	10
Atlantic Ave	9
Cates Ave	9
Glenwood Ave	7
New Hope Church Rd	7
Trailwood Dr	7
Wake Forest Rd	7
Jones St	6
Oberlin Rd	6
Leadmine Rd	5
Lynn Rd	5
MLK Jr Blvd	5

Data Source: 2009 City of Raleigh Bicycle Transportation Plan

2.6 Existing Pedestrian Facilities

On Campus Pedestrian Facilities

The original NC State campus, as established in 1887, was constructed around the existing Court of North Carolina located between the railroad tracks and Hillsborough Street. Sidewalks and paths were easily constructed between campus buildings because of their proximity. The campus has since grown to more than 2,200 acres in size, and the pedestrian facilities that link buildings have been constructed segments at a time.

The existing network of pedestrian facilities includes a variety of materials, including brick, asphalt, concrete, and pervious concrete that have been installed, maintained, and replaced over decades of campus growth. Slow and incremental growth of pedestrian facilities is how a network of sidewalks and paths is established for most universities and cities. Heavily traveled pedestrian corridors across the campus have been widened, straightened, or provided with amenities (benches, trash receptacles, shade trees) over time. Underutilized pathways (between buildings or parking lots) have been reconfigured or removed altogether by future building projects. This is the natural evolution of pedestrian facilities.

The North Carolina State University Physical Master Plan (2007) designates pedestrian paths into the following categories and describes landscaping standards, such as materials, patterns, building entrances, steps, and plant materials associated with each.

- **All Campus Path** – designed to support all people-powered mobility and incorporate aesthetic elements that reinforce the campus environment;
- **Connector Path** – designed to move high volumes of pedestrians safely and directly;
- **Neighborhood Path** – designed for much lower volumes of pedestrians, and may include bicycles;
- **Greenway / Multipurpose Path** – designed to be accessible paths along stream corridors, connecting to the City of Raleigh Capital Greenway System.

Off Campus Pedestrian Facilities

The City of Raleigh sidewalk network is extensive within residential neighborhoods adjacent to the university. Nearly all roadways have sidewalks along both sides of the street in this area. Roadways near the boundary of Centennial Campus and the Centennial Biomedical Campus, however, do not have as many sidewalks.

In 2010 the City of Raleigh began a Comprehensive Pedestrian Plan through grant funding awarded by the NC Department of Transportation. The plan vision is to enhance safe pedestrian mobility along existing roadways and all future roadway projects. Pedestrian collision data from this planning process was acquired from the city, and analyzed for the NC State campus vicinity (Figure 2a). Between 2004 and 2010 there were 82 reported collisions involving pedestrians near the NC State University campus (Table 5). Four of these pedestrian collisions resulted in a death or disabling injury (Table 6 below).

Table 5: Pedestrian Collisions by Severity near NC State University Campus (2004-10)

Severity	Number	Percentage
Killed	2	2%
Disabling Injury	2	2%
Evident Injury	33	40%
Possible Injury	34	41%
No Injury	10	12%
Unknown	1	1%
TOTAL	82	

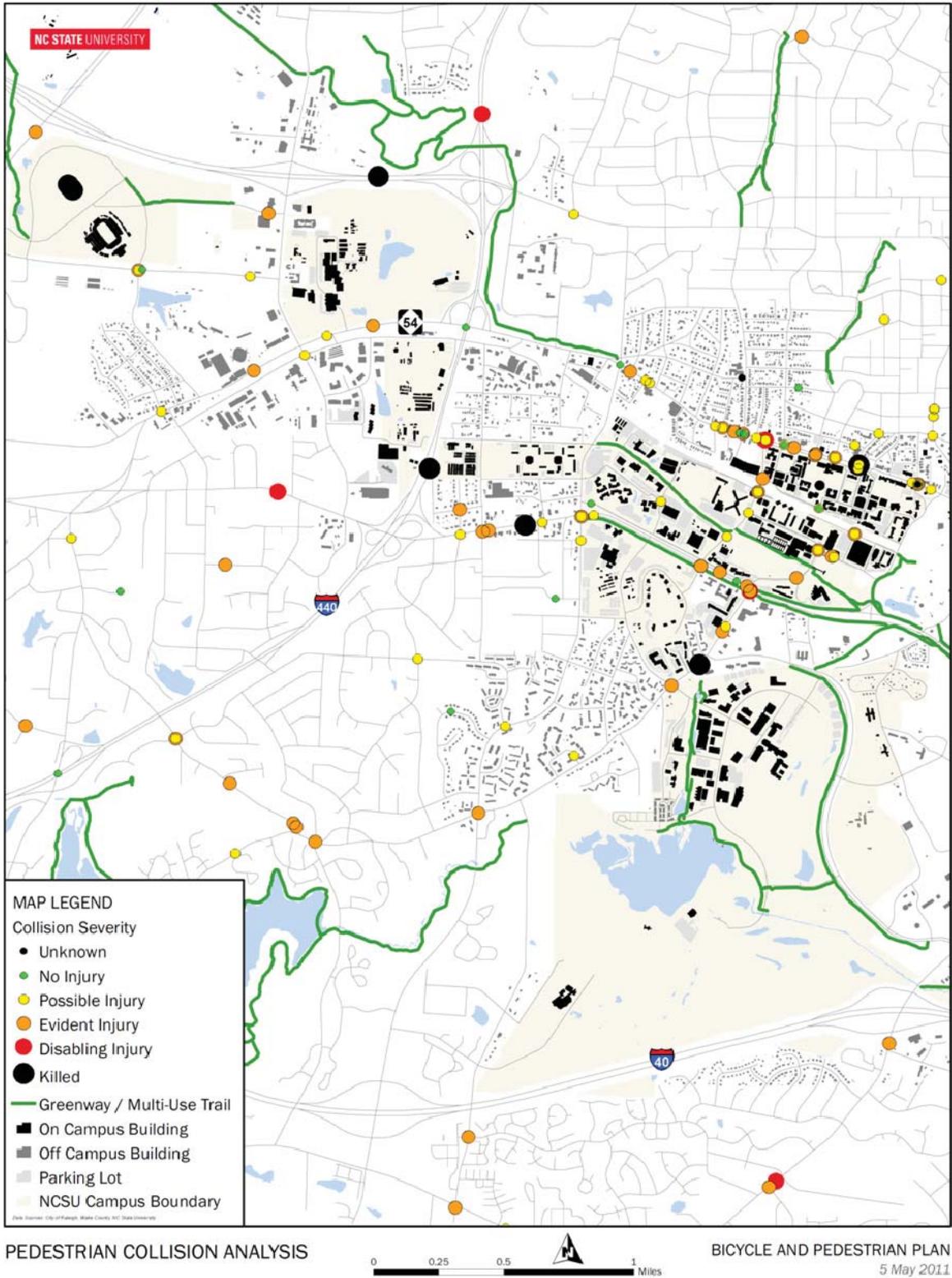
Data Source: 2010 City of Raleigh Pedestrian Plan

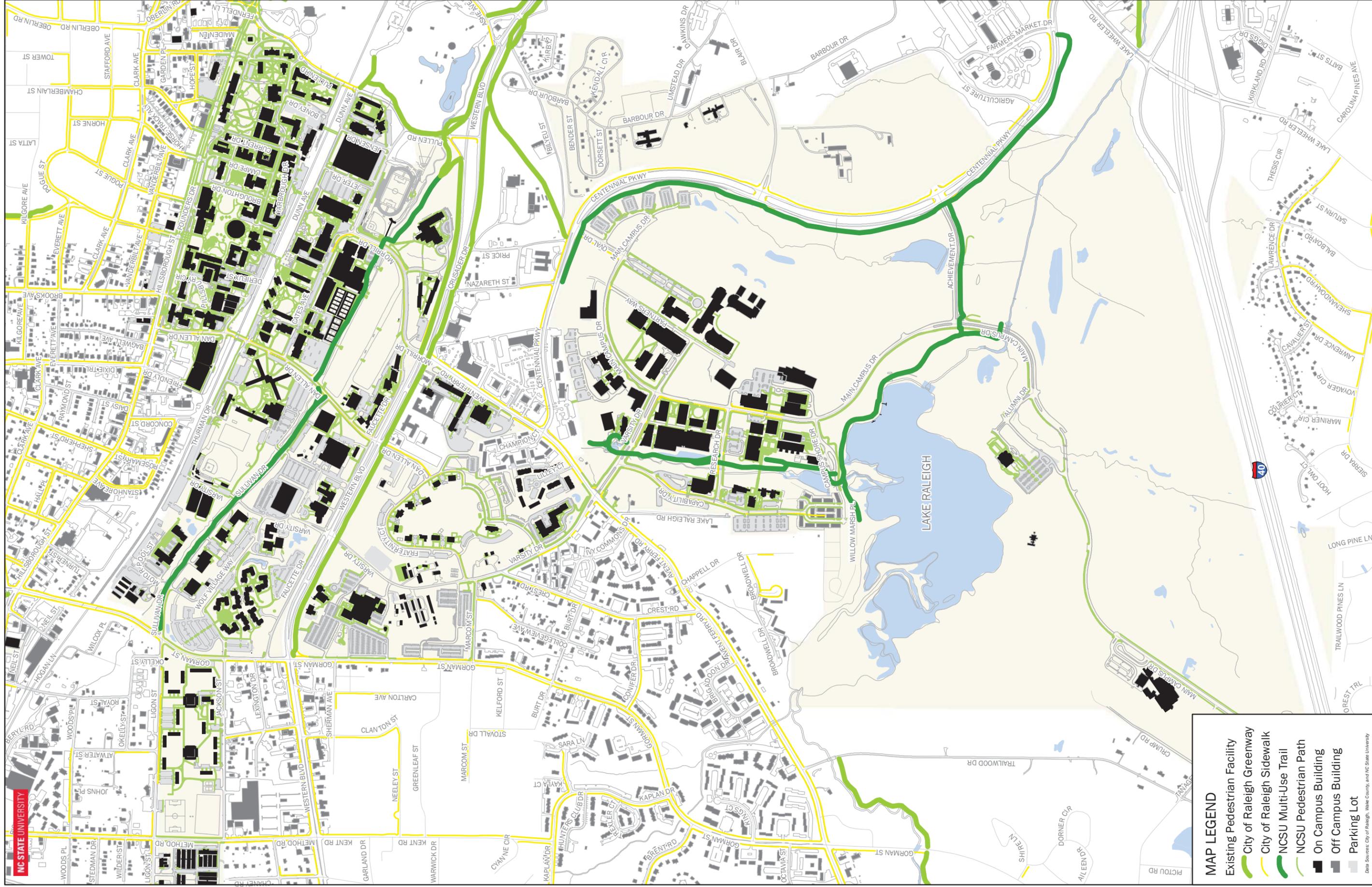
Table 6: Location of Severe Pedestrian Collisions near NC State University Campus (2004-10)

Roadway	Cross Street	Severity	Year
Avent Ferry Rd	Centennial Pkwy	Killed	2006
Hillsborough St	Horne St	Killed	2007
Hillsborough St	Dan Allen Dr	Disabling	2004
Western Blvd	Avent Ferry Rd	Disabling	2008

Data Source: 2010 City of Raleigh Pedestrian Plan

Figure 2a: PEDESTRIAN COLLISION ANALYSIS





NC STATE UNIVERSITY

MAP LEGEND

- Existing Pedestrian Facility
- City of Raleigh Greenway
- City of Raleigh Sidewalk
- NCSU Multi-Use Trail
- NCSU Pedestrian Path
- On Campus Building
- Off Campus Building
- Parking Lot

Data Source: City of Raleigh, Wake County, and NC State University

Figure 3: EXISTING PEDESTRIAN FACILITIES



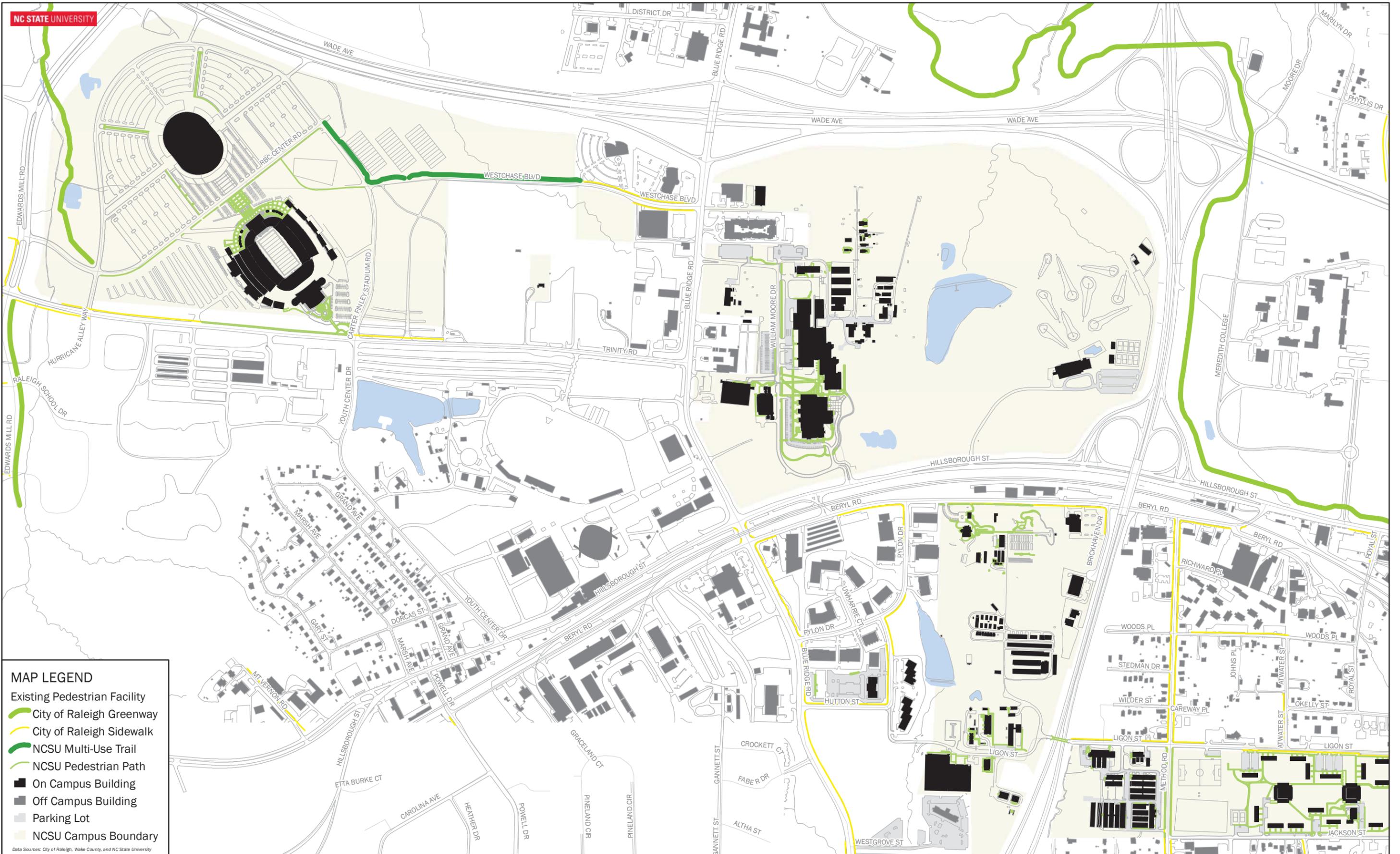


Figure 4: EXISTING PEDESTRIAN FACILITIES

2.7 Existing Bicycle Facilities

For the purpose of this Plan existing bicycle facilities are separated into two categories: on-road and off-road. On-road facilities include bike lanes, share-the-road arrows ('sharrows'), wide outside lanes, or signed bicycle routes that encourage riders to travel with vehicular traffic (see Section 4.4 for a complete description). Off-road facilities include greenway and multi-use paths and encourage separation of riders from vehicles. See Figures 5 and 6 for existing bicycle facilities near the university.

Campus bicycle facilities are part of a larger system of bicycle facilities in the City of Raleigh. Making a smooth transition between the campus and its surrounding neighborhoods is a critical element of determining the success of this plan. Campus bicycle systems are identified in the North Carolina State University Physical Master Plan (2007) and have been implemented over time as the campus has grown and developed. The University coordinates bicycle planning activities with the City of Raleigh to maximize opportunities and resources. The City of Raleigh, cooperation with the NCDOT, recently developed a citywide bicycle plan. The *Comprehensive Bicycle Transportation Plan* was adopted by City Council in April 2009. This comprehensive bicycle transportation plan proposes an integrated, seamless transportation framework to facilitate cycling as a viable transportation alternative throughout the City (see City of Raleigh Bicycle Program at www.raleighnc.gov).

On-Road Bicycle Facilities

Bicycle facilities have been constructed incrementally in the same manner as pedestrian facilities. There are three campus roadways with existing sharrows: Dan Allen Drive, Yarbrough Drive, and Stinson Drive. The original sharrows were painted during the spring of 2007 and have since weathered and faded.

A limited number of on-road bicycle lanes exist within the City of Raleigh, and more will be striped as repaving projects occur, in accordance with the Raleigh Bicycle Transportation Plan (2009). Portions of Hillsborough Street, Avent Ferry Road, and Gorman Street were recently striped with on-road bicycle lanes. Gaps still exist in the campus bike lane network that will be striped as needed to connect these bicycle lanes with existing bike lane along Ridge Road to the north.

Bicycle lanes also exist along Reedy Creek Road near the NC Museum of Art, and connect with a Capital Greenway Trail. A half-mile gap along Blue Ridge Road separates the Centennial Biomedical Campus (CBC) from these bicycle lanes. This deficiency has been included in the list of recommended projects in this Plan.

The City of Raleigh also designates signed bicycle routes along lower volume city streets to limit potential conflicts with vehicles. Signed routes are helpful to remind motorists that bicyclists share the roadway, and to encourage recreational riders to explore the city. There are a total of 13 signed routes, nine are cross town (linear) routes and four are recreational loop (circular) routes. Cross town route numbers 5, 7, and 8, as well as recreational loop number 4, travel through or adjacent to the NC State University campus. These routes are indicated on Figures 5 and 6.

Centennial Campus streets were intentionally designed to be 36 feet in width so that future accommodations for bicycle lanes (or on street parking) were possible. Although bicycle lanes or sharrows do not currently exist on these streets, they could easily be retrofitted. Many Centennial Campus streets currently function as wide outside lane bicycle facilities.

Off-Road Bicycle Facilities

The Rocky Branch Multi-Use Path that travels from west to east across the center of the university has been constructed to accommodate bicycles and pedestrians. A quarter-mile section between Dan Allen Drive and Morrill Drive has been recently completed, connecting the trail with the larger Capital Greenway Trail System. Additionally, the half-mile long Centennial Campus Multi-Use Path connects Varsity Drive with Lake Raleigh, including three tunnel underpasses of roadways. This trail currently dead-ends near Lake Raleigh, however future connections will link with the Capital Greenway Trail System and provide another off-road bicycle alternative.

Sidepaths exist along Western Boulevard and Centennial Parkway. These facilities are similar to greenway trails, but are typically located immediately adjacent to roadways. Because of their location adjacent to roadways, sidepaths experience some common safety and functional issues, such as: two-way paths require one direction of bike traffic to go against the flow of traffic; sidepaths may encourage wrong-way riding to get on and off the path; confusion at intersections; sidepaths require stops and yields at all driveways; and sidepaths are often blocked by vehicles using driveways.

On-Campus Amenities

There are a number of publicly-available shower facilities that are available to bicycle commuters or those interested in a lunch time ride or walk. There are many more showers on campus, including those in Carmichael Gym, the utility plants, various locker rooms (such as for athletes, police, etc.), however these do not meet the criteria of being open to the general public, and are therefore excluded.

Table 7: List of Existing Campus Shower Facilities Open to Bicycle Commuters

Building Name	Precinct	Approximate Room #		
		Men	Women	ADA
Biltmore/Robertson	Central	1111B	NA	
Constructed Facilities Lab	Centennial	B105	B105	X
Engineering Building I	Centennial	B015A	B011A	
Engineering Building II	Centennial	B025	B027	
Engineering Building III	Centennial	1111	1113	
Fox Science Teaching Lab	North	B05	B07	
Friday Institute	Centennial	225	224	
Jordan Hall Addition	Central	2212	2312	X
Monteith Engineering Research Center MERC	Centennial	116	117	
Schaub Food Science	Central	G34A	G36A	X
Sullivan Shops Building I		A115	A117	
Toxicology	Centennial	211	213	

Data Source: North Carolina State University Office of the University Architect, from AERES database.

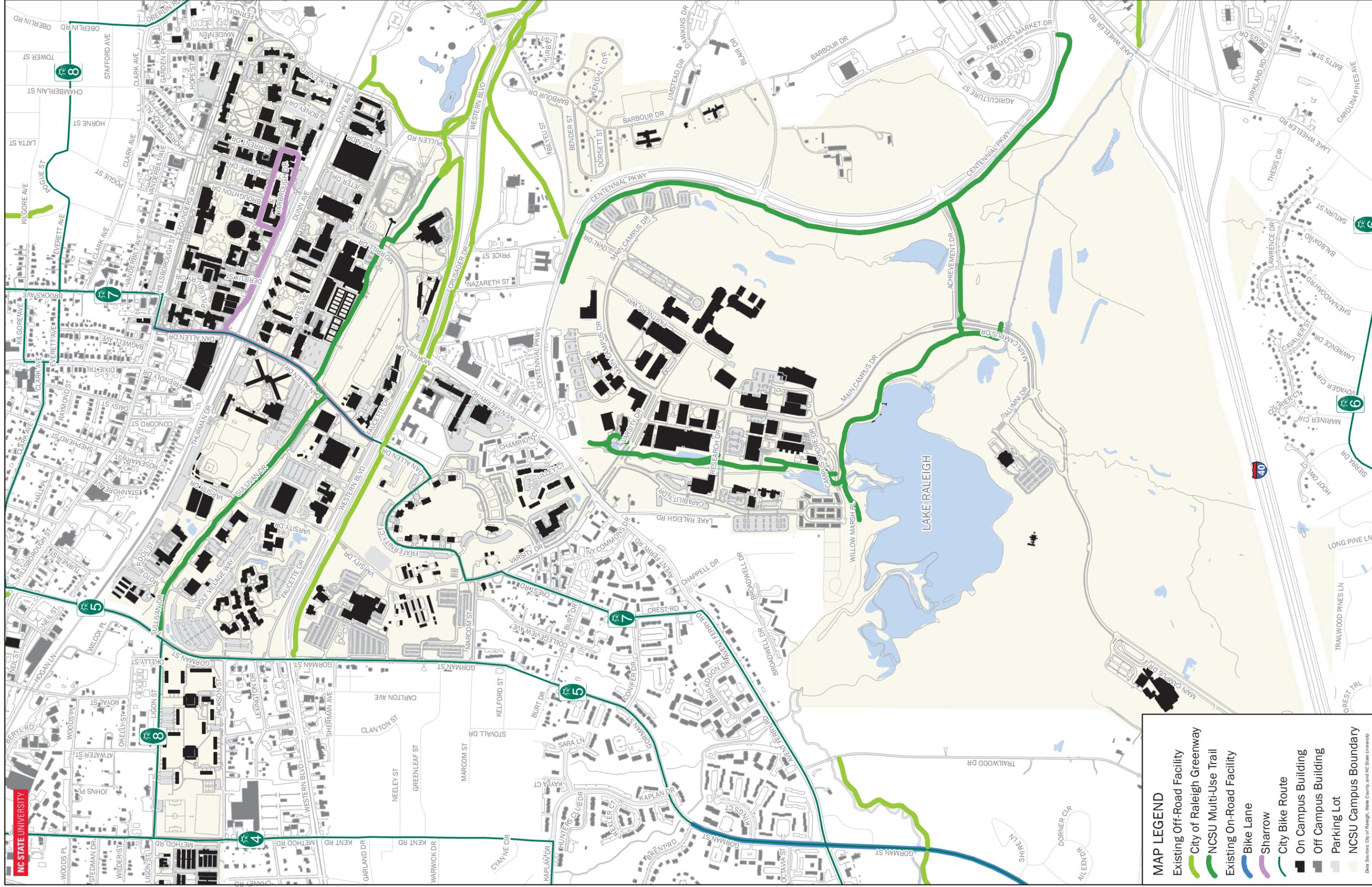


Figure 5: EXISTING BICYCLE FACILITIES

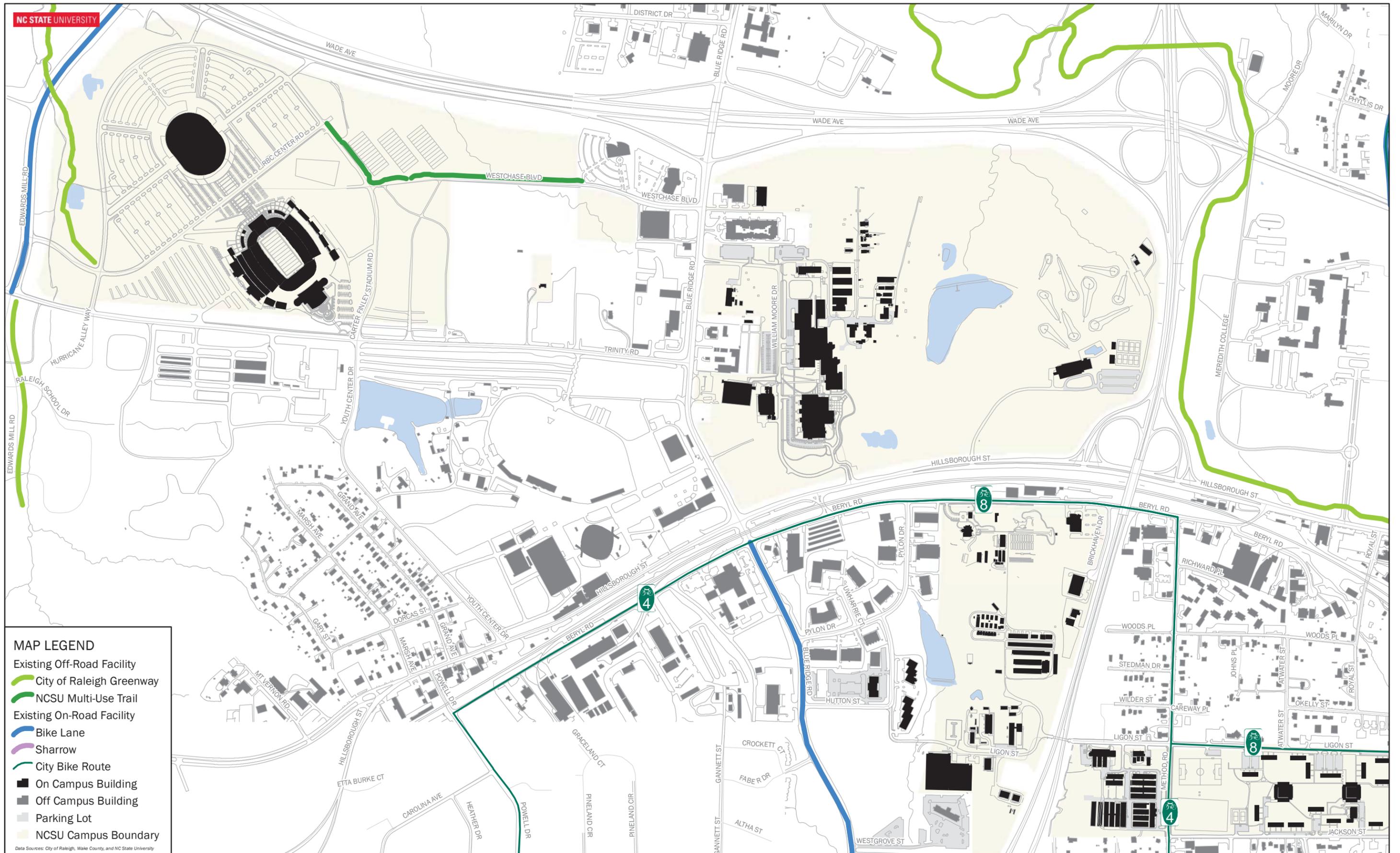


Figure 6: EXISTING BICYCLE FACILITIES

0 500 1,000 2,000 Feet



2.8 Campus TDM Programs

The North Carolina State University Transportation Department offers a variety of travel demand management (TDM) programs to encourage students and employees to utilize alternative modes of transportation. Several programs are summarized below. These programs are discussed separately from the transit system that serves the campus, which is detailed in Section 2.9, although all of these programs work together to offer alternatives to driving to campus.

Wolftrails

Wolftrails is an alternative commuting program that offers benefits and incentives to those who would otherwise drive a vehicle to campus. The program is open to employees who may choose to walk, bike, carpool/vanpool, or ride the bus, as well as students who carpool. Incentives are different for each type of commuter mode, and may include:

- Single-use parking permits for inclement weather (first 12-24 are free)
- Emergency Ride Home program
- Discounted parking permit fees for carpools
- Reserved parking space for vanpools

Clothing lockers are available to commuters on a first-come, first-serve basis in select buildings. For more information visit www.ncsu.edu/wolftrails or contact the Transportation Department 919.515.1609.

Wolfwheels

Wolfwheels is a bicycle rental program through the Transportation Department and Campus Recreation. All students and employees are eligible to participate with a valid university ID. Individuals may rent a bicycle for the day, weekend, week, or semester by visiting Outdoor Adventures within Carmichael Gym. For more information or rental pricing visit www.ncsu.edu/wolfwheels or contact the Transportation Department 919.515.1609.

