



UNCC[®] CHARLOTTE

Campus Circulation
Master Plan
May 2007



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landscape architecture*

Toole Design Group

Campus Circulation Master Plan

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I. INTRODUCTION

A. ORIGINS AND PURPOSE OF THE CIRCULATION MASTER PLAN

As visualized in the 2000 Facility Master Plan:

“The University shall establish the highest priority for pedestrians on campus while recognizing the need for a soundly reasoned system of circulation involving vehicles of various kinds, including bicycles. This shall be achieved through appropriate measures of circulation, separation and articulation.”

The focus of the 2000 Facility Master Plan is transitioning UNC Charlotte from a vehicular-oriented campus to one that is pedestrian-friendly and provides facilities and programs to support alternative modes of transportation. The Facility Master Plan presents the strategy to develop “a completely internal campus loop road to minimize vehicular traffic through the academic core and give priority to pedestrians” and to “create a system of well-connected open spaces surrounded by new and existing buildings”.

The 2006 Campus Circulation Master Plan examines pedestrian, bicycle and vehicular circulation systems and recommends improvements that address future changes to the campus as the Facility Master Plan evolves. The plan will not only address pedestrian, bicycle and vehicular issues and needs, but will also deal with alternative means of mobility, including disability awareness and a campus shuttle system. The potential for a light rail station and access through the campus will be folded into this plan. A separate planning effort, the Campus Parking Master Plan, is being completed concurrently with the Circulation Master Plan. Both efforts have been coordinated as circulation and parking are major components of growth for the UNC Charlotte campus.

The Campus Circulation Master Plan was initiated in January 2006 with a meeting of a steering committee comprised of student representatives, faculty and staff representing areas of campus facilities planning. This committee served as the sounding board throughout the planning process and provided information and commentary to help shape the Circulation Master Plan. Chancellor Phillip Dubois was also instrumental in providing insight from his experiences with other college campuses and their circulation systems. Information was gathered in March 2006 through two on-campus workshops attended by faculty and staff, and an online survey which revealed students’ issues and concerns regarding campus circulation.

The purpose of the Circulation Plan is to assess the existing circulation system and identify deficiencies and conflicts for both on and off campus locations. The Plan also identifies opportunities and provides recommendations for improving circulation, access and mobility on campus and to and from campus while providing safe routes for all modes of transportation.

B. STUDY APPROACH

DATA COLLECTION

Data was gathered from UNC Charlotte to create the base map for the Circulation Master Plan. Sample database information includes:

- Road centerline
- Topographic information
- Average daily traffic counts and volume data for the campus and adjacent roadways
- Existing and future parking areas with parking counts
- Key destinations and other points of interest
- Pedestrian and bicycle crash data for the campus and adjacent roadways
- Existing bike lane and trail/greenway locations
- Proposed (adopted) locations of trails and bikeways
- Locations of existing sidewalks and future sidewalk projects
- Bus routes and transit stops, light rail routes (existing and planned)
- Existing campus buildings; future buildings and those under construction
- Utilities
- Tree canopy
- Neighborhood boundaries
- Student residences for the study area (on and off campus)
- Campus building usage volumes (by time of day if available)
- Locations of shopping centers/districts
- Stream locations with floodplain information

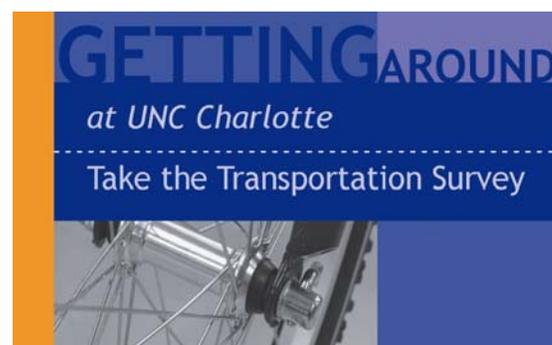
Substantial fieldwork was conducted on the UNC Charlotte campus to comprehensively map existing facilities and to understand the circulation experience from pedestrian, bicycle and motorist points of view. Deficiencies and gaps in the circulation system were identified related to:

- Bicycle lanes and routes
- Bicycle parking
- Sidewalks (gaps in connectivity, sidewalk quality, planting/buffer strips)
- Crosswalks and crossing facilities
- Vehicle congestion and speeds
- Connectivity to adjacent residential, commercial and recreational destinations
- Accessibility (ADA requirements)
- Signage and wayfinding

In addition, all pertinent UNC Charlotte policies and master plans were studied to understand the planning framework and identify future plans that will impact transportation.

PUBLIC PARTICIPATION

A key component of the data collection process was to solicit input from students, faculty and staff who use the campus circulation systems every day. Two open houses were held on March 1st, 2006 for students, faculty and staff to offer input and ideas on circulation deficiencies and opportunities. The open houses were held during two time periods: 12:00 - 2:00 PM and 4:00 - 6:00 PM. Additionally, a presentation was made during the weekly Student Government Association to gather



Graphic posted on the UNCC website linking to the survey

additional input from students. A total of 49 people attended the two open house sessions. A subsequent open house was held on April 3rd, 2006 in conjunction with CATS and individuals involved in developing the campus parking master plan. Approximately 32 people attended this event.

Participants of the open houses were invited to provide input on a variety of issues including bicycling, walking, and driving on campus, as well as a proposed campus shuttle system. Comments received during the open houses can be found in Appendix B.

A web-based survey was developed to gather input from a variety of users of the campus including students, faculty and staff, as well as visitors (such as local community members, alumni and parents). The goal of the survey was to measure habits, opinions and attitudes regarding transportation to and from campus. The survey addressed topic areas such as:

- Commute trip patterns
- Availability of bicycle facilities including lanes and bicycle parking
- Adequacy of sidewalks/paths on and adjacent to campus
- Usage of CATS buses and opinions regarding a potential campus shuttle system
- Accessibility of campus facilities for those using assistive devices
- Feasibility and safety of roadway crossings
- Wayfinding and signage to campus facilities
- Adequacy of lighting on campus

A link to the survey was posted on the UNC Charlotte website from March 15th through March 31st, 2006. Email notifications were sent to the campus community to promote the survey to a wide audience. During the two week period, more than 2,300 responses were received. Key findings from the survey are described in the next chapter, and detailed results can be found in Appendix A.

PLAN DEVELOPMENT

Results of the data collection and field analysis, and input gathered from the public participation process were used to develop concepts to improve circulation on the UNC Charlotte campus. Initial concepts for facility improvements were mapped and presented to the steering committee for comments. The final plan includes maps and a written plan document addressing facility improvements as well as changes to campus policies and programs.

C. PLANNING CONTEXT

The University of North Carolina at Charlotte's administration is committed to reducing the use of personal vehicles on campus and creating a bicycle and pedestrian friendly environment through investments in both facilities and programs. Improving circulation at the University for all modes of transportation will require improvements to facilities on campus as well as in adjacent areas. Increasing the share of students, faculty and staff walking, bicycling and taking transit to and from campus can raise the quality of life for the campus and local community through traffic relief, reduced air pollution, cost savings, and healthy lifestyles. However, the success of efforts to encourage the use of alternative modes hinges on the availability of pedestrian and bicycle access to the campus from nearby residential and commercial destinations. The existing design of a number of City and State roadways surrounding the campus present significant barriers to walking and bicycling. Coordination will be required between the University, the City of Charlotte and the North Carolina Department of Transportation to make improvements to these roadways to accommodate alternate modes of transportation.

The City of Charlotte and the North Carolina Department of Transportation have adopted context sensitive roadway design principals that support the construction of roads that meet the needs of pedestrians, bicyclists and transit users, as well as motorists. The City of Charlotte's 2006 Transportation Action Plan (TAP) endorses the City's 1994 *Centers and Corridors* growth strategy, directs development in existing centers and corridors to "improve employment opportunities and housing choices," and provide more transportation choices. The University of North Carolina at Charlotte lies within two designated corridors, University City Boulevard/US 49 and North Tryon Street/NC 29 (see figure on page 5). The TAP presents a number of policy statements that support the Centers and Corridors growth strategy and convey the City's commitment to improving bicycle and pedestrian facilities:

Policy 2.1.4

The City will promote context-sensitive streets (i.e. by designing transportation projects within the context of adjacent land uses to improve safety and neighborhood livability, promote transportation choices and meet land use objectives) consistent with the City's Urban Street Design Guidelines.

Policy 2.1.5

The City will work with NCDOT to create context-sensitive streets that include transit, bicycle and pedestrian friendly design features as part of new or widened NCDOT street construction projects.

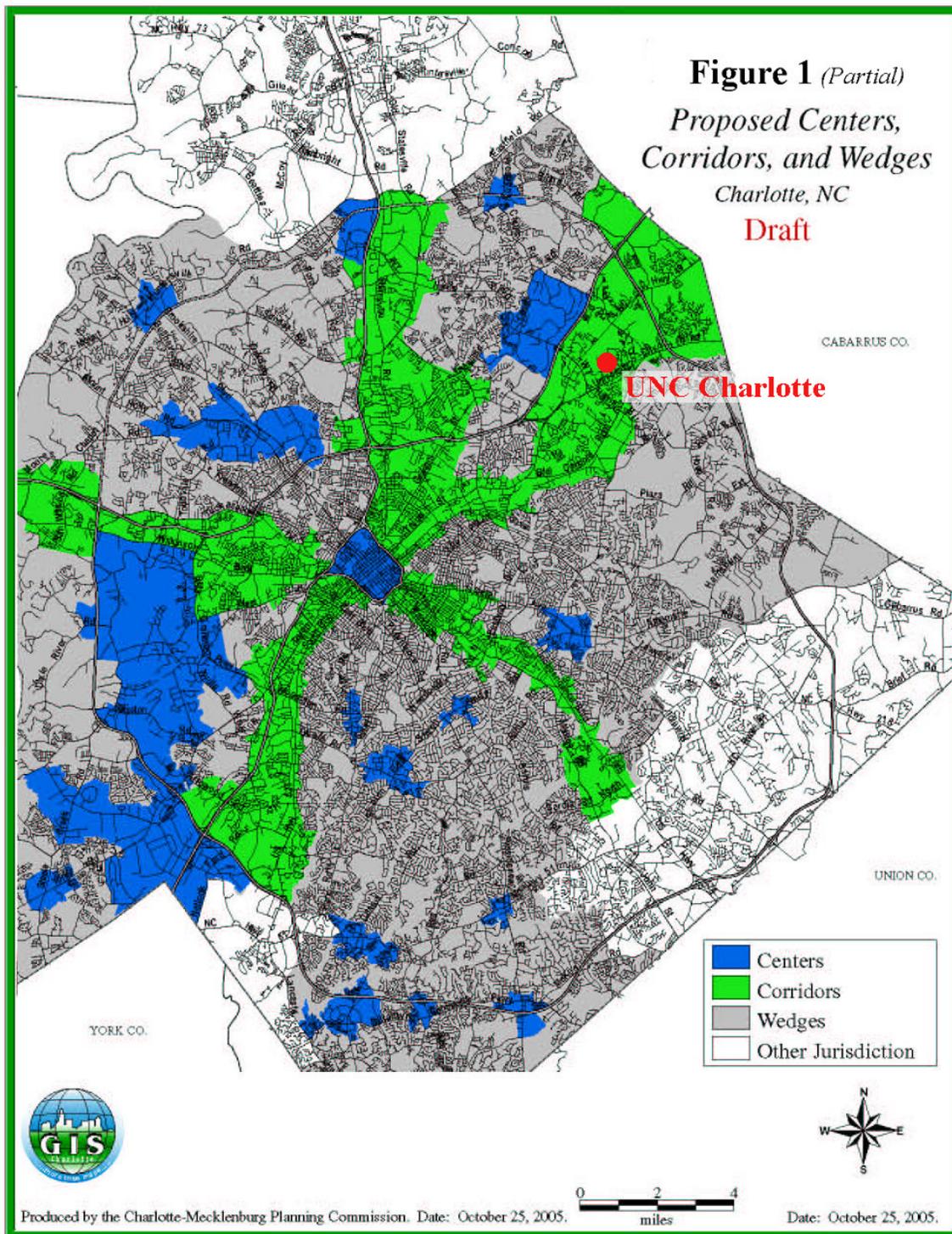
Policy 3.1.5

The City will work cooperatively with NCDOT to ensure that their transportation projects in the region meet the region's transportation and land use vision and air quality objectives.

NCDOT instituted formal guidelines and training in 2002 for Context Sensitive Solutions (CSS). The *NCDOT Context Sensitive Solutions: Goals and Working Guidelines* document outlines NCDOT's CSS goals and provides methods for implementing the CSS training. "NCDOT's ultimate goal is to build an infrastructure that provides safe and effective transportation while preserving and enhancing where possible the natural and human environment."¹

¹ www.ncdot.org/programs/environment/development/solutions/pdf/CSSGuidelines.pdf

The City's and NCDOT's adopted plans and policies fully support the inclusion of pedestrian and bicycle facilities as identified in this plan.



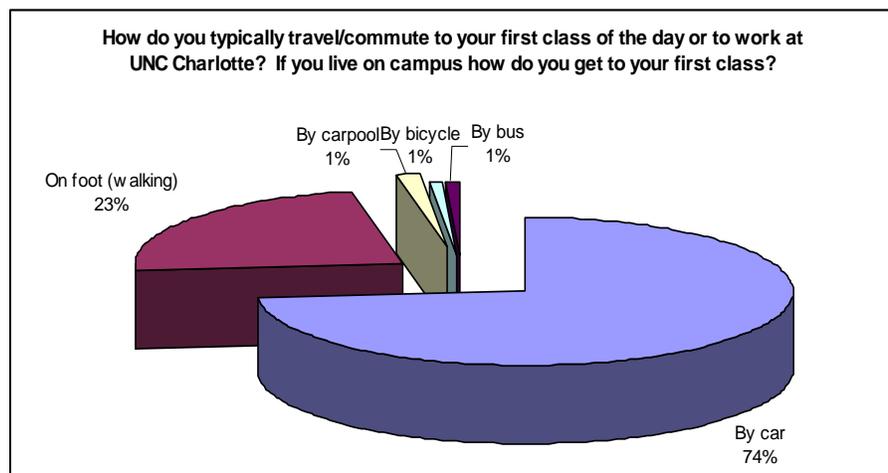
The City of Charlotte Transportation Action Plan 2006. Adopted Figure 1 (partial/modified).
www.charmeck.org/Departments/Transportation/Transportation+Action+Plan.htm

II EXISTING CONDITIONS

A. CAMPUS COMMUTING AND TRAVEL PATTERNS

The present transportation system at UNC Charlotte is primarily oriented for automobile access. The campus is surrounded by major arterials, such as WT Harris and North Tryon Street, and is dominated by automobile traffic during peak hours of the day. Many roadways lack sidewalks and basic bicycle facilities posing challenges for pedestrian and bicycle access. In addition, transit to campus is limited; only one CATS (Charlotte Area Transit System) bus route serves the campus with a stop at the East Deck parking garages.

The commuting mode share at UNC Charlotte, derived from the online survey conducted as part of this study (see Appendix A), reflects the lack of transportation options provided on campus. Three-fourths of student, faculty and staff respondents commute to campus by personal automobile. Nearly one-fourth of respondents walk, and a very small number commute by bike, bus, motorcycle, skateboard or carpool. Bicycling is shown to be an underutilized mode of transportation at UNC Charlotte, with an estimated mode share of approximately 1% of students, faculty and staff. Transit is also underused at UNC Charlotte; approximately 85% of respondents have never taken a CATS bus to or from campus.



Approximately 40% of respondents to the online survey live more than ten miles from campus. Half of those are faculty members. More than one-fourth of student, faculty and staff survey respondents live on campus or less than one mile from campus. Of those who live on campus or less than a mile from campus, approximately 80% walk, 15% drive, and 1.5% bike.

Generally, more undergraduate students live south and east of the UNC Charlotte campus than to the north and west². The largest concentrations of student residences are found:

- Southeast of campus on University City Boulevard between Suther Road and John Kirk Drive in apartment complexes including University Walk Apartments and College Station.
- East of campus on John Kirk Drive in University Terrace Apartments.
- North of campus and North Tryon Street along Mallard Creek Church Road in complexes including Thornberry Apartments and Berkeley Place Apartments.

Key destinations for students, faculty, staff and visitors arriving on campus include the Barnhardt Student Activity Center, Atkins Library, Bookstore, Robinson Hall, Reese, King and the Charlotte Research Institute. Since most students, faculty and staff are commuting to campus by personal

² *Undergraduate Students at UNC Charlotte, 2004-2005*. Prepared by UNC Charlotte Center for Applied Geographic Information Science

vehicle, their initial destination is a parking lot or garage. Parking facilities most frequently used include the West Deck, Cone Decks and East Decks.

Throughout the day, students, faculty and staff leave campus to patronize retail and commercial destinations nearby. Town Center Plaza, Grade Promenade, and Mallard Pointe shopping centers house restaurants and shops that are popular destinations. All key shopping centers are located along major arterials opposite the UNC Charlotte campus. There is no existing shuttle service or CATS service to these destinations.

B. IDENTIFIED NEEDS AND DEFICIENCIES

The consultant team conducted several days of fieldwork at UNC Charlotte to fully investigate the campus' circulation system. The travel patterns of drivers, pedestrians, bicyclists, and users of transit and alternate means of mobility were observed, including the use of sidewalks/paths, roadways and worn paths. The focus of the assessment was identifying needs and deficiencies in the campus' transportation facilities and in particular, barriers to access for pedestrians, bicyclists, and individuals with limited mobility. The following elements were investigated on-site and each one is addressed in detail in this section and illustrated on the *Existing Conditions* map:

- Pedestrian Accommodations
- Bicycle Accommodations
- Vehicular Circulation
- Lighting and Safety
- Alternate means of mobility (ADA)
- Signage and Wayfinding

PEDESTRIAN ACCOMMODATIONS

To fully assess pedestrian needs and deficiencies, an examination was conducted of the location and quality of sidewalks and pathways, roadway crossings, and curb ramps. Conditions for pedestrians at UNC Charlotte are generally favorable in the campus core at the center of the academic buildings; however, most other locations on and around campus lack adequate pedestrian facilities.

Sidewalks and Pathways

- Sidewalks and paths in the campus core generally accommodate demand; most facilities have several paths leading to entrances, and widths are adequate. Sidewalks and paths in this core area are constructed of brick or concrete and are in excellent condition.
- Paths in the central core of campus can become congested during peak hours of the day due to campus maintenance vehicles, delivery trucks and staff utility carts sharing the paths with pedestrians.
- A number of roadways have only walking lane on one side of the roadway constructed of asphalt in poor condition. Examples include Mary Alexander Road between Cameron and Craver Road and Craver Road. The lack of separation between pedestrians and motor vehicles puts pedestrians at risk walking along these roadways.



Brick path in front of Atkins Library



Pedestrians on Mary Alexander Road

- Many roadways on or near campus have narrow sidewalks without a buffer or planting strip between the sidewalk and roadway. On arterials such as North Tryon Street, sidewalks of 5' against the curb can be uncomfortable for pedestrians due to the speed and volume of traffic traveling in the adjacent lane.
- A number of roadways have a sidewalk on only one side or lack sidewalks altogether. Examples include Broadrick Boulevard, portions of John Kirk Drive and Cameron Blvd., and University City Boulevard. Pedestrians were observed using worn paths in the grass along these roadways or walking in the roadway itself.



Faded parallel line crosswalk on John Kirk Drive at University City Boulevard



Pedestrian warning sign on Craver Road.

ROADWAY CROSSINGS

Roadway crossing treatments are inconsistent and inadequate at UNC Charlotte putting pedestrians at risk while crossing roadways on and around campus.

- A number of intersections on and near campus have high visibility crosswalks, and a few (at the main entrance for example) have pedestrian signals. A majority of intersections however, have faded, low visibility, or non-existent crosswalks, such as the intersection of University City Boulevard with John Kirk Drive.
- Pedestrian warning sign placement and height is inconsistent and does not appear to meet MUTCD standards. Examples include signs on Mary Alexander Road, at midblock crossings along Craver Road, and on Broadrick Boulevard.
- A number of intersections have very long crossing distances without a refuge for pedestrians. At un-signalized intersections where through-traffic is traveling at higher speeds the lack of a pedestrian refuge puts pedestrians at risk. The intersection of Van Landingham Road and John Kirk Drive is one example.
- Many pedestrians were observed performing mid-block crossings at potentially hazardous locations. A constant stream of pedestrians were observed crossing University City Boulevard mid-block at East Deck 2 and on North Tryon Street at the Charlotte Research Institute. Mid-block crossings on these arterials adjacent to campus are particularly hazardous due to vehicle volumes and speeds and the lack of warning for drivers to expect pedestrians in the roadway.



Pedestrians crossing University City Boulevard midblock

BICYCLE ACCOMMODATIONS

Bicycle facilities provided on campus were assessed including on-road bicycle lanes or painted shoulders, off-road bicycle paths, and covered and uncovered bicycle parking.

- UNC Charlotte has limited on-road facilities for bicyclists. Bike lanes are provided on a portion of Cameron Boulevard from Mary Alexander west. The bike lanes extend to Craver on the outer loop and to Phillips Road on the inner loop.
- The number of bicycle parking spaces appears to be meeting demand; bike racks and covered bike parking are provided throughout campus. Bicycle racks are provided at most buildings on campus, and few were observed to be at capacity. Two different rack types are used on campus; dish-rack style and wave rack style. These rack types are not the most preferred by bicyclists as they do not adequately support the frame and can potentially damage a bike.
- Several covered bicycle parking locations are provided throughout campus. In some instances, racks are placed under building overhangs. In others, separate open garage type structures are provided. The typical structure on campus measures 15' x 9' and is 6'-7' high with a wide opening. In most cases, dish rack style racks are used in covered bike parking facilities.
- An off-road loop trail on the west side of campus primarily serves recreational riders. The trail also connects the campus to North Tryon Street. Except for an asphalt section north of the hospital, the trail surface is pit gravel.



"Wave" bike racks at Squires Hall



Covered dish-rack bike parking provided at Sanford Hall



Covered bike parking on Mary Alexander Road

VEHICULAR CIRCULATION

Motor vehicle congestion is common at several key intersections on campus during peak morning and evening rush hours. Observations suggest that most commuters entering campus are driving to the West Deck or the East Decks and lots on Martin Village Road. This results in most vehicles entering and leaving campus on Cameron Boulevard (between University City Boulevard and University Road) and Van Landingham and creates congestion at key intersections. Participants of the open houses also noted that during the day some commuters drive from one part of campus to the other to park closer to a particular class adding to already congested roadways. Additional observations regarding vehicular circulation include:

- Congestion is prevalent within the central core of campus as maintenance vehicles, delivery

trucks, and small UNC Charlotte staff utility carts/vehicles use the same path system as students who are walking and biking.

- Poor sight lines, challenging topography, skewed or offset intersections and adjacent driveways make it difficult for vehicles to turn on to key roadways to exit the campus.
 - The number of adjacent driveways and fast moving vehicles on Cameron Boulevard creates a backup into the West Deck and Cone Decks at the intersection of Cameron Boulevard and University Road.
 - The steep incline and poor sight lines at the intersection of Cameron Boulevard with Phillips Road makes it challenging for drivers to turn on to Cameron Boulevard.
- The concentration of cars and pedestrians at several specific locations on campus creates the potential for vehicular and pedestrian conflicts and reduces the efficient circulation of vehicles. Examples include:
 - Craver Road where students cross the roadway at will and the topography reduces sight lines
 - The traffic circle at Mary Alexander Road where there is a constant stream of pedestrians in the crosswalks
 - The intersection of Phillips Road and Cameron Boulevard where motorists must quickly accelerate to crest the hill and merge into traffic. Pedestrians crossing near this intersection are not highly visible.
- The gate on Mary Alexander Road closes at 11:00pm to limit access to campus for security reasons. The advanced warning sign for this gate closure is too close to the gate, providing limited reaction time for motorists to stop at the gate. There have been a number of incidents of drivers striking the gate with their vehicles. The existing sign is supplemented with a speed table to slow motorists.

SIGNAGE AND WAYFINDING

The effectiveness of existing signage on and off campus at UNC Charlotte is mixed.

On Campus

- Most wayfinding signs are targeted to motorists, have clear message content, and are in excellent condition. Directional signs clearly direct motorists to key buildings on campus.
- Wayfinding signs are not used to direct pedestrians and bicyclists in the core campus areas.
- Temporary cardboard signs currently direct pedestrians to buildings in the core campus area.
- Building/facility identification signs are inconsistent. Some buildings have standalone signs in the ground on the building's perimeter, others have lettering on the building facade, and others have no apparent identification.
- Orientation maps are located throughout campus, on key paths in the core of campus and leading from parking garages.

Off Campus

- Trail systems lack signage altogether. Pedestrian access points from campus, the public library and US 29 lack signage that would direct users to destinations or trail information or maps.
- Not all perimeter roads have signage directing visitors to the UNC Charlotte campus.



Directional sign on Mary Alexander Road



Identification on building face of Cato Hall is difficult to read

- The residential villages lack signage that is easily visible or locator maps to orient pedestrians to a specific building.
- Directional signage for parking areas does not distinguish between visitor, faculty or student parking areas.
- There is no signage at the US 49/US 29 split directing visitors onto US 49.
- Signage on the Interstates is mixed. Some exits have UNC Charlotte signage before an exit. Some exits only have signage after one has exited the Interstate.

ALTERNATE MEANS OF MOBILITY

The majority of buildings on campus have at least one accessible entrance to meet ADA requirements. UNC Charlotte's Disability Services has an accessibility map available online showing accessible routes through campus and from parking lots to specific buildings. Several issues regarding accessibility on campus include:

- Several key facilities on campus, such as the Charlotte Research Institute (CRI), the new Alumni Center and the athletic fields lack accessible routes from other areas of campus. Students currently climb or descend the grassy hill in front of the CRI buildings causing paths to be worn into the hill.
- Many paths on campus are constructed of brick which can settle unevenly over time creating edges and tripping hazards. Over the long term, these brick pathways should be assessed to ensure that they provide a smooth surface and continue to comply with ADA requirements.
- Many sidewalks/pathways lack curb cuts making it difficult for those using assistive devices or riding bicycles or scooters to travel around campus.
- The topography at UNC Charlotte poses challenges for persons using assistive devices. There are steep inclines in some parts of campus such as the sidewalk along Phillips Road at Cameron Boulevard, and along paths from residence halls such as Oak Hall/Elm Hall and Martin Village. Other areas with grade change difficulties include:
 - College of Education
 - Cone Center
 - East Deck 1
 - Burson
 - Kennedy
 - Woodward
 - Barnhardt Student Activity Center to Cone Center
- The ramp from the accessible parking outside the Student Activity Center to SAC Plaza is long and narrow, which may cause potential conflicts between bicyclists and wheelchair users.
- Some accessibility routes involve additional knowledge and wayfinding as users are directed through a building(s) to get to their destinations. Direct accessible routes do not exist to every building.
- Crossing the loop road (Cameron Boulevard/University Road) can be challenging for persons using assistive devices. Except for the traffic circle, there are no crossing signal systems to assist in these situations. This situation is especially difficult for those crossing Cameron Boulevard and Phillips Road to access CRI, and at the intersection of Broadrick Boulevard and University Road.
- The recreational trails are not accessible in many areas, either due to topography or the soft surface materials.
- There are no accessible routes across Mary Alexander Road to the Botanical Gardens or the residential villages.
- Participants of the workshop and survey respondents identified several buildings on campus that are difficult to access using assistive devices:
 - Administration (King and Reese)
 - College of Education
 - Denny

- Fretwell
- Colvard
- Atkins Library
- Student Activity Center
- Brocker Health
- Woodward Science and Technology
- Cameron
- Handicapped parking at Witherspoon is not accessible to the sidewalk; ramp accesses traffic lanes, not parking bays.

LIGHTING AND SAFETY

A campus safety walk, sponsored by the Student Government Association was conducted in November 2005. Participants included student leaders and members of the administration and staff. Issues of concern identified through this walk as well as observations by the consultant team, and participants of the open houses can be summarized as follows:

Campus Lighting

Poor lighting or lack of adequate lighting levels was observed in many locations throughout campus. Of particular note were:

- Paths from Brocker Health Center to the South Dorms
- ATM Locations
- Between campus buildings such as:
 - Colvard
 - Reese and King
 - Cone and Cone Parking Deck
 - Belk Gym
 - Martin Village
 - Fretwell to Friday
 - North of Storrs
- Charlotte Research Institute campus, access road and rear parking areas
- Parking lots 10 and 15 to Oak and Elm Halls
- Phillips Road
- Mary Alexander Road

Blue Lights

Blue lights are missing in several areas including:

- Pathway from Belk to Cone
- Parking Lot 7 beside Belk Gym
- Front of Reese
- Martin Village Area

In addition, many blue lights were observed to be non-functioning and requiring maintenance.

Several pathways around campus were noted as being in need of repair or paving, presenting tripping hazards for pedestrians. Shrubs and vegetation along paths and buildings (such as King Hall and Martin Village) are overgrown presenting safety hazards.

C. OPPORTUNITIES AND CONSTRAINTS

There are a number of external factors that present either opportunities or barriers to UNC Charlotte to improve circulation on campus and to encourage the use of alternative modes of transportation.

OPPORTUNITIES

- A large number of students live within one mile of UNC Charlotte, and many of them currently commute to campus by personal vehicle. There is potential to shift these car trips into walking and bicycling trips.
- Many key destinations are within walking and biking distance to campus: residential neighborhoods, shopping centers, greenway, recreational fields, and the public library.
- The majority of academic buildings are concentrated in one area.
- Some students and faculty are currently walking and biking to campus despite limited pedestrian and bicycle facilities. Improving conditions for pedestrians and bicyclists is likely to increase the rate of walking and bicycling.
- Many bike racks are well used; upgrading racks and adding covered bike parking will help promote bike use around campus.
- The campus parking plan is being developed concurrently with the Circulation Master Plan. Strategies to encourage alternative modes can be coordinated between the two plans.
- There are plans for a light rail system that will include a stop on the UNC Charlotte campus. This will provide an additional mode of transportation for the campus community.

CONSTRAINTS

- The campus has challenging topography which makes it difficult to provide ADA access to some campus facilities and presents challenges for some bicyclists.
- The rapid growth of the university has resulted in a number of academic buildings (such as the Charlotte Research Institute) being constructed on the perimeter of campus. This increases the distances that students, faculty and staff must travel to get to and from classes.
- Building siting and door placement hinders ADA access routes in many locations.
- UNC Charlotte has a car-oriented culture; students, faculty and staff are used to driving to and across campus to reach all facilities and having convenient and relatively inexpensive parking.
- The major arterial roads surrounding campus and typical suburban development on adjacent property (strip malls, wide setbacks, large parking lots between the street and building faces) are barriers for students, faculty and staff wanting to access nearby residential, retail and commercial destinations on foot or by bike.
- Limited and unreliable bus service to campus from surrounding areas.
- There is limited time in between classes. Students and faculty do not feel they have enough time in between classes to cross the campus on foot, so often drive.

III. MULTI-MODAL CIRCULATION RECOMMENDATIONS

The vision for the University of North Carolina at Charlotte is to transform it from an automobile-oriented campus into a multi-modal campus where walking, bicycling and taking transit are as convenient as driving. Three goals have been established that are essential to reaching this vision for the UNC Charlotte campus:

1. **Reduce vehicular volumes.** Today, most students, faculty and staff rely on motor vehicles as their primary mode of transportation, often driving from one end of campus to the other or from nearby destinations. The campus should strive to convert these vehicle trips into pedestrian, bicycle or transit trips and reduce the volume of vehicles on campus.
2. **Slow vehicular speeds.** Vehicular speeds should never exceed 20mph on campus, and should typically be no greater than 15mph. New road construction and roadway retrofits should be designed to ensure that motorists do not feel comfortable exceeding the speed limit anywhere on campus. Slower vehicle speeds will significantly improve the safety of all users of campus roadways.
3. **Improve connectivity between destinations on campus and adjacent properties.** UNC Charlotte is lacking basic pedestrian and bicycle facilities to allow students, faculty and staff to walk or bike on campus and to nearby residential and commercial areas. To successfully increase the use of alternative modes of transportation, pedestrians and bicyclists must feel comfortable walking and biking to campus.

Recommendations are included in this plan were developed to meet these goals by improving pedestrian, bicycle, and transit facilities and programs at UNC Charlotte.

A. PEDESTRIAN CIRCULATION

SIDEWALKS AND PATHWAYS

Sidewalks and paths in the core of UNC Charlotte generally accommodate demand; most facilities have several paths leading to entrances, and sidewalk widths are adequate. Many roadways outside of the campus core however, such as John Kirk Drive and portions of Cameron Boulevard, lack a complete network of sidewalks or have inadequate sidewalks for pedestrians. The following recommendations address the need to increase pedestrian safety and to encourage walking on campus.

1. **Construct new sidewalks on campus.** Any future roadway construction, changes or realignments should include pedestrian accommodations. UNC Charlotte's *Construction and Maintenance Standards* establishes appropriate widths for sidewalks on campus. Two standards are provided: A - Narrow Walkway and B - Wide Walkway (see image on the following page). The narrow walkway standard should be applied in this plan for locations on campus where a moderate amount of pedestrian activity is expected. The wide walkway should be applied in locations intended for bicycle and pedestrian shared use and/or where higher volumes of pedestrians are expected. Pedestrian volumes can be estimated based on the building type, use and capacity. Wider pathways in the core of campus have the added benefit of providing emergency vehicles access to internal portions of campus without damaging adjacent landscaping.

A 6' minimum width standard should be established for sidewalks on roads on the periphery of campus such as Cameron Boulevard, Toby Creek Road and Mary Alexander Road north of Cameron Boulevard. Recommended widths for sidewalks proposed for roadways off campus follow City of Charlotte *Urban Street Design Guidelines* depending on the road classification. Generally, city or county roadways adjacent to campus should have a minimum sidewalk width of 6 feet.

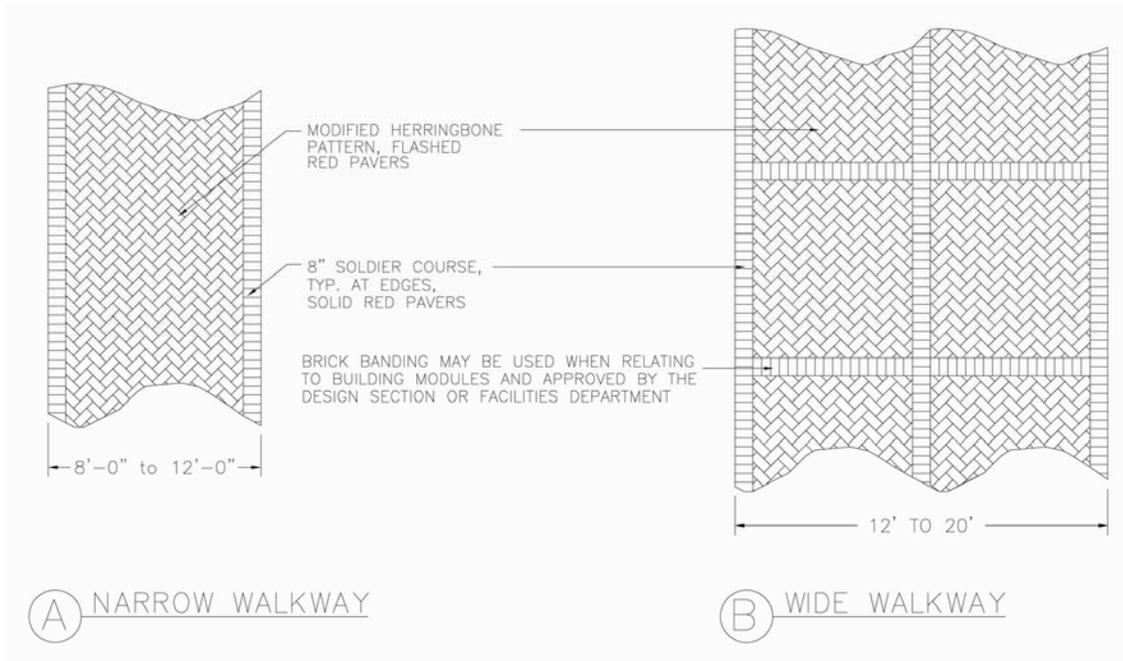
A buffer or planting strip between 10 and 15 feet wide should be included in all sidewalk construction on campus where space allows. A 10-foot buffer strip will allow for the planting of two rows of trees and will provide a safer and more comfortable walking environment for pedestrians by separating them from the roadway. Minimum buffer widths for roadways off campus should follow the City of Charlotte's *Urban Street Design Guidelines*.