GoPass

The GoPass program allows users to ride fare-free on any Capital Area Transit (CAT) and Triangle Transit (TT) bus, regardless of whether they are traveling to or from the university. GoPass is offered for free to all current students, faculty and staff through the Transportation Office. Each GoPass must be renewed annually (fall semester) with a valid student/staff/faculty ID. For more information visit www.ncsu.edu/gopass or contact the Transportation Department 919.515.1609.

Zipcar

Zipcar is short-term rental car program that accommodates students and employees who may not have access to a vehicle during the day. Zipcar offers the convenience of having a car on campus without the expense or hassle of parking it. The program includes four vehicles on campus, available at a low hourly rate (currently \$8/hour) that includes gas, insurance, and roadside assistance. Visit www.zipcar.com/ncsu to sign up for this service or contact the Transportation Department 919.515.1609 for more information.

Zimride

Zimride is an online carpooling/ride matching program that matches commuters who make similar trips. Zimride connects individuals via Facebook who would like to either (a) share a ride or (b) need a ride. For more information visit <http://zimride.ncsu.edu/> or contact the Transportation Department 919.515.1609.

2.9 Transit System

There are three transit agencies operating routes on or adjacent to the university. Each agency is independently operated, however coordination over several years has improved the quality and frequency of service for all riders. Students and employees who sign up for the GoPass program are able to ride all transit services for free, which provides a nice complement to those who also commute by bike or on foot.

Wolfline

The North Carolina State University Wolfline transit system operates weekday and weekend routes throughout the academic year. Wolfline is fare-free and open to the general public, serving locations on and near the NC State University campus. All buses have ADA-compliant lift equipment for loading/unloading persons in wheelchairs, and drivers are trained in the proper operation of this equipment.

Route scheduling may be adjusted each semester, however through the Transit Visualization System (TVS) riders can view all routes in real-time on their computers and web-enabled phones. This service is also available for download through the iPhone App Store.

For more information on Wolfline visit www.ncsu.edu/wolfline or contact the Transportation Department 919.515.1609. For more information on the TVS visit www.ncsu.transloc.com or the iPhone App Store <http://itunes.apple.com/us/app/transloc-transit-visualization/id367023550?mt=8>

Capital Area Transit (CAT)

Capital Area Transit is the City of Raleigh's public transit service, with four routes that serve the university area. There are a total of 42 routes operated by CAT across the City of Raleigh, many of which connect to either a Triangle Transit or Wolfline route that make it possible for thousands of NC State affiliates to ride transit to campus. All CAT buses include bike racks mounted to the front, making it possible to transport your bicycle to/from NC State each day.

Triangle Transit (TT)

Triangle Transit operates a regional system of routes that connect Chapel Hill to Durham and Raleigh. There are eight routes that serve the university area, including express routes from Durham and Chapel Hill. Triangle Transit offers more than 19 regional bus routes, and all buses are equipped with front-mounted bicycle racks.

For more information on planning a trip visit the Go Triangle website <http://www.gotriangle.org/> which includes individual system maps for all transit providers in the Triangle area. The GoTriangle site also includes resources for bike/walk commuters.

3 FUTURE CONDITIONS: WHERE WE ARE HEADED

3.1 Projected Campus Population Growth

North Carolina State University’s population (faculty, staff, and students) is projected to increase at a steady rate, driven in large part by student enrollment increases. By 2017, the total campus population may reach over 43,000, assuming current ratios of employees to students hold. The campus population growth will require additional facilities and infrastructure, as detailed in the Physical Master Plan, including new and upgraded bicycle and pedestrian facilities.

Table 8: Projected Enrollment Growth

Year	Campus Population
2017	43,000*
2010	38,840
2009	38,550
2008	38,371
2007	37,455
2006	36,742
2005	35,819
2004	35,648
2003	35,567
2002	35,127
2001	35,028

Note: North Carolina State University Office of Planning & Analysis reports a total student enrollment of 40,000 in 2017, which includes distance education students. This estimate removes D.E., and estimates total employees based on 2010 ratio of employees:students.

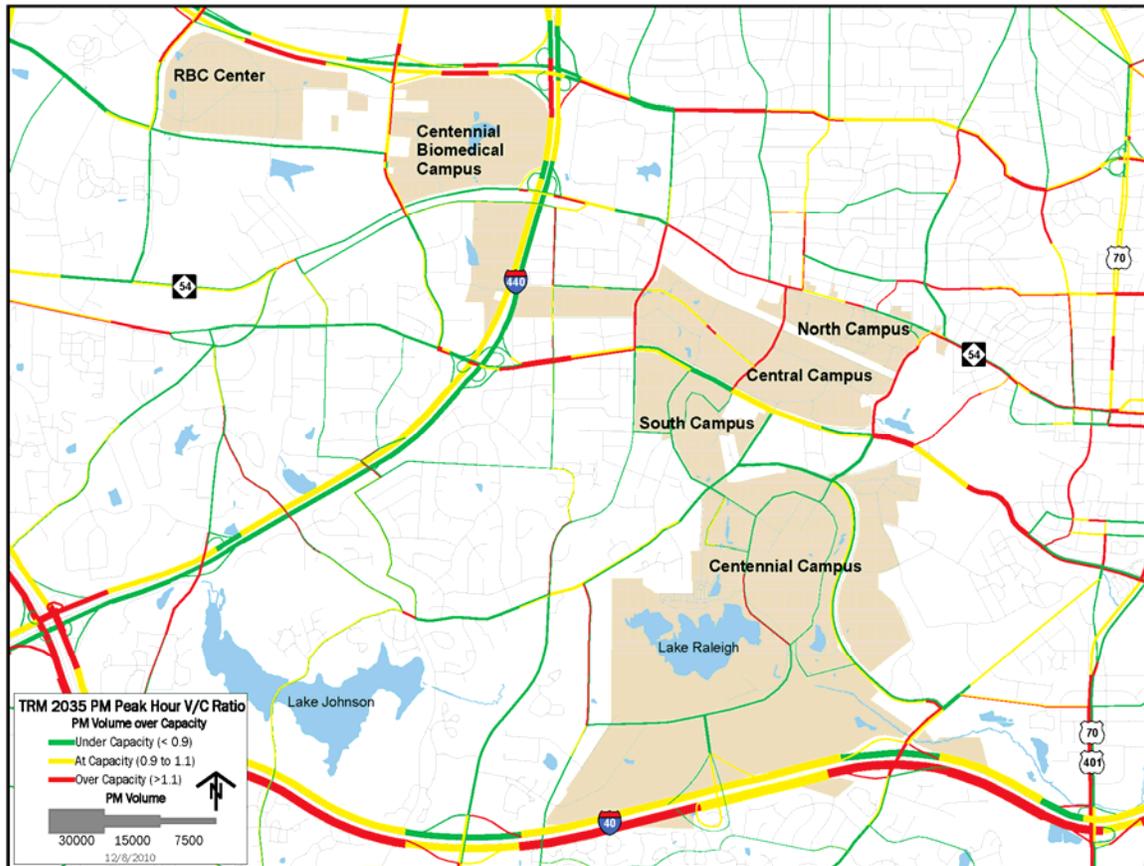
3.2 Projected Roadway Conditions

The Triangle Regional Model (TRM) is the travel demand model developed for the Raleigh, Durham, and Chapel Hill areas. A travel demand model is a tool used in transportation planning that forecasts long range development to evaluate transportation infrastructure needs. The model uses socio-economic, demographic, land use and transportation data in order to evaluate the number of trips (by mode) that would be generated by future growth.

One measure of traffic congestion is comparing a roadway’s capacity to the volume of vehicles it carries (commonly referred to as a ‘volume to capacity ratio’, or ‘v/c ratio’). In general, roadways that have a v/c ratio below 0.9 (or 90% of capacity) during the AM or PM peak hours are considered to be under capacity. Roadways with a v/c ratio between 0.9 and 1.1 are considered to be operating at capacity. Roadways with a v/c ratio greater than 1.1 are considered to be over capacity, and therefore deficient.

An analysis of future v/c ratios near the university indicates that some roadways around the perimeter of campus may be over capacity by 2035. All three roadways that cross the railroad tracks (Gorman, Dan Allen, and Pullen) may be over capacity (see red lines on Figure 7). The total volume of traffic along these roadways (displayed as the width of roadway segments) is much smaller by comparison to adjacent interstates (I-40 and I-440), which is understandable.

Figure 7: Projected Traffic Congestion (2035)



Data Source: 2035 Triangle Regional Model

3.3 Campus Physical Master Plan

The Physical Master Plan (2007) provides guiding principles and a framework for identifying primary and secondary bicycle and pedestrian corridors. Overlaying these corridors with existing bicycle and pedestrian facilities helped to identify gaps that represent potential future projects for this plan.

3.4 Planned Pedestrian Improvements

The Capital Area Greenway Trail System is a key source for identifying planned pedestrian improvements in the area around campus. The system is planned and managed by the City of Raleigh Parks and Recreation Department, representing a 63.4 mile network of off-road recreational greenway trails (mostly along stream corridors) with minimal roadside sidewalk connections, as needed. The Gorman Street connector trail is one example of a sidewalk (0.4 miles long) that connects two existing greenway trails (Reedy Creek and Rocky Branch) near the university.

Grant funding has been secured for connecting the Upper and Middle Walnut Creek Greenway Trails through Centennial Campus. This missing link is included in the Campus Bicycle and Pedestrian Plan because construction has not begun. Additional proposed projects will connect the Walnut Creek Greenway Trail with the rest of the university, including Rocky Branch Creek and Reedy Creek Greenway Trails to the north.

3.5 Planned Bicycle Improvements

The University has an ongoing program for implementing bicycle improvement projects and maintaining existing facilities. Planned on campus bicycle improvements include replacing the weathered sharrows along three campus streets. These efforts are being coordinated with this Plan and are included in the final recommended projects list (see Section 4).

The City of Raleigh completed a Bicycle Transportation Plan in April of 2009 to document existing conditions, identify deficiencies, and make recommendations for future bicycle facilities. Many proposed facilities are located along city streets that border the university, including:

- On-road Bicycle Lanes along:
 - Avent Ferry Road
 - Blue Ridge Road
 - Crest Road
 - Gorman Street
 - Hillsborough Street
 - Lake Wheeler Road
 - Trailwood Drive
 - Varsity Drive
- Wide Outside Lanes along:
 - Western Boulevard
- Sharrows along:
 - Hillsborough Street (portion)
 - Nazareth St

The purpose of the City’s plan was to identify roadways that could be striped or modified (in segments) according to roadway paving or re-surfacing schedules. Ultimately, an entire roadway facility could be completed, however during the interim years gaps would exist between on-road bicycle facilities. A timeline for construction (of each future project) was not included because individual projects were not identified as part of the plan.

3.6 Planned Transit Improvements

The NC State University Physical Master Plan includes a potential people-mover corridor between libraries (Hunt Library on Centennial Campus and D.H. Hill Library on North Campus). The possible corridor alignment is still conceptual at this point and is revisited as the Master Plan is updated.

Triangle Transit, the region’s transit authority, is planning for fixed-guideway rail improvements for the region, ultimately connecting Orange, Durham and Wake counties. The ultimate corridors may connect the region through some combination of light rail and commuter rail, and may be supplemented by bus rapid transit and more comprehensive local and express bus service. Providing fixed-guideway service to the NC State University campus area is a key part of these plans. Although station locations and designs are still preliminary and conceptual, possible station locations may include (a) Dan Allen Drive, near the existing parking deck; and (b) Pullen Road, near its intersection with Dunn Avenue. As station area development progresses it will be critical to plan for bicycle and pedestrian connections to the stations and amenities at the stations to promote these multimodal connections.

4 RECOMMENDATIONS: *WHERE WE WANT TO BE*

4.1 Introduction

The recommendations in this Plan are divided generally into bicycle projects and pedestrian projects, recognizing that the two modes function together and often intersect. The recommendations were built from the Plan Framework (see Section 4.2) and include improvements to facilities, ancillary facilities and amenities, programs and policies, roadways, and transit. Section 4.5 highlights a series of focus area concepts that provide depth and conceptual ideas for opportunity areas on campus.

4.2 Plan Framework

The Plan Framework is the skeleton around which the project recommendations were developed. The Framework identifies a network of existing and future paths that will ultimately serve the university bicycling and walking community by creating a safe, interconnected system with the amenities expected by various users.

The Framework was developed with the system of paths identified in the Physical Master Plan as the starting point. The hierarchy of paths in the Physical Master Plan includes:

- All Campus Paths
- Connector Paths
- Neighborhood Paths, and
- Greenway and Multi-Purpose Paths

For the purposes of the Campus Bicycle and Pedestrian Plan, these path types were distilled into two major path types: Primary Paths and Secondary Paths (see Figures 8 and 9). The Primary and Secondary Paths were developed by supplementing the Physical Master Plan path system with data and observations about existing bicycle and pedestrian conditions, as well as projected conditions.

Primary Paths

Primary Paths (identified by the purple lines on the Plan Framework maps) offer a direct route between major on and off campus origins and destinations. They often follow major vehicular routes and require dedicated bicycle and pedestrian facilities, such as bicycle lanes and multi-use paths, and high-level amenities to ensure safe travel.

Examples of Primary Paths on campus include:

- Varsity Drive
- Dan Allen Drive
- Morrill Drive
- Dunn Avenue
- Cates Avenue, and
- Centennial Parkway

Secondary Paths

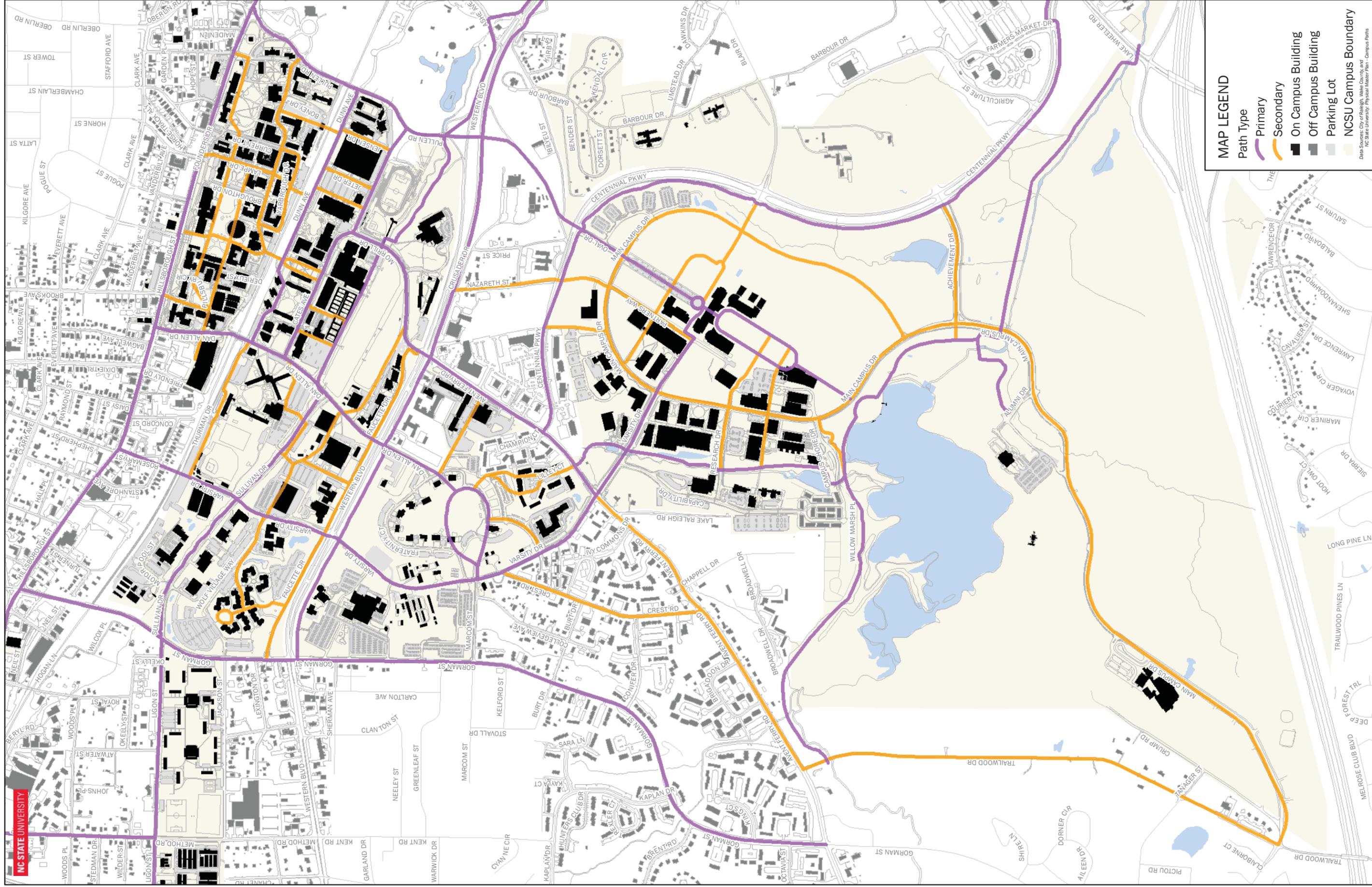
Secondary Paths (identified by the orange lines on the Plan Framework maps) serve as connectors to the Primary Paths. They also provide direct route connections to destinations not located along Primary Paths. Secondary Paths may contain dedicated bicycle and pedestrian facilities but could be served well by less formal facilities, such as sharrows or signed bicycle routes.

Examples of Secondary Paths on campus include:

- Faucette Drive
- Yarbrough Drive
- Stinson Drive
- Thurman Drive, and
- Main Campus Drive on Centennial Campus

Relationship to Pedestrian and Bicycle Plans

The Primary and Secondary Paths were used to identify specific projects in the Campus Bicycle and Pedestrian Plan. Existing facilities were overlaid on the Plan Framework to identify deficiencies and missing links in the overall system. These deficiencies were verified through fieldwork and through comments and input from the campus community and the project Steering Committee.



NC STATE UNIVERSITY

MAP LEGEND

Path Type

- Primary
- Secondary

On Campus Building

Off Campus Building

Parking Lot

NCSU Campus Boundary

Data Source: City of Raleigh, Wake County, and NC State University. Physical Feature Path - Campus Paths

Figure 8: PLAN FRAMEWORK



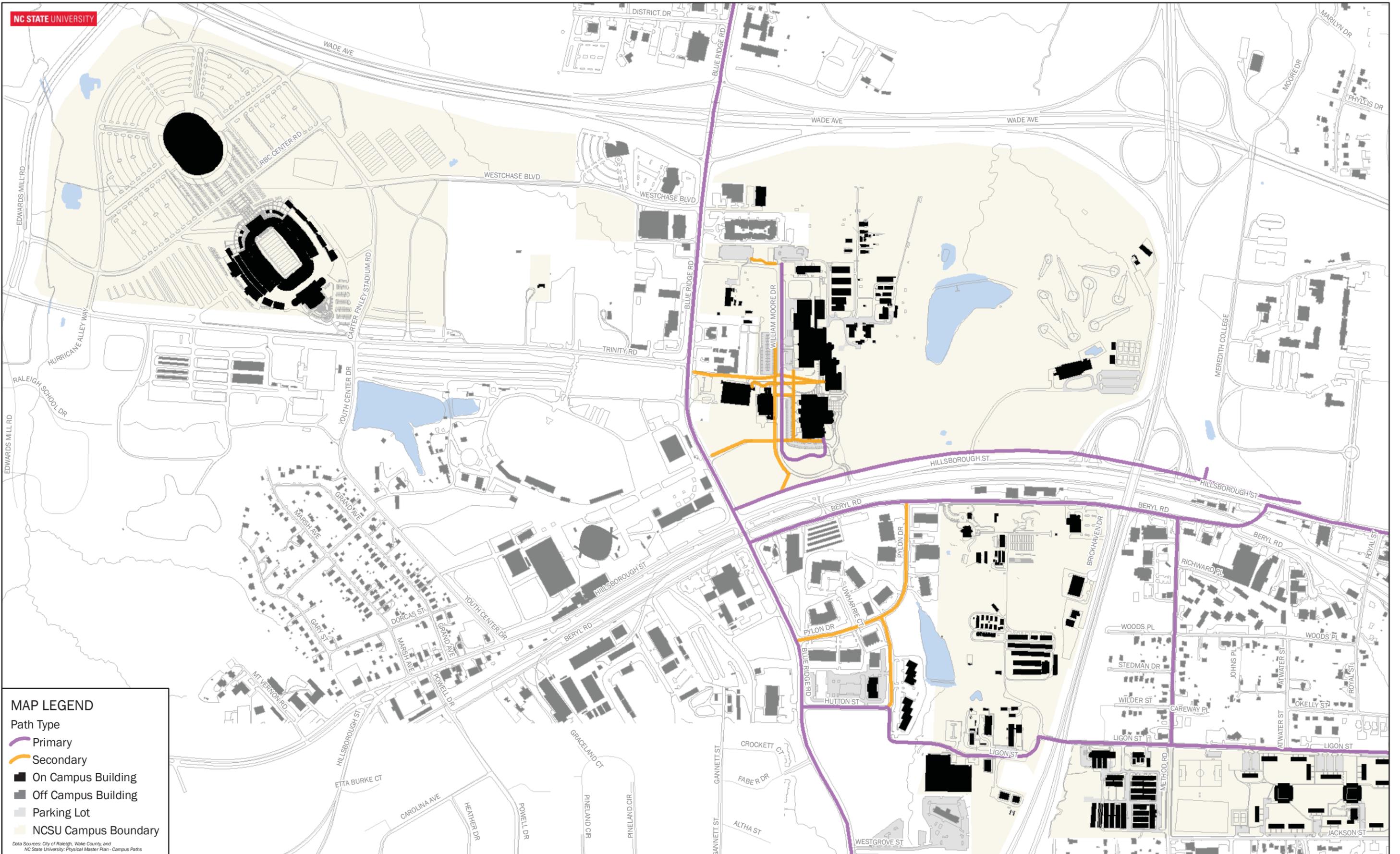


Figure 9: PLAN FRAMEWORK

0 500 1,000 2,000 Feet



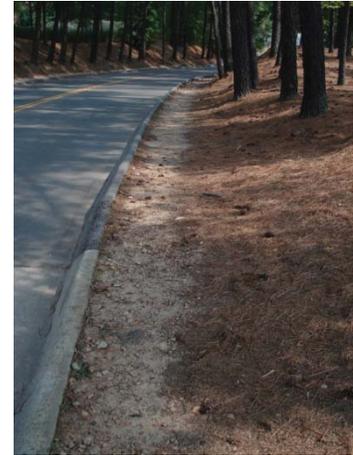
4.3 Pedestrian Project Recommendations

The Pedestrian Plan is comprised of pedestrian paths and sidewalks, many of which connect existing sidewalk dead ends, connect to transit stops, or construct a new sidewalk along a roadway with a heavily utilized (worn) foot path. Remaining pedestrian projects in the plan include placeholders for more general ‘connection improvements’ through a particular portion of campus, as well as safety improvements and pedestrian amenities for selected roadway intersections. Pedestrian Plan projects are detailed in Table 6 and illustrated on Figures 10 and 11.

Pedestrian Paths and Sidewalks

The campus outreach events discussed in Section 2 helped to identify many locations that are in need of sidewalk connections. Additional locations were otherwise identified during field work on campus. Two specific examples include Faucette Drive between Wolf Village and Dan Allen Drive, as well as the west side of Dan Allen Drive adjacent to the University Towers apartments. These types of projects are displayed as orange-dashed lines on Figures 10 and 11.

Several proposed paths indicated in the Plan will be constructed as part of a future Physical Master Plan project. Two examples include the West Lot parking deck (currently under construction) and the remaining phases of Greek Village.



Worn path, Varsity Drive

Intersection and Crossing Improvements

Recommended intersection and crossing projects (displayed as red circles on Figures 10 and 11) represent a variety of intersection enhancements, including the installation or relocation of pedestrian crossing signals, the installation or timing of traffic signals for pedestrian movements, pavement markings, and/or curb cut reconfiguration.

Locations that may have an impact on vehicular circulation should be further studied.



Pedestrian signal

Improved Transit Connections

Some recommended projects include the improvement of sidewalks or curb cuts located near transit stops. Although only two recommended projects (Projects 54 and 56) are identified as strictly transit improvements, several intersection or sidewalk improvements will also improve stop locations, for example:

- Project 68 provides a sidewalk along Dunn Avenue, connecting with a Wolfline and CAT bus stop
- Project 55 provides a new sidewalk and curb cut to an existing Triangle Transit bus stop
- Project 49 improves the pedestrian crossing of Varsity Drive adjacent to a Wolfline bus shelter
- Projects 28-30 and 35 provide sidewalks that connect with a Wolfline bus shelter

ADA Improvements

Pedestrian improvements are required to meet the standards of the Americans with Disabilities Act (ADA) of 1990 (see *2010 ADA Standards for Accessible Design*). Typical improvements include accessible curb cuts at intersections, signalization for the visual and hearing impaired, ensuring that sidewalks and paths are free of obstructions, and accessible access to transit facilities. NC State has an active program to retrofit existing facilities for accessibility and construct new facilities to ADA standards.