Sidewalks should be installed on both sides of roadways on campus. In limited circumstances where roadways on the perimeter of campus or off campus see very little pedestrian activity or have physical constraints, sidewalks on only one side of roadway may be acceptable. In all cases, sidewalks should be designed to accommodate expected user volumes.

Recommendations for the installation of sidewalks and pathways are detailed in the implementation table in Chapter XI.

Legend	
	Key Destination
	Existing Sidewalk
	Existing Footpath
	Future Sidewalk & Path
	Proposed Promenade
	Proposed Sidewalk
	Proposed Multi-Use Path
	Existing Crosswalk
	Proposed High Visibility Crosswalk
	Proposed Raised Crosswalk
	Proposed Parallel Crosswalk
	Proposed Pedestrian Warning Sign
	Proposed Pedestrian Refuge

See Circulation Recommendations Map: legend items related to pedestrian circulation



UNC Charlotte Approved Construction and Maintenance Standards. Brick Walkway Patterns 3-15-00

- In addition to the "narrow walkway" and "wide walkway", establish a new sidewalk type, a "promenade" for internal paths that showcase key destinations within the campus core. Constructed of brick, with a minimum width of 20 feet, promenades should visually help newcomers locate the entrance to the campus core and follow an internal network of pathways to reach key destinations such as the library and student center. The Circulation Recommendations Map illustrates the recommended promenades.
- Limit the use of maintenance trucks on pedestrian pathways through campus. Maintenance trucks/carts frequently drive on campus pathways throughout the day and during class change times. They add to congestion on pathways in the campus core, put pedestrians and bicyclists at risk, and generally add to the perception that the campus is not pedestrian-friendly.



Five maintenance trucks across from the bookstore Maintenance truck on a pathway in the campus core

There are a number of strategies that should be considered to reduce the use of maintenance trucks on campus pathways. Trucks should be restricted from certain pathways and/or building

entrances with moderate levels of pedestrian activity and should be prohibited from driving on pathways during the core class times. A speed limit for all maintenance vehicles should also be enforced. Creating specific parking areas for maintenance trucks/carts on the fringe of the campus core will also help encourage drivers to park and walk on internal pathways.

4. **Improve pedestrian safety in and around campus parking lots.** Many parking lots on campus lack pedestrian accommodations. In addition, aisles and driveways are very wide, resulting in higher vehicle speeds within parking lots, further degrading pedestrian conditions. Sidewalks and crosswalks should extend to each parking lot and should be provided along major pedestrian access points within parking lots (i.e. pedestrian walking aisles). This is particularly important in areas with substantial pedestrian activity, such as Lot 16 at Craver Road. For perpendicular parking, the standard measurements of 17-1/2-foot deep spaces and 26-foot wide aisles should be followed. Driveways with one-way access to lots should not measure more than 14 feet wide.

A number of improvements are recommended to create a safer environment for pedestrians crossing Craver Road near Lot 16 and the Lot 16 driveways. The outbound driveway from Lot 16 to Craver Road currently has a right turn lane and a left turn lane. Once Craver Road is closed to through-traffic, a dedicated right turn lane will be unnecessary. The width of both driveways to Lot 16 should be reduced to 14 feet wide, and the one-way aisles in the lots should be maintained. The narrower driveways will reduce the crossing distance for pedestrians and will slow vehicles turning into Lot 16. The existing sidewalk on the west side of the outbound driveway should be widened to 12 feet and a buffer should be included. The wider sidewalk will allow for a new high visibility crosswalk to align with pedestrian facilities on both sides of Craver Road (see Circulation Recommendations Map) and will reduce the number of vehicles turning through the crosswalk at a busy location.

A new 12-foot wide sidewalk connection with a buffer should be constructed on the east side of the inbound driveway. The aisle of the western side of Lot 16 should be reduced to 26 feet wide. The eliminated aisle space should be dedicated to widening the existing sidewalk on the west side of the lot from 6 feet wide to 10 feet minimum. As new facilities and lots are created on the north side of campus, pedestrian activity is likely to increase along this pathway justifying the need for improved pedestrian facilities in this area.

ROADWAY CROSSINGS

As described in Section II. Existing Conditions, pedestrian safety accommodations at intersections on campus are generally inconsistent. Many intersections do not have crosswalks or have faded crosswalks. Many intersections have long crossing distances without refuges for pedestrians. The following recommendations address the need to increase the safety of pedestrians and bicyclists crossing roadways on and adjacent to campus and to improve connectivity to nearby residential and retail destinations across major roadways.

5. **Create safe and convenient opportunities for students to access campus on foot and by bicycle from surrounding neighborhoods.** UNC Charlotte is surrounded by major arterials: University City Boulevard/US 49, North Tryon Street/US 29, and WT Harris. The width of and volume of traffic on these roadways present significant barriers to pedestrian and bicycle connectivity to and from campus. Creating safe crossings of roadways surrounding campus should be a top priority. Bike and pedestrian friendly routes/paths from neighborhoods and key destinations across major roadways around campus should be developed in the following priority order:
 - a. **University City Boulevard.**
University City Boulevard features the main and south entrances to the campus. A substantial number of students live directly across the roadway and cross the roadway at uncontrolled locations. Creating safer crossings of University City Boulevard should be a top

- priority (recommendations to improve crossings are addressed later in this chapter).
- b. **John Kirk Drive.**
A number of student apartment complexes are located along John Kirk Drive. John Kirk Drive is a two-lane road with lower traffic volumes than the adjacent arterials. All roadway crossings on John Kirk Drive should be evaluated for pedestrian and bicycle safety improvements.
 - c. **North Tryon Street.**
Numerous retail and residential destinations as well as bus stops are located across North Tryon Street from CRI. Students currently cross North Tryon Street in many different locations dodging traffic throughout the day. As additional buildings are constructed for CRI, pedestrian and bicycle activity is likely to increase, increasing the demand for safer crossing accommodations. The proposed realignment of the driveway into Mallard Point shopping center will create a signalized intersection at CRI, increasing vehicular and pedestrian activity at this location.
 - d. **WT Harris.**



Students crossing University City Boulevard mid-block

- The City of Charlotte's *Urban Street Design Guidelines* designate WT Harris as a parkway whose primary function is to move large volumes of motor vehicles efficiently. The guide further explains that parkways are not well suited for pedestrian and bicycle traffic and should not have pedestrian-oriented land uses. The segment of WT Harris between North Tryon Street and Toby Creek Road however has a number of pedestrian-oriented land uses including a shopping center, the public library and University Memorial Hospital. While WT Harris is a lower priority than the boulevards and roads listed above, improved pedestrian and bicycle facilities are needed along this segment of WT Harris to create safer access to these existing destinations.



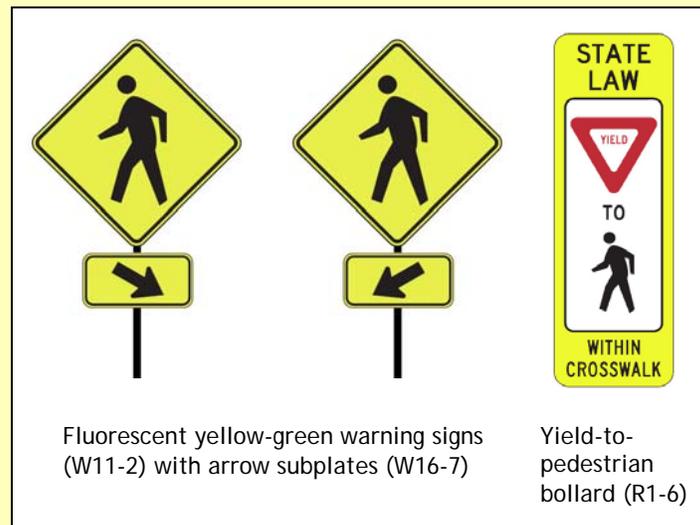
High visibility crosswalk and pedestrian signals on University City Boulevard

- 6. Improve roadway crossings by applying the pedestrian crossing standards (on the following page) throughout campus and on adjacent roadways.

PEDESTRIAN CROSSING STANDARDS

- **Install high visibility crosswalks throughout campus.** High visibility crosswalks are recommended throughout campus and on adjacent roadways. In unique situations with very low pedestrian and vehicular activity, parallel line crosswalks may be appropriate. Crosswalks are needed across all parking lot and facility driveways and pedestrian signal heads should be provided at all signalized intersections of more than two lanes.
- **Install raised crosswalks on roadways where increased visibility of pedestrians and/or traffic calming is needed.** Raised crosswalks improve the visibility of pedestrians crossing and slow vehicle speeds.
- **Install pedestrian signal heads at all signalized intersections.** A number of existing push button signals are currently not functioning and/or do not meet accessibility guidelines. Proposed crossing treatments are illustrated on the *Circulation Recommendations* map.
- **Install pedestrian refuges where appropriate to increase the safety of intersections with long crossing distances.** A number of roadways adjacent to campus have very long crossing distances, such as North Tryon Street and University City Boulevard. Refuges for pedestrians should be installed on these roadways and other wide crossings, as listed in the Implementation Table and illustrated on the *Circulation Recommendations* map.
- **Curb extensions should be used to reduce the crossing distance for pedestrians at intersections.** Curb extensions also increase the visibility of pedestrians waiting to cross the road.

- **Install fluorescent yellow-green pedestrian warning signs (W11-2) with arrow subplates (W16-7) at all key crossing locations (see image).** The *Circulation Recommendations* map illustrates all recommended locations for pedestrian warning signs. Existing pedestrian warning signs at UNC Charlotte should be replaced with more visible fluorescent yellow-green pedestrian warning signs with arrow subplates. Sign height and placement should be standard per the MUTCD. Signs should be placed in advance of and within 5' of each crosswalk. The bottom of the sign panels should be no less than 7' from the ground. The sign posts should be no less than 2' from the curb face (MUTCD 2003).



Fluorescent yellow-green warning signs (W11-2) with arrow subplates (W16-7)

Yield-to-pedestrian bollard (R1-6)

PEDESTRIAN CROSSING STANDARDS (cont.)

- **Install yield-to-pedestrian bollards (R1-6) in locations on campus where drivers are failing to yield to pedestrians in crosswalks.** The in-street pedestrian bollards are narrow sign panels (12" wide by 36" high) mounted on short posts at the centerline of a roadway at crosswalk locations, or adjacent to the road. Bollards can serve to reinforce the message to drivers arriving on campus to expect pedestrian activity and to yield the right-of-way to pedestrians in crosswalks. Due to their location in the roadway, the sign posts must adhere to standard sign breakaway requirements. Bollards should be installed per MUTCD and NCDOT standards.

The installation of pedestrian bollards can be combined with strategies to educate motorists about the rules of the road. The *Strategies for Education and Encouragement* section in the bicycling chapter of this plan includes a recommendation to develop a campus guide educating students about how to safely travel around UNC Charlotte using various modes. A graphic of a pedestrian bollard and an explanation of the law should be included in the guide.

- **Two curb ramps should be provided at each corner to meet ADA guidelines.**

B. VEHICULAR CIRCULATION RECOMMENDATIONS

IMPROVING VEHICULAR CIRCULATION

UNC Charlotte has a developed roadway system that provides multiple access points to campus facilities. Results of the online survey conducted as part of this study indicate that the majority of students, faculty and staff commute to campus by personal vehicle. This reflects the ease of driving to campus and the lack of convenient alternatives.

There are several locations that experience severe traffic congestion during peak hours of the day. In addition, high pedestrian and vehicular volumes at the new traffic circle and along Craver Road create conflict points. Recommendations are provided below to improve vehicular circulation.

Legend	
	Roadway
	Future Roadway
	Proposed Curb Realignment
	Proposed Speed Table
	Parking Garage

See Circulation Recommendations Map: legend items related to vehicular circulation

1. **Restrict left turns from Cameron Boulevard on to University City Boulevard.** Eliminating left turns at this intersection will benefit circulation in two ways: 1) Motorists needing to exit campus and travel east on University City Boulevard will be redirected to the main entrance, thereby reducing congestion at this location. 2) The left turn restriction will reduce conflicts between motorists and pedestrians that cross University City Boulevard and Cameron Boulevard (see new crossing location proposed on the *Preliminary Circulation Recommendations* map). Geometric changes (such as extending the median to prohibit left turn movements) should be explored to ensure compliance.



John Kirk Drive south of Van Landingham Road

2. **Replace the median island at the southwest edge of the practice fields at CRI with a T-intersection.** This intersection is not functioning properly due to poor geometric design and lack of signage. It is recommended that the intersection be reconfigured as a T-intersection with a 3-way stop control. This will help to reduce vehicle speeds on Phillips Road and will improve pedestrian and bicycle conditions.



Mary Alexander at Fretwell service driveway

3. **Over the long term, reconfigure Lot 6 to reduce driveways in and out of the parking lot.** Fewer driveways will increase the safety of pedestrians and drivers in the lot and on Martin Village Road.

4. **Conduct a traffic study of the intersection of John Kirk Drive and University City Boulevard to determine the feasibility of adding a second left turn lane.** The single left turn lane on John Kirk Drive at University City Boulevard becomes congested during peak hours, creating a traffic queue that extends to Van Landingham Road, and creating further traffic delays for motorists existing campus from Van Landingham Road at John Kirk Drive. Currently, there is one right turn lane, one center lane, and one left turn lane. Additional capacity is needed for left turning vehicles on to

University City Boulevard.

The University should conduct a traffic study and determine the feasibility of converting the dedicated through lane to a left hand turn lane. In this configuration, the right turn lane would be converted to a shared right hand and through lane. If a traffic study indicates the need to maintain the dedicated through lane, the road will need to be widened to accommodate a new left turn lane. The road reconstruction will provide the opportunity to include bicycle lanes and a pedestrian refuge at the intersection.

Allowing motorists to travel two ways on Mary Alexander Road (planned with construction of the new main entrance) is likely to reduce the number of motorists exiting the campus via Van Landingham and John Kirk Drive. Once Mary Alexander Road is two-way, UNC Charlotte should create an exit from East Deck 1 on to Mary Alexander south of the traffic circle to reduce congestion on Van Landingham and through the traffic circle.

5. Construct a vehicle pick-up and drop-off zone and turnaround on Mary Alexander Road north of Fretwell.

Motorists frequently stop along the curb on Mary Alexander Road to pick up and drop off students between Fretwell and Friday (north of the traffic circle). The stopped vehicles slow through-traffic, increasing congestion on busy sections of Mary Alexander. A formal pick-up and drop-off zone and a turnaround should be constructed on Mary Alexander in the service driveway between Fretwell and Friday. A turnaround area will also serve to reduce the number of vehicles in the traffic circle.

6. Realign Phillips Road with Craver Road. The steep incline of the current Phillips Road alignment creates a significant safety hazard for motorists turning on to Cameron Boulevard. The incline limits sight distance and requires motorists to accelerate quickly to crest the hill. This creates a potential conflict between motorists, pedestrians and bicyclists on Cameron Boulevard or Phillips Road. Realigning Phillips Road north of the tennis courts to meet Craver Road will reduce the approaching slope and will improve sight distance. The new alignment will also improve the safety of motorists exiting the West Deck via Barnhart Lane.



Cameron Boulevard at Phillips Road

Once the road is realigned, the existing portion of Phillips Road from the tennis court parking lot to Cameron Boulevard should be closed to vehicles. The curb at the intersection of Cameron Boulevard should be reconstructed to reduce the width of the opening to Phillips Road to 12-15 feet to prevent vehicular access. A new crossing of Cameron Boulevard should be installed, including a median refuge. The path on the opposite side of Cameron Boulevard leading to Barnhardt Lane should be widened to 12 feet to accommodate pedestrian volumes.



Left turn lane to Mallard Pointe on North Tryon Street near CRI entrance

7. Align the entrance to CRI on North Tryon Street with the driveway to the Mallard Pointe retail

strip and create a signalized intersection at this location. In order to access retail and residential destinations and bus stops directly across North Tryon Street from CRI, motorists leaving campus must cross two travel lanes and make a left turn at an un-signalized entrance. In addition, left turns are prohibited into and out of CRI. Pedestrians can be frequently observed crossing North Tryon at this uncontrolled location. A traffic signal at the CRI entrance with crosswalks and pedestrian signal heads is recommended to improve safety of all users.

8. **Prohibit delivery access and pick-up/drop off activity on University Road at Colvard and Reese.** Delivery trucks and personal vehicles are frequently observed idling on University Road between Colvard and Reese. The vehicles restrict vehicular flow through the intersection with Broadrick and create a barrier for pedestrians entering the academic area of campus. Once the new main entrance is constructed, this location will become more of a focal point for people entering the campus. To improve circulation as well as the aesthetics of the main entrance, delivery and personal vehicles should be prohibited from stopping or standing at this location. Alternative locations nearby should be investigated for deliveries, such as the driveway to the Cone Decks and the driveway in front of Robinson Hall.
9. **Study functioning of the new traffic signals in the roundabout at Van Landingham.** Early observations of the new signals indicate that during periods of low traffic flow, pedestrians cross the roadway against the signals. To ensure this behavior is not reinforced, traffic signals should be operated red/yellow/green only during peak class hours. The crossing guard at the Fretwell crossing should remain during peak hours to ensure that students are observing the signals. Flashing yellow signals are recommended for non-peak hours.

Strategies should also be pursued to reduce the volume of traffic traveling through the roundabout during peak period to reduce congestion for motorists and create a safer environment for this high pedestrian activity location. Strategies should include increasing bicycling mode share, providing a successful shuttle system, providing parking permits for specific garages/lots only to reduce frequency of inter-campus vehicular trips, and creating an exit from East Deck 1 directly on to Mary Alexander Road south of the circle once the new main entrance is constructed.

10. **Conduct an intersection analysis of University Road and Cameron Boulevard.** A steady volume of vehicles traveling on Cameron Boulevard allows few opportunities for motorists to turn left on to Cameron Boulevard from University Road. As a result, traffic backs up on University Road into the West Deck/Lot 7 driveway, particularly during peak hours. Traffic counts are needed to determine if a 3-way stop control would be an appropriate solution. Recommendations included in this plan will improve current conditions: raised crosswalks on Cameron Boulevard at Belk Track and Field (see Traffic Calming section) will slow vehicle speeds on Cameron Boulevard, and reconfigured parking policies for Lot 7 and the West Deck (see Parking Policies, Strategies and Programs) will reduce the number of vehicles entering/exiting the West Deck/Lot 7 driveway.