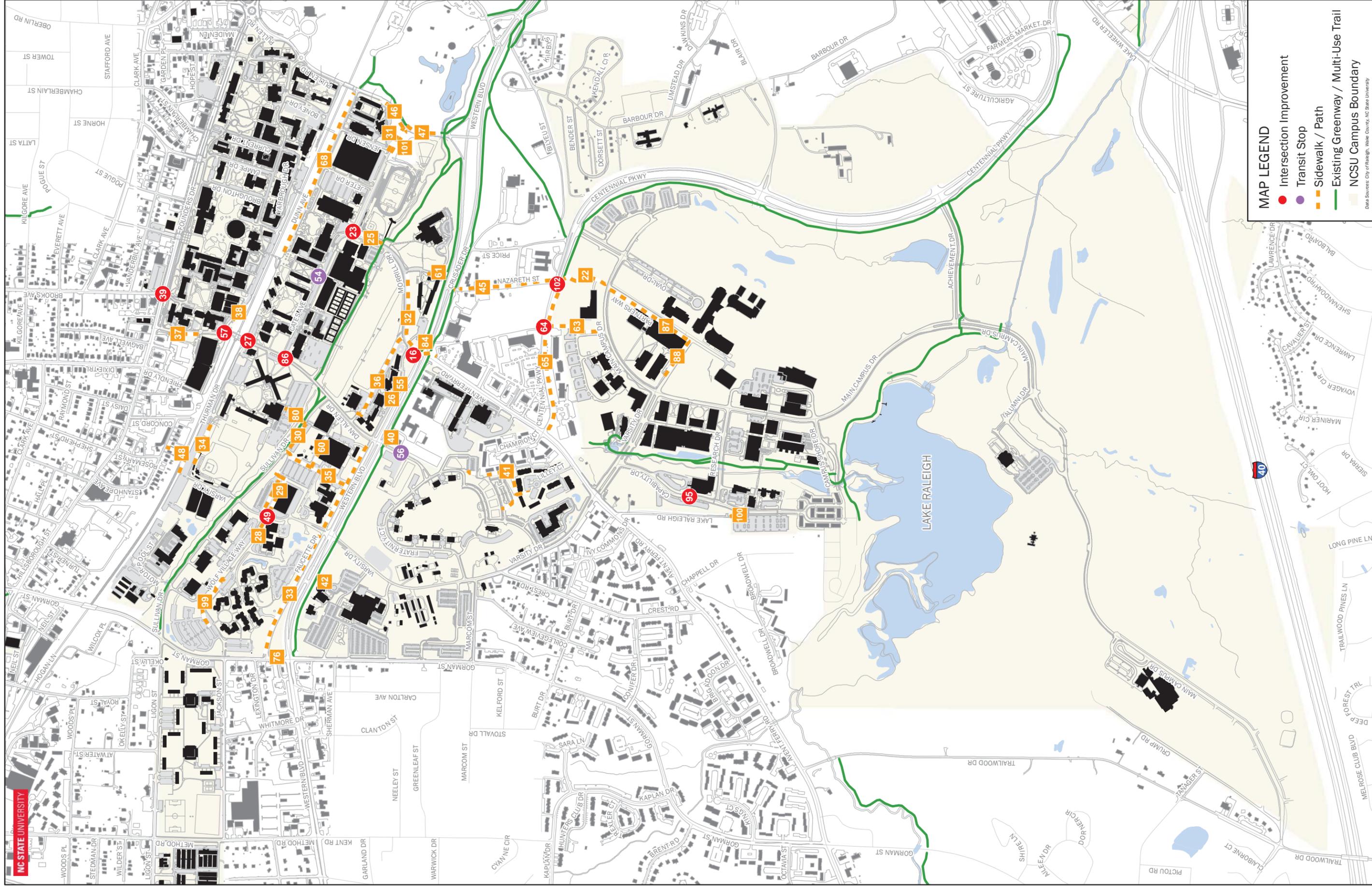
Accessible tunnel, NCSU

Table 9: Recommended Pedestrian Projects

On Campus Pedestrian Projects										
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Cost Category
22	New connection	Partners Way	Nazareth St	New	Centennial	Sidewalk / Path	Connect sidewalk	Extend Partners Way bike/ped component northward to Centennial Pkwy and connect with Nazareth St	0.12	\$10k - \$25k
23	Cates Ave	Morrill Dr	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Install pedestrian 'scramble' cycle for traffic signal; Close Talley Student Center loading dock access; New textured pavement and crosswalk markings for pedestrian crossings; Improve or relocate northbound bus stop / timepoint on Morrill to avoid pedestrian conflicts with motor vehicles	N/A	\$50k - \$100k
25	Morrill Dr	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Sidewalk / Path	Widen sidewalk	Coordinate with Transportation Department to improve transit amenities along east-side of Morrill Drive; Widen existing sidewalk and convert existing parking (32 spaces) to parallel onstreet	0.06	> \$500k
26	Faucette Dr - Jordan Hall	End of sidewalk	End of sidewalk	Retrofit	Central	Sidewalk / Path	Connect sidewalk	Coordinate with project ID-55, and University ADA Coordinator to connect existing dead end sidewalk segments to the east and west	0.02	\$100k - \$500k
27	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Intersection Improvement	Pedestrian signal	Install countdown pedestrian signals for north-south direction	N/A	\$25k - \$50k
28	Wolf Village Way	End of sidewalk	Varsity Dr	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk to Wolf Village Way / Varsity Dr intersection (south side); Includes retaining wall and removal of trees	0.05	\$25k - \$50k
29	New pedestrian connection	Wolf Village Way	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	New connection	Provide safe pedestrian path through West Lot parking area, and connect Wolf Village with Multi-Use Trail along Sullivan Dr	0.20	\$50k - \$100k
30	Sullivan Dr	West Lot	Schaub Hall parking lot	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk (south side)	0.07	< \$10k
32	Morrill Dr	Western Blvd	Warren Carrol Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct new sidewalk along east side of Morrill Dr to connect existing sidewalk segments	0.18	\$10k - \$25k
33	Faucette Dr	Gorman St	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct sidewalk along north side of Faucette Dr; connect to existing sidewalk	0.48	\$50k - \$100k
34	Thurman Dr	Varsity Dr	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Complete sidewalk along south side of roadway	0.11	\$10k - \$25k
35	New connection	Faucette Dr	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	Connect sidewalk	Establish new ped connection as identified in Campus Master Plan, north-south along the edge of West Lot	0.15	\$10k - \$25k
36	All Campus Path	Dan Allen Dr	Morrill Dr	New	Central	Sidewalk / Path	Connect sidewalk	Establish a new pedestrian connection adjacent to parking lot behind Biltmore/Jordan Halls; provide safe crossing of Dan Allen Dr with ADA-compliant curb ramps	0.20	\$10k - \$25k
37	Dan Allen Dr	End of sidewalk - University Towers	Dan Allen Dr - Pedestrian table	New	North	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk along west side of Dan Allen Dr from UT apartments to the Dan Allen parking deck	0.06	< \$10k
38	Yarbrough Dr	End of sidewalk	Existing parking	New	North	Sidewalk / Path	Extend sidewalk	Extend existing sidewalk from Wolfline bus stop eastward to parking area along Yarbrough Dr	0.04	< \$10k
40	Dan Allen Dr	End of sidewalk	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Connect existing sidewalks and make ADA-compliant	0.01	< \$10k
41	New connection	Greek Village	Lilley Ct / Avent Ferry Rd	Retrofit	South	Sidewalk / Path	New connection	Install opening in fence along Western Manor Apartments property line and establish a more direct ped connection from Greek Village southbound along Western Blvd	0.21	\$25k - \$50k
42	New connection	Visitor's Center	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Construct new sidewalk to connect building to Greenway trail	0.03	< \$10k
49	Varsity Dr	Wolf Village Way	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Provide new crosswalk markings and ADA-compliant curb ramps for all four directions; Connect Wolf Village Way with future transit stop at West Lot parking deck	N/A	< \$10k
54	Cates Ave	Alexander / Turlington Halls	N/A	New	Central	Transit Stop	Transit stop	Coordinate with Talley Student Center project; Construct new transit stop to access Free Expression Tunnel. Remove 2-3 parking spaces & improve ped crossing from residence halls to the north and Carmichael Gym to the south	N/A	\$100k - \$500k
55	Western Blvd	Triangle Transit bus stop	Faucette Dr	Retrofit	Central	Sidewalk / Path	Transit stop	Improve ADA access to transit stop from Faucette Dr sidewalk	0.01	< \$10k
56	Dan Allen Dr - south of Western Blvd	Western Blvd sidewalk	N/A	Existing	South	Transit Stop	Transit stop	Relocate Wolfline bus stop from utility pole near Western Blvd intersection to an ADA-compliant location (south) with ped countdown signals to cross Dan Allen Dr; coordinate with future Greek Village project	N/A	< \$10k
57	Dan Allen Dr	Yarbrough Dr	N/A	Retrofit	North	Intersection Improvement	New traffic signal	Install new traffic signal at intersection; install ADA-compliant curb ramps; stripe crosswalks	N/A	\$100k - \$500k
60	New connection	West Lot	Dan Allen Dr	Retrofit	Central	Sidewalk / Path	New connection	Establish a better east-west connection from West Lot east to existing sidewalk	0.07	< \$10k
61	New connection	Warren Carrol Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Construct sidewalk connection from Wood Hall to Western Blvd greenway	0.04	< \$10k
63	New connection	Centennial Pkwy	Main Campus Dr	New	Centennial	Sidewalk / Path	New connection	Establish a direct connection from Main Campus Dr to Mission Valley shopping center sidewalk	0.13	\$10k - \$25k
68	Dunn Ave	Free Expression Tunnel	Pullen Rd	New	Central	Sidewalk / Path	New connection	Construct new sidewalk or path along north side of Dunn Ave; connect all three tunnels and Pullen Rd; project within NCR right-of-way	0.37	\$50k - \$100k
76	Gorman St	Faucette Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Construct new sidewalk (east side) connection	0.03	< \$10k
80	New connection	Sullivan Dr	Fountain Dining Hall	New	Central	Sidewalk / Path	New connection	Construct new crossing of Sullivan Dr with ADA-compliant curb ramps; provide new pedestrian bridge over creek; provide new sidewalk through Bragaw parking lot	0.06	\$100k - \$500k
86	Dan Allen Dr	Cates Ave	N/A	Retrofit	Central	Intersection Improvement	Safety Improvements	Improve pedestrian safety at intersection by installing additional signage, such as advance warning "Ped Xing" pavement markings, and/or bollards for channelizing pedestrian crossings	N/A	< \$10k
87	Partners Way	Varsity Dr intersection	Parking Deck	New	Centennial	Sidewalk / Path	Connect sidewalk	Construct new sidewalk or path along west side of Partners Way between Varsity Dr intersection and parking decks	0.20	\$10k - \$25k
88	Varsity Dr	Partners Way	Red Hat Building	New	Centennial	Sidewalk / Path	Connect sidewalk	Construct new sidewalk or path along north side of Varsity Dr; connect to existing sidewalk near Red Hat Building; new crosswalk markings across Partners Way	0.09	\$10k - \$25k
95	Capability Dr	Midblock - near Research IV	N/A	Retrofit	Centennial	Intersection Improvement	Safety Improvements	Improve pedestrian safety at midblock crossing from Capability lot to Research IV building, such as pedestrian refuge median, or curb bulb-outs	N/A	< \$10k
99	Wolf Village Way	Wolfline Bus Stop	Parking Lot (NW of Wolf Village)	New	Central	Sidewalk / Path	Connect sidewalk	Study the possibility of connecting Wolfline bus stop to parking lot along north side of Wolf Village Way	0.13	\$10k - \$25k
100	New connection	Capability Dr sidewalk	Lake Raleigh Rd	New	Centennial	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to investigate connection of existing sidewalk along Capability Dr to end of Lake Raleigh Rd or Broadwell Dr	0.03	< \$10k

Off Campus Pedestrian Projects										
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Cost Category
16	Morrill Dr / Avent Ferry Rd	Western Blvd	N/A	Existing	N/A	Intersection Improvement	Relocate pedestrian signals (two of them)	Work with City of Raleigh &/or NCDOT to relocate existing pedestrian crossing signal buttons to more accessible locations	N/A	< \$10k
17	Blue Ridge Rd	Hillsborough St	William Moore Dr	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide new sidewalk connection to CBC (east side)	0.43	\$50k - \$100k
31	Cates Ave	Jensen Dr	Pullen Rd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to extend existing sidewalk (north side)	0.06	< \$10k
39	Brooks Ave	Hillsborough St	N/A	Retrofit	N/A	Intersection Improvement	Pedestrian signal	Work with City of Raleigh &/or NCDOT to install countdown pedestrian signals for east-west direction	N/A	< \$10k
45	Nazareth St	Western Blvd	End of sidewalk	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk and connect with Western Blvd greenway; improve lighting	0.19	\$10k - \$25k
46	Pullen Rd	Cates Ave	Bagwell Hall	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along west side of road; connect to existing sidewalk	0.08	< \$10k
47	Pullen Rd	Cates Ave	Western Blvd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along east side of road; connect to existing sidewalk at Cates / Pullen intersection	0.08	< \$10k
48	Varsity Dr	Thurman Dr	Concord St	New	N/A	Sidewalk / Path	New connection	Work with City of Raleigh &/or North Carolina Railroad to provide bike/ped connection under railroad tracks	0.09	> \$500k
64	Centennial Pkwy	Mission Valley rear entrance	N/A	Existing	N/A	Intersection Improvement	Intersection Improvement	Work with City of Raleigh &/or NCDOT to improve pedestrian crossing at intersection	N/A	< \$10k
65	Centennial Pkwy	Avent Ferry Rd	Multi-Use Trail	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk from intersection with Avent Ferry to the Multi-Use Trail entrance	0.33	\$25k - \$50k
77	Trinity Rd	Blue Ridge Rd	End of sidewalk	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk (north side)	0.07	< \$10k
81	Blue Ridge Rd	Beryl Rd	Hillsborough St	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to provide new sidewalk connection over railroad tracks	0.04	< \$10k
82	Blue Ridge Rd	William Moore Dr	NC Museum of Art	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide sidewalk connection along road	0.63	\$50k - \$100k
84	Western Blvd	Morrill Dr	Avent Ferry Rd	New	N/A	Sidewalk / Path	New connection - Tunnel	Work with City of Raleigh &/or NCDOT to provide tunnel for long-term separation of transit, bicycle, and pedestrians	0.06	< \$10k
101	Cates Ave	Derr Track	Pullen Rd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to extend existing sidewalk (south side)	0.06	< \$10k
102	Centennial Pkwy - End of trail	Nazareth St	N/A	Retrofit	N/A	Intersection Improvement	Safety improvement	Work with City of Raleigh &/or NCDOT to study mid-block crossing safety improvement	N/A	< \$10k

Notes: 1. "Map Category" and "ID" columns correspond with recommended projects maps (Figures 10-11).
 2. Projects in this table are ordered numerically by project ID # and are not prioritized. For prioritized projects list please see Table 8 in Section 5.4 (Implementation Plan).



NC STATE UNIVERSITY

MAP LEGEND

- Intersection Improvement
- Transit Stop
- Sidewalk / Path
- Existing Greenway / Multi-Use Trail
- NCSU Campus Boundary

Data Source: City of Raleigh, Wake County, NC State University

Figure 10: RECOMMENDED PEDESTRIAN PROJECTS



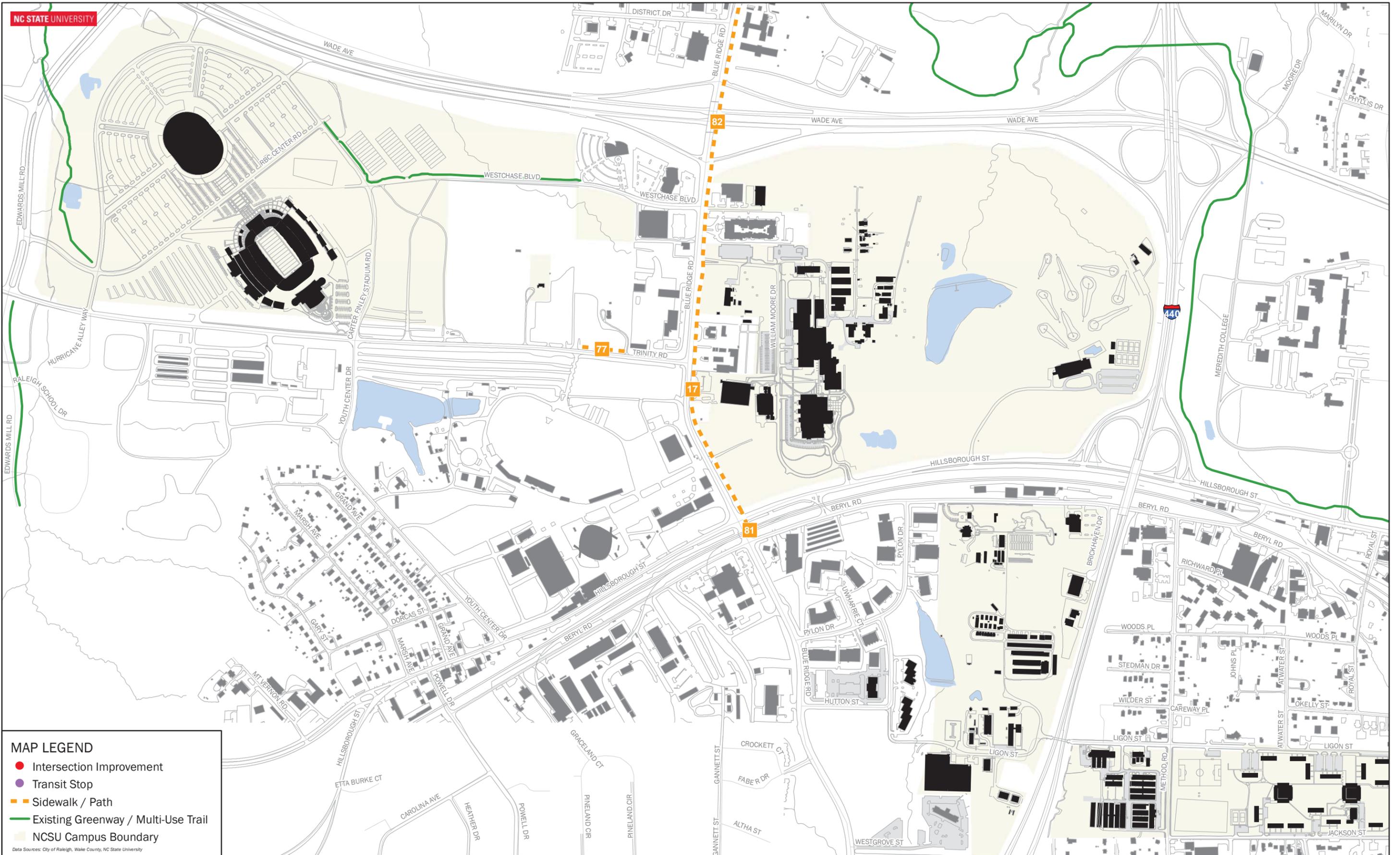


Figure 11: RECOMMENDED PEDESTRIAN PROJECTS

4.4 Bicycle Project Recommendations

Facility Types

There are several possible ways to accommodate bicycles on roads, depending on conditions. The most common ways are: shared roadways (signed or unsigned), bicycle lanes, wide outside lanes, and shared use (or multi-use) paths. Although not common, some campuses, such as the University of Illinois, have dedicated bicycle paths not intended for shared use. The *Guide for the Development of Bicycle Facilities* (American Association of State Highway and Transportation Officials, 1999) defines each of these facility types and their proper application, summarized below.

Standards and design guidelines for construction, markings, and signage of these facilities are detailed in Section 4.5.

Shared Roadways

Most bicycle travel in the United States occurs on shared roadways, which have no special bicycle designations or markings. Many residential and local low-volume streets are appropriate shared roadways. If signed with bicycle route signs, shared roadways can provide continuity to other bicycle facilities (usually bicycle lanes), or designate preferred routes through high-demand corridors. Most of the on campus streets are unsigned shared roadways.



Bicycle Lanes

Bicycle lanes are intended to delineate the right-of-way for bicyclists and motorists and to provide for movements that are more predictable by each. Typically, bicycle lanes are no less than five feet wide, and are striped and marked with standard markings (see Section 4.5). Bicycle lanes are usually located on the curbside of the street, but can be located between the travel lane and parallel parking.



Bike lane, University of Wisconsin

Unmarked and unstriped lanes, commonly known as wide outside lanes, can also be successfully implemented. Typically, wide outside lanes are travel lanes that are shared with motorists that are a minimum of 14 feet wide. The expectation is that bicycles keep to the curb side and motor vehicles can pass within the lane. As with shared roadways, bicyclists using bicycle lanes and wide outside lanes are expected to make the same movements and follow the same traffic rules as motorists.

A more recent option is the use of shared lane markings (or “sharrows”). Sharrows may be used to increase motorist awareness of bicyclists and encourage safe passing, help prevent wrong-way bicycling, and aid bicyclists in positioning themselves laterally to avoid getting “doored” or where lanes are too narrow for motorists and bicyclists to travel side by side. For pavement marking and signage guidelines, see Section 4.5.



Sharrows marking (source: PBIC)

Shared Use (or Multi-Use) Paths

Generally, shared use (or multi-use) paths should be used on corridors not served by streets, and should offer opportunities not provided by the road system. They provide recreational opportunities and can serve as direct commuter routes if cross-flow by automobiles and pedestrians is minimized. Shared use paths are appropriate where motor vehicle speeds exceed 35 mph or along non-roadway alignments (e.g. stream corridors and water/sewer easements). University campuses have successfully incorporated shared use paths and off street dedicated bicycle paths, especially in areas of campus with limited vehicular traffic. The multi-use paths at NC State are good examples of shared use paths that function well as part of a larger system of paths and on street facilities.



Multi-use path at NCSU

Application

Campuses across the United States have had varying success implementing each of the three major bicycle facilities noted above. In general, bicycle travel is enhanced when a high quality network of bicycle facilities is developed. On most campuses, more than one facility type is used.

The *Guide for the Development of Bicycle Facilities* notes: “In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or motorists to operate in a manner that is inconsistent with the rules of the road...An important consideration in selecting the type of facility is continuity. Alternating segments of shared use paths and bicycle lanes along a route are generally inappropriate and inconvenient because street crossings by bicyclists may be required when the route changes character.” (p. 8)

In general, streets with low speeds and multiple intersections and driveways should have on street bicycle lanes, sharrows, or no marked facilities at all, rather than shared use paths (also called sidepaths) next to roadways. Having bicycles on the street in these situations has proven to be safe for bicyclists, and also can act as traffic calming for vehicular traffic. Off-street bicycle paths should be considered in areas adjacent to higher-speed streets or streets with inadequate width for standard bicycle lanes, or in areas used for recreational purposes with few vehicular intersections.

Facility Improvements

Bicycle Plan projects are detailed in Table 10 and illustrated in Figures 12 and 13.

On-road Improvements

Bike lanes are recommended for several campus streets that have sufficient roadway width to accommodate them without costly relocation of the curb and gutter. The exception is Dan Allen Drive (Project 1) which is recommended to have new streetscape improvements, a cycle track, and new sidewalk. See Section 4.6 for conceptual ideas for Dan Allen Drive improvements.

Sharrows are recommended for more narrow campus streets, such as Yarbrough Drive (Project 4) and Stinson Drive (Project 10) on North Campus, as well as Varsity Drive (Project 69) and Nazareth Street (off campus).

All on-road facilities are displayed as blue and gray dashed lines on Figures 12 and 13. Recommended bike lane projects include many off campus roadways that coordinate with the City of Raleigh's Bicycle Transportation Plan.

Off-road Improvements

Off-road bicycle improvement projects are displayed as green dashed lines, and mainly refer to new multi-purpose paths that connect to city greenway trails (Projects 18, 21, and 62 on Centennial Campus).

Potential Off-Campus Roadway Improvements

Three recommended improvement projects are intended to address bicycle safety through vehicular enhancements to either on street parking alignment, extension of an existing median, or the extension of an existing roadway and new connection. One of these projects (Project 20) is on campus and two are at least partially off campus (Projects 58 and 59), which will require coordination with the City of Raleigh and the NCDOT.

Table 10: Recommended Bicycle Projects

On Campus Bicycle Projects										
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Cost Category
1	Dan Allen Dr	Western Blvd	Thurman Dr	Retrofit	Central	On-Road Bicycle Facility	Cycle Track	Convert each shoulder of roadway to one-way on-street bicycle path with texturized pavement and flush curb (cycle track)	0.33	\$50k - \$100k
2	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Bicycle Amenities	Bicycle box	Install bicycle box at intersection, both directions	N/A	< \$10k
3	Dan Allen Dr	Thurman Dr	Hillsborough St	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.18	< \$10k
4	Yarborough Dr	Dan Allen Dr	Stinson Dr	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.46	< \$10k
6	Dan Allen Dr	Western Blvd	Greek Village	New	South	On-Road Bicycle Facility	Bicycle lanes	Add bicycle lanes along roadway as Greek Village road improvements occur	0.13	< \$10k
10	Stinson Dr	Current Dr	Yarborough Dr	Retrofit	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.21	< \$10k
14	Rocky Branch Multi-Use Trail	Morrill Dr	Pullen Rd	Existing	Central	Greenway / Multi-Use Trail	Trail maintenance	Improve pruning and general maintenance practices to ensure trail is passable at all times	0.10	< \$10k
15	Rocky Branch Multi-Use Trail	Morrill Dr	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	< \$10k
18	Upper Walnut Creek Connector Trail	NCSU Campus Property Line	End of trail - Campus Shore Dr	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail west to connect with the existing City of Raleigh greenway system	0.33	\$100k - \$500k
20	Cates Ave	Dan Allen Dr	Morrill Dr	Retrofit	Central	Streetscape Improvement	Improvements	Convert Cates Ave to pedestrian-friendly corridor and convert on-street parking to parallel	0.31	> \$500k
21	Multi-Use Trail connection	Main Campus Dr	Alumni Center	New	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail; connect existing Centennial campus trail network to Alumni Center	0.22	\$100k - \$500k
24	Carmichael Complex Plan	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Greenway / Multi-Use Trail	Improve connection	Establish an ADA-compliant connection for bicycle/pedestrian access northbound from multi-use trail to Cates Ave, between Dan Allen and Morrill Dr	0.19	< \$10k
52	Main Campus Dr	Achievement Dr	Trailwood Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway	1.45	\$10k - \$25k
62	Middle Walnut Creek Connector Trail	End of trail - Main Campus Dr	City of Raleigh Greenway - Lake Wheeler Rd	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail east to connect with the existing City of Raleigh greenway system	0.70	\$100k - \$500k
66	Bicycle Station	Carmichael Gym	N/A	New	Central	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$100k - \$500k
67	Bicycle Station	Monteith Research Center	N/A	New	Centennial	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$100k - \$500k
69	Varsity Dr	Thurman Dr	Western Blvd	New	Central	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.32	< \$10k
70	Varsity Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway	0.26	< \$10k
71	Oval Dr	Main Campus Dr	Centennial Pkwy	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.12	< \$10k
72	Main Campus Dr	Oval Dr	Achievement Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway	1.07	\$10k - \$25k
78	New recreational trail	CBC Campus	N/A	New	CBC	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail around CBC Campus	1.90	> \$500k
79	Achievement Dr	Main Campus Dr	Centennial Pkwy	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.26	< \$10k
89	Centennial Campus Multi-Use Trail	Campus Trailhead - Avent Ferry Rd	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	< \$10k
90	Centennial Campus Multi-Use Trail	Trail split - Research Dr sidewalk	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Directive (Sign Type #20) sign at trail split	N/A	< \$10k
91	Centennial Campus Multi-Use Trail	Trail split - Walnut Creek Connector Trail	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Directive (Sign Type #20) sign at trail split	N/A	< \$10k
92	Upper Walnut Creek Multi-Use Trail	NCSU Campus Property Line	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	< \$10k
94	Middle Walnut Creek Connector Trail	Campus Trailhead - Lake Wheeler Rd	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	< \$10k
96	Bicycle Trough	Morrill Dr - Greenway Trail steps	N/A	Retrofit	Central	Bicycle Amenities	Bicycle trough	Install bicycle trough at stairs leading from Morrill Dr sidewalk to Rocky Branch Greenway Trail	N/A	< \$10k
97	Centennial Campus Streets Study	Partners Way; Capability Dr	Research Dr; Campus Shore Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Study the possibility of installing (a) bicycle lanes along roadways without onstreet parking, or near Lake Raleigh, or (b) MUTCD Sharrows in proper location along Centennial Campus roadways with onstreet parking	N/A	< \$10k
103	Existing Shower Facilities	Various Buildings - See Report Table	N/A	Retrofit	Various	Wayfinding Sign	Shower facility signage	Install new wayfinding signage to buildings with existing shower facilities; utilize the NC State Campus Signage Standard	N/A	\$10k - \$25k
104	Administrative Services I Building	N/A	N/A	Retrofit	Central	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$50k - \$100k
105	Broughton Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$50k - \$100k
106	Daniels Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$50k - \$100k
107	Ricks Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$50k - \$100k

Off Campus Bicycle Projects										
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Cost Category
5	Hillsborough St	Brooks Ave transit stop	N/A	New	N/A	Bicycle Amenities	Bicycle lockers	Work with Triangle Transit to install bicycle lockers near Hillsborough St/Brooks Ave transit stop to serve commuter populations	N/A	< \$10k
7	Varsity Dr	Western Blvd	Avent Ferry Rd	New	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.67	\$25k - \$50k
8	Gorman St	Brent Rd	Hillsborough St / Faircloth St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh to extend existing bicycle lanes	1.64	\$50k - \$100k
9	Nazareth St	Western Blvd	Centennial Pkwy	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to provide MUTCD Sharrows in proper location on roadway	0.22	< \$10k
11	Dan Allen Dr	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection, both directions	N/A	< \$10k
12	Avent Ferry Rd	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection	N/A	< \$10k
13	Hillsborough St	Gardner St	Faircloth St / Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.84	\$100k - \$500k
19	Avent Ferry Rd	Varsity Dr	Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.91	\$25k - \$50k
43	Extend Multi-Use Trail	End of trail	Avent Ferry Rd	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh to extend existing multi-use trail north; connect with Avent Ferry Rd sidewalk &/or Centennial Pkwy	0.07	\$25k - \$50k
44	Avent Ferry Rd	Centennial Pkwy	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.18	< \$10k
50	Crest Rd	Avent Ferry Rd	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.45	< \$10k
51	Trailwood Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.07	\$50k - \$100k
58	Avent Ferry Rd	Western Blvd	Centennial Pkwy	Retrofit	N/A	Streetscape Improvement	Bicycle facilities, median extension, landscaping	Work with City of Raleigh &/or NCDOT to further study and improve bicycle/pedestrian safety through streetscape improvement	0.24	> \$500k
59	Pullen Rd	Western Blvd	Centennial Pkwy	New	N/A	Possible New Roadway	New roadway connection	Work with City of Raleigh &/or NCDOT to extend existing Pullen Rd to south and provide new connection; Construct sidewalks/bicycle facilities and improve intersection geometry	0.38	> \$500k
73	Ligon St	Gorman St	I-440 Tunnel	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.58	< \$10k
74	Ligon St	Hutton St	I-440 Tunnel	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.37	< \$10k
75	Hutton St	Ligon St	Blue Ridge Rd	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.14	< \$10k
83	Hillsborough St	Blue Ridge Rd	Beryl Rd - Multi-Use Trail	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh &/or NCDOT to provide two-way multi-use trail connection on north side of road; connect with Reedy Creek trail	0.93	> \$500k
85	Blue Ridge Rd	Beryl Rd	NC Museum of Art - Reedy Creek Greenway Trail	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.12	\$50k - \$100k
98	Upper Walnut Creek Connector Trail	Trailwood Dr	NCSU Campus Property Line	New (Funded)	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh to extend existing multi-use trail west to connect with the existing greenway trail	0.29	\$100k - \$500k

Notes: 1. "Map Category" and "ID" columns correspond with recommended projects maps (Figures 12-13).

2. Projects in this table are ordered numerically by project ID # and are not prioritized. For prioritized projects list please see Table 8 in Section 5.4 (Implementation Plan).

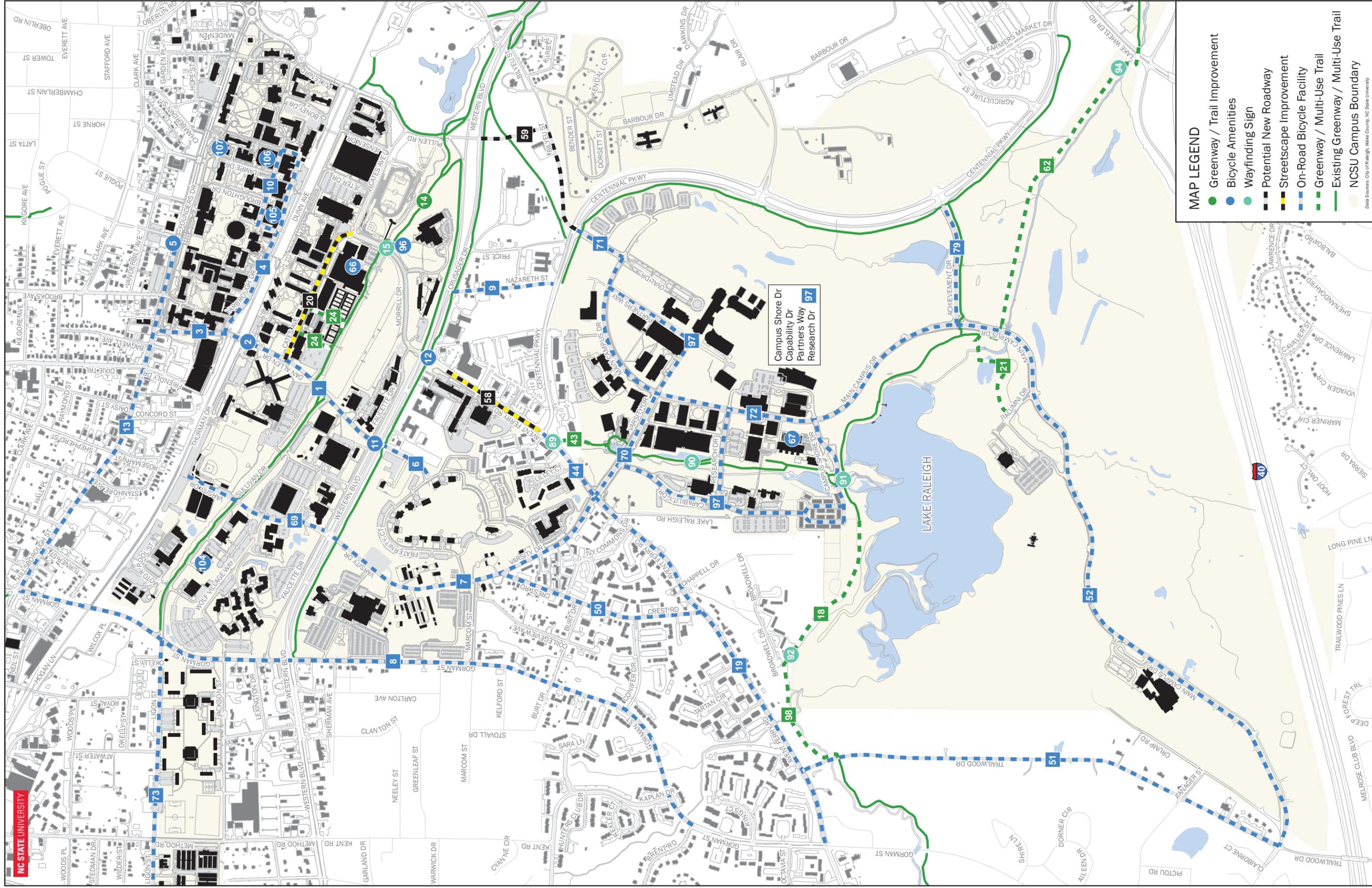


Figure 12: RECOMMENDED BICYCLE PROJECTS

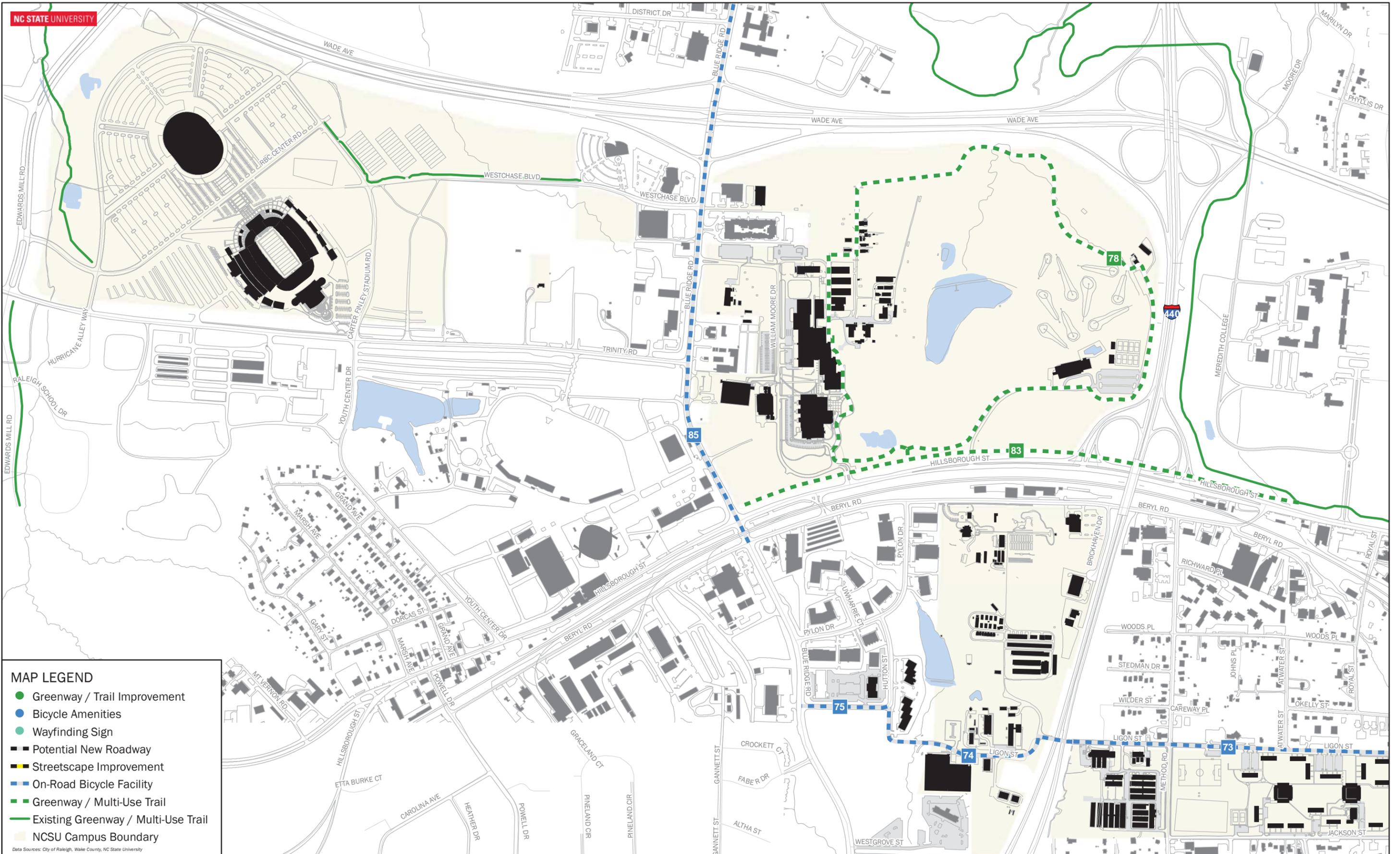


Figure 13: RECOMMENDED BICYCLE PROJECTS

Recommended Ancillary Facilities and Amenities

Bike Parking

The location, supply, and design of bicycle parking are important considerations in determining the effectiveness of this amenity. In general, bicycle parking should be provided at entrances to every major campus building. The University should also continue to investigate and identify opportunities for covered bicycle parking to provide weather protection and security for bicyclists. Covered bicycle parking can be incorporated into building overhangs, awnings, and breezeways. In addition, campus parking decks often have suitable locations for covered bicycle parking or bike cages, providing longer term storage options and allowing people who commute by car to easily store and retrieve their bicycle for trips around campus. Bicycle lockers also provide long-term storage and excellent weather and theft protection (Project 5, Figure 12).



Wave-style racks under overhang, NCSU

The University has adopted a bike rack style for use across campus. The rack is a wave-style rack with 18" vertical spacing between pipes allowing for the bike and frame to be locked, rather than just the wheel. The University also maintains a Bicycle Parking Map that locates bike racks on campus (<http://www2.acs.ncsu.edu/trans/maps/bikeRackMap-all.html>).

Intersection/Signal Improvements

These projects are displayed as blue circles, and include bicycle loop detectors (Projects 11 and 12) and bicycle boxes (Project 2) within Figure 12.

Bike Stations

A bike station is a small building or kiosk that provides bicycle commuters with a place to make minor repairs or inflate tires, as well as provide information on bicycle programs or amenities on campus. Bike stations can be staffed by volunteers or they can be self-serve stations that are periodically maintained by staff.



Bike station, Univ. of Colorado, Boulder

Basic recommended components of a bike station are: an air pump, secure bike parking, and a bike map/bike route information. Optional amenities may include bike repair, a small coffee shop, or a shower and changing facility. Two recommended locations for future bike stations are Carmichael Gym (66) near the Wolfwheels bicycle rental program, and the Monteith Research Center (67) on Centennial Campus near the College of Textiles building (Figure 12).

Wayfinding

NC State has adopted a comprehensive signage manual for interior and exterior campus signs (http://www.ncsu.edu/facilities/campus_signage/index.htm). Greenway signage is included at the end of the exterior signage manual. Utilizing these standard signage types around each campus precinct and between campus precincts will promote bicycle safety and awareness. A consistent signage program will make bicycle movements more predictable and increase safety for bicyclists, pedestrians, and motorists alike.

Figures 12 and 13 illustrate six locations where additional wayfinding or trail information may be appropriate. Three projects are located at a trail split, where one direction continues on the multi-use path and the other heads to a nearby sidewalk. These three locations would be satisfied by a directive sign, such as the Campus Signage Program sign type #20. The three remaining wayfinding projects are located at the NC State property boundary, and may benefit from a trailhead sign, such as the Campus Signage Program sign type #21.

The Manual for Uniform Traffic Control Devices (MUTCD) contains guidance and instruction for bicycle wayfinding. These standards could be used together with the Campus Signage Program sign types, especially for those facilities that are parts of systems that connect to bicycle systems in the City of Raleigh.

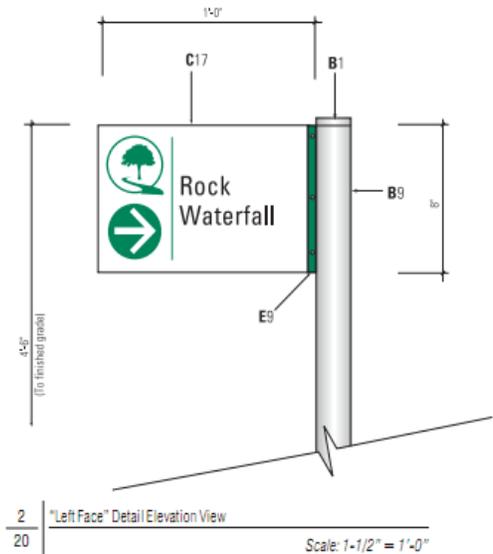
Shower Facilities

Table 7 in Section 2.7 lists twelve building with shower and changing facilities that are available to the campus population. It is recommended that the university retrofit several campus buildings to accommodate bicycle commuter shower facilities. Table 11 lists four buildings that are strategically located to satisfy an existing gap in coverage, and are ranked high on the capital projects list for major renovations.

Table 11: List of Recommended Future Campus Shower Facilities

Building Name	Precinct
Admin I	Central
Broughton	North
Daniels	North
Ricks	North

Data Source: North Carolina State University Office of the University Architect.



NCSU Greenway Sign Type 20



Bicycle wayfinding signs (source: MUTCD)

Recommended Programs and Policies

Bicycle improvements are often discussed in terms of the “Four E’s” of bicycle planning and design: Engineering, Education, Enforcement and Encouragement. Together, the “Four E’s” the effectiveness of systems and programs and ensure that the needs of all users are met. The Engineering component of this Plan is detailed in the project recommendations in Table 10. The other three E’s (Education, Enforcement and Encouragement) are discussed below.

Education and Safety

In addition to infrastructure improvements for bicycles, it is important to improve the information available for both current and potential bicyclists, and to inform the campus community and general public about bicyclists’ rights, rules of the road, and general safety. In North Carolina, the NCDOT maintains information to educate bicyclists on state law and promote safety (see <http://www.ncdot.org/bikeped/lawspolicies/>).

The University collaborates with City and regional partners to develop education and safety programs that benefit the University community. Current outreach programs designed for campus bicyclists include campus bike tours and safety sessions, distribution of a campus bike safety pamphlet, a voluntary bicycle registration program to prevent theft (see <http://www2.acs.ncsu.edu/trans/forms/wolftrailsBikeReg.html>), a bicycle rental program called WolfWheels, bike repair classes offered at the NCSU Craft Center, and emergency ride home offerings to employee cyclists who participate in the campus Travel Demand Management (TDM) program (see Section 2.8). The University might consider a Bike Ambassador Program that uses a peer education model to promote safe cycling on campus and distribute bicycling information to the campus community,

Enforcement

Enforcement of regulations and policies can be critical to maintaining a safe bicycling and walking environment. Enforcement may include basic traffic regulations for automobiles, jaywalking for pedestrians, or bicyclists riding the wrong way on streets or riding on sidewalks. Enforcement is especially critical at high volume intersections with conflict points and known safety issues, such as the intersection of Western Boulevard and Avent Ferry Road. University Police can use targeted enforcement efforts at key problem areas to raise awareness and enforce applicable laws. It is also recommended that the University Police collaborate with the City and Capitol Police on enforcement programs in those areas shared by multiple jurisdictions.

Encouragement

The University currently distributes a campus bike parking map and a walk times map for pedestrians, however it is recommended that a more comprehensive campus bicycle map be developed. The bicycle map should show bicycle routes to, around, and between each of the campus precincts, and should differentiate between exclusive and shared facilities. It should also indicate where amenities for bicyclists are located, such as bicycle stations, covered or long-term bicycle parking, and other helpful information for bicycle commuters. Rules of the road and safety information should also be included. These maps should be distributed on campus and at local bicycle shops, and should be incorporated into new student orientation programs in parallel with any information on car parking.

The University may also consider other campus programs to raise awareness, promote cooperation, and create a bike culture on campus. Such programs may include a bicycle benefits club that encourages sustainability through incentives and rewards, bike-to-work weeks and related activities, providing bicycle

commuter courses on campus, and encouraging on-campus retailers to provide bicycle apparel and equipment.

4.5 Facility Standards and Design Guidelines

As the University implements the recommendations in the Campus Bicycle and Pedestrian Plan it will be important to do so in a consistent and predictable way. The facility standards and design guidelines in this section establish the baseline for a variety of improvements and should be referred to as improvements are implemented and constructed. These standards and guidelines are comprised of best-practices nationally and from other communities, and are referenced as such.

BICYCLE FACILITIES

Bicycle Lanes

Striping and Markings

The bicycle lane should be striped at least five feet from the curb or parking area, with a minimum useable surface of four feet. “Useable surface” may include up to one foot of a concrete gutter pan, provided that the transition between pavement surface and concrete gutter pan is very smooth.

Wider bike lanes should be provided on streets with high motor vehicle speeds and/or traffic volumes, or where pedestrians, drains, grates or other obstacles may exist in the bicycle lane. Regular maintenance to bicycle lanes is imperative.

Bicycle lanes should be constructed to the same standards as the adjacent roadways. **(AASHTO, Guide for the Development of Bicycle Facilities)**

Bicycle lanes should be striped with a four to six inch wide longitudinal pavement marking. A dashed line should be used in intersections or taper areas to denote an extension of the lane using two foot line segments with two to six foot gaps. **(Manual on Uniform Traffic Control Devices, MUTCD, 3A.06)** Alternately, bike lanes can be dropped at intersections to indicate that cyclists should utilize travel lanes for through and turning movements. Bike lanes should always be striped to the left of dedicated right turn lanes if utilized at intersections, in order to avoid turning movement conflicts.

Words, symbols, and/or arrow markings used to denote bicycle lanes should be placed at the beginning of the bicycle lane and at periodic intervals thereafter, based on “engineering judgment,” as shown on Figure 14. **(MUTCD 9C.04)**

Whenever possible, curb opening inlets should be used for drainage. If this is not feasible, any drainage grate within a bicycle lane should be retrofitted so that it is flush with the pavement surface, contains no gap between frame and grate, and does not contain slots that are parallel to the roadway. Where grates, utility covers, or other obstructions cannot be eliminated, a solid white line should be applied to guide the bicyclist around the obstruction, as shown on Figure 16. **(MUTCD 9C.06)**

Intersections

For the safety of bicyclists and to allow them to obey traffic laws, loop detectors at actuated signalized intersections should be designed to respond to bicycles and marked accordingly using pavement markings, such as the one shown on Figure 15. The R10-22 sign may also be installed to supplement the pavement marking, as shown on Figure 18. **(MUTCD 9C.05)** Pavement markings can be used to indicate bike-sensitive loop detector locations on the roadway.

At intersections where visibility of traffic signals is limited for a bicyclist, the signal faces should be adjusted to allow for greater visibility. If this is not possible, separate signal faces for bicyclists should be provided. **(MUTCD 9D.02)**

Signage

The bike lane sign (R3-17) and supplemental plaques (R3-17aP and R3-17bP) (see Figure 19) should be used to indicate the presence of a marked bicycle lane. They should be placed in advance of, at the end of, and at periodic intervals along marked bicycle lanes “as determined by engineering judgment based on prevailing speed of bicycle and other traffic, block length, distances from adjacent intersections, and other considerations.” **(MUTCD 9B.04)**

Where bicycle lanes are not present, a W16-1P plaque may be used in conjunction with a W11-1 sign (see Figure 20) to warn or remind motorists of the presence of bicycles, which may be moving at slower speeds. These signs may also be appropriate along roadway sections where shared lane markings, or “sharrows” are present (see next section). **(MUTCD 2C.60)**

Shared Lane Markings or “Sharrows”

The Shared Lane Marking, shown in Figure 17, may be used to increase motorist awareness of bicyclists and encourage their safe passing, help prevent wrong-way bicycling, and aid bicyclists in positioning themselves laterally to avoid getting “doored” or where lanes are too narrow for motorists and bicyclists to travel side by side.

Shared Lane Markings should not be used on roads with a speed limit greater than 35 mph or on shoulders or bicycle lanes.

Shared Lane Markings should be placed immediately following an intersection and spaced thereafter at intervals no greater than 250 feet. If used on streets with on street parallel parking, the center of the marking should be at least 11 feet from the curb or pavement edge if there is no curb. For streets with no parking, the center of the marking should be at least 4 feet from the curb or pavement edge if there is no curb. **(MUTCD 9C.07)**

Bicycle Boxes

A bike box can be installed at intersections to allow bicyclists to move to the front of the queue, which improves the visibility of bicyclists to motorists and improves the safety of left and right bicycle turning movements (see Figures 21 and 22). Bicyclists can position themselves to more easily make left turns without having to merge into traffic. The safety of right turning movements is also improved as motorists are

prohibited from turning right on red and are less likely to conflict with bicycle through traffic when turning right on green. Bicycle boxes are relatively new and not yet included within the MUTCD or AASHTO guidelines.

Bike boxes are most appropriate at intersections with high volumes of bicycles and motor vehicles, intersections where there are frequent turning movements or conflicts between

turning motorists and bicyclists, and/or intersections where there are high rates of bicycle crashes.

Bike boxes should be approximately 8-10', though there are instances in the U.S. of slightly smaller and larger ones. Cities such as Portland, Minneapolis, and New York City have successfully implemented bike boxes.



Bike box in Portland, OR

Bicycle Troughs

Stairs at NC State University can be a formidable barrier for bicyclists. Bicycle troughs can be installed on the sides or center of long stairs on hills to allow bicyclists to place the wheels of the bicycle in a guided track and push the bicycle up or down the stairs without having to carry it or push it on the stairs. Existing stairs can be retrofitted to add this amenity.



Potential bicycle trough location at NCSU

PEDESTRIAN FACILITIES

All-Pedestrian Signal Phase (“Scramble”)

An all-pedestrian signal phase, or pedestrian scramble, incorporates a traffic signal phase where all motorists are stopped and all pedestrian may cross in any direction, including diagonally. A scramble may be used in situations where there is a high pedestrian volume or frequent conflicts between turning vehicles and pedestrians. Some examples of signage and pavement markings are given on Figure 23.



Intersection with all-pedestrian phase signal

Mid-Block Crosswalk

The In-Street Pedestrian Crossing (R1-6a) sign may be used at an unsignalized pedestrian crosswalk to increase road users’ awareness of pedestrians and remind them of laws regarding the right-of-way (see Figure 24). The In-Street Pedestrian Crossing sign, if used, should be placed at the crosswalk in the roadway on a lane-line, center line, or center island/refuge.



In-street pedestrian crossing sign

Figure 14 – Bicycle Lane Pavement Markings

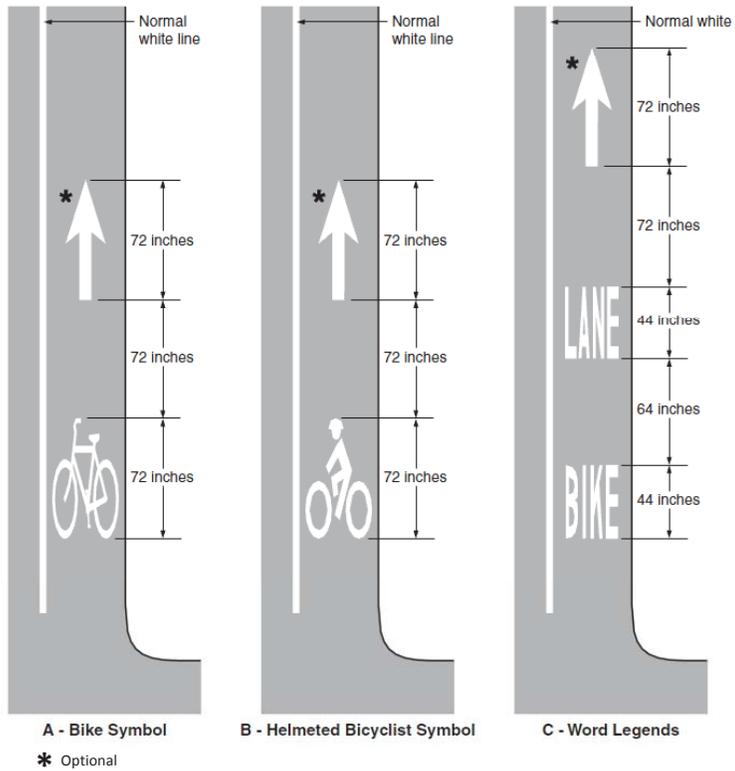


Figure 15 – Bicycle Loop Pavement Markings

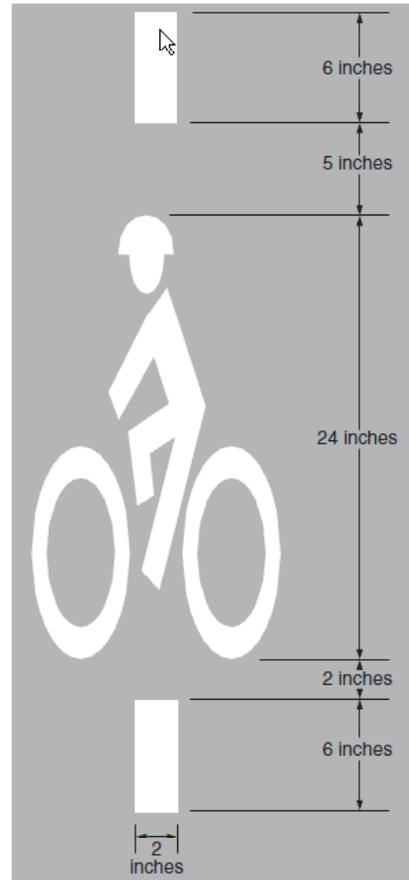


Figure 17 – Shared Lane Pavement Markings

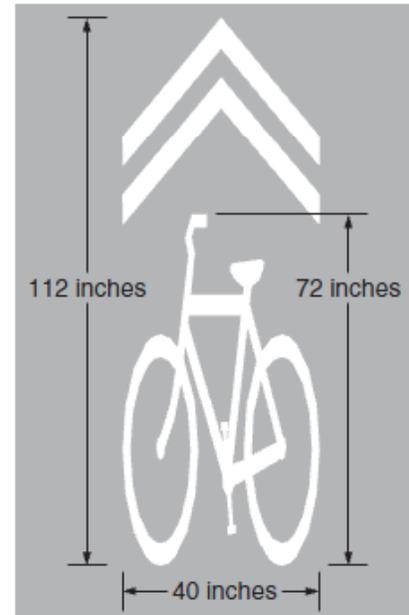
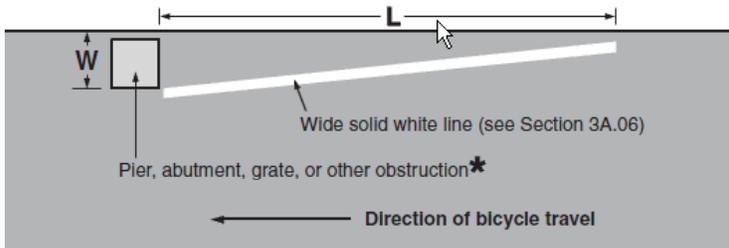


Figure 16 - Examples of Obstruction Pavement Markings



$L = WS$, where W is the offset in feet and S is bicycle approach speed in mph

* Provide an additional foot of offset for a raised obstruction and use the formula $L = (W+1) S$ for the taper length

Source: MUTCD, 2009 Edition

Figure 18 – Bicycle Loop Signage

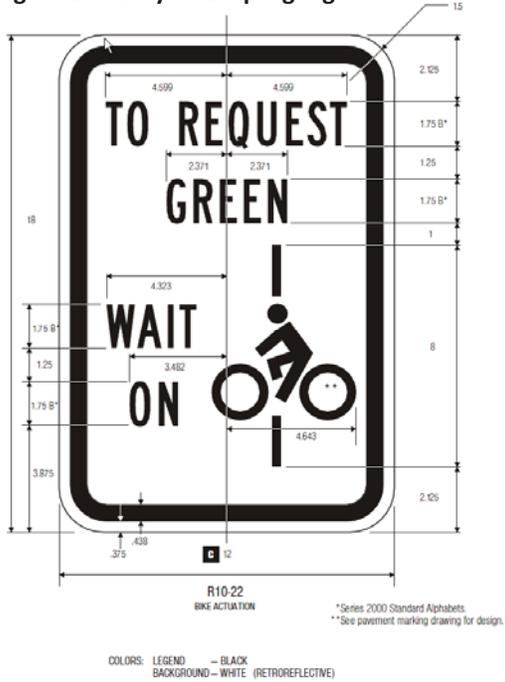
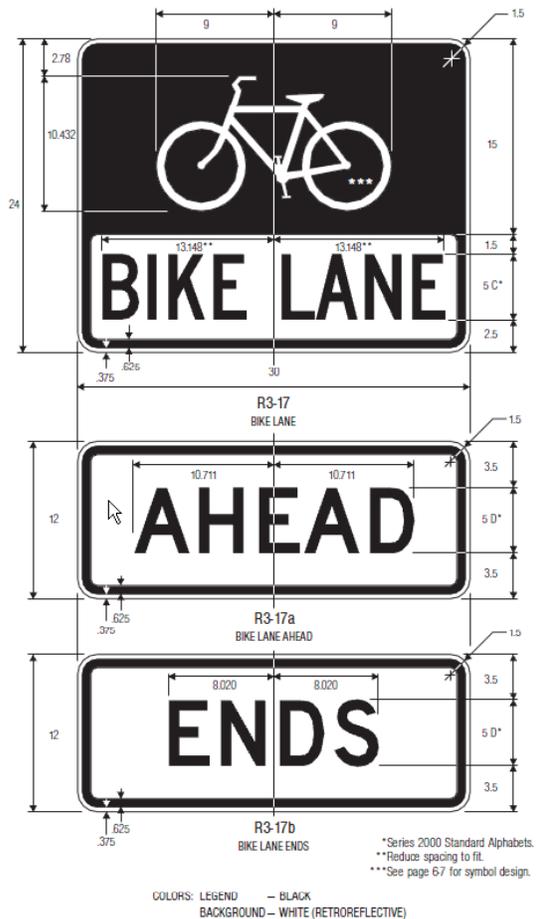


Figure 20 – Share the Road Signage



Figure 19– Bike Lane Signage



Source: MUTCD, 2009 Edition

Figure 21 – Bicycle Box Design

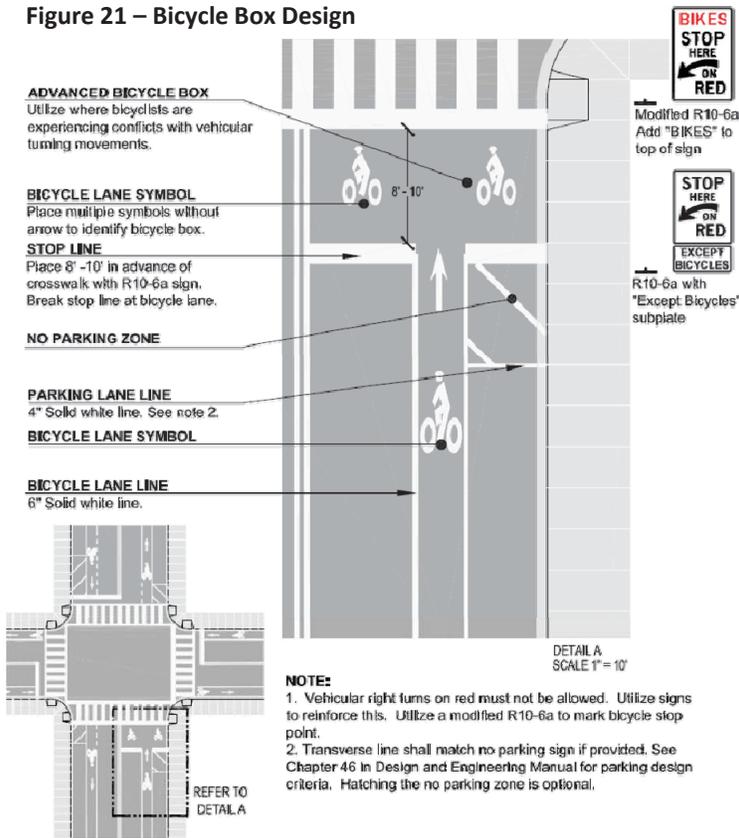
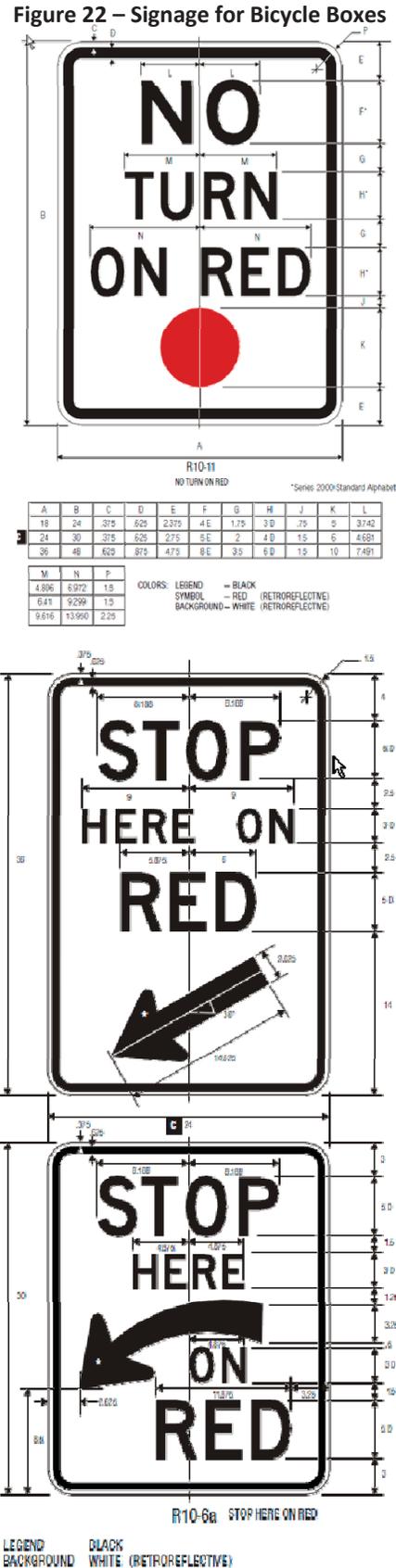
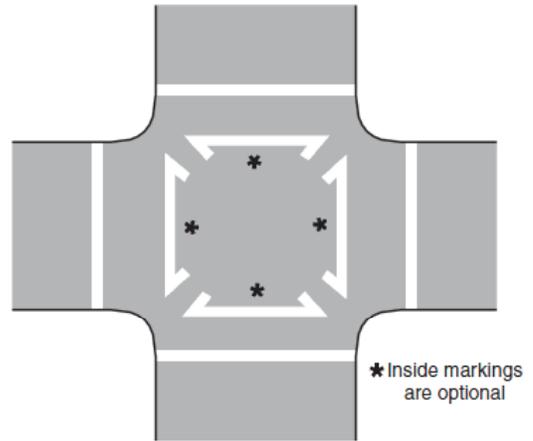


Figure 22 – Signage for Bicycle Boxes



Source: Washington D.C. DOT Bicycle Facility Design Guide

Figure 23– Signage and Pavement Marking for All-Pedestrian Signal Phasing



4.6 Focus Area Concepts

A few areas of campus were discussed frequently during the campus outreach sessions, in the survey, and during work with the Steering Committee as areas that deserved more detailed planning and attention. This Plan includes conceptual plans and ideas for four areas:

- Dan Allen Drive
- Intersection of Western Blvd and Avent Ferry Rd
- Avent Ferry Rd
- Intersection of Cates Ave and Morrill Dr

The focus area concepts for these four areas are found on the following four pages. These concepts are not intended as final designs or conceptual products. Rather, they are intended to identify potential solutions that could be carried forward into more detailed study and analysis. While these four focus areas are not comprehensive examples of campus bicycle and pedestrian issues, they are representative of the kinds of issues that if resolved will have an immediate and positive impact on bicyclists and pedestrians.