TRAFFIC CALMING

Observations and feedback from the open houses indicate that motorists frequently exceed posted speed limits on campus. Roads where excessive vehicle speeds are often observed include Mary Alexander, Martin Village Road, and Phillips Road. **In order to maintain a pedestrian and bicycle-friendly campus, vehicle speeds need to be reduced on all roadways to 20mph or less.** Excessive vehicle speeds create a particular safety hazard in areas with high pedestrian activity and poor visibility. To reduce speeds on campus, a number of traffic calming strategies are recommended below and in the Key Corridor Plans (see Chapter VI), and are seen on the *Circulation Recommendations* map.

11. Install traffic calming treatments around CRI.

Construct two raised crosswalks (speed tables combined with high visibility crosswalks) between Grigg and Duke Centennial Halls and the practice fields. Low traffic speeds are critical at this location due to the high volumes of pedestrians crossing the road. A speed table should also be constructed along the east side of Duke Centennial Hall.



Vehicles and a pedestrian crossing into Lot 5

12. Install traffic calming treatments on Martin Village Road.

Motorist behaviors at the intersection of Martin Village Road with Lot 5, such as speeding and driving in the oncoming lane, create the potential for conflict between motorists and pedestrians. To reduce vehicle speeds, a raised crosswalk should be installed on Martin Village Road south of the driveway to Lot 5. A pedestrian refuge should also be constructed across the driveway to Lot 5 to narrow the driveway entrance, increase the visibility of pedestrians and to encourage motorists to yield to pedestrians and to drive in the appropriate travel lane.



Location of proposed raised crosswalk on Van Landingham Road

Two additional raised crosswalks are recommended on Martin Village Road along Lot 6 to slow vehicle speeds.

13. Install traffic calming treatments on Van Landingham Road.

Construct a raised crosswalk at the location of the existing crosswalk on Van Landingham that leads from East Deck 3 to Lot 5. A speed table should be constructed to the east of the intersection with Martin Village Road. These treatments will reduce vehicle speeds and improve conditions for pedestrians crossing the road and bicyclists sharing the road.

14. Install traffic calming treatments on Witherspoon Road. Members of the User's Group identified speeding as an issue on the roadway from Cameron Boulevard past Lot 21 and Witherspoon Hall to Lot 16. Two speed tables and a raised crosswalk are recommended along this route, as indicated on the *Circulation Recommendations* map.

15. Install traffic calming treatments on Phillips Road. To reduce vehicle speeds on Phillips Road, three speed tables are recommended between the pork-chop island south of CRI and Cameron

Boulevard. When Phillips Road is reconstructed to align with Craver Road, chicanes (of at least 6 feet wide) should be considered to slow vehicles as alternatives to speed tables.

16. **Install raised crosswalks on Cameron Boulevard at Belk Track and Field.** Raised crosswalks will increase the visibility of pedestrians and will slow vehicles traveling on Cameron Boulevard. Slower speeds for southbound vehicles will have the added benefit of providing an opportunity for motorists to turn left on to Cameron Boulevard from University Road.

PARKING POLICIES, STRATEGIES AND PROGRAMS

Parking policies at UNC Charlotte should be managed to reduce the number of motorists traveling on the most congested roads on campus, and to encourage the use of alternative modes of transportation. Fewer vehicles on the roadways will increase the efficiency of the shuttle and the safety of pedestrians and bicyclists. Students, faculty and staff are passionate about parking, so changes need to be implemented carefully and incrementally with a greater goal in mind of improving overall circulation on campus and enhancing the quality of campus life. The following strategies are recommended to manage the development of parking:

17. **Revisit the demand for parking once the campus shuttle has been operating for several months.** The new shuttle service may potentially change the demand for parking (the total number of spaces and the location parking). Major decisions regarding capital investment in parking lots or garages should be delayed until the impact of the new shuttle system is evident.
18. **Establish a goal to reduce the provision of parking per student.** Enrollment figures are currently used to project future parking demand. The ratio of parking spaces to student enrollment should be used to set a goal for reducing parking demand. Fewer parking spaces provided per student translate into greater use of more sustainable alternative modes of transportation. With the cost savings gained by not building large parking decks, it will be possible to significantly improve bicycle, pedestrian and transit facilities and programs at UNC Charlotte. UNC Charlotte should establish the following goals for reducing the provision of parking:

Year	Parking Ratio Goal
2008	1 parking space per 1.2 students
2011	1 parking space per 1.5 students
2015	1 parking space per 2 students

19. **Avoid adding any new parking near the academic core.** The goal in selecting the location of parking should be to get motorists out of their vehicles as quickly as possible after entering campus. Parking on the fringe is preferred to internal parking lots. Parking should be located proximate to various campus entrances/exits to disperse vehicles and reduce congestion on the busiest roadways, including Van Landingham Road, Mary Alexander Road, the traffic circle, Cameron Boulevard, and John Kirk Drive at University City Boulevard. No new parking capacity should be added that would cause motorists to rely on these roadways for access. Land close to the academic core (such as Lot 16 and proposed redevelopment of the residential area between Mary Alexander and Martin Village Road) should be dedicated to higher density, mixed-use development instead of parking.
20. **Lots or garages planned for Cameron Boulevard outside the loop should be strategically designed to reduce pedestrian crossings at dangerous locations and to not hinder the efficiency of the shuttle.** For example, a large structure on the northwest corner of Cameron Boulevard outside the loop will generate significant pedestrian and vehicular activity at a location with poor site distances and where motorists tend to exceed posted speed limits. A dual parking structure with a pedestrian bridge across Cameron Boulevard is one alternative for reducing at-grade

crossings. Resident parking on the north side of campus could be accommodated in a dual structure in place of lot 24 and directly across Cameron Boulevard. A pedestrian bridge could connect the two garages. A facility of this type would eliminate the need for surface lots 16, 20 and 21.

High visibility crosswalks should be installed across Cameron Boulevard at any new parking facility located outside the loop. Bus stops should also be located at these fringe parking facilities, behind the crosswalks, to encourage students to use the shuttle. If a pull-off area is constructed for the shuttle stop, a minimum 5-foot buffer should be included to increase the visibility of pedestrians using the crosswalk.

21. **Restrict resident student parking, and commuter parking for students living within ¼ mile of campus to a designated lot on the fringe of campus.** The institution of the shuttle system allows new parking restrictions to be concurrently implemented to reduce congestion and improve the efficiency of the shuttle. Providing parking spaces adjacent to students' residences encourages students to drive to lots/garages across campus, contributing to congestion on key roadways with trips that could be taken on foot, bike or shuttle. In addition, these students are using valuable parking spaces close to the campus core that could be allocated to faculty/staff, commuters or visitors traveling from outside the area. The convenience of such resident parking also reduces the likelihood that students will use alternative modes of transportation.

UNC Charlotte should begin a program of restricting resident students and commuters who live within a ¼ mile of campus from parking in interior lots/garages close to the academic core. Students that live on campus or in close proximity should be encouraged to use lots/garages furthest from the center of campus. Lot 23 should allow commuter, F/S and visitor permits only. The West Deck should allow commuters living more than ¼ mile from campus and F/S permits only. Resident students should be permitted to park in only one designated lot to reduce the occurrence of residents driving to lots closer to their destination throughout the day.

22. **Over the long term, prohibit freshmen from bringing cars to campus.** Many universities use this strategy to reduce parking demands and congestion. It is also held that encouraging first year students to spend more time on campus improves student academics, the student experience and campus life.
23. **Develop a tiered parking permit pricing structure for commuters, faculty and staff.** The goal in adjusting the current parking permit strategy is to reduce the pressure to construct additional parking facilities, to encourage the use of alternative modes of transportation, and to make convenient parking spaces available for those (particularly faculty and staff) who live at greater distances from campus. Permits for lots/garages in desirable locations (East Decks, Cone Decks, West Deck) should be more expensive than those on fringe. For the most expensive and desirable lots, UNC Charlotte should guarantee permit holders a space in one dedicated lot (the number of permits sold for that lot/garage should be equal to the number of parking spaces; spaces are not reserved). Guaranteed spaces will reduce some concern over price increases. It can also reduce the number of vehicles circling inside garages waiting for spaces to open.

Additional analysis will need to be conducted to determine the effect of a new tiered permit structure on the Parking and Transportation Services' total revenue. Permit costs can be adjusted to achieve a revenue-neutral pricing structure.

24. **Reconfigure permits allowed in West Deck and Lot 7 to improve circulation on University Road.** The intersection of University Road and the driveway leading to Lot 7 and West Deck is frequently congested, with vehicles backed up to Cameron Boulevard waiting to turn left into the West Deck or Lot 7. Once in the West Deck and Lot 7, motorists are often circling aisles looking for spaces in a full garage, adding to the congestion and confusion. Currently, these two parking areas are for commuters, faculty and staff. It is recommended that Lot 7 be restricted to faculty and staff

parking only, with access only through the Cone Decks. Exiting Lot 7 from the west side will continue to be permitted. The University should consider providing reserved faculty and staff parking spaces in Lot 7, the Cone Decks and the West Deck (see the previous recommendation) to reduce the number of vehicles circling aisles and entering/exiting. Once the loop road is completed, left turns on to University Road should be prohibited from the West Deck/Lot 7 driveway.

25. **Establish an annual price increase for all parking permits.** Lessons learned from benchmark institutions suggest that a predetermined price increase for parking permits should be applied each year to offset increasing construction costs for parking structures and to continue to encourage use of other modes. Below are tables indicating permit prices at UNC Charlotte and at other institutions. The benchmark institutions have increased their parking rates approximately between 5% and 16% between 2005 and 2006.

UNC Charlotte Permit Prices for 2006-2007

Permit	Rate
Commuter (full year)	\$265
Faculty & Staff Permit (full year)	\$265
Motorcycle Permit	\$265
Resident Permit (full year)	\$265
Spring Permit (Commuter/Resident/Faculty & Staff)	\$163
Temporary Faculty/Staff (full year)	\$134
Summer Permit (both sessions)	\$107
Temporary Faculty/Staff (per semester)	\$67
Gate Cards (full year)*	\$50
Summer Permit (one session)	\$59
Night Permit (per semester)	\$53
Additional Vehicles (no cost after 2nd vehicle)	\$15
Gate Cards (January)	\$25
Temporary Permits (per day)	\$3

* For faculty and staff only

Permit costs per academic year at other institutions (2006-2007)

Institution	Student Permit	Faculty Permit
Cornell	\$644	Range of no fee (off campus parking served by bus routes) to \$689 for lots closest to central campus
Stanford	\$510 for lots closest to buildings; \$204 for those within walking distance. Freshmen not eligible.	
University of Georgia	\$120 - \$360 based on proximity to campus core	Same
University of Maryland	Commuters: \$191.00 Campus residents: \$369	\$314 - \$470 scaled by salary
University of North Carolina, Chapel Hill	\$200 - \$365 depending on location/ type (gated) Freshmen not eligible.	\$300 - \$1,160 based on salary and location/type of lot
University of Virginia	Commuter: \$168/year Resident: \$360/year	\$168 - \$516 per year based on proximity to classroom buildings and reserved/not reserved

University of Wisconsin - Madison	On campus lots: \$445 - \$1035 based on proximity Park & ride lots \$175
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26. **Implement incentive programs to encourage students, faculty, and staff to not purchase parking permits.** Initiate a Commute Club or Commute Trip Reduction program for employees to encourage the use of alternative modes of transportation. The program should include benefits such as a free parking passport, guaranteed ride home, showers and lockers and cash rewards.

A number of universities have successful programs designed to reward employees (including student employees) who use alternative modes of transportation at least 60% of the time. To be eligible for the programs, employees should: live more than ¼ mile of campus, otherwise need to purchase a parking permit at their principal place of work or study, and be required to work on campus during business hours at least half-time for three consecutive months.

Benefits awarded to employees who join the program typically include:

- A parking passport: a set of daily parking passes (Temporary Permits, currently \$3 per day) allowing the employee to park free 5 to 10 times per semester.
- Guaranteed ride home (taxi or rental car transportation) for employees in the event of a qualifying emergency or illness. Up to four rides free per academic year.
- Private showers and clothing lockers at no cost.

People can often be apprehensive about foregoing an annual parking permit and committing to bicycling to work every day because of anticipated severe weather, family emergencies, illness, and/or personal errands or business that require a car before or after work. A set of daily parking passes can reduce this apprehension by offering employees the opportunity to drive a number of times per semester.

The guaranteed ride home is another strategy to ensure that employees who use a commute alternative to get to work are not stranded if they have an emergency, become ill, or have to work late without prior notice.

Additionally, employees bicycling to work typically need changing and/or showering facilities and lockers. Lack of shower and changing facilities can be a major disincentive for employees to bike to work. The University should seek opportunities to add these types of facilities to on-campus buildings.

An additional, more direct incentive includes offering cash rewards or subsidies to employees choosing to bike to work. Eligible employees who participate in the cash rewards program by commuting by bicycle, bus or foot at least 60% of the time are given a reward of \$30 - \$40 per semester in their payroll checks. This type of program emphasizes the benefits to the entire campus community of the use of alternative modes of transportation through reduced traffic congestion, improved air quality, reduced parking hassles and commute stress, and of course the cost of accommodating vehicles in parking garages and lots.

B. BICYCLE CIRCULATION

The climate and geography of the UNC Charlotte campus are well-suited to bicycle travel; the weather is mild, distances that may be challenging on foot are a quick bicycle ride, and in many cases parts of campus with challenging topography can be circumvented. Currently, however, bicycling is an underutilized mode of transportation at UNC Charlotte. Bicycling mode share, derived from the online survey conducted as part of this study, is currently estimated at less than 1% of the campus' students, faculty and staff. This presents an opportunity for improvement. Most campuses in North Carolina and throughout the United States have a much higher bicycle mode share.

Many aspects of the UNC Charlotte campus currently make traveling by bicycle difficult. The campus is dominated by automobile traffic during peak hours. The only bicycle lanes, routes or paths on campus are faded bike lanes on a portion of Cameron Boulevard. Intersections are not designed to safely accommodate bicyclists or pedestrians.

It is anticipated that modest investments in bicycle facilities and programs could significantly increase the current bicycling mode share. Thirty percent of respondents to the online survey reported that bike lanes, trails and/or paths would encourage them to ride at UNC Charlotte. Converting vehicle trips into bike trips will benefit all members of the campus community by reducing congestion and air pollution, reducing the demand for parking, and improving the quality of campus life.

Legend

-  Key Destination
-  Existing Bike Lane
-  Proposed On-Road Bike Facility
-  Proposed Shared Use Road
-  Existing Bike Rack
-  Proposed Bicycle Rack
-  Proposed Bike Shelter
-  Mallard Creek Greenway
-  Future Greenway

See Circulation
Recommendations Map: Legend
items related to bicycle circulation

1. **Establish a goal to raise the percentage of bicyclists commuting to campus or class to 5% over a 5-year timeframe.** The goal of a 5% bicycle mode share is modest in comparison to bicycling rates at other universities and other university towns. The town of Madison, Wisconsin has a bicycling rate of 11% and a bicycling rate among students of 27%. University of California at Davis has a student bicycling rate of more than 50%. More than 9% of the general population of Boulder, Colorado commutes by bicycle, and more than 20% of the student population at the University of Colorado commutes to class by bicycle.

The 1% bicycling mode share estimated from results of the online survey can be used as a baseline to measure the success of raising bicycling mode share. A second online survey should be conducted in five years and compared to the baseline survey.

The goal of increasing bicycling mode share should be considered when determining the ratio of parking spaces to be provided per student. As described in the *Parking Strategies* section in Chapter III setting a lower ratio of parking spaces to students establishes the University's dedication to more sustainable alternative modes of transportation. With the cost savings gained by reducing the need for structured parking, it will be possible to significantly improve bicycle, pedestrian and transit facilities at UNC Charlotte. Other strategies pursued concurrently, such as strategically increasing parking rates and developing incentive programs (addressed elsewhere in this document) will encourage bicycling.

ON-ROAD BICYCLE FACILITIES

2. **All key routes into and through campus should accommodate bicycles.**
For bicyclist accommodation on roadways, the following general principals should be followed:

- Bicycle lanes. Provide 5-foot minimum bicycle lanes on principal traveled ways and circulator roads. Examples of roadways at UNC Charlotte in need of bicycle lanes include Cameron Boulevard, Mary Alexander Road and University City Boulevard. In locations where vehicular speeds can be reduced to 15mph, bike lanes are not needed.
- Short-term shared-use. Roadways currently too narrow to accommodate bicycle lanes should be designated as shared-use in the short-term. Wide, multi-use paths can also be provided along these roadways to accommodate bicyclists and pedestrians. In the long term, if there is an opportunity to reconstruct these roadways, 5-foot bike lanes on both sides should be included. Examples of roadways currently too narrow to accommodate bike lanes include Cameron Boulevard south of Toby Creek Road and Van Landingham Road.
- Shared-use. Dedicated bike lanes are unnecessary on narrow, low volume and low speed or dead end roadways. These roadways should be designed to be shared with bicycles. A number of improvements should be made to the road however, to create comfortable on-road conditions for bicyclists.



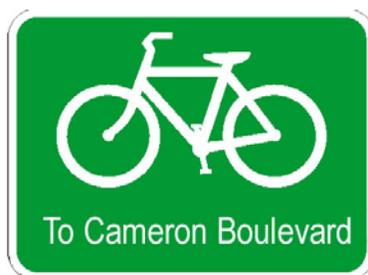
Bicyclist riding in a bike lane

On-road bike facilities for key routes are described in the Key Corridor Plans (Chapter VI.). The *Circulation Recommendations* map and Implementation Table describe all recommended bicycle facilities.

3. Incorporate wayfinding signs to direct cyclists to bike routes and bike parking.

Bike route signs including arrows and destinations will encourage bicyclists to use designated bike lanes and will simplify navigating the campus on bike. They are also reminders to vehicles to share the road with bicyclists. The destination sign illustrated below should be used.

Similarly, signage indicating the location of large banks of bicycle racks and shelters can encourage bicyclists to use racks instead of railings, trees, lampposts or benches.