Figure 25– Dan Allen Drive Focus Area

Issues:

- High traffic volumes
- Lack of streetscape appeal for major campus gateway and through street
- Bikes share busy street with many automobiles
- Multiple intersections and driveways create numerous conflict points for vehicles, bicycles and pedestrians

Concepts:

- Rebuild street to be a “complete street” for automobiles, bicycles, pedestrians, and transit
- Introduce “cycle track” to give bicyclists priority and promote safety
 - 5 ft one-direction cycle path on either side of street
 - Separated from street by planting buffer with street trees
 - 8 ft (min) sidewalk adjacent to cycle track
 - Street travel lane reduced to 11 ft
 - Well-marked and signed intersections
- Introduce bike box at Dan Allen Dr/ Thurman Dr intersection
 - Give left-turning bicycles priority at signalized intersection
 - Reduces conflicts and promotes predictability
 - Painted, marked and signed to be visible and understandable



Cycle track concept (Dan Allen Dr/Sullivan Dr)

Bike box concept (Dan Allen Dr/Thurman Dr)



Figure 26– Intersection of Western Boulevard and Avent Ferry Road

Issues:

- Extremely high traffic volumes, especially during peak hours
- Wide crossing of Western Blvd for pedestrians
- Unclear and potentially unsafe crossing for bicyclists, especially those attempting to turn onto Western Blvd sidepaths from Morrill Dr
- Poorly located pedestrian push buttons to activate pedestrian signal

Concepts:

- Pursue grade separated crossing (tunnel) for bicycles, pedestrians, and transit
- Introduce NCDOT-approved pedestrian channelization improvements on Western Blvd west of the intersection to encourage pedestrians to cross at signalized intersection
- Relocate push buttons as needed to be accessible to crosswalk users
- Promote enforcement of traffic laws to improve safety of bicyclists and pedestrians, especially in path of turning vehicles



Figure 27– Avent Ferry Road

Issues:

- Extremely high traffic volumes, especially during peak hours
- No dedicated bicycle facilities or amenities
- Multiple driveways and left-turning vehicles, many conflict points
- Lack of streetscape appeal
- Feels unsafe to pedestrians and bicyclists



Concepts:

- Work with the City of Raleigh and the NCDOT to develop streetscape improvements
- Investigate possible expansion and extension of existing narrow median to promote access management and enhance streetscape
- Investigate potential to develop as a “complete street” boulevard, including on-street bicycle facilities

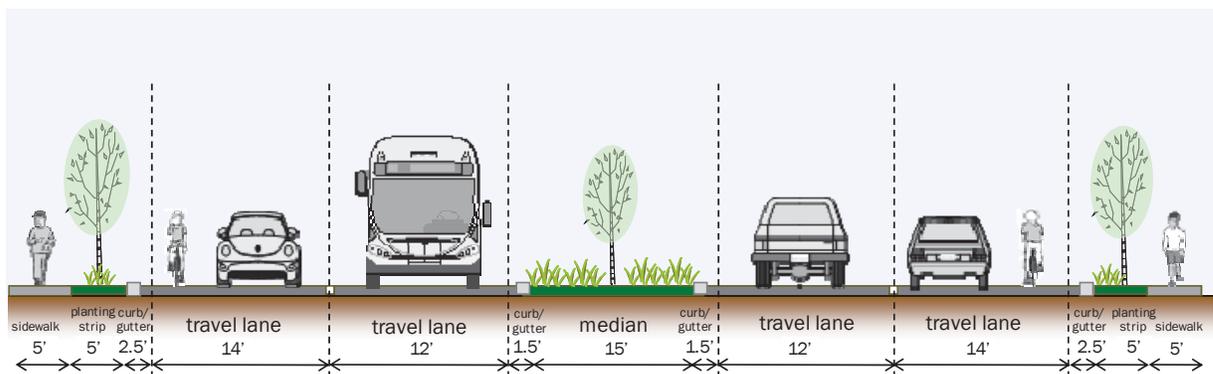


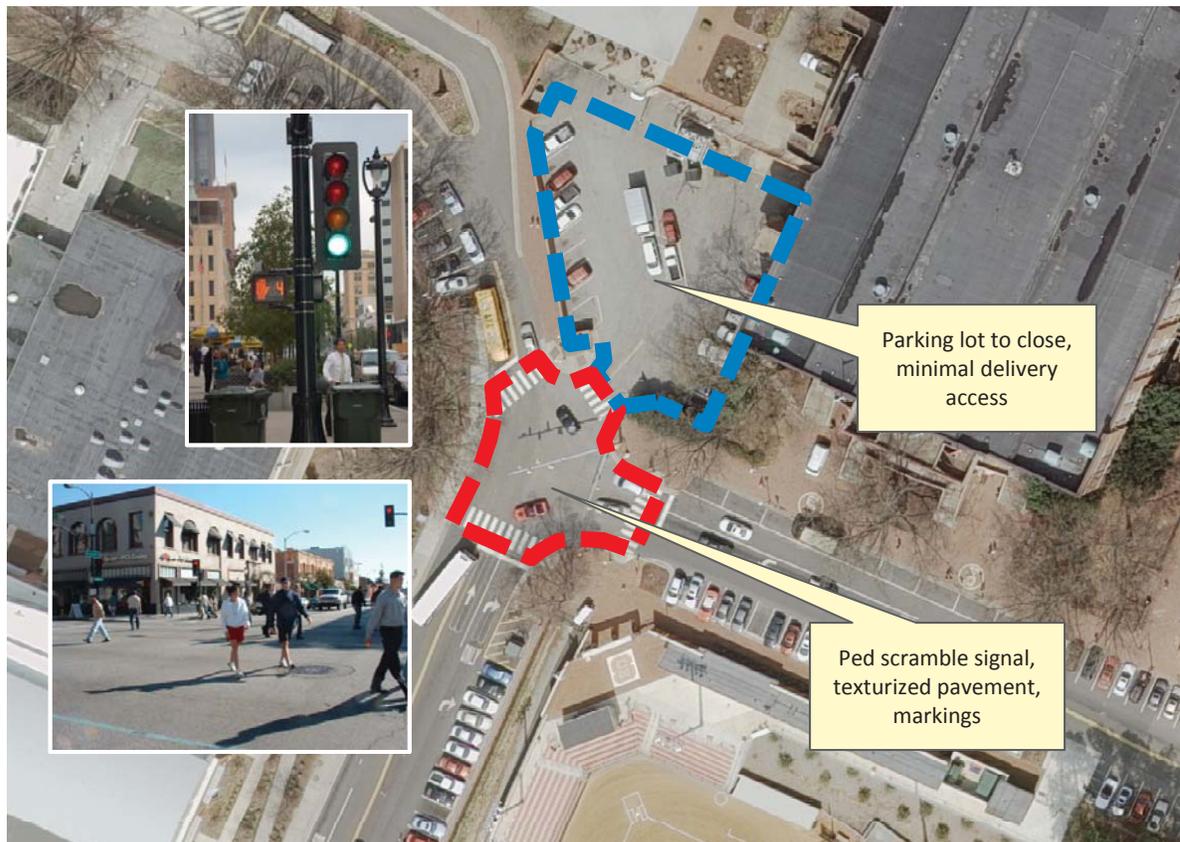
Figure 28– Intersection of Cates Avenue and Morrill Drive

Issues:

- High pedestrian volumes
- Turning vehicles
- Bus traffic and layovers
- Lack of streetscape appeal as a major campus intersection

Concepts:

- Improve intersection concurrent with Talley Center renovations
 - Close parking lot (NE of intersection) except for deliveries
 - Modify curbside at parking lot entrance per Talley renovation plans to reduce pedestrian crossing distance
- Introduce all-phase pedestrian “Scramble” signal
 - Make signal improvements
 - Texturize or paint pavement to set-off from street
 - Mark and sign appropriately for Scramble
- Relocate bus layovers away from intersection



5 IMPLEMENTATION PLAN: HOW WE ARE GOING TO GET THERE

5.1 The Key: Implementation

While many of the recommendations in the Campus Bicycle and Pedestrian Plan are long-term, it is critical that the Plan be useable and effective in the short- and mid-terms. Both funding and staff time are major constraints for planning and implementing improvements. Additionally, some recommendations can be started immediately but others must await particular developments or campus capital projects. It is therefore important to evaluate, plan and prioritize projects.

The implementation plan on the following pages (Table 8) suggests a method for carrying out each of the recommendations. It shows, for each recommendation, the timeframe (short-, mid-, and long-term), cost, potential funding options, the lead responsibility, and any coordination required. For most of the recommendations, NC State University will need to take the lead, but often coordination will be required with other local transportation partners. For some recommendations, such as off campus bike lanes or streetscape improvements, another agency takes the lead but the university should have a place at the table, making its case and offering support and assistance.

5.2 Funding

Some recommendations have little cost, but others will require capital investment or ongoing funding. Overall, while the total bicycle and pedestrian investment may be substantial in the long term, when compared to investments required to fund automobile improvements (e.g., new roadways, parking decks), those bicycle and pedestrian investments are relatively small.

There are a variety of potential funding sources for campus bicycle and pedestrian improvements. Some of them are internal campus funds for capital improvement projects, others may be NC Department of Transportation (NCDOT) funds, and others may be grants or funds made available through partnerships. Some key potential funding sources are:

- Campus funding sources
 - Capital improvement projects (requires coordination with new construction projects)
 - Maintenance programs (roadways, sidewalks, greenways and multi-use paths, signage)
- City of Raleigh Capital Improvement Program (CIP)
<http://www.raleighnc.gov/home/content/PubAffairs/Articles/CIPRoads.html>
- Capital Area Metropolitan Planning Organization (CAMPO) funding <http://www.camponc.us/>
 - Congestion Mitigation and Air Quality (CMAQ) Improvement Program (federal funds for air quality improvement projects, allocated through the NCDOT)
 - Surface Transportation Program – Direct Allocation (STP-DA) Funds (federal discretionary funds allocated by the MPO for regionally-significant projects)
- NCDOT funding sources
 - Transportation Enhancement Program (provides State funds for wide variety of bicycle and pedestrian projects and programs)
 - State Transportation Improvement Program
 - Statewide Discretionary Funding (allocated through the NCDOT Bike/Ped Division)
 - Other NCDOT programs, including Small Urban Funds, Hazard Elimination Program, Spot Improvement Program, and the Governor’s Highway Safety Program (GHSP)

- Grants and funds from partnerships with local non-profits and advocacy groups

5.3 Project Prioritization

The recommended projects were developed through an iterative process involving many campus stakeholders, with significant help from university staff and the project Steering Committee. The results from the campus survey and feedback from the campus outreach events were key in providing depth to the recommendations.

Once the draft list of recommended projects was developed, the Steering Committee identified factors by which each project could be prioritized. This prioritization process formed the backbone of the implementation plan, found in Section 5.4.

The prioritization factors were:

- **Accessibility:** does the project link major campus activity centers or campus precincts?
- **Safety:** does the project meet an identified safety need?
- **Connectivity:** does the project complete a missing link?
- **Constructability:** what is the relative ease of implementation of the project? Does it coordinate with other capital projects? What is its relative cost?
- **Character:** does the project promote broader Physical Master Plan goals?
- **Campus Priority:** is there strong support for the project from the Steering Committee and campus community?

The complete scoring and ranking of projects is found in Appendix 3.

5.4 Implementation Plan

The implementation plan on the following pages contains the projects in Tables 6 and 7, ranked and ordered according to the prioritization system described in Section 5.3. The projects are grouped into Short-term (0-5 years), Medium-term (6-10 years), and Long-term (11+ years) projects. While the prioritization system and timeframes are useful for day-to-day implementation of the many projects in this Plan, there should also be flexibility to change the order of project implementation as plans evolve, complementary roadway projects are initiated, or other opportunities for incidental improvements should arise.

Table 12: Prioritized Pedestrian and Bicycle Projects

On Campus Pedestrian Projects														
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Total Points	Time Frame
40	Dan Allen Dr	End of sidewalk	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Connect existing sidewalks and make ADA-compliant	0.01	\$922	< \$10k	Low	1	Short
86	Dan Allen Dr	Cates Ave	N/A	Retrofit	Central	Intersection Improvement	Safety Improvements	Improve pedestrian safety at intersection by installing additional signage, such as advance warning "Ped Xing" pavement markings,	N/A	\$1,000	< \$10k	Low	3	Short
56	Dan Allen Dr - south of Western Blvd	Western Blvd sidewalk	N/A	Existing	South	Transit Stop	Transit stop	Relocate Wolfline bus stop from utility pole near Western Blvd intersection to an ADA-compliant location (south) with ped countdown signals to cross Dan Allen Dr; coordinate with future Greek Village project	N/A	\$1,200	< \$10k	Low	2	Short
55	Western Blvd	Triangle Transit bus stop	Faucette Dr	Retrofit	Central	Sidewalk / Path	Transit stop	Improve ADA access to transit stop from Faucette Dr sidewalk	0.01	\$1,352	< \$10k	Low	2	Short
76	Gorman St	Faucette Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Construct new sidewalk (east side) connection	0.03	\$3,787	< \$10k	Low	1	Short
42	New connection	Visitor's Center	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Construct new sidewalk to connect building to Greenway trail	0.03	\$4,039	< \$10k	Low	2	Short
100	New connection	Capability Dr sidewalk	Lake Raleigh Rd	New	Centennial	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to investigate connection of existing sidewalk along Capability Dr to end of Lake Raleigh Rd or Broadwell Dr	0.03	\$4,178	< \$10k	Low	3	Short
38	Yarbrough Dr	End of sidewalk	Existing parking	New	North	Sidewalk / Path	Extend sidewalk	Extend existing sidewalk from Wolfline bus stop eastward to parking area along Yarbrough Dr	0.04	\$4,978	< \$10k	Low	1	Short
49	Varsity Dr	Wolf Village Way	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Provide new crosswalk markings and ADA-compliant curb ramps for all four directions; Connect Wolf Village Way with future transit stop at West Lot parking deck	N/A	\$5,472	< \$10k	Low	1	Short
37	Dan Allen Dr	End of sidewalk - University Towers	Dan Allen Dr - Pedestrian table	New	North	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk along west side of Dan Allen Dr from UT apartments to the Dan Allen parking deck	0.06	\$7,911	< \$10k	Low	1	Short
88	Varsity Dr	Partners Way	Red Hat Building	New	Centennial	Sidewalk / Path	Connect sidewalk	Construct new sidewalk or path along north side of Varsity Dr; connect to existing sidewalk near Red Hat Building; new crosswalk	0.09	\$11,250	\$10k - \$25k	Low	3	Short
99	Wolf Village Way	Wolfline Bus Stop	Parking Lot (NW of Wolf Village)	New	Central	Sidewalk / Path	Connect sidewalk	Study the possibility of connecting Wolfline bus stop to parking lot along north side of Wolf Village Way	0.13	\$15,673	\$10k - \$25k	Low	2	Short
87	Partners Way	Varsity Dr intersection	Parking Deck	New	Centennial	Sidewalk / Path	Connect sidewalk	Construct new sidewalk or path along west side of Partners Way between Varsity Dr intersection and parking decks	0.20	\$24,876	\$10k - \$25k	Low	3	Short
27	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Intersection Improvement	Pedestrian signal	Install countdown pedestrian signals for north-south direction	N/A	\$40,000	\$25k - \$50k	Med	2	Short
26	Faucette Dr - Jordan Hall	End of sidewalk	End of sidewalk	Retrofit	Central	Sidewalk / Path	Connect sidewalk	Coordinate with project ID-55, and University ADA Coordinator to connect existing dead end sidewalk segments to the east and west	0.02	\$146,545	\$100k - \$500k	High	3	Short
95	Capability Dr	Midblock - near Research IV	N/A	Retrofit	Centennial	Intersection Improvement	Safety Improvements	Improve pedestrian safety at midblock crossing from Capability lot to Research IV building, such as pedestrian refuge median, or curb bulb-outs	N/A	\$5,000	< \$10k	Low	2	Medium
61	New connection	Warren Carrol Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Construct sidewalk connection from Wood Hall to Western Blvd greenway	0.04	\$5,426	< \$10k	Low	1	Medium
30	Sullivan Dr	West Lot	Schaub Hall parking lot	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk (south side)	0.07	\$8,460	< \$10k	Low	1	Medium
60	New connection	West Lot	Dan Allen Dr	Retrofit	Central	Sidewalk / Path	New connection	Establish a better east-west connection from West Lot east to existing sidewalk	0.07	\$9,177	< \$10k	Low	1	Medium
34	Thurman Dr	Varsity Dr	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Complete sidewalk along south side of roadway	0.11	\$13,659	\$10k - \$25k	Low	1	Medium
22	New connection	Partners Way	Nazareth St	New	Centennial	Sidewalk / Path	Connect sidewalk	Extend Partners Way bike/ped component northward to Centennial Pkwy and connect with Nazareth St	0.12	\$15,386	\$10k - \$25k	Low	2	Medium
35	New connection	Faucette Dr	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	Connect sidewalk	Establish new ped connection as identified in Campus Master Plan, north-south along the edge of West Lot	0.15	\$18,538	\$10k - \$25k	Low	1	Medium
32	Morrill Dr	Western Blvd	Warren Carrol Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct new sidewalk along east side of Morrill Dr to connect existing sidewalk segments	0.18	\$22,897	\$10k - \$25k	Low	1	Medium
28	Wolf Village Way	End of sidewalk	Varsity Dr	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk to Wolf Village Way / Varsity Dr intersection (south side); Includes retaining wall and removal of trees	0.05	\$26,298	\$25k - \$50k	Med	1	Medium
29	New pedestrian connection	Wolf Village Way	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	New connection	Provide safe pedestrian path through West Lot parking area, and connect Wolf Village with Multi-Use Trail along Sullivan Dr	0.20	\$51,128	\$50k - \$100k	Med	1	Medium
33	Faucette Dr	Gorman St	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct sidewalk along north side of Faucette Dr; connect to existing sidewalk	0.48	\$59,756	\$50k - \$100k	Med	1	Medium
23	Cates Ave	Morrill Dr	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Install pedestrian 'scramble' cycle for traffic signal; Closure of Talley Student Center loading dock access; New textured pavement and	N/A	\$70,508	\$50k - \$100k	Med	4	Medium
57	Dan Allen Dr	Yarbrough Dr	N/A	Retrofit	North	Intersection Improvement	New traffic signal	Install new traffic signal at intersection; install ADA-compliant curb ramps; stripe crosswalks	N/A	\$130,400	\$100k - \$500k	High	1	Medium
25	Morrill Dr	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Sidewalk / Path	Widen sidewalk	Coordinate with Transportation Department to improve transit amenities along east-side of Morrill Drive; Widen existing sidewalk and convert existing parking (32 spaces) to parallel onstreet	0.06	\$583,448	> \$500k	High	2	Medium
63	New connection	Centennial Pkwy	Main Campus Dr	New	Centennial	Sidewalk / Path	New connection	Establish a direct connection from Main Campus Dr to Mission Valley shopping center sidewalk	0.13	\$16,351	\$10k - \$25k	Low	1	Long
36	All Campus Path	Dan Allen Dr	Morrill Dr	New	Central	Sidewalk / Path	Connect sidewalk	Establish a new pedestrian connection adjacent to parking lot behind Biltmore/Jordan Halls; provide safe crossing of Dan Allen Dr with ADA-compliant curb ramps	0.20	\$24,902	\$10k - \$25k	Low	1	Long
41	New connection	Greek Village	Lilley Ct / Avent Ferry Rd	Retrofit	South	Sidewalk / Path	New connection	Install opening in fence along Western Manor Apartments property line and establish a more direct ped connection from Greek Village southbound along Western Blvd	0.21	\$25,932	\$25k - \$50k	Med	1	Long
68	Dunn Ave	Free Expression Tunnel	Pullen Rd	New	Central	Sidewalk / Path	New connection	Construct new sidewalk or path along north side of Dunn Ave; connect all three tunnels and Pullen Rd; project within NCR right-of-way	0.37	\$92,718	\$50k - \$100k	Med	1	Long
54	Cates Ave	Alexander / Turlington Halls	N/A	New	Central	Transit Stop	Transit stop	Coordinate with Talley Student Center project; Construct new transit stop to access Free Expression Tunnel. Remove 2-3 parking spaces & improve ped crossing from residence halls to the north and Carmichael Gym to the south	N/A	\$104,000	\$100k - \$500k	High	2	Long
80	New connection	Sullivan Dr	Fountain Dining Hall	New	Central	Sidewalk / Path	New connection	Construct new crossing of Sullivan Dr with ADA-compliant curb ramps; provide new pedestrian bridge over creek; provide new sidewalk through Bragaw parking lot	0.06	\$120,050	\$100k - \$500k	High	1	Long

Off Campus Pedestrian Projects														
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Total Points	Time Frame
16	Morrill Dr / Avent Ferry Rd	Western Blvd	N/A	Existing	N/A	Intersection Improvement	Relocate pedestrian signals (two of them)	Work with City of Raleigh &/or NCDOT to relocate existing pedestrian crossing signal buttons to more accessible locations	N/A	\$1,900	< \$10k	Low	1	Short
39	Brooks Ave	Hillsborough St	N/A	Retrofit	N/A	Intersection Improvement	Pedestrian signal	Work with City of Raleigh &/or NCDOT to install countdown pedestrian signals for east-west direction	N/A	\$1,900	< \$10k	Low	1	Short
77	Trinity Rd	Blue Ridge Rd	End of sidewalk	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk (north side)	0.07	\$9,328	< \$10k	Low	1	Short
81	Blue Ridge Rd	Beryl Rd	Hillsborough St	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to provide new sidewalk connection over railroad tracks	0.04	\$5,537	< \$10k	Low	3	Medium
101	Cates Ave	Derr Track	Pullen Rd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to extend existing sidewalk (south side)	0.06	\$7,165	< \$10k	Low	2	Medium
31	Cates Ave	Jensen Dr	Pullen Rd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to extend existing sidewalk (north side)	0.06	\$7,467	< \$10k	Low	2	Medium
47	Pullen Rd	Cates Ave	Western Blvd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along east side of road; connect to existing sidewalk at Cates / Pullen intersection	0.08	\$9,570	< \$10k	Low	2	Medium
46	Pullen Rd	Cates Ave	Bagwell Hall	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along west side of road; connect to existing sidewalk	0.08	\$9,880	< \$10k	Low	2	Medium
45	Nazareth St	Western Blvd	End of sidewalk	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk and connect with Western Blvd greenway; improve lighting	0.19	\$24,137	\$10k - \$25k	Low	2	Medium
65	Centennial Pkwy	Avent Ferry Rd	Multi-Use Trail	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk from intersection with Avent Ferry to the Multi-Use Trail entrance	0.33	\$40,667	\$25k - \$50k	Med	1	Medium
17	Blue Ridge Rd	Hillsborough St	William Moore Dr	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide new sidewalk connection to CBC (east side)	0.43	\$54,136	\$50k - \$100k	Med	1	Medium
82	Blue Ridge Rd	William Moore Dr	NC Museum of Art	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide sidewalk connection along road	0.63	\$78,699	\$50k - \$100k	Med	1	Medium
64	Centennial Pkwy	Mission Valley rear entrance	N/A	Existing	N/A	Intersection Improvement	Intersection Improvement	Work with City of Raleigh &/or NCDOT to improve pedestrian crossing at intersection	N/A	\$2,986	< \$10k	Low	1	Long
102	Centennial Pkwy - End of trail	Nazareth St	N/A	Retrofit	N/A	Intersection Improvement	Safety improvement	Work with City of Raleigh &/or NCDOT to study mid-block crossing safety improvement	N/A	\$2,986	< \$10k	Low	1	Long
84	Western Blvd	Morrill Dr	Avent Ferry Rd	New	N/A	Sidewalk / Path	New connection - Tunnel	Work with City of Raleigh &/or NCDOT to provide tunnel for long-term separation of transit, bicycle, and pedestrians	0.06	\$7,016	< \$10k	Low	2	Long
48	Varsity Dr	Thurman Dr	Concord St	New	N/A	Sidewalk / Path	New connection	Work with City of Raleigh &/or North Carolina Railroad to provide bike/ped connection under railroad tracks	0.09	\$1,781,164	> \$500k	High	1	Long

Notes: 1. "Map Category" and "ID" columns correspond with recommended projects maps (Figures 10-11).
 2. Projects in this table are prioritized according to the process described in Section 5.3.

Table 12: Prioritized Pedestrian and Bicycle Projects (continued)

On Campus Bicycle Projects															
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Total Points	Time Frame	
14	Rocky Branch Multi-Use Trail	Morrill Dr	Pullen Rd	Existing	Central	Greenway / Multi-Use Trail	Trail maintenance	Improve pruning and general maintenance practices to ensure trail is passable at all times	0.10	\$650	< \$10k	Low	1	Short	
96	Bicycle Trough	Morrill Dr - Greenway Trail steps	N/A	Retrofit	Central	Bicycle Amenities	Bicycle trough	Install bicycle trough at stairs leading from Morrill Dr sidewalk to Rocky Branch Greenway Trail	N/A	\$1,000	< \$10k	Low	3	Short	
15	Rocky Branch Multi-Use Trail	Morrill Dr	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install Greenway Directive (Sign Type #20) sign at trailhead	N/A	\$1,000	< \$10k	Low	2	Short	
89	Centennial Campus Multi-Use Trail	Campus Trailhead - Avent Ferry Rd	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	\$1,000	< \$10k	Low	2	Short	
92	Upper Walnut Creek Multi-Use Trail	NCSU Campus Property Line	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	\$1,000	< \$10k	Low	2	Short	
94	Middle Walnut Creek Connector Trail	Campus Trailhead - Lake Wheeler Rd	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Trailhead (Sign Type #21) sign at trailhead	N/A	\$1,000	< \$10k	Low	2	Short	
24	Carmichael Complex Plan	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Greenway / Multi-Use Trail	Improve connection	Establish an ADA-compliant connection for bicycle/pedestrian access northbound from multi-use trail to Cates Ave, MUTCD Sharrows in proper location along Centennial Campus roadways with onstreet parking	0.19	\$1,039	< \$10k	Low	3	Short	
97	Centennial Campus Streets Study	Partners Way; Capability Dr	Research Dr; Campus Shore Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Study the possibility of installing (a) bicycle lanes along roadways without onstreet parking, or near Lake Raleigh, or (b) MUTCD Sharrows in proper location along Centennial Campus roadways with onstreet parking	N/A	\$1,500	< \$10k	Low	2	Short	
3	Dan Allen Dr	Thurman Dr	Hillsborough St	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.18	\$1,841	< \$10k	Low	4	Short	
10	Stinson Dr	Current Dr	Yarbrough Dr	Retrofit	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.21	\$2,107	< \$10k	Low	2	Short	
4	Yarbrough Dr	Dan Allen Dr	Stinson Dr	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.46	\$4,554	< \$10k	Low	2	Short	
90	Centennial Campus Multi-Use Trail	Trail split - Research Dr sidewalk	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Directive (Sign Type #20) sign at trail split	N/A	\$5,000	< \$10k	Low	2	Short	
91	Centennial Campus Multi-Use Trail	Trail split - Walnut Creek Connector Trail	N/A	Retrofit	Centennial	Wayfinding Sign	Trail wayfinding	Install Greenway Directive (Sign Type #20) sign at trail split	N/A	\$5,000	< \$10k	Low	2	Short	
103	Existing Shower Facilities	N/A	N/A	Retrofit	Various	Wayfinding Sign	Shower facility signage	Install new wayfinding signage to buildings with existing shower facilities; utilize the NC State Campus Signage Standard	N/A	\$13,000	\$10k - \$25k	Low	3	Short	
21	Multi-Use Trail connection	Main Campus Dr	Alumni Center	New	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail; connect existing Centennial campus trail network to Alumni Center	0.22	\$157,024	\$100k - \$500k	High	2	Short	
18	Upper Walnut Creek Connector Trail	NCSU Campus Property Line	End of trail - Campus Shore Dr	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail west to connect with the existing City of Raleigh greenway system	0.33	\$234,465	\$100k - \$500k	Grant	3	Short	
62	Middle Walnut Creek Connector Trail	End of trail - Main Campus Dr	City of Raleigh Greenway - Lake	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail east to connect with the existing City of Raleigh greenway system	0.70	\$487,721	\$100k - \$500k	Grant	3	Short	
71	Oval Dr	Centennial Pkwy	Main Campus Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.12	\$1,611	< \$10k	Low	2	Medium	
2	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Bicycle Amenities	Bicycle box	Install bicycle box at intersection, both directions	N/A	\$2,012	< \$10k	Low	2	Medium	
69	Varsity Dr	Thurman Dr	Western Blvd	New	Central	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrows in proper location on roadway	0.32	\$3,213	< \$10k	Low	2	Medium	
70	Varsity Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway	0.26	\$3,607	< \$10k	Low	2	Medium	
79	Achievement Dr	Main Campus Dr	Centennial Pkwy	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.26	\$3,682	< \$10k	Low	2	Medium	
6	Dan Allen Dr	Western Blvd	Greek Village	New	South	On-Road Bicycle Facility	Bicycle lanes	Add bicycle lanes along roadway as Greek Village road improvements occur	0.13	\$6,290	< \$10k	Low	2	Medium	
72	Main Campus Dr	Oval Dr	Achievement Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway	1.07	\$14,970	\$10k - \$25k	Low	2	Medium	
52	Main Campus Dr	Achievement Dr	Trailwood Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes/sharrows	Stripe bicycle lanes along roadway	1.45	\$20,300	\$10k - \$25k	Low	2	Medium	
104	Administrative Services I Building	N/A	N/A	Retrofit	Central	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$75,000	\$50k - \$100k	Med	2	Medium	
105	Broughton Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$75,000	\$50k - \$100k	Med	2	Medium	
106	Daniels Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$75,000	\$50k - \$100k	Med	2	Medium	
107	Ricks Hall	N/A	N/A	Retrofit	North	Bicycle Amenities	Shower facility	Construct new shower facility or retrofit existing bathroom to include shower facility	N/A	\$75,000	\$50k - \$100k	Med	2	Medium	
1	Dan Allen Dr	Western Blvd	Thurman Dr	Retrofit	Central	On-Road Bicycle Facility	Cycle Track	Convert each shoulder of roadway to one-way on-street bicycle path with texturized pavement and flush curb (cycle track)	0.33	\$98,446	\$50k - \$100k	Med	3	Medium	
66	Bicycle Station	Carmichael Gym	N/A	New	Central	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$200,000	\$100k - \$500k	High	2	Long	
67	Bicycle Station	Monteith Research Center	N/A	New	Centennial	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$200,000	\$100k - \$500k	High	2	Long	
78	New recreational trail	CBC Campus	N/A	New	CBC	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail around CBC Campus	1.90	\$1,332,995	> \$500k	High	1	Long	
20	Cates Ave	Dan Allen Dr	Morrill Dr	Retrofit	Central	Streetscape Improvement	NCSU Planned Improvements	Convert Cates Ave to pedestrian-friendly corridor and convert on-street parking to parallel	0.31	\$2,189,594	> \$500k	High	3	Long	

Off Campus Bicycle Projects															
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Total Points	Time Frame	
5	Hillsborough St	Brooks Ave transit stop	N/A	New	N/A	Bicycle Amenities	Bicycle lockers	Work with Triangle Transit to install bicycle lockers near Hillsborough St/Brooks Ave transit stop to serve commuter populations	N/A	\$5,000	< \$10k	Low	2	Short	
11	Dan Allen Dr	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection, both directions	N/A	\$6,000	< \$10k	Low	1	Short	
12	Avent Ferry Rd	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection	N/A	\$6,000	< \$10k	Low	1	Short	
98	Upper Walnut Creek Connector Trail	Trailwood Dr	NCSU Campus Property Line	New (Funded)	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh to extend existing multi-use trail west to connect with the existing greenway trail	0.29	\$206,418	\$100k - \$500k	Grant Funded	3	Short	
75	Hutton St	Ligon St	Blue Ridge Rd	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.14	\$1,387	< \$10k	Low	1	Medium	
9	Nazareth St	Western Blvd	Centennial Pkwy	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to provide MUTCD Sharrows in proper location on roadway	0.22	\$2,156	< \$10k	Low	1	Medium	
74	Ligon St	I-440 Tunnel	Hutton St	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.37	\$3,733	< \$10k	Low	1	Medium	
73	Ligon St	Gorman St	I-440 Tunnel	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrows in proper location on roadway	0.58	\$5,835	< \$10k	Low	1	Medium	
43	Extend Multi-Use Trail	End of trail	Avent Ferry Rd	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh to extend existing multi-use trail north and connect with Avent Ferry Rd sidewalk and/or Centennial Pkwy	0.07	\$48,093	\$25k - \$50k	Med	3	Medium	
51	Trailwood Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.07	\$51,189	\$50k - \$100k	Med	1	Medium	
8	Gorman St	Brent Rd	Hillsborough St / Faircloth St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh to extend existing bicycle lanes	1.64	\$78,628	\$50k - \$100k	Med	1	Medium	
50	Crest Rd	Avent Ferry Rd	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.45	\$6,233	< \$10k	Low	2	Long	
44	Avent Ferry Rd	Centennial Pkwy	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.18	\$8,415	< \$10k	Low	2	Long	
7	Varsity Dr	Western Blvd	Avent Ferry Rd	New	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.67	\$31,955	\$25k - \$50k	Med	2	Long	
19	Avent Ferry Rd	Varsity Dr	Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.91	\$43,736	\$25k - \$50k	Med	2	Long	
85	Blue Ridge Rd	Beryl Rd	NC Museum of Art - Reedy Creek Greenway Trail	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.12	\$53,932	\$50k - \$100k	Med	1	Long	
13	Hillsborough St	Gardner St	Faircloth St / Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.84	\$251,413	\$100k - \$500k	High	2	Long	
83	Hillsborough St	Blue Ridge Rd	Beryl Rd - Multi-Use Trail	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh &/or NCDOT to provide two-way multi-use trail connection on north side of road; connect with Reedy Creek trail	0.93	\$648,111	> \$500k	High	2	Long	
58	Avent Ferry Rd	Western Blvd	Centennial Pkwy	Retrofit	N/A	Streetscape Improvement	Bicycle facilities, median extension, landscaping	Work with City of Raleigh &/or NCDOT to further study and improve bicycle/pedestrian safety through streetscape improvement	0.24	\$1,109,917	> \$500k	High	2	Long	
59	Pullen Rd	Western Blvd	Centennial Pkwy	New	N/A	Possible New Roadway	New roadway connection	Work with City of Raleigh &/or NCDOT to extend existing Pullen Rd to south and provide new connection; Construct sidewalks/bicycle facilities and improve intersection geometry	0.38	\$1,800,213	> \$500k	High	3	Long	

Notes: 1. "Map Category" and "ID" columns correspond with recommended projects maps (Figures 12-13).
2. Projects in this table are prioritized according to the process described in Section 5.3.

APPENDIX 1

Summary of Campus Outreach Comments

NC State University – Bicycle and Pedestrian Plan
Summary of Public Outreach Comments
14 October 2010

The following comments were collected during two public outreach events on campus. The first was a booth on the NCSU Brickyard on the afternoon of October 13th, 2010; the second was a booth on Centennial Campus near the MRC Building on the afternoon of October 19th, 2010. Comments were summarized and condensed for clarity.

Safety / Lighting Concerns

- Improved lighting is needed:
 - around Wolf Village, Sullivan Dr, West Lot
 - near West Lot; unsafe for pedestrians
 - along Nazareth St
 - around tunnels connecting North and Central campuses
 - along Avent Ferry
 - along Sullivan Ave & multi-purpose trail
- There is confusion on whether bikes should be on sidewalks or roadways:
 - Bikes on sidewalks is dangerous and can cause conflict to pedestrians
 - Encourage road biking
 - I don't feel safe riding my bike on Cates Ave
 - Cycling along Main Campus Dr with onstreet parking is too dangerous
- Mixing bikes and pedestrians:
 - Need "No Bike Zones" in tunnels and North campus areas
 - Need a dismount zone @ Brickyard
 - Avoid Bike/Ped/Skateboard conflicts
 - Bikers through campus zipping around in pedestrian areas is scary
 - Separation of Bike / Ped for Tunnels
- Pedestrians cross at inappropriate times @ Cates / Morrill intersection
- Pedestrians crossing at Main Campus Dr near the College of Textiles is dangerous
- Off campus areas:
 - Crossing Western Blvd is dangerous
 - Blind curves along Trailwood Rd
 - Gorman St northbound towards Western Blvd is dangerous; vehicles parking along the street and there is little space for cyclists
 - Biking on Hillsborough is risky
 - Hillsborough St round-about is dangerous because of drivers; New Hillsborough St is GREAT for cycling
 - Would like protected left-turns for cyclists @ intersection of Avent Ferry Rd and Varsity Dr

Infrastructure / Utility Alterations

- Repair utility manholes along Dan Allen Dr (too deep)
- Connect Bike / Ped Trails; they end in bad locations and become pointless
 - Path from Western Blvd to Centennial Pkwy (through the wooded area) is poorly paved, and does not connect directly
 - Connect/Extend sidewalk along Cates Ave near parking deck to Pullen Rd sidewalk
 - Need sidewalk along east side of Morrill Dr
 - Connect/Extend Centennial Blvd multi-purpose trail to Avent Ferry

- Connect City Greenway trail near intersection of Western Blvd and Ashe Ave
- Connect City Greenway trail near Farmers Market, east of Centennial Campus
- Connect City Greenway trail near Trailwood Dr, west of Centennial Campus
- Lots of stairs on campus; need more ramps for cyclists
 - Lots of stairs; need better access for bikes @ Talley
- Widen campus roads to accommodate bike lanes
- Bike lane requests for the following locations:
 - Gorman/Faircloth, connect to existing bike lanes that end @ Kaplan, and Clark
 - Avent Ferry Rd
 - Dan Allen Dr needs bike lanes
- Off campus facility maintenance:
 - Varsity Dr sidewalk from Western to Centennial is 'not fun'
 - Trim tree branches along Avent Ferry
 - Traffic signal detection loops do not detect bicycles
 - Dan Allen / Western Blvd
 - Avent Ferry / Western Blvd
 - Greenway along Western is not in good condition near Avent Ferry Rd
 - too many driveway access cuts/dips
 - Resurface Trailwood shoulders for bikes (City of Raleigh)
 - Need better wayfinding on trails (City of Raleigh)
 - Concrete median on Faircloth separates City Greenway trail access from bicycle route
 - Dangerous intersection because of its poor design for vehicles
 - New crosswalks on Hillsborough are working well!

Bike Rack / Amenities Requests

- Brickhaven bldg
- Free expression tunnel near Dabney
- More racks near Wolf Village (very high utilization)
- More racks near library & all over campus
- Near front door of bldgs to deter theft
- Rack design is too outdated (too narrow - the 'Wave' racks?)
 - Bigger racks (larger capacity) at certain locations
- More covered bike racks; other than WolfWheels; more covered bike areas
- Bike storage in parking decks (covered)
- Bike Racks on Wolfline Buses:
 - Bike racks on Wolfline buses, especially WolfProwl, Centennial, and Main routes
 - Need bike racks on Wolfline
 - Bike racks on buses would help connect to Centennial campus
- Need fenced, secured, and covered bike racks on Centennial Campus
- Need a bike-for-rent program on Centennial Campus
- Bicycle shower facilities needed on Centennial Campus buildings (NCSU-affiliated or private)
- Bicycle Maintenance Station:
 - Bike pumps and maintenance station on campus (Talley?)
 - Need a bike co-op / maintenance station for repairs

Traffic Concerns

- Faucette is one-way eastbound, however cyclists have to flow backwards, against traffic
 - Dunn Ave one-way is difficult for cyclists to reach Pullen Rd (eastbound)
- More driving regulations; vehicles speed and do not stop for pedestrians, especially Dan Allen Dr
- Drivers don't look along Stinson Dr
- Need a non-commuter parking deck for vehicle storage (resident students); This will remove parking along Cates Ave
- Difficult crossing @ Sullivan Dr and Dan Allen Dr (4-way stop)
- Dan Allen Drive:
 - is too narrow; difficult to see traffic; Bike/Peds fear for life
 - cars are too aggressive, and dangerous
 - has too much stop & go traffic
 - tunnel sidewalk is too close to the Wolfline bus mirrors; almost hit
 - has a poor design for bikes
 - difficult to turn right onto Dan Allen Dr from Sullivan (up hill towards Western Blvd)
 - is hard to merge onto Dan Allen Dr traffic on a bicycle

General / Maintenance Comments

- If there was a train or light rail I would bring a bike or keep a bike on campus
- I don't walk from Wolf Village to Centennial campus (EB-I and II) because there is nothing [interesting or to purchase] along the way, like DH Hill library or food
- My bike has been stolen from campus
- Need a standing Bike/Ped Committee
 - Need free bike-sharing program, where students only purchase a helmet to participate
 - Build a bike culture
- Need a bridge or tunnel over Western @ Avent Ferry
- Need tunnel connection from Varsity / Thurman towards Hillsborough
- Bike-only path through campus (bike-only through tunnels)
- No cars allowed to drive on campus; just buses & bikes
- Need a Centennial Campus transit circulator route
- Better Wolfline service to residential areas near Trailwood Dr
 - Better bus amenities
- Improve safety-education for all roadway users
 - Need bike/motorist education
 - Need a code of conduct and education for consistency with rules
 - Drivers don't respect crosswalks, especially Dan Allen & Western intersection
 - Cars do not respect Sharrows
- Everything on campus is made for pedestrians or vehicles; all over needs a makeover
- Would like a jogging trail around Lake Raleigh
- Need a better, safer way for bikes to mix with buses and other vehicles on streets
- Need a better connection:
 - Brickyard to Centennial
 - North & Centennial campuses through Nazareth St
 - North to Centennial, and North to Centennial Bio-Medical campuses
 - off-campus housing south of Centennial

NC State University Bicycle and Pedestrian Plan
Outreach Comments (October 2010)

- Lake Wheeler Rd to Multi-purpose Trail
- EB-I to College of Textiles (food)
- Centennial Parkway and Mission Valley
- Centennial Multi-purpose Trail (northern portion) to Western/Morrill
- From North Raleigh (more direct than existing)
- From Chapel Hill or Cary to NCSU campus
- Fairgrounds from Beryl Rd
- off-road North/South access alternative to Dan Allen Dr
 - off-road path to Centennial campus, separate from vehicles

APPENDIX 2

Campus Survey Results

Campus Bicycle & Pedestrian Survey Results

Survey Period: 10/6/2010 - 11/5/2010

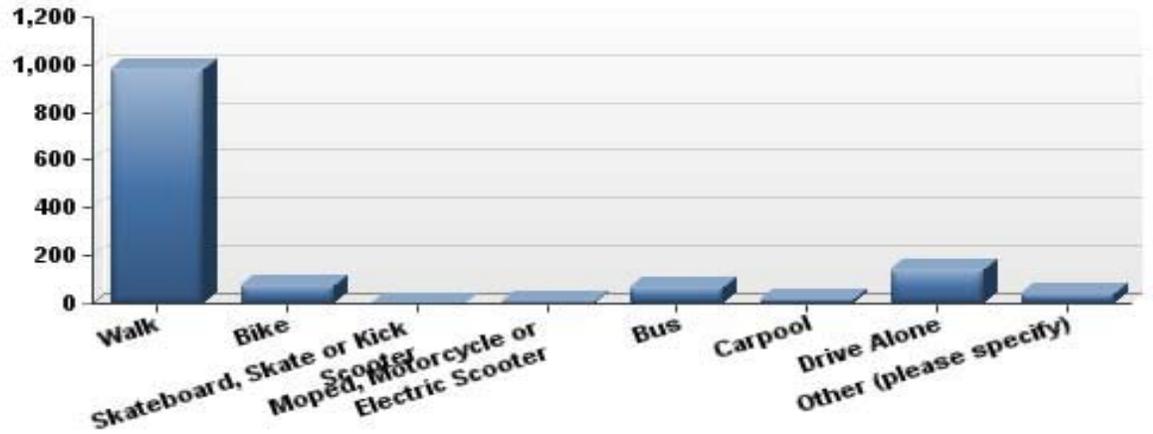
1. What is your campus affiliation?

#	Answer	Response	%
1	Undergraduate Student	419	31%
2	Graduate Student	187	14%
3	Staff	467	35%
4	Faculty	249	19%
5	Corporate Partner (Centennial Campus)	1	0%
6	Visitor	1	0%
7	Other (please specify)	12	1%
	Total	1,336	100%

2. What is the primary mode of transportation you use to go between your home and campus?

#	Answer	Response	%
1	Walk	82	6%
2	Bike	74	6%
3	Skateboard, Skate or Kick Scooter	1	0%
4	Moped, Motorcycle or Electric Scooter	9	1%
5	Bus	143	11%
6	Carpool	114	9%
7	Vanpool	0	0%
8	Drive Alone	777	58%
9	I live on campus	105	8%
10	Other (please specify)	30	2%
	Total	1,335	100%

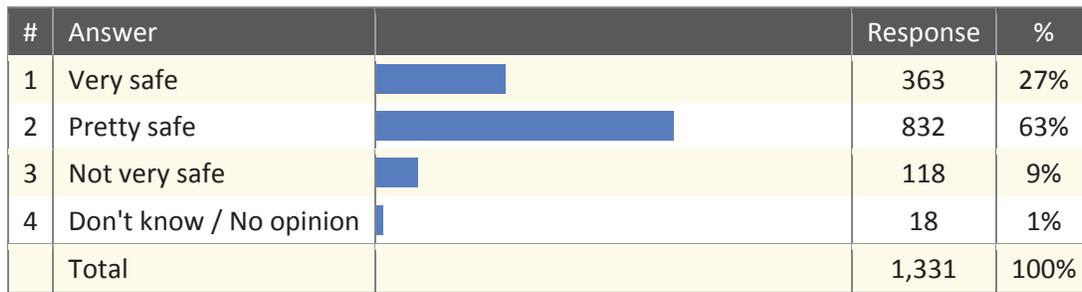
3. What is the primary mode of transportation you use to get around campus once you get here?



#	Answer	Response	%
1	Walk	982	74%
2	Bike	78	6%
3	Skateboard, Skate or Kick Scooter	3	0%
4	Moped, Motorcycle or Electric Scooter	5	0%
5	Bus	64	5%
6	Carpool	17	1%
7	Drive Alone	146	11%
8	Other (please specify)	40	3%
	Total	1,335	100%

4. In general, how safe do you think it is to walk on/around campus?

#	Answer	Response	%
1	Very safe	363	27%
2	Pretty safe	832	63%
3	Not very safe	118	9%
4	Don't know / No opinion	18	1%
	Total	1,331	100%



5. Please explain why you feel this way:

Text Response

no designated bike lanes- to much pedestrian and car traffic

I spend a lot of time on Dan Allen/Cates...lots of cars. Cars don't always observe cross walk right of way rules.

I just worry about traffic, espically crossing Avent Ferry or Western blvd. Once I'm between Hillsborough and Western, it's very walkable

Lots of sidewalks and crosswalks

Well lit, good PS service.

on campus is generally ok, as there are few through-roads, but around campus is dangerous - mainly due to drivers' attitudes

Students do not follow simple pedestrian rules. They don't use the sidewalks. They don't look before crossing.

Cars do not always stop when pedestrians are at crosswalks and skateboarders zip around on the sidewalks.

Well ... I was very nearly run over by a bicyclist on Dan Allen at the cross walk near Nelson. He completely was ignoring the crosswalk pedestrian right of way

Numerous crosswalks and plenty of sidewalks

I have almost been hit in crosswalks three times- not the university's fault- young student drivers with little experience

As a pedestrian, I find the vast availability of crosswalks to be very friendly. As a driver interacting with pedestrians, there needs to be more education on how to be a courteous pedestrian. Just because I have the right of way doesn't mean I should step out in front of traffic and make drivers slam their brakes to keep from hitting me.

Its OK for travel with a given campus and very poor for getting to/from campus to campus.

if you dont bother anyone, no one is lookin for trouble.

Raleigh is a safe city. Although the campus does seem less safe to walk around alone than the city in general.

Very safe during the day, even in secluded locations. I haven't been on campus at night, but that deserves a different consideration.

Pretty safe - but you have to watch where you are going at all times!! Most cars will not stop for you. Wolfline drivers will, however. I have also been almost hit several times by cyclists (at crosswalks). They are much harder to see than cars when you are crossing the street, and many times go faster than cars, and don't obey the rules of the road at all!

Sidewalks in most places.

Every vehicle stops and lets the people to walk across the road

Its pretty safe to walk except sometimes near the carmichael gym parking area where I have to be extra careful while walking

Crossing Dan Allen and Hillsborough Streets can be tricky, even when crossing at a light. Having the

pedestrian walkway at Dan Allen (between David Clark & Nelson) much more prominently marked and signs telling cars to yield to pedestrians would be helpful.

Bricks are often slippery...walkways do not go shortest distance from point A to point B...walkways on CVM campus curve and most people short-cut across the grass/dirt

When I did work on the main campus, I found that most people driving were very careful regarding pedestrians. The biggest concern is that people tend to cross the street in undesignated areas.

I'm comfortable walking through this campus, it doesn't feel dangerous.

There still aren't enough provisions made for the pedestrian on campus. More raised crosswalks/crosswalk striping is needed. Signage, too.

campus is generally very walker-friendly EXCEPT for people who ride bikes and skateboards way too fast.

bikes on the sidewalk; cars and busses don't yield to pedestrians

People on bikes are always on sidewalks not paying attention and going real fast. I have had NUMEROUS close calls and can't stand the bikes on sidewalks.

I don't feel any kind of threat when walking around campus. I do sometimes worry about drivers on campus not paying attention to the pedestrians.

There are robberies that happen so I think it's always wise to be on guard but the campus does their best to keep everyone safe.

Sometimes, I feel like high catwalks would be a good idea for crossing the streets on campus for one it's no guessing game for me if a car will actually stop or not for me when I am crossing and it would help traffic just a little more. Though, I know cost and prices play a huge role in all that we do.

People drive much too fast through pedestrian crosswalks. They go around stopped cars. People talk on the phone - and sometimes text - while driving.

i walk primarily during the day

cars stop for crossing pedestrians and there are designated crossing areas

crosswalk protocol for pedestrians and cars seems to be understood by most but would be better if there were signs explaining it.

Always have to watch the drivers and student pedestrians especially when people get frustrated with the bad jam.

There are plenty of side walks and pedestrian crossings.

Cars do not watch out for pedestrians and pedestrians walk out in the middle of the road because it takes too long for "walk" signals at intersections. Cars cut into pedestrian walkways when pedestrians are crossing.

I've never encountered or witnessed a problem; nor have students reported such to me.

overall too congested with walkers, car and buses to travel safely around campus. Traffic rules are not followed.

There are enough walkways and students to keep you focused on driving, instead of other distractions.

I stick to walking in day time hours, and there are always people around making it feel safe and secure.

I hate to generalize, but many young people tend to drive the same way they walk - while texting and talking. They don't devote their attention to the road or to what is going on near the road.

If you have a defensive mind set, then you're ok.

As far as drivers, those walking do not look where they are walking and walk right out in front of cars. I have almost hit numerous students many times. This mainly occurs on main campus.

Never feel in danger really.

bikers and skateboarders going wrong way on one-way streets; students plugged into their cell phones not paying any attention to what they are doing; very poor lighting at night ; brick walkways are slippery when wet

Fewer pavements for walking

There's not really a lot of traffic, if any, in the places that I walk.

There are lots of roads to cross, but generally the cars are aware of pedestrians

The cars tend to drive pretty slow and are aware of all the pedestrian traffic

I started to work for NCSU in July, and I was on campus for only three months. It already happened twice that a left turn car almost hit me when I walked through an intersection. At the time when I was walking through the intersection, the walk sign was white for people to walk through the intersection. One intersection is Hillsborough & Gardener, and the other intersection is Hillsborough & Brooks.

I think it's really unsafe around the avent ferry dorms. The bus stop is by the burger king and we have to cross the busy street. I've almost been hit by a car.

I have no fears for myself, but in general, if I am walking at night, I am careful for fear of issues. Also, traffic is very heavy and I am careful about that.

Very little through car traffic. Unlike UNC.

Sometimes busses can be too aggressive with pedestrians

Drivers need to show greater respect for pedestrian crossings on Dan Allen Drive

People are pretty good about yielding to crosswalks

Never really noticed any issues with vehicles as I have been walking around campus.

Cars usually respect crosswalks and the sidewalks are generously sized

If you stay on the sidewalk and crosswalk, i think you'll be okay.

There are abundant sidewalk and intersections are equipped with lights/cross walks

There are wide enough walkways and zebra crossings too. The 20 mph limit on cars is also well enforced.

Most of the time, I feel safe, but occasionally I come in contact with inconsiderate bikers and skateboarders.

drivers on the whole reasonably courteous

As far as paths go it's really simple and safe to walk around on campus and be safe about it. The only reason I didn't select "Very Safe" is because, depending on the time of day (or night), there's the rare but potential problem of robberies and assaults. All in all, though, I think that a little common sense is all that's needed to avoid that

Have very few opportunities to observe other than Western Boulelvard/Morrill Dr. intersection but have always felt that is not a safe passageway for pedestrians

There are definitely spots where I don't feel safe due to tall plants/bushes or near the bridges and closer to the book store. I also think that the crosswalks can be dangerous with vehicles not always looking for people crossing.

I am on campus during the day, and it seems well-populated and well-lit in the areas that I frequent.

I have not walked on campus during the evenings or at night.

Some cars go much faster than they should...can be dangerous.

Not a problem for me but students need to pay attention - see comments

open spaces, paths, and lots of lighting

There are many crosswalks and sidewalks, campus traffic is generally very respectful of pedestrians and bikers

Because campus roads are closed to through traffic, there is very little traffic to watch out for.

Students drive above speed limit and do not stop on cross walks.

The drivers here seem to be respectful to pedestrians.

for the most part, cars actually will pay attention to cross walks....a few people just fly through

Many times pedestrians cross the street without looking, and a lot of drivers don't pay attention.

The drivers are very accustomed to having to stop for students constantly crossing the road.

Crosswalks are clearly marked, motorists usually are courteous to watch for pedestrians and give them the right of way.

I don't think it is particularly safe after dark.

Plenty of walking routes.

Walking on the sidewalk is safe.

Cars give pedestrians the right of way

There are always lots of people around and emergency/security buttons.

Cars and bikes ride around very quickly and it feels dangerous to walk sometimes.

There are plenty of cross walks and various walkways on campus.

Students basically walk out in front of traffic without looking

Since I work on campus, whenever I walk it is during the day and there is a lot always going on during the day

I am only here during daylight hours. The students tend to be very aggressive in crossing and don't always look for cars.

Cars need to stop at pedestrian crosswalks, and there needs to be more lighting around campus when it gets dark

Areas where crosswalks do not have automated signals - - cars do not give the right away to pedestrians

Many side walks to get where ever you need to go. Traffic moves slowly and people seem to be paying attention.

Plenty of space to walk around.

Cross walks are poorly marked and often ignored by drivers turning down Stinson Dr. I've had several near misses trying to cross to Poe Hall.