MUTCD # D11-1 (modified)



Bike parking directional sign

OFF-ROAD BICYCLE FACILITIES

There are currently limited off-road facilities for bicyclists. A short system of gravel trails is located on the west side of campus connecting to the University City Public Library and North Tryon Street. The Mallard Creek Greenway runs along the north tip of campus, with a connection from Mallard Creek

Church Road.

4. **Include multiple connections for bicyclists to and from the planned greenway.** A new greenway is planned along the west side of campus from University City Boulevard at WT Harris north to the Mallard Creek Greenway. The new greenway will significantly improve connectivity from the north part of campus. Multiple paths should be constructed connecting the greenway to existing roads and paths at UNC Charlotte. The *Preliminary Circulation Recommendations* map illustrates proposed paths to improve the off-road bicycle trail system at UNC Charlotte. These paths should be 10 feet wide at a minimum to accommodate multiple uses.
5. **Reconstruct and improve the path connection from Lot 8 to Cameron Boulevard.** This path, connecting Lot 8 to a small parking lot of a facility on Cameron Boulevard near University City Boulevard, creates a critical connection from residential halls on the south side of campus to retail destinations across University City Boulevard. Currently, the path presents significant safety hazards due to deteriorated asphalt, overgrown vegetation and inadequate lighting. This path should be reconstructed to a 10-foot wide minimum multi-use path. The shrubs should be cut back and ample lighting installed.

BICYCLE PARKING

6. **Provide bike parking in convenient locations throughout the UNC Charlotte campus.** Providing safe and convenient places to park bicycles encourages the use of bicycles for transportation. Racks are most effective when they are located within 50-100 feet of a building entrance and easily accessible to the building's adjacent walkway/pathway system (refer to the *Placement of Bicycle Parking Racks* diagram in this section). This allows bicyclists to conveniently park without impeding pedestrian access by blocking pathways or entrances. Racks must be located on concrete pads. It is therefore important to account for bicycle rack locations in landscaping plans for UNC Charlotte buildings. For security, the area should be lit for nighttime access.

UNC Charlotte has bicycle racks at a majority of facilities on campus. A number of buildings however are in need of more convenient or additional bicycle racks. The *Preliminary Circulation Recommendations* map indicates all recommended locations for the installation of new racks. Several key facilities in need of bicycle parking include:

- Fretwell Hall
- Atkins Library
- College of Education
- Science and Technology
- Cafeteria activities building
- Cato hall/Admissions
- Colvard North/South
- McEniry Hall

Quantity of Bicycle Parking Spaces

The question of how many bicycle parking spaces to allocate to each building is difficult to answer because it is dependent on existing and projected volumes of bicyclists. The following charts can be used as a general guideline to identify approximate bicycle parking needs for various building types. As the volume of bicyclists increases on campus, UNC Charlotte will need to re-evaluate the quantity of bicycle parking spaces at each facility.

The number of spaces needed varies depending on the type of building, its use, and the building's capacity. Buildings where bicycles are expected to be parked for shorter periods of time (such as a classroom building) may not need as much parking as buildings where bikes will be parked all day or for several days at a time. Additionally, given that a greater percentage of students than staff

members are likely to commute by bicycle, classroom buildings and student resident halls are likely to need a greater proportion of bike parking. The charts below are based on estimated bicycling rates and building capacity as developed by Toole Design Group.

Student Housing Facilities

Building Capacity (# of beds)	Approximate # of bike parking spaces (approx. 30% of capacity)
1 - 50	15
50 - 100	30
100 - 200	60
500 - 600	180

Bicycle parking at residence halls should be provided in covered areas as bicycles are likely to be parked overnight and for longer periods of time. A large number of racks are needed at residence halls due to the parking duration and higher bicycling rates of students compared to other members of the campus community.

Administrative buildings

Building Capacity	Approximate # of bike parking spaces (approx. 5% of capacity)
< 100	5
100 - 250	12
250 - 500	25
500 - 1500	75
1500 - 3500	175

Classroom Buildings

Building Capacity	Approximate # of bike parking spaces (approx. 18% of capacity)
< 100	18
100 - 250	45
250 - 500	90
500 - 1500	270
1500 - 3000	540

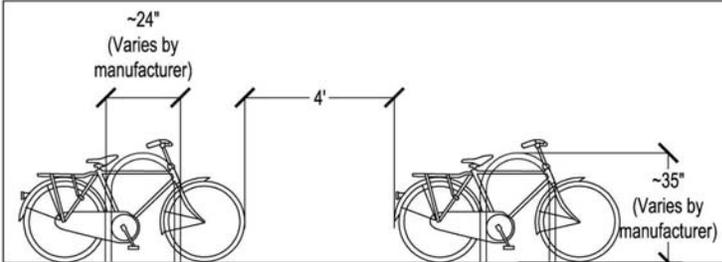
Bicycle parking at classroom buildings should be provided primarily as uncovered racks, with covered bicycle parking where possible. A moderate number of spaces are needed at classroom buildings; students are the primary users of classroom buildings, however bicycles are not likely to be parked for extended periods of time.

Space Needed for Bicycle Parking

A typical bicycle is approximately six feet in length and up to fifteen inches in width at the handlebars. For areas where many bicycles are stored together it is advisable to place racks in accordance with the diagram on page 25.

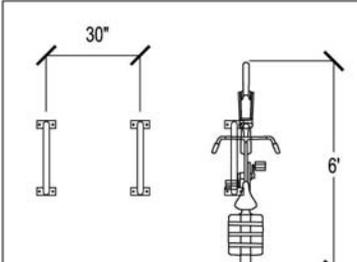
PLACEMENT OF BICYCLE PARKING RACKS

SIDE VIEW



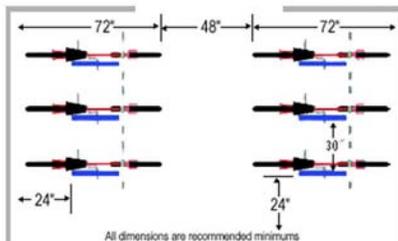
SCALE 1" = 4'

SIDE BY SIDE RACKS:



SCALE 1" = 4'

RACK PLACEMENT RULES:

<p>5' from: Fire hydrant Crosswalk</p> <p>4' from: Loading zone Bus stop Bus shelter Bus bench</p> <p>Min. 2', Rec. 3' from: Curb</p> <p>3' from: Parking meter Newspaper rack US mailbox Light pole Sign pole Driveway Tree space Trash can Other street furniture Other sidewalk obstructions</p>	<p>Wall Setbacks For racks set parallel to a wall: Min. 24", Rec. 36"</p> <p>For racks set perpendicular to a wall: Min. 28", Rec. 36"</p>	<h3>Bike Rack Area</h3>  <p style="font-size: small;">All dimensions are recommended minimums</p> <p>The rack area is a bicycle parking lot where racks are separated by aisles. The aisle is measured from tip to tip of bike tires across the space between racks. The minimum separation in between aisles should be 48 inches. This provides enough space for one person to walk one bike. In high traffic areas where many users park or retrieve bikes at the same time, such as a classroom building, the recommended minimum aisle width is 72 inches.</p>
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PLACEMENT OF BICYCLE PARKING RACKS

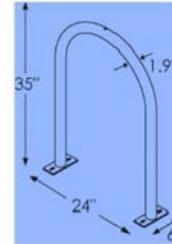
University of North Carolina at Charlotte
Campus Circulation Master Plan
June 2006

ACCEPTABLE BICYCLE RACK DESIGNS

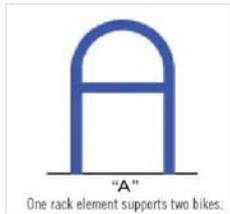
ACCEPTABLE DESIGNS



Minimum distance between U elements: 30"



Dimensions vary by manufacturer and model.



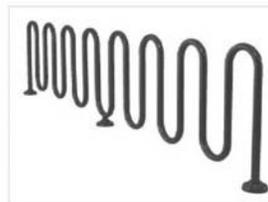
"A"
One rack element supports two bikes.



UNACCEPTABLE DESIGNS



The dishrack or wheelbender style rack can bend a bike's wheel



Wave racks do not support a bicycle frame in at least 2 places

RACK ELEMENTS

The rack must:

- Support the bicycle frame in at least 2 places, allowing the frame and wheel to be locked using a U-lock or cable lock.
- Height of U rack elements should be 35" to support the frame
- Prevent the wheel of the bicycle from tipping over.
- Not damage the bicycle.
- Be durable and securely anchored.
- Allow front-in or back-in parking.

ACCEPTABLE BICYCLE RACK DESIGNS

University of North Carolina at Charlotte
Campus Circulation Master Plan
June 2006

7. Provide supportive bicycle racks.

As described in Chapter II: Existing Conditions, the bicycle rack type currently used on campus does not meet national standards due to potential damage to the bike. U-shaped racks are the recommended rack type as they provide sufficient stability for bicycles and are designed to allow two bikes to be properly locked per rack (refer to the *Acceptable Bicycle Rack Designs* diagram on the previous page). U-racks are appropriate parking facilities for classroom buildings, recreational facilities and administrative buildings. U-racks should be 35" tall; detailed specifications regarding rack design and placement can be found at the end of this section. Wave racks are generally a less efficient design and are not as useful as u-racks.

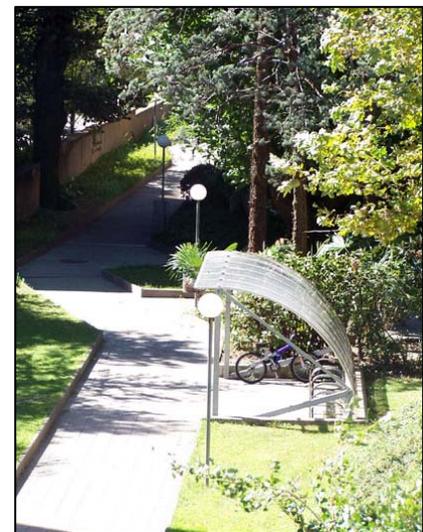


Dish-rack or "wheelbender" racks do not support the frame of the bicycle, potentially damaging the front wheel.

8. Provide covered bike parking at key locations throughout campus.

Offering a variety of quality bicycle parking helps ensure that bicycles can be conveniently and securely locked and protected from weather, theft, and accidental damage. Covered parking, cages and lockers protect bikes from weather, and cages and lockers can serve as theft-deterrents. Protecting parked bikes, as well as bicyclists from the elements while parking their bikes, can be a critical amenity for encouraging more people to ride.

There are several ways to generate covered bike parking in the short term without the expense of building new structures. Bike racks can be installed under very wide overhangs or roof structures of buildings on campus to provide covered parking. UC Davis offers bike parking inside a foyer on the first floor of new dormitories. A separate room or cage in the foyer is accessed by a key provided only to resident bicycle owners who opt for the service. UC Davis has also installed bike hooks in the ceilings of dorm rooms to allow students to hang bikes in their own rooms for the greatest security. Extra support is needed to hold the hook through a drop ceiling to bear the weight of a bicycle.



Bicycle Lid

Bicycle "lids" are another option for providing covered bike parking. Bike racks are covered by a half shell to keep precipitation from falling directly on the bicycle or bicyclist while parking. Bike lids require less space than other covered bicycle parking options and are an attractive amenity.

Longer term parking options that offer more security and protection than a bike rack are particularly important for students who park bicycles at dormitories over an extended weekend or vacation. All new residential halls at UNC Charlotte should be designed with a bike parking facility within the building. Bike shelters, lockers, locked cages and bike hooks in the ceiling of dorm rooms (following UC Davis' example) are additional facilities to increase secure and covered bike parking in residential areas.

It is recommended that covered bike parking be provided in key locations at UNC Charlotte. New locations for bicycle racks have been recommended throughout campus to take advantage of any existing overhangs to provide covered parking. The *Circulation Recommendations* map indicates the recommended location of new bicycle racks as well as new bicycle parking shelters. A number of these bike shelters have been proposed around the perimeter of the campus core to encourage bicyclists to park their bike and walk on the more congested internal pathways. Key locations of proposed covered bike parking and bike shelters include:



Bike lockers outside a student residence hall
Photo credit: www.cycle-safe.com

- Hunt Village. Remove bike racks from under existing picnic shelter. Construct new bike shelter to serve residence halls.
- Reese Hall. A large concrete pad south of Reese Hall is an ideal location for a bike shelter. There is a space 16 feet x 50 feet available. Bicyclists arriving via Broadrick Boulevard or University Road could park at this facility and conveniently reach buildings in the campus core, such as Atkins Library on foot.
- Colvard South. Expand the existing bicycle rack with new U-racks under the Colvard South and North overhang to provide additional covered bike parking.
- Fretwell. Install U-racks under the overhang on the south side of the building. Two racks can be accommodated in each space between columns without obstructing pedestrian access.
- Future Student Union. A bike shelter should be provided at the student union
- If Cedar, Hickory and Sycamore residence halls are going to be replaced with other residence halls, the existing covered bike parking structures across Mary Alexander should be rebuilt.
- Atkins Library. Expand existing bank of racks on the south side of the building; remove shrubbery to accommodate.

A number of covered bike parking facilities currently exist on campus, such as on Mary Alexander across from Sycamore Hall. These facilities should be increased in size, and existing racks should be replaced with the recommended U-racks. They should otherwise be improved to guard against inclement weather.

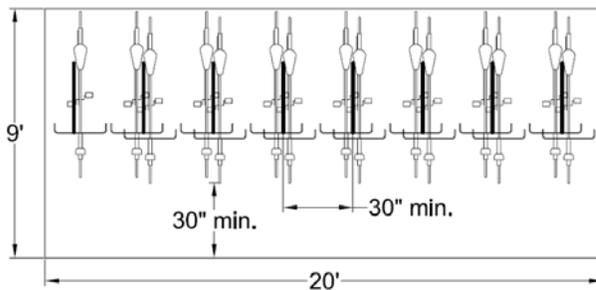
9. Provide bicycle parking in vehicle garages

Bike racks should be provided inside vehicle parking garages to provide convenient and secure covered bike parking. Bike racks should be installed in existing parking garages on campus (East Decks, West Deck and Cone Decks) and any new garages to be constructed. Bike racks should be placed close to manned parking booths or in a keypad-access bike cage to provide a higher level of security.

Up to 15 bicycles can be accommodated within one typical vehicle parking space. This volume can be doubled with racks that allow bicycles to be stacked on top of each other. Parking garages can be easily modified to create this parking, however, there is much less resistance to providing bicycle parking if it is accounted for in the original garage design instead of converting vehicle parking spaces later. Below is a diagram illustrating the conversion of one vehicular parking space to an area for bicycle parking.



Examples of bike parking bays in car parking garages.



STRATEGIES FOR EDUCATION AND ENCOURAGEMENT

10. **Develop a bike rental program.** A number of campuses have implemented shared bicycle programs in which students, faculty and staff can reserve bicycles for two days at a time, free of charge. In one example, bicycles are donated from the Parking and Transportation Services' pool of recovered bicycles and labor/maintenance is provided by several local bicycle shops. The bikes can be painted with the school's colors. The high visibility of the bicycles sends a clear message that the University supports bicycling.
11. **Create a bicycling section on the UNC Charlotte website with prominent placement that promotes bicycling on campus and informs bicyclists.** Promoting bicycling on campus is a way to increase bicycle trips without substantial financial investment. The current messages sent to potential bicyclists at UNC Charlotte are limited. The Transportation and Parking Services section on the UNC Charlotte website provides information primarily on parking locations and permits. There is one bullet directed to bicyclists to visit Parking Services to register their bikes. It should be made clear that bike registration is optional and serves primarily to recover stolen bikes.

Several other universities and colleges have thorough bicycling sections on their websites that can be used as models when developing a bicycling section for UNC Charlotte:

- o <http://www.bike.cornell.edu/CAMPUS.htm>
- o <http://www.taps.ucdavis.edu/bicycle/>
- o http://transportation.stanford.edu/alt_transportation/BicyclingAtStanford.shtml
- o <http://www.tps.ucsb.edu/bicycle.html>

12. **Develop a guide for pedestrians, bicyclists, transit users and motorists with travel information relevant to each mode.**

Creating a transportation system that bicyclists, pedestrians and motorists can safely share requires education of all the users of the system. UNC Charlotte should develop, print and distribute a guide that includes safety rules and precautions for all users of the roadway system including motorists, pedestrians, and bicyclists. The guide should be oriented to students with messages that appeal to this group. The guide should be available online as a pdf, and should be

printed and distributed throughout campus, included in packets mailed to incoming students and reviewed during freshman orientation. It should include links to additional information online and any other pertinent resources for getting around campus.

Sample messages for pedestrians may include:

- Reasons to walk; stay healthy, save money
- Cross the street at marked crosswalks or at intersections
- Make eye contact with oncoming motorists and cyclists, and indicate your intention to cross
- Pay attention to the speed of approaching cars and bikes and give them enough time to stop when using a crosswalk
- Yield to vehicles when you are not within a crosswalk, or crossing at an intersection
- Avoid walking in dedicated bike lanes

Sample messages for bicyclists may include:

- Reasons to bike, such as saving time, money, and staying healthy.
- Wear a helmet; be alert for cars and pedestrians at all times
- Ride on the right side of the street and yield to pedestrians
- Dismount and walk your bike on congested sidewalks or paths
- Wear light colors and use reflective gear after dark or in foul weather
- Park at bike racks

Sample messages for motorists may include:

- Observe all traffic signals, signs, and posted speed limits
- Yield to pedestrians within a crosswalk and when traffic-control signals are not in place
- Avoid driving through the center of campus during peak hours
- Be alert for pedestrians, cyclists and buses and share the road respectfully with them
- Communicate your intentions to other drivers, cyclists, and pedestrians (contact, nod, wave, use turn signals, etc.)

Sample messages for transit users

- Riding the bus can get you from place to place quickly
- Visit (link) for transit routes and schedules

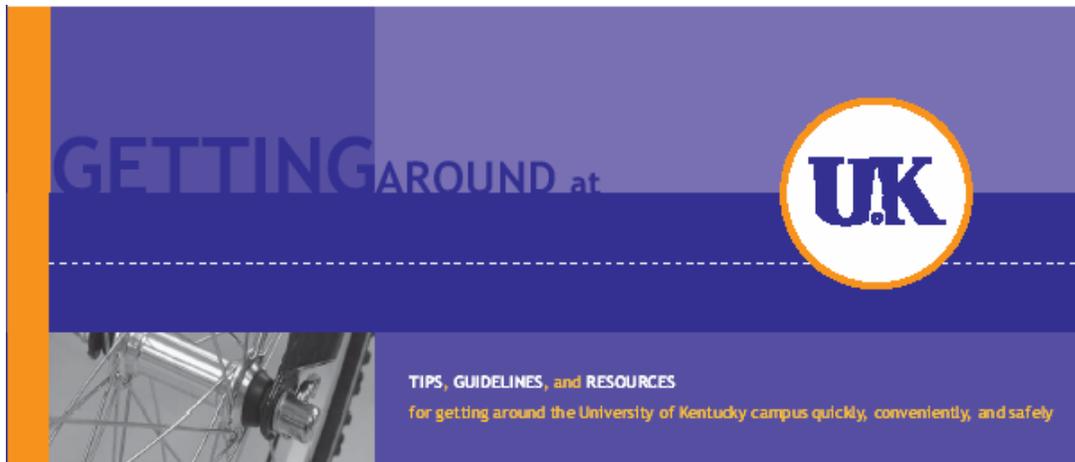
13. Develop a commuter encouragement program for students to raise awareness and give them incentive to commute by bike rather than motor vehicle.

Students are likely to be encouraged to ride a bicycle to and around campus by improving the facilities available, such a complete bicycle route network, more accessible and greater variety of bike parking, and a map of bike facilities. Encouragement programs and contests have also been used at other universities to provide students with an extra incentive to bike to campus.



Evergreen College's Commuter Contest advertisement

A commuter encouragement program can be open to all students who use alternative modes of transportation to commute to campus. At Evergreen College in Washington, students residing off campus who participate in the school's encouragement program must fill out and submit a commuter log for one week at the start of each quarter and in turn are provided with free ventilated clothing lockers to use for the quarter. They are also entered into a drawing for prizes such as bike messenger bags, massages and gift certificates to local shops and restaurants. Students who continue to participate in the program for three consecutive quarters are entered into a grand prize drawing for larger gifts such as a bike or laptop. The program has been a successful tool to publicize the campus' bike system and the benefits of leaving the car at home.



REASONS TO BIKE

- **Sleep in.** If you live less than five miles from UK, riding a bicycle is FASTER than driving a car to campus. Avoid traffic, and have more free time—BIKE!
- **Save money.** A bicycle is significantly less expensive than owning and operating a car (\$120 per year compared to over \$5,000 per year). Add to this the savings from not having to buy a UK parking permit. Think about all the fun new ways you can spend that extra cash when you ditch the car and start BIKING to campus.
- **Dodge the "Freshman 15".** A recent study showed that college students gain an average of 4 pounds during the first 12 weeks of their freshman year. The Surgeon General recommends 30 minutes of moderate physical activity MOST days of the week just to stay healthy, and more to lose weight or get in shape. Need an aerobic form of exercise that's easier on your joints than running? BIKE!
- **Avoid vehicle parking hassles.** Ever drive around and around in circles trying to find a parking space? Ever park so far from campus that it takes you another 20–30 minutes to reach your destination? Avoid all of these headaches by BIKING to campus.

Sample pages taken from the student guide developed for the University of Kentucky

14. Increase parking permit rates, restrict student parking, and provide incentives for not purchasing parking permits. Participants of the online survey responded that financial incentive would encourage them to bike more often. Encouragement programs such as the one described above and those addressed in Chapter III. Vehicular Circulation Recommendations provide incentives for using alternatives to the single occupancy vehicles. As a disincentive to drive, parking permit rates should be increased, and students residing on campus should only be allowed to park in lots furthest from the campus core. Chapter III. Vehicular Circulation Recommendations describes the proposed changes to UNC Charlotte's current parking policies. These policy changes are critical to shift mode share away from motor vehicles to more sustainable modes such as walking, bicycling, and taking transit.

D. TRANSIT RECOMMENDATIONS

UNC CHARLOTTE SHUTTLE SYSTEM

A shuttle bus system for the UNC Charlotte campus is essential for improving mobility around campus and reducing the number of vehicles on campus roadways.

The most successful university-sponsored shuttle systems are simple and uncomplicated. Particularly in the first year of a new shuttle system, students are more likely to ride the shuttle if service is frequent (5-8 minute maximum headways) and the route is easy to understand. The goal in the first year should be to convince the campus community that the shuttle is an easy and efficient way to travel around campus.

UNC Charlotte's *Parking Services* division is developing a shuttle route with proposed stops and schedules. The following recommendations should be considered during the shuttle system development and implementation:

1. **Buses should ideally have no more than a five- to eight-minute headway to encourage use.** If a short headway is used, a bus schedule is not needed and there is less required coordination. Buses run continuously. Avoid bus-bunching by instructing drivers to pause on the route to readjust headways.
2. **Develop simple and straightforward shuttle routes.** The bus routes should connect key destinations on campus, such as parking lots on the east side of campus, academic buildings in the campus core and CRI, and should be simple to understand.



University of Kentucky student using the city of Lexington's *Bike n' Ride* service

3. **Buses must have bike-on-bus capability.** Bicycle racks that accommodate four bicycles should be used on each bus.
4. **Shuttles should run in the evenings (until 11pm or midnight), on weekends, and on holidays on a limited basis.** Input from the public participation process strongly supported a shuttle that runs in the evenings and seven days a week. If students believe they may be "stranded" after a late class or studying at the library they are more likely to drive than take a shuttle. Similarly, if students are not able to rely on the shuttle to travel around campus on weekends or holidays, they may choose to bring a car to campus.

Extended hours and service can be provided after a successful first year of the shuttle system.

To provide night or weekend/holiday service, headways can be increased to reduce costs. If it is found that ridership is low at night, the shuttle bus could be replaced with an "on-call" service with smaller vehicles.

5. **Over the long term, consider adding routes that stop at key residential locations and key shopping destinations near campus.** Input from the public input process indicated a desire for shuttle service to nearby residential and retail destinations. Residential areas may include Thornberry Apartments at North Tryon Street and Mallard Creek Church Road. Shopping

destinations may include Town Center Plaza and Grande Promenade.

6. **Consider the possibility of running the shuttle in two directions.** If a relatively long shuttle route/loop is developed, running the shuttle in two directions can reduce trip length for riders, thereby improving service. For shorter loops, two directions are unnecessary and can create a safety hazard for pedestrians. Riders waiting for a bus (that takes a short loop) may be inclined to run across the road to catch a bus traveling in the opposite direction.
7. **Install covered bus shelters.** To protect riders from inclement weather, bus shelters should be provided at each bus stop.
8. **Provide shuttle pamphlets at all sporting events and events held early in the school year.** Big sporting events (where parking is already limited and people may be more like to use a shuttle) can be an opportunity to introduce the shuttle system and capture new riders.
9. **Charge the Student Government with developing an identity and design for UNC Charlotte buses.** UNC Charlotte students will be encouraged to use the shuttle system if it is specifically marketed to them. Other universities have involved students in the development of their shuttle system's identity by giving them the opportunity to create a design concept or a name for the system. UNC Charlotte should consider involving their student government in developing an identity for the campus' new shuttle system.



North Carolina A&T State University's campus shuttle



University of Colorado's campus shuttle

10. **Buses must be ADA accessible.** The campus shuttle system should serve members of the campus community who have physical disabilities. If the buses cannot accommodate riders needing assistance, a separate "on demand" service from parking lots to campus facilities for physically disabled individuals should be provided.
11. **Increase coordination with CATS to improve bus service to and from UNC Charlotte.** After a successful first year of the shuttle system, students, faculty and staff may be more inclined to commute by bus. UNC Charlotte should work with CATS to increase bus service to and from the campus. Consider arranging reduced rates or no charge for students on CATS buses that serve campus to encourage use. The University could also consider subsidizing bus passes for students who do not purchase a parking permit.

CHARLOTTE AREA TRANSIT SYSTEM (CATS)

There are currently three (3) CATS bus routes serving the UNC Charlotte area: Route 29 (UNCC/Southpark); Route 11 (N. Tryon/Sugar Creek); and Route 80X (Concord Express). The 80X route stops along North Tryon Street (US 29). Routes 11 and 29 also provide service on North Tryon Street, and also have stops on Mallard Creek Church Road, John Kirk Drive and University City Boulevard (US 49), and in the front of West Deck 2 on campus. There are eighteen (18) bus stops between the three routes. There used to be a CATS shuttle running the loop outside of the campus serving retail establishments around the campus area. The shuttle was discontinued due to lack of ridership.

The current CATS bus routes seem to be ample at this point in time with only a few recommendations that should be considered in improving CATS visibility and potentially ridership.

1. Install covered bus shelters. Work with CATS to help protect riders from inclement weather and provide better visibility to each stop, bus shelters should be provided at each bus stop.
2. See #11 under UNC Charlotte Shuttle System.
3. Ensure that all circulation routes serving the bus stops are well lit and vegetation is maintained to provide good visibility and safe routes to and from each stop.
4. Provide information on CATS routes and stops on UNC Charlotte website that would direct users to the campus maps and provide schedule information.

LIGHT RAIL

UNC Charlotte is located along the CATS proposed northeast line on the future light rail project. The northeast line will extend fourteen miles from Center City Charlotte through the North Davidson and University Areas to I-485 just north of campus. There is currently a refined locally preferred alternative proposed that would bring the northeast line onto campus with a station located on Cameron Boulevard across from Squires Hall. If approved, there would be three stations located within easy proximity of UNC Charlotte:

1. UNC Charlotte Station located on North Tryon Street between Carolinas Medical Center and Charlotte Research Institute.
2. UNC Charlotte Central Station located on Cameron Boulevard across from Squires Hall.
3. Mallard Creek Church Station located at North Tryon Street and Mallard Creek Church Road.

The current schedule for the northeast line shows design beginning in 2007 with the line being operational in mid-2013.

IV. KEY CORRIDOR PLANS

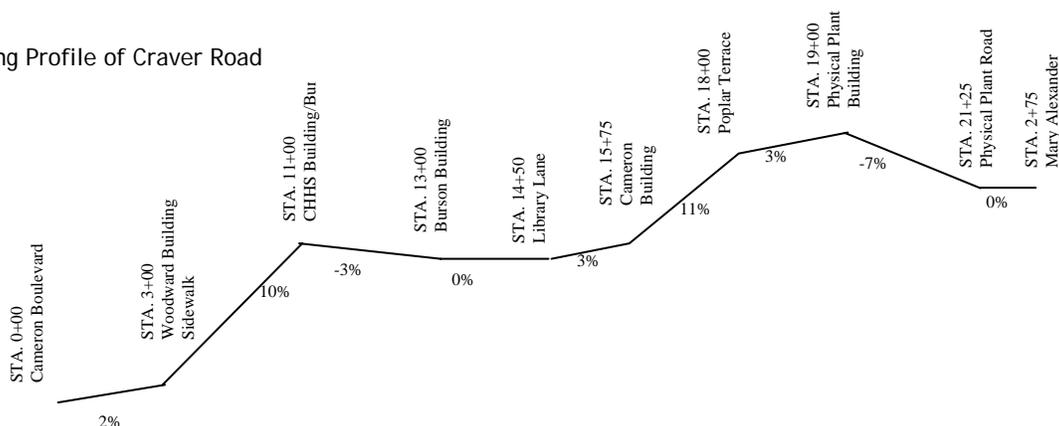
To create a safe and efficient circulation system at UNC Charlotte for motorists, pedestrians, and bicyclists, several key roadways on and around campus need significant improvements. To improve conditions for users in these locations, the recommendations for each corridor below should be considered concurrently; in many cases proposed facilities are interdependent. Refer to the *Circulation Recommendations* map for illustrations of all improvements.

CRAVER ROAD

The Campus Master Circulation Plan includes a conceptual design plan to improve the functioning of Craver Road and create a roadway that is safer for pedestrians, bicyclists, motorists and transit users. Once the new student union is constructed, pedestrian and bicycle activity is likely to increase on the roadway, increasing the urgency to improve conditions for non-motorized travelers and to reduce vehicular traffic on Craver Road. Appendix C includes drawings for the Craver Road conceptual design.

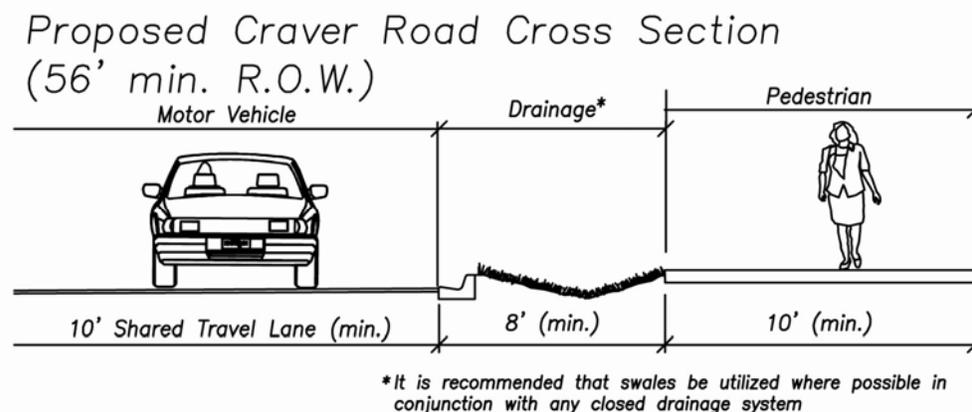
1. Craver Road should be redesigned into an aesthetically pleasing corridor that is pedestrian, bicycle and transit oriented.
 - Enhance the pedestrian and bicycle environment on Craver Road by creating needed facilities and reducing automobile traffic. Through-traffic on Craver Road should be prohibited for unauthorized vehicles (student, faculty, visitors) at the planned Student Union. Access should be permitted by UNC Charlotte shuttle buses, emergency and maintenance vehicles only.
 - Establish an ADA-compatible crossing of Craver Road between the planned Student Union and the proposed pedestrian plaza.
2. The existing steep grades along Craver Road present a unique design challenge for implementing the proposed improvements. To reduce the steep grades and to allow for the construction of a level pedestrian plaza near the planned Student Union, the vertical profile of Craver Road will need to be raised, as much as 4 feet at the lower end of the plaza. Towards the high end of the plaza, the profile will be lowered as much as one foot. Cutting of the existing pavement is kept to a minimum to avoid impacting existing utilities within the corridor. The Craver Road Conceptual Design - Appendix C includes a proposed vertical profile. The existing steep topography also presents a challenge along the edges of the roadway. Although the proposed conceptual design narrows the curb to curb width, buffers and sidewalks are increased and the overall corridor cross section is wider than existing in most areas. This may require the use of steep side slopes or small retaining walls to minimize impacts to adjacent property. The AASHTO Policy on Geometric Design of Highways and Streets was generally used to establish geometric design parameters. However, to accomplish the proposed improvements, AASHTO Guidelines may not be met in all situations.

Existing Profile of Craver Road



3. The following recommendations are illustrated in the Craver Road Conceptual Design - Appendix C:
- Create a continuous and consistent roadway cross section.
 - Eliminate the perpendicular parking along the north side of Craver Road.
 - Eliminate the parking in the Cameron Hall Lot to accommodate a sidewalk - The driveway can be maintained as a service area for delivery or maintenance purposes.
 - Provide a level (2% max slope) pedestrian plaza, approximately 60 feet wide on Craver Road at the planned Student Union.
 - The plaza and areas with limited vehicular access should be constructed of an alternate textured surface to provide visual cues that it is a pedestrian zone and is not a continuation of the roadway. Brick, stamped asphalt or concrete are suggested.
 - Utilize asphalt paving for areas open to all vehicular traffic.
 - Allow through bus access, but prohibit unauthorized vehicles through the plaza area. Access to service driveways at the College of Education and College of Health and Human Services is maintained for maintenance and deliveries. Signage at these driveways should provide direction for authorized vehicles.
 - Maintain a horizontal alignment of Craver Road at the planned Phillips Road entrance.
 - Enforce slower vehicle speeds through geometry and the installation of speed tables or raised crosswalks. With lower vehicular speeds, Craver Road will operate as a shared roadway with bicyclists.
 - Limit grading impacts to the greatest extent feasible by minimizing the size of the pedestrian plaza, maintaining the existing roadway vertical geometry as much as possible, and possibly constructing retaining walls.

The conceptual plan does not address drainage, but by eliminating parking and working within the approximate existing right-of-way it is envisioned that a combination curb and swale system can be installed that provides pre-treatment to storm water runoff.



4. It is recommended that raised crosswalks be installed periodically (as shown on the conceptual design) to further reinforce the need for lower vehicular speeds along Craver Road. The existing grades encourage higher travel speeds for northbound motorists than can be safely accommodated along the roadway due to limited sight lines. Necessary sight distances for higher speed operation cannot be provided without major re-grading of the two crest vertical curves.



Pedestrians waiting to cross the northbound lanes of University City Boulevard near East Deck 2

As described in Chapter IV, University City Boulevard is a major arterial running along the southeast side of campus and connects to both the main and south entrances. There are high volumes of pedestrians, bicyclists and vehicles traveling on and crossing University City Boulevard throughout the day between John Kirk Drive and WT Harris Boulevard. Average daily traffic counts in 2004 were 40,600 vehicles per day and the posted speed limit is 50mph¹. The goal of each recommendation below is to improve the safety of all users of the roadway and to enhance the appearance and function of the roadway.

1. Change the character of University City Boulevard to better accommodate all modes of transportation and expected future growth.

In the City of Charlotte's 2006 *Transportation Action Plan (TAP)*², University City Boulevard is identified as a key corridor (drawn from the 1994 Centers and Corridors strategy) targeted for future residential and commercial development. Given the existing land uses along University City Boulevard in the vicinity of the campus and the expected future growth, University City Boulevard should be redesigned to provide a safe and convenient facility for all users, including pedestrians, bicyclists, and motorists. UNC Charlotte should work with the City and NCDOT to apply Policy 2.1.5 of the TAP to University City Boulevard "to create context-sensitive streets that include transit, bicycle and pedestrian friendly design features"³.