Travel all over the campus at different times with no problems

parked cars along sides of many street make line of sight for pedestrians and drivers very limited.

I have had no problems. I am not on campus after dark so I am not sure what it is like at night.

there aren't that many high-speed roads to worry about walking on

Not safe only because bikers and pedestrians do not follow any sort of rules such as crosswalks....

6. In general, how safe do you think it is to bike on/around campus?

#	Answer	Response	%
1	Very safe	94	7%
2	Pretty safe	499	37%
3	Not very safe	367	28%
4	Don't know / No opinion	374	28%
	Total	1,334	100%

Statistic	Value
Mean	2.77

7. Please explain why you feel this way:

Text Response

I see bikers without helmets weaving in and out of traffic daily! Students generally don't know bike traffic rules-what side of road to ride on, helmets, etc.

Again, just traffic across major roads. Not enough pedestrian walkways

No dedicated bike lanes, limited adherence to traffic rules by bikers, limited awareness of bikers by car drivers

may be some streets and places where lots of cars, but overall, good and have some bike paths.

no bike lanes off campus, combined with bad drivers' attitudes

Same as above. They want to be treated like vehicles but don't follow vehicle rules

I have to cross busy roads - there are no dedicated bike lanes

Never ride bike on campus

same as above

The bikers do not follow the letter of the law of safety, They care less and do not follow simple rules. they are unsafe to motorists and pedestrians.

know of many people who've almost been hit by cars

I don't bike on or around campus, but from what I've seen, the campus attitude toward bicycles has improved with increased awareness campaigns by Transportation and better signage on the roads to alert drivers to the possibility of cyclists in their midst. I think there could be better education to cyclists and drivers on how to coexist peacefully and safely. It can be done!

Its OK for travel with a given campus and very poor for getting to/from campus to campus. No bike paths. No over/underpass from Centennial to Central.

There are a lot of VERY bad drivers, and the busses make it hard to bike around the streets.

People recognize the increasing presence of bicycles.

The road construction work on avent ferry road and on hillsborough street had made it some what inconvenient for biking

Few or no dedicated bike lanes

Basically, the same as my reason above. Drivers are careful, bikers aren't necessarily careful.

Unless you have a very secure place to store your bike, the reason why I haven't been biking is because I'm afraid it would get stolen.

because of all the parking on roadways and the narrowness of the north/central campus roads, I would be concerned about safety.

Cars reign supreme on campus streets. There are no marked bike lanes, not even any "sharrows" to demonstrate to drivers they share the streets with bikers.

don't bike

I don't ever bike

Biking is probably a little safer than walking because you are getting around faster but it's still good to be cautious.

I personally haven't tried it, though I do sometimes think that cyclist on the streets are in the way. So bikeways would be nice.

i don't bike

Don't own a bike

I have biked to work on occasion and had no problems.

Don't bike myself though at the times student bikes share the campus road, I am in full alert.

Never thought about it

You have to navigate pedestrians and traffic. Many of the main entrances to campus are not easy to bike on because of the amount of traffic or the rate at which the traffic is traveling. There is also a distinct lack of shoulder on many of the roads.

No bike lanes, and cars do not leave room on the side of the road for bikes.

If it's "between" campuses, that depends on traffic. No experience biking across W.Blvd.

I feel that students need to be instructed more on THEIR safety. Many times I have had a student dart in front of me from a sidewalk without signaling or looking. IF they are instructed to watch for others, then I think it becomes MORE safe around campus.

I think that some people are not paying attention to people and bikes in crosswalks. I almost saw a biker get hit by a car that seemed in way too much of a hurry. Takes moments to allow a biker or pedestrian to cross the street. People just need to be aware and slow down.

I have never ridden a bike near campus

Bikers have their own road rules that are between cars and pedestrians.

I do bike to work often, and have no trouble on campus. I also walk often and have encountered no issues. If there is an issue, it is crossing Dan Allen from the parking deck.

narrow streets; conflict with cars

Fewer pavements for biking

Can't say because I don't bike on campus. Would be great though if there was more enforcement on the helmet laws! I'm tired of being stuck being bikers going really slow in the middle of the road, especially when they don't have a helmet on.

Never rode a bike on campus

The cars tend to drive pretty slow and are aware of all the pedestrian traffic. However all the pedestrians is challenging on a bike sometimes

mix of cars and bikes on streets is dangerous. you can avoid streets when walking.

Very safe except going between Central and Centennial campuses.

Never biked on campus.

I have never biked on campus

The campus has major roads running all through it. Couple this with dismal student pedestrian crossing etiquette and road rage towards cyclists, the campus is just a volcano waiting to erupt into one major accident.

bikers when mixed with car traffic create a sketchy scene.

It's not exactly safe for students to ride on the road and it's not exactly safe for the pedestrians if they

ride on the sidewalks.

not a cyclist

I'm a road cyclist, so I use my bike more for exercise than actual transport. However, the NC State area is one place that I will avoid on my bike, especially during any sort of event or work traffic. Throughout main campus there's just too much going on for drivers to keep up with cyclists as well, and often the cyclists don't bother with looking to see who has right-of-way or obeying traffic laws as opposed to acting like highly mobile pedestrians. I'm actually surprised we don't have more incidents with cyclists than we do.

Have very few opportunities to observe other than Western Boulevard/Morrill Dr. intersection but have always felt that is not a safe passageway for pedestrians

Our cyclists have not respect for cars. They zoom in and out without looking for vehicles. I am surprised that there are not more bike accidents annually.

Because it seems to me that the bikes and the cars are in the same space and bikes can't compete with cars. Also, when I was on campus as a student (pre-1973), a friend of mine was nervously riding her bike on Dan Allen Drive and was so busy watching the cars that she hit a bump in the road, fell off her bike, and knocked out her two front (upper) teeth.

I do not bike on campus.

Some cars go much faster than they should...can be dangerous.

lots of uneven/wet bricks

It is safe if bikers obey the traffic laws

open spaces, paths for bikes (not only stairs), and lots of lighting - but could use more in parking lots

I have a 12 mile round trip bike commute to campus every day this year and I have been biking to campus for all four years i have been at NCSU and I have never been buzzed and only had a few people blow a horn at me. Most everyone else is respectful and gives me space to bike. Additionally the streets around campus are wide. The parts of hillsborough street that they have not redone can be dangerous due to cracks and pot holes that can blow a bike tire.

While on campus, it is not fast or practical to use the roads to get around, thus it is easier to use walking paths. During times of heavy foot traffic, it is difficult to ride on these paths safely without hitting pedestrians.

I've never felt unsafe, but I also don't bike on campus, so I can't speak to that

Indecisiveness can, on occasion, cause potential accidents.

No feeling of danger

some people pay attention, others follow way too close. needs to be a bike lane

Do not bike

Again, other drivers are accustomed to sharing the road with cyclists.

bicyclist do not always follow rules, on some busy campus streets there is not a lane for bicyclist.

No bike lanes. Not enough routes to travel between campus precincts, especially crossing railroad tracks. Too much foot traffic crossing bike routes. Bus drivers are inconsiderate to bikers.

Sharing the road with vehicles always has risks.

I have never biked on campus

Cars don't always yield as they should.

There is more potential for someone riding a bike to get hit by a car.

I think it is pretty safe, but students should follow the bike riding rules a lot of them ride on sidewalks and it makes it unsafe for walkers

I have seen students not really obeying traffic laws when on their bikes, and sometimes come around cars when oncoming traffic can't see them.

Bikers seem to be a bit less careful than pedestrians or drivers in cars.

I don't own a bike

I don't bike--just walk during lunch hour.

Have had no problems with bicyclists

There are no bike lanes. You have two choices: 1) ride directly in the road as if you were a car, or 2) ride far to the right to let cars pass you when they need to. Both ways are not safe, especially option 2. The far right sides of the roads on campus are not well maintained with many cracks and changes in concrete composition. This makes it very very dangerous for a road bike to be ridden.

There is not too much room sometimes that is why I chose "pretty" safe.

I've done it many times before even around 4 am.

Cars on some busy roads may make it difficult to get around by bike.

no real bike lanes. its not really a biking campus either so drivers and pedestrians aren't locked into that culture of always being on the watch for them.

I never bike on campus.

roads are narrow and people do not pay much attention to cyclists

Many will pass cars on the right which a) frightens the driver and b) if the driver doesn't see them before moving over then the biker is hit

I have not ridden my bike around that much. Don't know of any trouble spots, but defer to the regular bikers

You can bike on campus if you cannot safely bike to campus! Two of my coworkers have been hit by cars trying to bike to work at ncsu. I would bike every day but the City of Raleigh and NCSU do not make biking a priority. Bike racks are too limited in number. It is not safe to be on the roads around campus. If this project will have any impact it must interface with the City of Raleigh and make meaningful changes and bike paths around campus. I am sorry, but putting up signs that say "share the road" is like asking wolves to let sheep sleep in the same pad! These signs do not help bikers stay safe. It is truly sad the lack of environmental commitment present in this area.

Lack of safe indoor places to keep a bike, too much thievery.

bikers do not follow traffic laws and do not watch out for pedestrians and run out in front of cars and impede traffic

low campus speedlimits, though bike lanes could help

when done correctly, biking can be pretty safe but it seems that a lot of people on bikes just kind of do what they want to.

Hillsborough street around the veterinary school is INCREDIBLY UNFRIENDLY for bikes, VERY DANGEROUS!!

never tried biking

Lack of dedicated bike lanes.

I don't bike on campus.

Most bike accidents on campus are caused by the bicyclist rather than a motor vehicle. Following traffic laws would cut down on bicycle accidents.

They do not follow any transportation rules of the road!! They have a lane designated and still use the entire road!!

I'm on N side of campus and there are enough "back routes" to avoid traffic.

8. How often do you travel between campus precincts?

#	Answer	Response	%
1	Daily	326	24%
2	Several times a week	256	19%
3	Weekly	213	16%
4	Monthly	229	17%
5	Very rarely (once or twice per year)	252	19%
6	Never	57	4%
	Total	1,333	100%

Statistic	Value
Mean	3.00

9. How often do you walk or bike to get from one campus precinct to another?

#	Answer	Response	%
1	Not applicable -- I never go to other campus precincts	82	6%
2	Never	406	31%
3	Sometimes	409	31%
4	Frequently	187	14%
5	Very frequently	247	19%
	Total	1,331	100%

Statistic	Value
Mean	3.08

10. The following are a list of reasons why people might not walk or bike between campus precincts. Mark all that apply to you.

#	Answer	Response	%
1	It's too far to walk or bike	741	61%
2	I prefer to ride the campus buses	289	24%
3	I prefer to drive	353	29%
4	I don't feel safe walking and/or biking	211	17%
5	I don't like to get disheveled during the work day (e.g. sweaty)	469	39%
6	Other (please specify)	230	19%

13. Which of the following would actually encourage you to walk to/from/around campus more often? If you already walk on a regular basis, which changes would you most like to see? Mark all that apply.

#	Answer	Response	%
1	More sidewalks on campus streets	395	34%
2	More sidewalks on off-campus streets	396	34%
3	More greenway trails	519	44%
4	Improvements to campus-area intersections	406	34%
5	Improved ADA access	59	5%
6	Better lighting of streets and walkways	524	45%
7	Improved motorist awareness and courtesy	556	47%
8	Other (please specify)	128	11%

14. Which streets and/or intersections in particular do you think should be improved for pedestrian access and safety?

INTERSECTIONS

IIIIIIIIIIIIIIIIIIII	Western & Avent Ferry
I	Cates & Pullen
IIIIII	Centennial Pkwy & Avent Ferry (and other crossing locations)
IIIIIIII	Hillsborough St intersections
IIIIII	Western Blvd & Dan Allen
II	Faucette & Dan Allen
IIII	Dan Allen & Cates
II	Sullivan & Dan Allen
II	Western & Gorman
II	Western & Varsity
I	Gorman & Sullivan
I	Method & Ligon
I	Stinson Dr @ Poe Hall
I	Cates & Morrill
I	Varsity & Main Campus Dr
I	Avent Ferry & Varsity
II	Dan Allen & Thurman

- I Gorman & Jackson
- II Dan Allen & Yarborough
- I Faucette & Varsity
- I Stinson & Pullen
- I Sullivan & Varsity
- I Sullivan @ West Lot
- STREETS**
- IIIIIIIIII Dan Allen
- I Cates
- II Sullivan
- IIIIIIIIII Western
- IIIIII Hillsborough St (west of Dan Allen)
- IIIIIIIIII Avent Ferry
- II Morrill
- IIIIIIIIII Dunn
- I Blue Ridge Rd
- I Brooks Ave (missing sidewalk)
- IIIIIIIIII Yarborough
- I Lake Wheeler
- II Varsity
- I Stinson
- IIIIIIIIII Tunnels

15. If you are a Faculty or Staff member, do you participate in the WolfTrails alternative commute program?

#	Answer	Response	%
1	Yes	74	6%
2	No	694	55%
3	I am not Faculty/Staff	486	39%
	Total	1,254	100%

16. Please use the space below to share any additional comments regarding biking and walking conditions on campus.

Text Response

I go to the Admin Bldg a lot and would walk more if I wasn't afraid to cross Western

My primary work location is at Method Rd. Unit 4. Every once in awhile I have a need to travel to Thomas Hall, and in the interests of time I generally use a University vehicle to travel. The addition of sidewalks and better lighting along Ligon St. between Method Rd. and Gorman might make the option of walking more appealing. I do not ride a bike, since I live in Durham and must drive to work every day.

It would be great to beef up patrols and monitoring of people who blow through red lights and otherwise ignore the pedestrians' right of way.

Drivers and buses need to be made more aware of the pedestrian crossing policy. When there is no light but a pedestrian cross walk I believe the pedestrian/cyclists has the right of way to cross.

Most of my opinions regarding improved conditions are in the above comments. In general, I would like to see more education available for pedestrians and cyclists on campus on how to maximize their safety without sacrificing the benefits of these modes of transportation. I see too many people crossing against a crossing signal, stepping into the street where there is no crosswalk, and other things that are unsafe, but people assume vehicle traffic will be able to stop. I hope that education (both via signage on the sidewalks/streets and online/printed resources) will prevent what seems to be imminently inevitable: a car or bus will hit a pedestrian or cyclist doing something stupid, and someone will be seriously injured or killed.

I would like to suggest to have a footover bridge on the western blvd and avent ferry road intersection that will save a lot of time for pedestrians

This isn't related to walking per se, but the wolfline should service Tryon Road. Many students live in apartments on Tryon between Trailwood and Avent Ferry.

Bikes are considered vehicles, so I can't understand why they are permitted on sidewalks. Pedestrians cannot hear them coming from behind, or coming at them on corners that have hedges (Dan Allen across from the deck). It's bad enough dealing with the skateboards, but at least I can hear them. This is also an issue for anyone on campus with a disability that cannot hear or get out of the way fast enough.

walking isn't bad bikers are just careless and go way to fast and they think the traffic patterns don't apply to them

Zip car is coming as one of Transportation services. I look forward to students and staffs changing their habit and giving up their cars on campus.

I actually think that students need more motorist awareness and courtesy as they just cross anywhere they choose and expect cars to stop for them. This is what pedestrian crossing are for, and there are plenty of them, but they don't use them. So, more education of students of traffic rules would help them to be safer!

It is scary to ride on or around campus. I was riding up Hillsborough last week and got buzzed by a campus bus. They then proceeded to cut me off and came to an immediate stop. When I pulled around them they made a second attempt to hit me with the bus, which I avoided by hoping the sidewalk with my bike. Campus buses are scary. Car traffic is also scary as they often times try and maliciously hit

cyclists around campus.

I love the new look of Hillsborough. I do think that more bike lanes along inner campus streets would help with flow of traffic as well as bike safety.

I was a student at the University of Akron in Akron, Ohio when they closed all of the streets through campus and routed all traffic around campus. (That campus was very much like NCSU in that it was right in the middle of a downtown area.) It was a pain initially while figuring out the best way to manage traffic patterns but it really cut way down on pedestrian and biking accidents and made for a much safer and less segregated campus. Parking was put on the perimeter of campus and for the most part, you really never had to walk too far to your first or last class (depending on your strategy). I was very pleased with the change and would highly recommend it for NCSU.

When driving on campus, I try to be extra careful around bikers and walkers because they are students and in their own little world. Bikers are not very predictable. When walking, I try to be a defensive person, because of the unpredictability of others.

When the faculty parking opens up after 5PM, campus is a disaster: students are driving around hunting for parking places and paying no attention to what they are doing: require parking permits for parking between 5PM and 9PM on weekdays.

Generally the conditions are good. It's difficult with the spreading, and I know in the past I've had problems a couple of times getting between main and centennial when I had back to back classes. I don't see any particular solution to said issue though, i.e. don't allow buses to ever breakdown/have problems/get delayed. Most of main campus is very walkable. Centennial, I did have a hard time when I was considering taking a class in MRC, because walking between the EBs and MRC takes almost all of the 15 minute passing time, and could be more when the weather is bad.

There are not enough bike racks at EB I, II and III.

There is too much leniency in traffic enforcement on Dan Allen. The frequency of active enforcement is also poor. There are plenty of signs and the laws are in place. Just enforce the laws!

I work on Centennial Campus and don't have a very frequent need for going to any of the other precincts (maybe 1-2 times a month, sometimes more frequently, sometimes less). While I would love to be able to just walk to main campus it's a bit far and not a very efficient use of work time, so I think that is skewing my responses some. When I was a student I would walk everywhere whenever possible (only taking buses to Centennial and back) and loved how easy it was to get around campus that way. All in all, I think NC State has done a good job for walking and, to some extent, biking, and once on campus walking is still my preferred method of getting where I need to be.

Implement a No Right Turn on Red at Western Blvd/Dan Allen so that all traffic is stopped to allow safer crossing at intersection. I have witnessed close hittings of several pedestrians trying to cross Western Boulevard from Dan Allen and vehicles turning right on red have barely missed pedestrians on more than one occasion.

Cyclists and pedestrians need to look before crossing streets. Not looking is a huge problem. I am very scared for both the people in vehicles and those outside them with this apparent disregard for safety concerns.

My office is located in downtown Raleigh, so part of my battle is getting to campus. If I ride the Raleigh bus, I am then coordinating the Raleigh and Wofline bus schedules or managing to get my bike to campus via the Raleigh bus, and I just have not been that ambitious.

Often bikers ride on the sidewalks when there are large volumes of foot traffic and I am afraid I am going to be knocked down.

As indicated above, a majority of the time it is not the faculty/staff motorists who are an issue. Students on bikes and skate boards can be issues. Some bikers are obeying the traffic laws, but most do not. The weave in and out of traffic, dart across moving traffic, travel against one way street, will come up rapidly behind a car that is signalling to turn right. Skate boards are a real danger on campus. Students will walk out from between cars without looking; they are frequently walking and talking on cell phones or have ipods ear plugs in while walking, so cannot hear traffic coming. While walking on Hillsborough Street students will ignore lights and walk right in front of cars exiting campus.

I tried a couple of times to bike to campus. I live 11 miles away and it took me 2 hrs and 15 minutes one way. It was a rigorous, demanding commute. Near campus, the main problem with cycling is that there is not a safe bike-friendly connection between the greenway that ends at Merideth's campus and an entry to NCSU's campus. Bikes and cars have an uneasy relationship on campus. e.g., s. yarbrough, cyclists dodge in and out of the car lane. There needs to be a marked bike lane. If I could keep a bike on campus, I would use it to get around to other precincts IF there was a safe way to do it. There is not a safe way to get from North to Centennial Campus, for example.

Biking is a really great way to get to class, it is time efficient, saves gas, and you get good exercise. More bike lanes on road would definitely make biking safer and a more attractive option to the average student.

-My primary complaint is that Students walk in the middle of the street when there is a sidewalk provided. And when a sidewalk isn't provided, they walk in the middle of the street rather than on the side. If students who are walking want automobiles to respect them, then they need to respect the primary purpose of streets - to transport vehicles. -A second concern is with bike riders (primarily students) who use the sidewalks as bike paths, do not stop or or swerve around walkers and who dart in front of cars.

Walking on the main campus feels very safe. I'm not on campus rarely when it is dark but having adequate lighting everywhere would be important to me.

Since, I just walk, so far everything looks good for me.

Bikers, Walkers, and Drivers all need to be a little more careful and patient.

Have had a major problem with skate boarders using Morrill drive & Cates; Skate boarders should be banned from using the streets. They are very difficult to see (especially depending on the sunlight); no helmets, and are moving fast.

This is a very car-friendly campus. Far too many cars have access to the central part of north campus. Crosswalks are very poorly marked. Not even the buses stop for them. Very dangerous. Only a matter of time before someone is killed.

It would be nice to close the middle of main campus to vehicles and open for pedestrians and bikes only. Keeps traffic moving and reduces hazards.

I don't know about the WolfTrails alternative commute. I'll have to look that up. thanks for doing this survey!

Biking and walking conditions must be safe. To bike on campus, the roads leading to campus must be safe. Many more staff and faculty would bike if there were paths for them to use around campus and getting to campus. Bikes cannot ride in car lanes going to and from campus. This must be a project that works with the City of Raleigh to make real change - on campus might change with this effort, but not many people will safely get to campus with their bike to take advantage of this change and it will be an ineffective up-grade. Engage the community and the city to make this work.

The womens' showers need a serious makeover, remodeling, cleaning on the veterinary school (west

precinct) campus. I would bike to school everyday if I had a functioning and clean shower to use! They all either leak water, have terrible water pressure, are used for storage, or are disgusting and appear to have last been cleaned last year.

It is too far to walk from Centennial Campus and biking is too dangerous.

Overall I think N.C. State's campus is safe and user friendly for whatever mode of transportation one would choose to use. I feel safe and comfortable walking around campus.

Hillsborough street from Cary to campus desperately needs bike lanes and sidewalks!

Bicyclists need to learn that they must obey the traffic laws. I have seen so many bicyclists ignore traffic signs, especially stop signs on Dan Allen Dr. Another problem is them riding the wrong way on the one-way streets.

Currently, bikers on SIDEWALKS - including along Hillsborough - pose a real safety problem. Apparently we are supposed to "feel" them approaching from behind and move to the side. This occurs on campus, too, but there is not much room along Hillsborough to get out of the way. I know riding on Hillsborough is a problem, but it can't be safely solved by riding on the sidewalk.

Improved bus service, including smaller vehicles, are needed. Increasing bike traffic will only endanger riders and walkers. Regulating student walking across busy intersections via more lights and controls will improve transportation for walkers and drivers.

Weather is a big contributor.

I really believe it would be beneficial to pedestrians and bikers if certain campus roads were shut down to unauthorized (non-university vehicles) during the main school hours. This would also help considerably with the inefficiency of the campus buses through those main thoroughfares like Morrill and Cates.

As a staff person it is too far for me to ride a bike to work (from home) so unless there are bikes on campus that could be "borrowed" I would not be able to take advantage of cycling. Also, I am located off campus, so a lot of this is meaningless. Especially in terms of walking around on campus.

I bicycle commute to school 2-3 times/week from Cary, and ride recreationally up to 150 miles/week during favorable months of the year. I moved here from Austin in February. The culture here regarding the respect offered cyclists by motorists is not healthy. On almost every commute I make, I feel that a motorist has put me at risk by passing too close, or cutting me off in order to save 5 seconds. In the Austin area I felt less threatened while riding with traffic. Not sure how this culture can be changed.

The one thing that I would care about more than everything I just mentioned is some kind of lighting installed beside bike racks. I walk around campus because I had my bike stolen on 09/22/2010 and I know a girl who had her bike stolen on 10/04/2010. The number of bike thefts is just ridiculous; I don't know if lighting would help deter theft but if there was a way to decrease the number of bike thefts, I would stand behind it 100%.

I did ride TTA Van from home to NCSU for years. It was canceled August of this year because there were not enough participants.

Like many other cyclists, I ride differently based on traffic conditions. I ride my bike on the sidewalk when possible on Hillsborough Street, since cars often pass close and don't treat me like a vehicle. They are a hazard to me but, in avoiding them, I become a hazard to pedestrians on the sidewalk. I sometimes ride in the road along with cars but on the right side of the lane on Dan Allen, but again, drivers can be aggressive. In order to feel safer and "take the road," I often ride in the road along with cars but on the far left (near the double yellow). This often annoys drivers and makes them feel unsure of what I'm

going to do next. I'm sure they are less comfortable, but I feel safer. I believe that dedicated bike lanes or bike paths would solve all of these issues and encourage more people to ride bikes on campus. Incidentally, I have also had problems with people texting while they are walking. A shared pedestrian/bike way but with dashed line in the middle could help with this. I bike to and from all 3 campuses (Centennial, main campus, and Vet School).

There needs to be more pedestrian awareness and courtesy. My suggestion is that at every orientation and periodically throughout the year, it should be impressed upon students that they need to utilize caution and common sense when crossing the street. They need to look both ways when they cross and not depend on drivers to stop on a dime when they stepped off a curb. Even at 10 & 15 miles per hour this is sometimes impossible. They need to be made aware that it is still a 2000lb machine coming towards them. I am always cautious while driving on campus, but do you realize how many times I have come around the curve at Yarborough before Stinson and some student stepped off the curb as I came around that curve and had to slam my brakes on? They need to cross streets defensively.

I used to bike to work somewhat regularly (before having kids). I felt pretty safe biking to work (on Centennial Campus). About half of my route was on Raleigh greenway trails. I probably would not have biked in without that. If I had a bike on campus, I would be more likely to use it when going to meetings by myself. However, for most meetings I attend, I am traveling with one or more coworkers. I live too far away to consider walking to campus (~50 minute bike commute each way).

People need to look where they are going. People walking seldom look before they step out in traffic. There needs to be an officer helping with traffic at 5:00. There should not be skaters in the parking deck on Partners Way.

Again, bike robbery is a big issue. Probably by using cameras in the bike lanes and parking spots might help.

Non-motorized access and easy of pedestrian/bike movement is a huge planning coordination effort that has to reassess motorized transport...The busses help. Restricted or slowed car movement helps. Slowly squeezing cars/trucks from main will help and will be tolerated if well planned to avoid peak snarls. Good luck

When I was living on campus I used to walk everywhere. If I owned a bike I would use that to get to class to cut down on travel time.

For me, the biggest drawback for biking to work is the lack of showers/locker room.

Would like more regular information on the WolfTrails alternative commute program - how many people use it, programming around it, and faculty incentives to bike about.

Pedestrians need to realize that bikers cannot stop suddenly for them, and cannot always move around them easily. Bike awareness in general is very necessary.

I have a problem with the trick riders on the sidewalks. I was very nearly run over on the sidewalk outside Broughton last week. They travel in packs, don't use the roads, have no courtesy and go fast among walkers. I would love to see them fined.

Again, both drivers and bikers/skateboarders need additional education to increase their awareness of each other and in the basics of sharing the road. Pedestrians on cell phones certainly don't help either as they usually fail to look either direction before crossing a street.

Students should not be allowed to bike or skateboard on sidewalks. Skateboard issues should be addressed as well.

I am very disappointed that bike lanes were not put in on Hillsborough Street during the construction. I

have noticed that bike lanes have gone in on Avent Ferry past Gorman street going towards Lake Johnson, but think that it is dumb that they did not continue them towards campus all the way down Avent Ferry. I would like to see campus become bike friendly.

Since I am staff member, time is most important reason of choosing driving over walking. It is not always feasible to plot out extra 10-15 minutes to walk across campus, not to mention going to Centennial, for meeting or just to eat lunch at one of the dining hall. What happen to the shuttle bus , small shuttle bus that was to be implemented a while back for easy access thru out campus. Wolfline has to go around about and still drop you off a distance sometime from your distination because of the route for students. So staff are almost forced to drive short distances or not participant or frequent other areas on campus very much due to parking limitations when drive to another or for walking, take to long to go and come back say on lunch hour.

I wish there was more courtesy from drivers towards pedestrians. I had a friend walking across Western (when the pedestrian light was on) and a driver turned right, slammed on his breaks right in front of her, and then preceded to YELL at her about crossing the street. She had the right of way! I sometimes feel like it is so dangerous to walk on campus. The large sidewalk on Sullivan is also blocked a lot with NC State vehicles. I am on a sidewalk, not the road, and I am still dodging car and those all terrain vehicles. No one will let people cross the street, and the sidewalk on Sullivan floods any time it rains, and people will speed by and drench any pedestrians. Believe me, if I could park on campus, I would. This campus is so dangerous, especially at night. It is very frustrating to walk on campus.

It is a shame that the Hillsborough reconstruction (which is very nice) did not include bike lines...I can't believe it, actually.

I have no idea what the WolfTrails alternative commute program is. I live out past Clayton. I am not counting on useful commute alternative coming out to Johnston - we are always the last - they are talking about stopping light rail at the Wake - Johnston line.

I think things have come a long way in the recent past but hope to see more improvements come out of this survey.

Bike lockers in North Campus would be great!

I have been trying to make the Admin more aware of bike commuters for 15 years with zero impact. There are no campus bike paths which seems ridiculous for a big campus like this with such pleasant weather. Look at U of Wisc with much worse weather but lots of bikes. Almost all campuses do a better job. Need walking/running/biking paths between your so called precincts like one down Nazareth street with a bridge over Western. Also need to finish the bike path through Lake Johnson that ends on Trailwood Drive to Cent and main campus.

N/A

Centennial Campus is very pedestrian unfriendly. The construction of new buildings has greatly increased the time it takes to get between buildings. There are straight paths that would cut down on walking time, but are not accessible due to wooded areas.