The TAP includes a roadway classification system that identifies University City Boulevard as a "Boulevard" (see figure on the following page). To reduce vehicle speeds and increase the safety of multi-modal users along UNC Charlotte property, the specific requirements for the design of boulevards outlined in the City's *Urban Street Design Guidelines* should be followed:

- Reduce speed limit from 50mph to 35-40mph.
- Create 11-foot wide travel lanes.
- Construct 6-foot minimum width sidewalks, with 8-foot minimum width buffer/planting strips.
- Install pedestrian-scale light fixtures.
- Intersections should be 1,000 feet to 1,200 feet apart to provide more frequent crossing opportunities. The corridor along UNC Charlotte property, from WT Harris Boulevard to John Kirk Drive is approximately 1 mile long. Six intersections or pedestrian crossings are proposed between these roads allowing approximately 1,000 feet between each: WT Harris Boulevard (existing signal), Cameron Boulevard (proposed mid-block crossing), new main entrance (proposed signal), Suther Road (existing signal), East Deck 2 (proposed mid-block crossing) and John Kirk Drive (existing signal).
- Include tree planting and other landscaping to improve the aesthetic quality of the roadway and calm traffic.

2. Construct or upgrade sidewalks on both sides of University City Boulevard.

- Construct a 12-foot wide path on the north side of University City Boulevard along UNC Charlotte property between John Kirk Drive and WT Harris Boulevard. The wider facility will accommodate shared-use, will allow bicyclists to travel east along the campus without crossing University City Boulevard, and will accommodate bicyclists who are not comfortable riding on the roadway. This multi-use facility should include a connection to the planned greenway that will extend northeast through campus.

¹ CDOT Traffic Count Data 2004

² www.charmeck.org/Departments/Transportation/Transportation+Action+Plan.htm

- Existing sidewalks on the southeast side of the roadway near Cameron Boulevard should be reconstructed to be a minimum of 6 feet wide with an 8-foot buffer (as per Charlotte's *Urban Street Design Guidelines*).



The City of Charlotte *Transportation Action Plan* 2006. Adopted Figure 3 (partial/modified).
www.charmeck.org/Departments/Transportation/Transportation+Action+Plan.htm

3. Create two mid-block crossings to improve the safety of pedestrians crossing University City Boulevard and to improve bicycle and pedestrian connectivity to retail and residential destinations.

- Create an at-grade mid-block crossing at University Walk Apartments and East Deck 2 (refer to drawing on following page).

- Install a 20-foot wide, high visibility crosswalk across University City Boulevard.
- Fill median drainage swale (build culvert under crossing). Creating a median level with the roadway surface will increase the visibility of pedestrians standing in the median waiting to cross the roadway.
- Install light fixtures to illuminate the crosswalk.
- Install pedestrian crossing warning signs.
- Construct a path through the middle of the grass pork-chop island on the north side of University City Boulevard at East Deck 2. Install a high visibility crosswalk on the garage's exit driveway and continue the path on the west side of the driveway to East Deck 2.
- Build a new sidewalk and curb ramps on the landscaped pork-chop island at University Walk Apartments. The existing island extends to the shoulder of the roadway, beyond the trees lining University City Boulevard. Pedestrians waiting on the island will be more easily seen by motorists traveling on University City Boulevard. The sidewalks should be connected into the apartment complex.



Pedestrians entering University Walk Apartments

- Create an at-grade mid-block crossing at Cameron Boulevard to improve access to residential areas such as College Downs, and retail areas southeast of University City Boulevard.

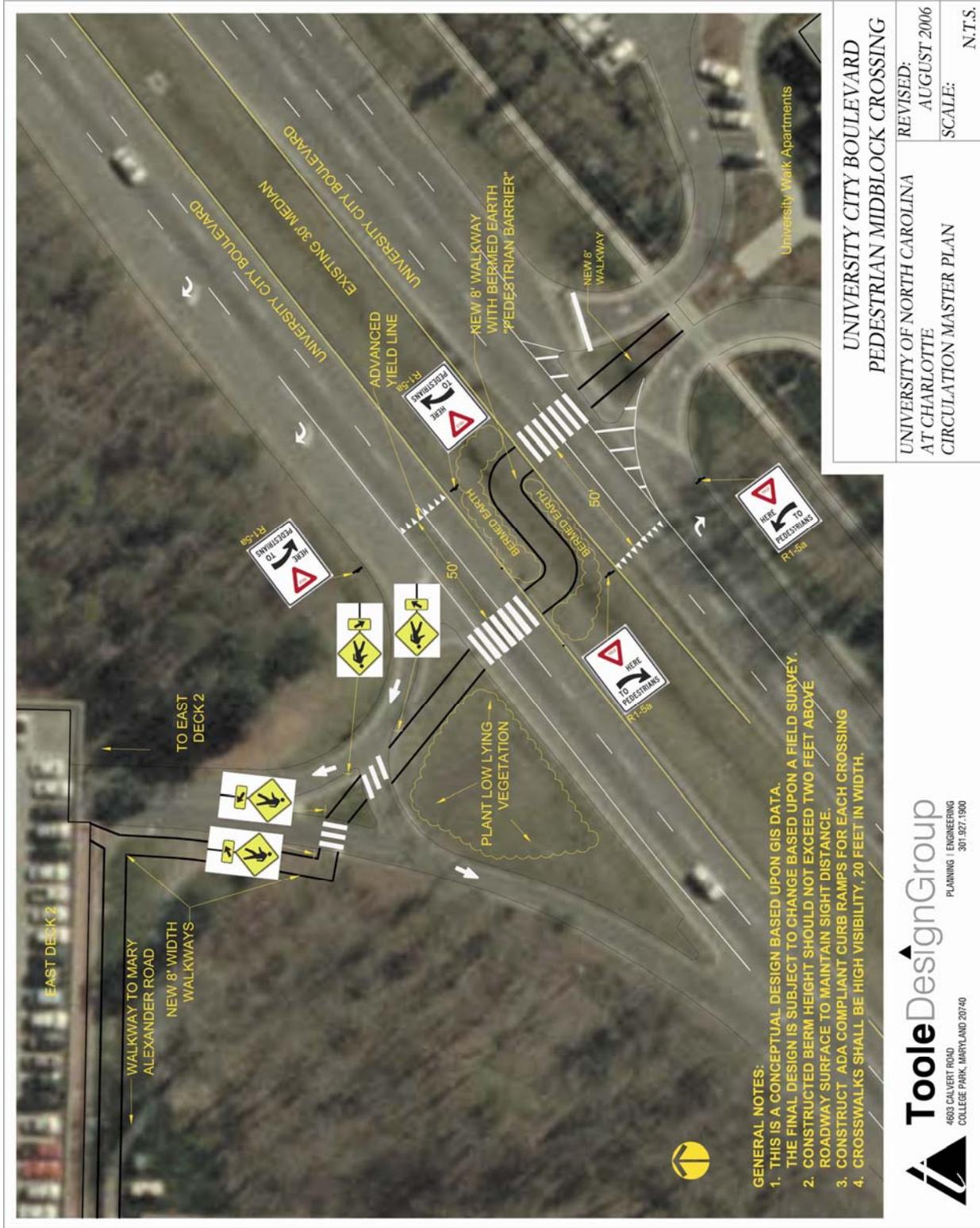
- Install a 20-foot wide, high visibility crosswalk across University City Boulevard.
- Fill median drainage swale (build culvert under crossing) to create a surface level with the roadway to increase the visibility of pedestrians standing in the median waiting to cross.
- Install light fixtures to illuminate crosswalk.
- Install pedestrian warning crossing signs.



Pork-chop island at University Walk Apartments

4. Create on-road bike facilities. Designate existing painted shoulders as bike lanes. Bike lanes should extend from WT Harris Boulevard to John Kirk Drive.

5. The intersection with John Kirk Drive should include high visibility crosswalks, pedestrian countdown signal heads, and pedestrian refuges.



**UNIVERSITY CITY BOULEVARD
PEDESTRIAN MIDDLEBLOCK CROSSING**

UNIVERSITY OF NORTH CAROLINA
AT CHARLOTTE
CIRCULATION MASTER PLAN

REVISED: AUGUST 2006
SCALE: N.T.S.

- GENERAL NOTES:**
1. THIS IS A CONCEPTUAL DESIGN BASED UPON GIS DATA. THE FINAL DESIGN IS SUBJECT TO CHANGE BASED UPON A FIELD SURVEY.
 2. CONSTRUCTED BERM HEIGHT SHOULD NOT EXCEED TWO FEET ABOVE ROADWAY SURFACE TO MAINTAIN SIGHT DISTANCE.
 3. CONSTRUCT ADA COMPLIANT CURB RAMPS FOR EACH CROSSING
 4. CROSSWALKS SHALL BE HIGH VISIBILITY, 20 FEET IN WIDTH.



TooleDesignGroup
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301.827.1900

NORTH TRYON STREET/US 29

North Tryon Street runs along the northwest side of UNC Charlotte and features the newly constructed Charlotte Research Institute (CRI). It carries substantial traffic; average daily traffic volumes were estimated at 37,900³ and the posted speed limit is 45mph. Numerous retail and residential destinations as well as bus stops are located across North Tryon Street in close proximity to UNC Charlotte. Students can be observed crossing the roadway mid-block to or from the CRI entrance frequently throughout the day. The following recommendations were developed to improve conditions for all roadway users, with an emphasis on facilities to encourage walking and biking.



Pedestrians crossing North Tryon Street mid-block to and from campus.

6. **Over the long term, the sidewalk and roadway standards established in the City of Charlotte's *Urban Street Design Guidelines* should be met.** North Tryon Street is also included in the Centers and Corridors strategy targeted for future growth. Existing land uses and pedestrian activity and anticipated growth on North Tryon warrant a street that includes transit, bicycle, and pedestrian friendly design features. The roadway is categorized in the City's TAP as a "boulevard" and should be designed to meet the standards established in Charlotte's *Urban Street Design Guidelines*:
 - 6-foot minimum width sidewalks, with 8-foot minimum width buffer/planting strips
 - 11-foot wide travel lanes
 - Speed limit of 35-40mph
 - On-road bicycle facilities
7. **Construct sidewalks on the northwest side of the roadway from the existing sidewalks to Mallard Creek Church Road.** Sidewalks should be a minimum width of 6 feet with an 8-foot buffer. Over the long term, the existing sidewalks should be reconstructed to meet City of Charlotte standards.
8. **On the southeast side of the roadway, construct a 10-12 foot wide multi-use path from Mallard Creek Church Road to WT Harris Boulevard.** The roadway is not currently designed to accommodate bicyclists. The multi-use trail will improve pedestrian and bicycle access from student residences northwest of campus, will serve the University Memorial Hospital, and will improve connectivity to CRI and the campus' recreational loop trails. The multi-use path will encourage the use of the crossing at the signalized intersection at Mallard Creek Church Road, and may reduce mid-block crossings near CRI. The path should include trail connections to the Mallard Creek Greenway and the planned Toby Creek Greenway.
9. **Include high visibility crosswalks, pedestrian countdown signals, and pedestrian refuges at the proposed signalized intersection at CRI.** As discussed in the Vehicular Circulation chapter, this plan supports the realignment of the entrance to CRI with the driveway to Mallard Pointe. A signalized intersection creates the opportunity to improve the safety of pedestrians and bicyclists by controlling traffic and providing crosswalks, signal heads and a median refuge.

³ CDOT Traffic Count Data 2004

10. The intersection with JW Clay Boulevard should include high visibility crosswalks, pedestrian countdown signal heads, and pedestrian refuges.
11. The intersection with W.T. Harris Boulevard should include high visibility crosswalks, pedestrian countdown signal heads, and pedestrian refuges.
12. The intersection with Mallard Creek Church Road should include high visibility crosswalks, and pedestrian refuges.
13. Over the long term, reduce the width of the travel lanes on North Tryon Street, per Charlotte's *Urban Street Design Guidelines*, and stripe 5' bike lanes to provide bicyclists with an on-road facility. In the short-term, bicyclists will be served by the proposed multi-use path along the southeast side of the road.

W.T. HARRIS BOULEVARD

WT Harris Boulevard is a major arterial running along the west side of campus. It is a six lane road, carrying an average daily traffic volume of 51,100⁴. As described in Chapter IV., Charlotte's *Urban Street Design Guidelines* designate WT Harris as a parkway whose primary function is to efficiently move motor vehicles. Although a parkway is not designed for pedestrians and bicyclists, the proximity and type of land uses on WT Harris Boulevard between Toby Creek Road and North Tryon Street generate pedestrian activity. Pedestrians were observed crossing WT Harris at the public library traveling to and from the library, hospital, pharmacy and restaurants. Consequently, several recommendations have been developed to improve safety for pedestrians and bicyclists using this section of WT Harris.



Pedestrian crossing WT Harris mid-block north of the library

14. Construct a 10-foot wide sidewalk with an 8-foot minimum grass buffer on the northeast side of WT Harris from Toby Creek Road to North Tryon Street to accommodate shared-use. The sidewalk should be located outside the existing guardrail (between the guardrail and the hospital).
15. Construct a 10-foot wide sidewalk with an 8-foot wide (minimum) grass buffer on the southwest side of WT Harris Boulevard from the shopping center entrance (across from the library) to the intersection of North Tryon Street.
16. Construct a mid-block crossing of WT Harris Boulevard at the library. The pedestrian-oriented land uses, proximity of destinations, and existing pedestrian activity crossing WT Harris mid-block warrant improved crossing treatments to make conditions safer.
 - Use the existing raised median (designed to channelize left turns) to divide the crossing into two segments. The crosswalk across the northbound lanes will be located south of the roadway to the library. Once pedestrians reach the median, they will walk north along the median to reach the crosswalk across the southbound lanes (aligned north of the driveway to the retail

⁴ CDOT Traffic Count Data 2004

strip). This will force pedestrians to face oncoming traffic and to cross one set of lanes at a time.

- Modify the median to add curb ramps, eliminate the rolled curb and install barrier curb. This will raise the median slightly and provide a greater sense of protection for the pedestrian.
- Install reflective flexible bollards on the narrow (north and south) ends of the median to increase visibility of the median.
- Install new light fixtures to adequately illuminate the crossing.
- Install pedestrian warning signs.

CAMERON BOULEVARD

Cameron Boulevard is a two-lane UNC Charlotte roadway that forms a loop around the campus from John Kirk Drive to University City Boulevard. Cameron Boulevard is a key campus roadway, providing access to a majority of facilities. A number of improvements should be made to Cameron Boulevard to create safer conditions for pedestrians, bicyclists and motorists.

17. Construct a 6-foot minimum-width sidewalk along the west side of the Cameron Boulevard from University City Boulevard to the existing sidewalk in front of the Belk Track and Field facility. A 10-foot minimum buffer width should be installed to allow for tree planting.
18. Construct a 6-foot minimum-width sidewalk on the east side of Cameron Boulevard from University Road to the intersection of Toby Creek Road. When plans are implemented to reconstruct Cameron Boulevard to create a full loop road to the new main entrance, sidewalks should be installed on both sides of the roadway. A 10-foot minimum buffer width should be installed to allow for tree planting.
19. Continue the existing sidewalk on the west side of Cameron Boulevard from Phillips Road to Lot 25. A 6-foot wide sidewalk with 10-foot wide buffer at a minimum should be constructed.
20. Construct a 6-foot wide minimum continuous sidewalk on both sides of Cameron Boulevard from the driveway to Lot 25 through to John Kirk Drive. A 10-foot minimum buffer width should be installed to allow for tree planting.
21. Re-stripe the existing bike lanes on Cameron Boulevard. Existing bike lanes are 3-1/2 to 4 feet wide and are faded. The roadway should be re-stripped with 5-foot wide bike lanes (per national standards), and continued the full length of the roadway from John Kirk Drive to Toby Creek Road. The existing roadway width south of Toby Creek Road is not sufficiently wide enough to accommodate bike lanes. However, when Cameron Boulevard is reconstructed as described above, 5-foot bike lanes should be included. This will improve connectivity from Toby Creek, the Alumni Center and the Chancellor's residence to the central part of campus. In the meantime, the segment of Cameron Boulevard between University City Boulevard and Toby Creek Road should be treated as shared-use.



Cameron Boulevard east of Mary Alexander Road

UNIVERSITY ROAD

University Road is a narrow roadway close to the central core of campus that connects Cameron Boulevard to Broadrick Boulevard. Due to the proximity of residence halls, parking garages and academic buildings, there is substantial pedestrian and vehicular activity on this short roadway. Drivers should be encouraged to drive slowly and to take alternate routes to reduce congestion and conflicts with pedestrians. A number of improvements should be made:

22. **Widen the 6-foot sidewalk on south side of University Road to 10 feet.** The existing street width is 24 feet. The travel lanes should be reduced to 10 feet wide and the extra 4 feet should be converted to sidewalk space.



Sidewalks on the south side of University Road

23. **Designate the roadway as shared-use by installing sharrows and bicycle route signage.** The narrower lane widths should encourage motorists to reduce speed, creating safer conditions for bicyclists.

24. **Construct an 8-foot wide sidewalk connection on the north side of University Road from the West Deck driveway to Cameron Boulevard.**

25. **Construct an 8-foot wide sidewalk connection on the north side of University Road from Reese to Cone Deck 1 to connect to the existing path to Cone Center.**

MARY ALEXANDER ROAD

Mary Alexander Road runs primarily north-south through campus from Mallard Creek Church Road to University City Boulevard. A new roundabout at Van Landingham Road diverts southbound traffic to Van Landingham Road. North of Cameron Boulevard, Mary Alexander is a city-maintained facility. The following improvements should be made to Mary Alexander Road in order to accommodate pedestrians and bicyclists and to reduce vehicle speeds.

26. **Remove on-street parking on Mary Alexander Road between Cameron Boulevard and Craver Road. Construct an 8-foot minimum width sidewalk on both sides of the street** (space constraints prohibit a wider sidewalk). If space allows, include a buffer between the sidewalk and the street. Sidewalks on the west side should connect to existing sidewalks at McEniry. Sidewalks on the east side should connect to the off-road path across from Fretwell.



Asphalt path along Mary Alexander Road

27. **Construct a 6-foot wide sidewalk on the west side of Mary Alexander from Mallard Creek Church Road to Cameron Boulevard. Prohibit on-street parking on the west side of the roadway.**

28. Reconstruct the existing 4-1/2-foot sidewalk on the east side of Mary Alexander from Mallard Creek Church Road to Cameron Boulevard to create a 6-foot wide sidewalk with a buffer. Trim tree branches to increase usable sidewalk space.