I think the university does a good job promoting alternative ways to commute to work and around work but does not provide the "infrastructure" to support it. Dress codes, lack of shower facilities etc. makes it impractical to use these alternatives.

I have walked to meetings in the summer and I stopped at Bragaw for a rest/and air-conditioning break. There are no water fountains on the way anymore. Walking to a meeting works sometimes. I thought about taking the bus but the routes seem longer than they need to be to get from the Admin area to central campus. I'm not sure where I could walk for lunch break exercise that I would not be run over by

students. Where is a map of the greenway that runs through campus? I looked but could not find it. Is it safe to enter Pullen from NCSU for a lunch walk? That seems a little more dicey. And how would the idea of common bikes work here?

Bikers should slow down when riding through campus for example on the brickyard in front of the library. Bikers sometimes come by people just a little too fast. Never know when a person is going to pull (turn) in front of them to go to a particular building. Should just be a little careful.

I appreciate the increased awareness and the effort to gather feedback. Thanks!

I live 50 miles away and have need to visit most precincts during a given week, so biking or rideshare is not feasible, but I do walk when I can.

As one crosses western from avent ferry towards campus there should be bike lanes on that road leading to the gym.

There needs to be more done to encourage students to wear helmets and a greenway system would be hugely beneficial in encouraging people to bike to and around campus. I love biking, but it is a great difficulty to do around campus sometimes.

Fast travel (warp points)

campus is relatively safe to bike through, it is the streets surrounding campus- Avent Ferry, kent, method, etc.- that could use improvements

There would need to be bike specified road/lane on Campus and the surrounding areas where student live with safe crossing of main roads such as overpasses in order to have more studentns, and employees feel safe enough to take the bike or walk.

safety is the biggest concern as well as sidewalk access.

It might be nice to have "green" pedestrian bridges over Dan Allen and Western Blvd.

Walking and biking around campus could be made easier if motorists payed better attention while driving.

I'm concerned about bikers traveling the wrong way on many of the North Campus streets, especially at the Stinson & Yarbrough/Current intersection.

As a staff worker on campus, I feel the bicyclist now are dangerous and unthinking when it comes to passing around vehicles. They fly around disregarding the stop-lights, stop-signs, vehicles turning left.

Varsity Drive really needs some sidewalks put in. I walk alot up Varsity from Sullivan and it is dangerous. I think with the new parking deck going in there should definety be sidewalks installed.

When if there were more bike racks available, like on at each building, it would make it a lot easier to bike on campus. If there's not where to lock them to while in class then you're not going to want to ride everywhere.

I know it is unsafe for bikers, but they are a group on campus that I see making some very stupid decisions when it comes to their own safety or the safety of people walking. When I do walk I am MUCH more scared of the bikers than I am the cars.....

I believe strongly that the intersection of western and avent ferry should dramatically altered for pedestrian use. I do not believe someone should need to be seriously injured or killed before action is taken. There should either be a tunnel or an overpass. Folks regularly run red lights at that intersection. Seldom do cars yield to pedestrians unless they are walking in large numbers. Additionally, I think the addition of a bike lane on campus streets / and off campus would be an excellent way to protect pedestrians further... and make driving conditions better for all those in the area.

Those who bike must follow traffic rules and not cut in and out of cars, go down a one way street in the wrong direction, slow down.

Love the WolfTrails program but haven;t been able to use it much (from Durham). V. glad you are studying this aspect of campus life.

Biking from near E.S. King Village is fun until I have to travel up Dan Allen to get to North Campus. This is really the only "dangerous" part of the commute. With a dedicated bike lane I would feel much safer.

most of very bad, and beyond a simple repair. This is "black and white" issue -- Safety for walkers, drivers, including bus drivers is the most important factor- It is a pity if we have to wait for a serious accident/or death to change the situation is getting worse as the bikers and skateboarders, etc., become more aggressive in doing their own thing -- no matter what danger it creates for others.

Haven't heard of the WolfTrails alternative commute program--guess I need to look it up.

I have considered an electric bike but can't risk a fall. If there were a transportation network of golf carts or small vehicles that people could ride between the furthest campus locations, like McKimmons Center, that would be great. Many employees could not get to the Wellness Fair due to the distance. I actually have a hairdryer in my desk because I get soaked walking from my car to the office when it rains or when it's above 90 degrees, I am so "wet" from the heat that I need my little "repair" kit to make me presentable for meetings.

I began taking the Wolfline from Varsity parking in August, 2010 (after driving to and fro alone for 10yrs. It is convenient to Main Campus and easy. AS THE TRANSPORT OF PEOPLE EVOLVES,I FIRMLY BELIEVE ONLY THE FOLLOWING SHOULD BE ALLOWED ON THE MAIN AND CENTENNIAL CAMPUS ROADS: Wolfline buses, pedestrian traffic, cyclists, NCSU maintenance vehicles, emergency vehicles and very few privately owned autos. This would bring the campus together in a healthy way and improve the already good efforts of NCSU Transportation.

Being that I was hit by a biker, it would be a great idea if there were some guidelines and/or rules for the bikers to follow for their protection as well as the motorists. I was very happy that a biker wasn't injured a few months ago when he ran into my car full speed while I was sitting still. I can't recall ever being more frightened, yet the biker jumped up,since he did fall off of his bike upon impact with my car,apologized for the damages and left before campus police could get there. While it was more important to me that he wasn't hurt, it was a costly repair to my vehicle and I've heard several other staff members say the same thing. The skate boarders should adhere to some rules as well since they frequently dart out from seemingly no where as well. Student bikers dart out in front of cars constantly and have caused injuries to themselves as well as walkers and motorists. Not sure what remedy would work, but something needs to be done to help eliminate and/or lessen these accidents.

Getting from Central Campus to North Campus Via bike is somewhat difficult, having ways to cross the railroad tracks without using dan allen or pullen, or dismounting at the tunnel steps would be very helpful

There is a very convenient road for walking/biking to and from Centennial from Main campus, which begins where Pullen intersects Western and ends where Oval Drive hits Centennial Pkwy. However, the road is in very poor condition, making it difficult for bikers.

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APPENDIX 3

Project Prioritization Results

Appendix 3: Prioritized Bicycle Projects with Prioritization Scores

On Campus Pedestrian Projects										Prioritization Factors									
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Y=1, N=0					Total Points	
													Accessibility	Safety	Connectivity	Constructability	Character		Campus Priority
40	Dan Allen Dr	End of sidewalk	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Connect existing sidewalks and make ADA-compliant	0.01	\$922	< \$10k	Low	1	0	0	0	0	0	1
86	Dan Allen Dr	Cates Ave	N/A	Retrofit	Central	Intersection Improvement	Safety Improvements	Improve pedestrian safety at intersection by installing additional signage and/or bollards for channelizing pedestrian crossings	N/A	\$1,000	< \$10k	Low	0	1	0	1	1	0	3
56	Dan Allen Dr - south of Western Blvd	Western Blvd sidewalk	N/A	Existing	South	Transit Stop	Transit stop	Relocate Wolfline bus stop from utility pole near intersection to an ADA-compliant location with ped countdown signals.	N/A	\$1,200	< \$10k	Low	1	0	0	1	0	0	2
55	Western Blvd	Triangle Transit bus stop	Faucette Dr	Retrofit	Central	Sidewalk / Path	Transit stop	Improve ADA access to transit stop from Faucette Dr sidewalk	0.01	\$1,352	< \$10k	Low	1	0	0	1	0	0	2
53	Sullivan Dr	West Lot stairs	N/A	Existing	Central	Intersection Improvement	Mid-block crossing	Remove mid-block striping across road; encourage use of existing sidewalk connection to nearest intersection for safe crossing	N/A	\$2,500	< \$10k	Low	0	0	0	1	0	0	1
76	Gorman St	Faucette Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk (east side)	0.03	\$3,787	< \$10k	Low	0	0	1	0	0	0	1
42	New connection	Visitor's Center	Western Blvd greenway	Retrofit	South	Sidewalk / Path	Connect sidewalk	Connect existing sidewalk near building to Greenway trail	0.03	\$4,039	< \$10k	Low	0	0	1	0	0	1	2
38	Yarborough Dr	End of sidewalk	Existing parking	New	North	Sidewalk / Path	Extend sidewalk	Extend existing sidewalk from Wolfline bus stop eastward to parking area along Yarborough Dr	0.04	\$4,978	< \$10k	Low	0	0	1	0	0	0	1
49	Varsity Dr	Wolf Village Way	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Provide new crosswalk stripe and ADA curb cuts for all four directions; Connect Wolf Village Way with future transit stop at West Lot parking deck	N/A	\$5,472	< \$10k	Low	0	1	0	0	0	0	1
37	Dan Allen Dr	End of sidewalk - University Towers	Dan Allen Dr - Pedestrian table	New	North	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk along west side of Dan Allen Dr from UT apartments towards the Dan Allen parking deck	0.06	\$7,911	< \$10k	Low	0	0	1	0	0	0	1
27	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Intersection Improvement	Pedestrian signal	Install pedestrian crossing signals with count-down clock for north-south direction	N/A	\$40,000	\$25k - \$50k	Med	1	1	0	0	0	0	2
26	Faucette Dr - Jordan Hall	End of sidewalk	N/A	Retrofit	Central	Sidewalk / Path	Connect sidewalk	Remove parking (10 spaces) and construct sidewalk to connect existing segments to the east and west	0.02	\$146,545	\$100k - \$500k	High	1	0	1	1	0	0	3
95	Capability Dr	Midblock - near Research IV	N/A	Retrofit	Centennial	Intersection Improvement	Add curb cut bulb-outs	Construct curb cut bulb-outs at midblock crossing from parking area to Research IV building	N/A	\$5,000	< \$10k	Low	0	1	0	1	0	0	2
61	New connection	Warren Carrol Dr	Western Blvd	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk near Wood Hall and connect with Western Blvd greenway	0.04	\$5,426	< \$10k	Low	0	0	1	0	0	0	1
28	Wolf Village Way	End of sidewalk	Varsity Dr	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk to next intersection (south side)	0.05	\$6,298	< \$10k	Low	0	0	1	0	0	0	1
30	Sullivan Dr	West Lot	Schaub Hall parking lot	New	Central	Sidewalk / Path	Connect sidewalk	Extend existing sidewalk (south side)	0.07	\$8,460	< \$10k	Low	0	0	1	0	0	0	1
60	New connection	West Lot	Dan Allen Dr	Retrofit	Central	Sidewalk / Path	New connection	Establish a better east-west connection	0.07	\$9,177	< \$10k	Low	0	0	0	0	1	0	1
34	Thurman Dr	Varsity Dr	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Complete sidewalk along south side of roadway	0.11	\$13,659	\$10k - \$25k	Low	0	0	1	0	0	0	1
22	New connection	Partners Way	Nazareth St	New	Centennial	Sidewalk / Path	Connect sidewalk	Extend Partners Way bike/ped component northward to Centennial Pkwy and connect with Nazareth St	0.12	\$15,386	\$10k - \$25k	Low	0	0	1	0	1	0	2
35	New connection	Faucette Dr	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	Connect sidewalk	Establish new ped connection north-south along the edge of West Lot	0.15	\$18,538	\$10k - \$25k	Low	0	0	0	0	1	0	1
32	Morrill Dr	Western Blvd	Warren Carrol Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct new sidewalk along east side of Morrill Dr and connect to existing sidewalk	0.18	\$22,897	\$10k - \$25k	Low	0	0	1	0	0	0	1
29	New pedestrian connection	Wolf Village Way	Sullivan Dr - through West Lot	New	Central	Sidewalk / Path	New connection	Provide safe pedestrian path through West Lot parking area, and connect Wolf Village with Multi-Use Trail along Sullivan Dr	0.20	\$51,128	\$50k - \$100k	Med	0	0	1	0	0	0	1
33	Faucette Dr	Gorman St	Dan Allen Dr	New	Central	Sidewalk / Path	Connect sidewalk	Construct sidewalk along north side of Faucette Dr; connect to existing sidewalk	0.48	\$59,756	\$50k - \$100k	Med	0	0	1	0	0	0	1
23	Cates Ave	Morrill Dr	N/A	Retrofit	Central	Intersection Improvement	Intersection improvement	Pedestrian 'scramble' cycle for traffic signal; Closure of Talley Student Center loading dock access; New textured pavement and crosswalk markings for pedestrian crossings; Improve or relocate northbound bus stop / timepoint on Morrill to avoid pedestrian conflicts with passing motor vehicles.	N/A	\$70,508	\$50k - \$100k	Med	1	1	0	0	1	1	4
57	Dan Allen Dr	Yarborough Dr	N/A	Retrofit	North	Intersection Improvement	New traffic signal	Install new traffic signal at intersection; install ADA-compliant pedestrian crossing ramps; stripe crosswalks	N/A	\$130,400	\$100k - \$500k	High	0	1	0	0	0	0	1
25	Morrill Dr	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Sidewalk / Path	Widen sidewalk	Widen existing sidewalk to 8' wide along east-side of Morrill Drive; Remove on-street parking (32 spaces)	0.06	\$583,448	> \$500k	High	1	0	1	0	0	0	2
63	New connection	Centennial Pkwy	Main Campus Dr	New	Centennial	Sidewalk / Path	New connection	Establish a direct connection from Main Campus Dr to Mission Valley shopping center sidewalk	0.13	\$16,351	\$10k - \$25k	Low	0	0	1	0	0	0	1
36	All Campus Path	Dan Allen Dr	Morrill Dr	New	Central	Sidewalk / Path	Connect sidewalk	Establish a new pedestrian connection adjacent to parking lot behind Biltmore/Jordan Halls; provide safe crossing of Dan Allen Dr with ADA-compliant curb cuts	0.20	\$24,902	\$10k - \$25k	Low	0	0	0	0	1	0	1
41	New connection	Greek Village	Lilley Ct / Avent Ferry Rd	Retrofit	South	Sidewalk / Path	New connection	Install opening in fence along Western Manor Apartments property line and establish a more direct ped connection from Greek Village southbound along Western Blvd	0.21	\$25,932	\$25k - \$50k	Med	0	0	1	0	0	0	1
68	Dunn Ave	Free Expression Tunnel	Pullen Rd	New	Central	Sidewalk / Path	New connection	Construct new sidewalk or path along north side of Dunn Ave; connect all three tunnels and Pullen Rd	0.37	\$92,718	\$50k - \$100k	Med	0	0	1	0	0	0	1
54	Cates Ave	Alexander / Turlington Halls	N/A	New	Central	Transit Stop	Transit stop	Construct new transit stop to access Free Expression Tunnel. Remove 2-3 parking spaces & improve ped crossing from residence halls to the north and Carmichael Gym to the south.	N/A	\$104,000	\$100k - \$500k	High	1	0	0	0	1	0	2
80	New connection	Sullivan Dr	Fountain Dining Hall	New	Central	Sidewalk / Path	New connection	Construct new crossing of Sullivan Dr with ADA curb-cuts; provide new pedestrian bridge over creek; provide new sidewalk through Bragaw parking lot	0.06	\$120,050	\$100k - \$500k	High	0	0	0	0	1	0	1

Off Campus Pedestrian Projects										Prioritization Factors									
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Y=1, N=0					Total Points	
													Accessibility	Safety	Connectivity	Constructability	Character		Campus Priority
16	Morrill Dr	Western Blvd	N/A	Existing	N/A	Intersection Improvement	Relocate pedestrian signals (two of them)	Work with City of Raleigh &/or NCDOT to relocate existing pedestrian crossing signal buttons to more accessible locations	N/A	\$1,900	< \$10k	Low	0	1	0	0	0	0	1
39	Brooks Ave	Hillsborough St	N/A	Retrofit	N/A	Intersection Improvement	Pedestrian signal	Work with City of Raleigh &/or NCDOT to install pedestrian crossing signals with count-down clock for east-west direction	N/A	\$1,900	< \$10k	Low	0	1	0	0	0	0	1
77	Trinity Rd	End of sidewalk	N/A	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk (north side)	0.07	\$9,328	< \$10k	Low	0	0	1	0	0	0	1
81	Blue Ridge Rd	Beryl Rd	Hillsborough St	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to provide new sidewalk connection over railroad tracks	0.04	\$5,537	< \$10k	Low	0	1	1	0	0	1	3
31	Cates Ave	Jensen Dr	Pullen Rd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to extend existing sidewalk (north side)	0.06	\$7,467	< \$10k	Low	0	0	1	0	0	1	2
47	Pullen Rd	Cates Ave	Western Blvd	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along east side of road; connect to existing sidewalk at Cates / Pullen intersection	0.08	\$9,570	< \$10k	Low	0	0	1	0	0	1	2
46	Pullen Rd	Cates Ave	Bagwell Hall	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to construct sidewalk along west side of road; connect to existing sidewalk	0.08	\$9,880	< \$10k	Low	0	0	1	0	0	1	2
45	Nazareth St	Western Blvd	End of sidewalk	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk; improve lighting	0.19	\$24,137	\$10k - \$25k	Low	0	1	1	0	0	0	2
65	Centennial Pkwy	Avent Ferry Rd	Multi-Use Trail	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh to extend existing sidewalk from intersection with Avent Ferry to the Multi-Use Trail entrance	0.33	\$40,667	\$25k - \$50k	Med	0	0	1	0	0	0	1
17	Blue Ridge Rd	Hillsborough St	William Moore Dr	Retrofit	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide new sidewalk connection to CBC (east side)	0.43	\$54,136	\$50k - \$100k	Med	0	0	1	0	0	0	1
82	Blue Ridge Rd	William Moore Dr	NC Museum of Art	New	N/A	Sidewalk / Path	Connect sidewalk	Work with City of Raleigh &/or NCDOT to provide sidewalk connection along road	0.63	\$78,699	\$50k - \$100k	Med	0	0	1	0	0	0	1
64	Centennial Pkwy	Mission Valley rear entrance	N/A	Existing	N/A	Intersection Improvement	Intersection improvement	Work with City of Raleigh &/or NCDOT to improve pedestrian crossing at intersection	N/A	\$2,986	< \$10k	Low	0	1	0	0	0	0	1
84	Western Blvd	Morrill Dr	Avent Ferry Rd	New	N/A	Sidewalk / Path	New connection - Tunnel	Work with City of Raleigh &/or NCDOT to provide tunnel for long-term separation of transit, bicycle, and pedestrians	0.06	\$7,016	< \$10k	Low	0	1	0	0	0	1	2
48	Varsity Dr	Thurman Dr	Concord St	New	N/A	Sidewalk / Path	New connection	Work with City of Raleigh &/or North Carolina Railroad to provide bike/ped connection under railroad tracks	0.09	\$1,781,164	> \$500k	High	1	0	0	0	0	0	1

Table 8: Prioritized Bicycle Projects (continued)

On Campus Bicycle Projects														Prioritization Factors						
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Y=1, N=0					Total Points		
													Accessibility	Safety	Connectivity	Constructability	Character		Campus Priority	
15	Rocky Branch Multi-Use Trail	Morrill Dr		Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
87	Rocky Branch Multi-Use Trail	Campus Trailhead - Gorman St	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
88	Rocky Branch Multi-Use Trail	Trail split - Western Blvd - Pullen Rd	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trail split	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
89	Centennial Campus Multi-Use Trail	Campus Trailhead - Avent Ferry Rd	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
90	Centennial Campus Multi-Use Trail	Trail split - Research Dr sidewalk	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trail split	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
91	Centennial Campus Multi-Use Trail	Trail split - Walnut Creek Connector	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trail split	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
92	Upper Walnut Creek Multi-Use Trail	Campus Trailhead - Trailwood Dr	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
93	Walnut Creek Multi-Use Trail	Trail split - Achievement Dr sidewalk	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trail split	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
94	Middle Walnut Creek Connector Trail	Campus Trailhead - Lake Wheeler Rd	N/A	Retrofit	Central	Wayfinding Sign	Trail wayfinding	Install wayfinding access signs at trailhead	N/A	\$250	< \$10k	Low	0	0	0	1	1	0	2	
14	Rocky Branch Multi-Use Trail	Morrill Dr	Pullen Rd	Existing	Central	Greenway / Multi-Use Trail	Trail maintenance	Improve pruning and general maintenance practices to ensure trail is passable at all times	0.10	\$650	< \$10k	Low	0	0	0	1	0	0	1	
24	Improve connection	Rocky Branch Multi-Use Trail	Cates Ave	Retrofit	Central	Greenway / Multi-Use Trail	Improve connection	Establish an ADA-compliant connection for bicycles and pedestrian northbound from multi-use trail to Cates Ave, between Dan Allen and Morrill Dr	0.19	\$1,039	< \$10k	Low	1	0	1	1	0	0	3	
3	Dan Allen Dr	Thurman Dr	Hillsborough St	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrow in proper location on roadway	0.18	\$1,841	< \$10k	Low	1	0	0	1	1	1	4	
10	Stinson Dr	Current Dr	Yarborough Dr	Retrofit	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrow in proper location on roadway	0.21	\$2,107	< \$10k	Low	0	0	0	1	1	0	2	
4	Yarborough Dr	Dan Allen Dr	Stinson Dr	Existing	North	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrow in proper location on roadway	0.46	\$4,554	< \$10k	Low	0	0	0	1	1	0	2	
21	Multi-Use Trail connection	Main Campus Dr	Alumni Center	New	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail; connect existing Centennial campus trail network to Alumni	0.22	\$157,024	\$100k - \$500k	High	0	0	1	1	0	0	2	
18	Upper Walnut Creek Connector Trail	End of trail - Campus Shore Dr	Trailwood Dr	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail west to connect with the existing City of Raleigh greenway system	0.63	\$440,883	\$100k - \$500k	Grant Funded	0	0	1	1	0	1	3	
62	Middle Walnut Creek Connector Trail	End of trail - Main Campus Dr	City of Raleigh Greenway - Lake Wheeler Rd	New (Funded)	Centennial	Greenway / Multi-Use Trail	Multi-Use Trail	Extend existing multi-use trail east to connect with the existing City of Raleigh greenway system	0.70	\$487,721	\$100k - \$500k	Grant Funded	0	0	1	1	0	1	3	
71	Oval Dr	Centennial Pkwy	Main Campus Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.12	\$1,611	< \$10k	Low	0	0	0	1	1	0	2	
2	Dan Allen Dr	Thurman Dr	N/A	Retrofit	Central	Bicycle Amenities	Bicycle box	Install bicycle box at intersection, both directions	N/A	\$2,012	< \$10k	Low	0	0	0	1	1	0	2	
69	Varsity Dr	Thurman Dr	Western Blvd	New	Central	On-Road Bicycle Facility	Sharrow	Install MUTCD Sharrow in proper location on roadway	0.32	\$3,213	< \$10k	Low	0	0	0	1	1	0	2	
70	Varsity Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway	0.26	\$3,607	< \$10k	Low	0	0	0	1	1	0	2	
79	Achievement Dr	Main Campus Dr	Centennial Pkwy	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway; connect with Multi-Use Trail	0.26	\$3,682	< \$10k	Low	0	0	0	1	1	0	2	
6	Dan Allen Dr	Western Blvd	Greek Village	New	South	On-Road Bicycle Facility	Bicycle lanes	Add bicycle lanes along roadway as Greek Village road improvements occur	0.13	\$6,290	< \$10k	Low	0	0	0	1	1	0	2	
72	Main Campus Dr	Oval Dr	Achievement Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway	1.07	\$14,970	\$10k - \$25k	Low	0	0	0	1	1	0	2	
52	Main Campus Dr	Achievement Dr	Trailwood Dr	Retrofit	Centennial	On-Road Bicycle Facility	Bicycle lanes	Stripe bicycle lanes along roadway	1.45	\$20,300	\$10k - \$25k	Low	0	0	0	1	1	0	2	
1	Dan Allen Dr	Western Blvd	Thurman Dr	Retrofit	Central	On-Road Bicycle Facility	Cycle Track	Convert shoulder of roadway to on street bicycle path with texturized pavement and flush curb (cycle track)	0.33	\$98,446	\$50k - \$100k	Med	1	0	0	0	1	1	3	
66	Bicycle Station	Carmichael Gym	N/A	New	Central	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$200,000	\$100k - \$500k	High	0	0	0	0	1	1	2	
67	Bicycle Station	Monteith Research Center	N/A	New	Centennial	Bicycle Amenities	Bicycle station	Construct new bicycle repair station with air pump	N/A	\$200,000	\$100k - \$500k	High	0	0	0	0	1	1	2	
78	New recreational trail	CBC Campus	N/A	New	CBC	Greenway / Multi-Use Trail	Multi-Use Trail	Construct new multi-use trail around CBC Campus	1.85	\$1,297,573	> \$500k	High	0	0	0	0	1	0	1	
20	Cates Ave	Dan Allen Dr	Morrill Dr	Retrofit	Central	Streetscape Improvement	NCSU Planned	Convert Cates Ave to pedestrian-friendly corridor and convert on-street parking to parallel	0.31	\$2,189,594	> \$500k	High	1	0	0	0	1	1	3	

Off Campus Bicycle Projects														Prioritization Factors						
ID	Facility / Intersection	From	To	Status	Precinct	Map Category	Description	Comment	Length (mi)	Total Cost	Cost Category	Cost Group	Y=1, N=0					Total Points		
													Accessibility	Safety	Connectivity	Constructability	Character		Campus Priority	
5	Hillsborough St	Brooks Ave transit stop	N/A	New	N/A	Bicycle Amenities	Bicycle lockers	Work with City of Raleigh to install bicycle lockers near Hillsborough St/Brooks Ave transit stop to serve commuter populations	N/A	\$5,000	< \$10k	Low	0	0	0	0	1	1	2	
11	Dan Allen Dr	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection, both directions	N/A	\$6,000	< \$10k	Low	0	0	1	0	0	0	1	
12	Avent Ferry Rd	Western Blvd	N/A	Existing	N/A	Bicycle Amenities	Bicycle loop detectors	Work with City of Raleigh &/or NCDOT to install bicycle loop detectors at signalized intersection, both directions	N/A	\$6,000	< \$10k	Low	0	0	1	0	0	0	1	
75	Hutton St	Ligon St	Blue Ridge Rd	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrow in proper location on roadway	0.14	\$1,387	< \$10k	Low	0	0	0	1	0	0	1	
9	Nazareth St	Western Blvd	Centennial Pkwy	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to provide MUTCD Sharrow in proper location on roadway	0.22	\$2,156	< \$10k	Low	0	0	0	1	0	0	1	
74	Ligon St	I-440 Tunnel	Hutton St	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrow in proper location on roadway	0.37	\$3,733	< \$10k	Low	0	0	0	1	0	0	1	
73	Ligon St	Gorman St	I-440 Tunnel	Retrofit	N/A	On-Road Bicycle Facility	Sharrow	Work with City of Raleigh &/or NCDOT to install MUTCD Sharrow in proper location on roadway	0.58	\$5,835	< \$10k	Low	0	0	0	1	0	0	1	
43	Extend Multi-Use Trail	End of trail	Avent Ferry Rd	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh to extend existing multi-use trail north and connect with Avent Ferry Rd sidewalk and/or Centennial Pkwy	0.07	\$48,093	\$25k - \$50k	Med	1	0	1	1	0	0	3	
51	Trailwood Dr	Avent Ferry Rd	Main Campus Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.07	\$51,189	\$50k - \$100k	Med	0	0	0	1	0	0	1	
8	Gorman St	Brent Rd	Hillsborough St / Faircloth St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh to extend existing bicycle lanes	1.64	\$78,628	\$50k - \$100k	Med	0	0	0	1	0	0	1	
50	Crest Rd	Avent Ferry Rd	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.45	\$6,233	< \$10k	Low	0	0	0	1	0	1	2	
44	Avent Ferry Rd	Centennial Pkwy	Varsity Dr	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.18	\$8,415	< \$10k	Low	0	0	0	1	0	1	2	
7	Varsity Dr	Western Blvd	Avent Ferry Rd	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.67	\$31,955	\$25k - \$50k	Med	0	0	0	1	1	0	2	
19	Avent Ferry Rd	Varsity Dr	Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.91	\$43,736	\$25k - \$50k	Med	0	0	0	1	0	1	2	
85	Blue Ridge Rd	Western Blvd	NC Museum of Art - Reedy	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	1.78	\$85,507	\$50k - \$100k	Med	0	0	0	1	0	0	1	
13	Hillsborough St	Gardner St	Faircloth St / Gorman St	Retrofit	N/A	On-Road Bicycle Facility	Bicycle lanes	Work with City of Raleigh &/or NCDOT to stripe bicycle lanes along roadway	0.84	\$251,413	\$100k - \$500k	High	0	0	0	1	1	0	2	
83	Hillsborough St	Blue Ridge Rd	Beryl Rd - Multi-Use Trail	New	N/A	Greenway / Multi-Use Trail	Multi-Use Trail	Work with City of Raleigh &/or NCDOT to provide multi-use trail along road	0.93	\$648,111	> \$500k	High	1	0	0	0	1	0	2	
58	Avent Ferry Rd	Western Blvd	Centennial Pkwy	Retrofit	N/A	Streetscape Improvement	Bicycle facilities, median extension, landscaping	Work with City of Raleigh &/or NCDOT to further study and improve bicycle/pedestrian safety through streetscape improvement	0.24	\$1,109,917	> \$500k	High	0	0	0	0	1	1	2	
59	Pullen Rd	Western Blvd	Centennial Pkwy	New	N/A	Possible New Roadway	New roadway connection	Work with City of Raleigh &/or NCDOT to extend existing Pullen Rd to south and provide new connection; Construct sidewalks/bicycle facilities and improve intersection geometry	0.29	\$1,378,115	> \$500k	High	1	0	1	0	1	0	3	