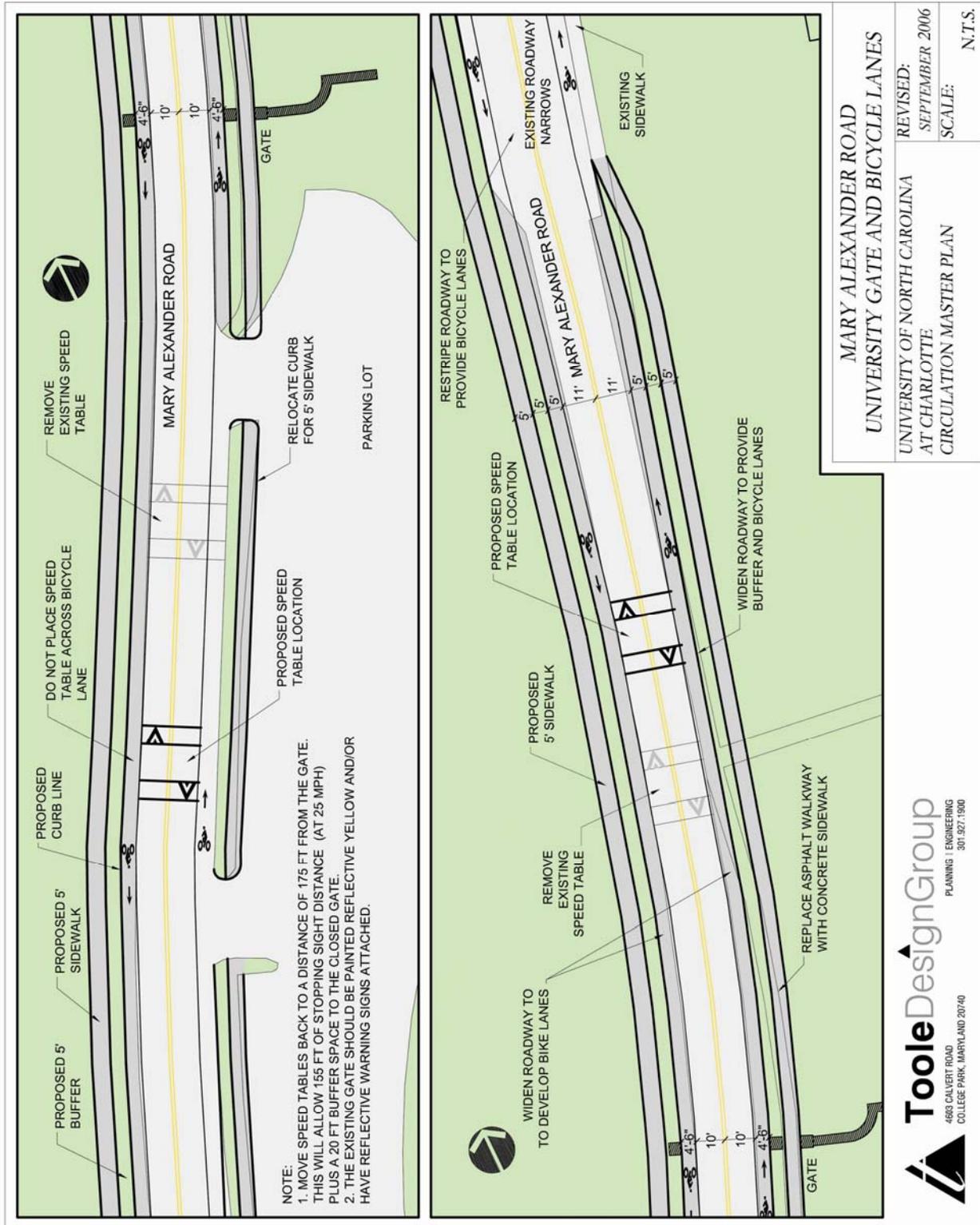
29. Between Cameron Boulevard and Mallard Creek Church Road, Mary Alexander Road should be re-striped to accommodate bike lanes and sidewalks on both sides of the roadway.

- The street should be striped with 10-foot wide travel lanes and 5-foot wide bike lanes. Extra roadway space can be used for sidewalk construction.
- Between the brick posts (29-1/2 feet wide), stripe 10' travel lanes and 4-1/2-foot bike lanes. Construct 6-foot minimum asphalt paths on both sides outside the brick posts to accommodate bicyclists when the gates are closed at night. Provide curb cuts before and after the posts to allow bicyclists to transition from the roadway to the paths.
- Improve drainage by repairing the gutters.



Gravel/worn path on Mary Alexander Road at McMillan Greenhouse

30. Improve functioning of the gate on Mary Alexander Road at Cameron Boulevard. The gate on Mary Alexander is closed at 11pm each night to prohibit vehicle access for security purposes. To improve the visibility of the gate, reflective tape or reflective yellow paint should be applied to the gate surface. The existing speed bumps should be moved 125 feet back from the gate to allow vehicles adequate stopping distance to the closed gate. A larger and more visible sign should be posted to indicate the gate closure time. See concept drawing on the following page for detailed recommendations for the gate and roadway improvements.



Concept drawing of improvements to a section of Mary Alexander Road

V. LIGHTING AND SAFETY RECOMMENDATIONS

It is important to maintain a safe campus for pedestrians, especially during evening hours. Area lighting is an issue throughout campus, as is easy access to blue emergency light locations. The following recommendations are made to improve and maintain a safe campus environment.

1. **Hold campus safety walks quarterly during both daylight and evening hours to observe and inspect:**
 - Lighting
 - Blue lights
 - Crossings
 - Pavement conditions
 - Visibility issues
 - Etc
2. **Rank needs immediately after each walk and address needs as soon as possible especially in keeping all existing lighting, blue lights and emergency phones in working condition.**
3. **Evaluate entire campus to determine the need for additional blue lights. The following priority areas have been identified as needing lights:**
 - In front of Reese
 - Between Cone Center and Belk Tower
 - In Parking Lot 7 by Belk Gym
 - In the Martin Village Area
4. **Add reflectors to crosswalks along High Rise Road.**
5. **Add lighting or increase lighting levels:**
 - Along wooded paths and to residential areas
 - Between Colvard, Reese and King
 - Cone and West Parking Decks
 - Back of Belk Gym
 - Martin Village Area
 - Mary Alexander and Phillips Roads
 - ATM areas and bookstore
 - Path to Charlotte Research Institute
 - Between Fretwell and Friday
 - Crossroads Café area
6. **Initiate a website or email address and phone/fax numbers for students and faculty to report lighting and safety issues.** This contact information needs to be published regularly in the campus newspaper and online.

VI. RECOMMENDATIONS FOR ALTERNATIVE MEANS OF MOBILITY

The topography remains the biggest challenge facing pedestrians and those using assistive devices traveling the UNC Charlotte campus. Disability Services has produced a map that is available on the UNC Charlotte website that outlines accessibility routes and parking areas. There are also “blind” routes associated with dorms housing the blind and campus buildings for which they have classes.

The university should continue to strive to make UNC Charlotte accessible to all users.

1. Clear signage should be introduced that highlights accessible and blind routes and crossings as reflected on the Disabilities Awareness Maps.
2. Consideration should be given to introducing an on-demand shuttle for both on and off campus needs.
3. Regular inspections (quarterly) should be conducted at each building access designated as accessible to ensure pathways are clean of debris, lighting and door opening equipment are fully operational and directional signage is visible.
4. Develop policies and rules that should be put in place to address other means of mobility such as scooters and segways. It is highly suggested that scooters not be allowed on campus walkway systems and follow the same rules as motorcycles.
5. Policies on segways should guide use and define parking and storage requirements related to buildings, pathways and streets, as segways are designed to work anywhere pedestrians are also found. Each campus building would need to be reviewed for segway access, much like ADA accessibility. The Illinois Institute of Technology (IIT) has published “Proposed Usage Guidelines for the Segway Human Transporter” which can be reviewed as an example (view at: <http://segway.iit.edu/pg.pdf>). In addition to IIT, other segway friendly campuses include: Duke University, MIT, Stanford University and Xavier University.

VII. SIGNAGE AND WAYFINDING RECOMMENDATIONS

Signage and wayfinding will be extremely important as the UNC Charlotte campus continues to grow in building expansion and in increased enrollment over the next decade. Vehicular traffic will need to be able to easily access the campus and find parking quickly. Pedestrian and bicycle users need to find their destinations without difficulty.

1. All buildings need to have easy-to-read identification signage.

2. Buildings which need new on-building identification signage include:

- Belk Gym - Central East Side
- Both residence cafeterias
- Engineering Research Building - Northwest and Southeast Sides
- Applied Optics and Physics Building - Northwest and Southeast Sides
- Colvard North and South - East and West Sides
- Winningham - West Side
- Storrs - North Side
- Macy - West Side
- Friday - North Side
- McEnry - East and South Side
- Smith - Southeast Corner
- Prospector Cafeteria - East Side

3. Buildings which need new in-ground identification signage include:

- King - Relocate existing sign on East Side
- Rowe - East Side
- Storrs - East and West Side
- Robinson - East Side
- Fretwell - North Side
- Kennedy - North Side
- McEnry - East Side



Temporary sign for Colvard and Storrs Halls

4. Directional Signage - On Campus

- Parking Decks and Lots - Need wayfinding kiosks or directories at key pedestrian nodes leading from parking facilities (especially, West Deck, Cone Decks and East Decks) into campus to direct students and visitors to key destinations on campus. Key destinations for students, faculty, staff and visitors arriving on campus include the Barnhardt Student Activity Center, Atkins Library, Bookstore, Robinson Hall, Reese, King and the Charlotte Research Institute.
- Main Pedestrian Sidewalk Intersections - Need wayfinding directories at key pedestrian nodes on campus to direct students and visitors to key destinations. Smaller directional signs should also be installed at sidewalk nodes to direct students and visitors to specific buildings, thus replacing the temporary cardboard signage that is installed at the beginning of each semester.
- Residential Villages - Need new signage that is easily visible and a locator map of the building letters.
- Facilities Management - Needs better signage directing visitors to parking as well as to the main entrance.

5. Directional Signage - Off Campus

- WT Harris Blvd - Needs a sign on southbound side directing UNC Charlotte visitors to exit

- onto University Blvd.
- US 49/US 29 split northbound needs signage directing visitors onto US 49
 - I-85 needs signs northbound directing visitors to Exit onto W.T. Harris Boulevard.
 - I-77 needs a southbound sign at W.T. Harris Boulevard.
 - Need signs at W.T. Harris Boulevard and US 29 intersection.
 - I-485 needs signage both directions on the interstate directing visitors to exit onto US 49. There are signs at each exit, but are located at US 49 only after one has exited the interstate.
 - W.T. Harris needs sign directing visitors to turn onto Toby Creek.
 - Need signage at the back entrance to Charlotte Research Institute campus from US 29.

XI. PROJECT IMPLEMENTATION TABLE

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
Cone Deck 1	Vehicle Circulation	Shrubs on the northeast corner of the garage should be trimmed or removed to improve visibility for drivers exiting the garage.	n/a	Short Term
CRI	Vehicle Circulation	Rebuild the median island south of CRI.	n/a	Mid Term
CRI	Vehicle Circulation	Align the entrance to CRI on North Tryon Street with the driveway to the Mallard Pointe retail strip and create a signalized intersection.	n/a	Mid Term
John Kirk Drive	Vehicle Circulation	Conduct a traffic study of the intersection of John Kirk Drive and University City Boulevard.	n/a	Mid Term
Lot 6	Vehicle Circulation	Reconfigure Lot 6 to reduce driveways in and out of the parking lot.	n/a	Long-term
Phillips Road	Vehicle Circulation	Realign Phillips Road with Craver Road. Close original segment east of tennis courts to vehicles, reconstruct curb, and create new crossing with median refuge.	n/a	Long-term
University Road	Vehicle Circulation	Prohibit delivery access and pick-up/drop off activity on University Road at Colvard and Reese.	n/a	Mid Term
University Road	Vehicle Circulation	Conduct an intersection analysis of University Road and Cameron Boulevard.	n/a	Mid Term
CRI	Traffic Calming	Install traffic calming treatments around CRI.	n/a	Mid Term
CRI	Traffic Calming	Install two raised crosswalks in front of the main buildings for pedestrian crossings and to slow traffic.	n/a	Short Term
Martin Village Road	Traffic Calming	Install traffic calming treatments on Martin Village Road.	n/a	Short Term
Phillips Road	Traffic Calming	Install traffic calming treatments on Phillips Road.	n/a	Mid Term
Van Landingham Road	Traffic Calming	Install traffic calming treatments on Van Landingham Road.	n/a	Mid Term
Witherspoon Road	Traffic Calming	Install traffic calming treatments on Witherspoon Road.	n/a	Long Term
Cameron Boulevard	Traffic Calming	Install two raised crosswalks in front of Belk Track and Field to increase pedestrian visibility and slow traffic.	n/a	Short Term
Campus-wide	Parking	Revisit the demand for parking once the campus shuttle has been operating for several months.	n/a	Short Term
Campus-wide	Parking	Establish a goal to reduce the per student provision of parking.	n/a	Short Term
Campus-wide	Parking	Restrict resident student parking and commuters living within 1/4 mile to a designated lot on the fringe of campus.	n/a	Short Term
Campus-wide	Parking	Prohibit freshmen from bringing cars to campus.	n/a	Long Term
Campus-wide	Parking	Consider a tiered parking permit pricing structure for commuters and faculty and staff.	n/a	Mid Term
Campus-wide	Parking	Establish an annual price increase for all parking permits.	n/a	Short Term
Campus-wide	Parking	Implement incentive programs to encourage students, faculty, and staff to not purchase parking permits.	n/a	Mid Term
University Road	Parking	Reconfigure permits allowed in West Deck and Lot 7 to improve circulation on University Road.	n/a	Mid Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
Barnhardt Lane	Sidewalks and Pathways	Widen existing path from Barnhardt Lane to Cameron Blvd at Phillips Rd.	12' wide	Long Term
Cafeteria	Sidewalks and Pathways	Widen existing path northeast of the Cafeteria at Martin Village to accommodate multi-use. Trim shrubbery to increase security and visibility.	12' wide	Long Term
Campus-wide	Sidewalks and Pathways	Limit the use of maintenance trucks on pedestrian pathways through campus.	n/a	Short Term
Cedar Hall	Sidewalks and Pathways	Reduce street width from 18 feet to 15 feet to accommodate a new sidewalk on the south side of the street.	6' wide min	Mid Term
Chancellor's Place	Sidewalks and Pathways	Construct a sidewalk along the north side of the full length of Chancellor's Place.	6' wide min	Mid Term
CRI	Sidewalks and Pathways	Construct an off-road pathway from North Tryon Street through the planned buildings to connect directly to the east side of the Engineering and Research building. Connect the end of the driveway to the path that runs along the east side of the practice fields.	10' wide min	Long Term
East Deck 2	Sidewalks and Pathways	Construct an off-road pathway from North Tryon Street through the planned buildings to connect directly to the east side of the Engineering and Research building. Connect the end of the driveway to the path that runs along the east side of the practice fields.	6' wide min	Mid Term
High-Rise Road	Sidewalks and Pathways	Construct a sidewalk on the north side of High-Rise Road from Broadrick Blvd (or planned roundabout for new main entrance) to the driveway to Hunt Village. Narrow existing roadway width along Lot 8 from 26 feet to 20 feet to accommodate a sidewalk and buffer and reduce vehicle speeds.	8' wide min	Mid Term
John Kirk Drive	Sidewalks and Pathways	Construct a continuous sidewalk on the west side of John Kirk Drive from Mary Alexander to University City Boulevard.	6' wide min	Mid Term
John Kirk Drive	Sidewalks and Pathways	Construct a sidewalk on the east side of John Kirk Drive from the driveway to University Terrace to University City Boulevard.	6' wide min	Short Term
Library Lane	Sidewalks and Pathways	Continue existing sidewalk from Craver Road, to the north edge of the Smith building. Create a brick walkway/roadway of a consistent width of 20' between Library Lane north and Library Lane South. Will serve pedestrians and will allow delivery vehicles and maintenance carts to access facilities.	20' wide	Mid Term
Lot 20	Sidewalks and Pathways	Construct a sidewalk on the southeast side of the driveway from the roadway along Lot 20. Connect to existing sidewalks leading to Phase 8.	6' wide min	Mid Term
Lot 8	Sidewalks and Pathways	Reconstruct and improve the path connection from Lot 8 to Cameron Boulevard	10' min	Long Term
Mallard Creek Greenway	Sidewalks and Pathways	Create multi-use paths to connect to the greenway.	10' min	Mid Term
Martin Village Road	Sidewalks and Pathways	On the west side of Martin Village Road, sidewalk gaps should be filled from Cameron Blvd to Van Landingham Rd. On the east side, continue sidewalk from Van Landingham Rd to the southern edge of Lot 6. If this roadway is reconstructed sidewalks should be constructed the full length of the east side.	8' wide min	Short Term
Planned Greenway	Sidewalks and Pathways	Create multi-use paths to connect to the greenway.	10' min	Long Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
Smith Building lot	Sidewalks and Pathways	The parking lot should be re-striped, landscaped, and a formal pedestrian pathway created.	8' wide min	Long Term
Toby Creek Road	Sidewalks and Pathways	Construct a sidewalk on the north side of Toby Creek Road from Cameron Boulevard to WT Harris	6' wide min	Long Term
Van Landingham Road	Sidewalks and Pathways	Construct sidewalks on the north side of Van Landingham Rd between Martin Village Rd and John Kirk Dr.	8' wide min	Mid Term
Van Landingham Road	Sidewalks and Pathways	Create continuous sidewalk on the south side of the roadway from Mary Alexander to John Kirk Drive	8' wide min	Short Term
Witherspoon Road	Sidewalks and Pathways	Construct a sidewalk on the northwest side of the roadway from Cameron Boulevard along Lot 21 to connect to existing sidewalks at Witherspoon.	6' wide min	Long Term
West Deck	Sidewalks and Pathways	Construct a sidewalk on the south side of West Deck to University Road	6' wide min	Long Term
Hunt Village	Sidewalks and Pathways	Construct a multi-use path from Hunt Village/Lot 9a to Cameron Boulevard	10' wide min	Long Term
Campus-wide	Roadway Crossings	Establish priorities for improving connectivity to adjacent neighborhoods	n/a	Short Term
Campus-wide	Roadway Crossings	Improve roadway crossings throughout campus by installing high visibility or parallel line crosswalks and pedestrian signal heads	n/a	Short Term
Campus-wide	Roadway Crossings	Install fluorescent yellow-green pedestrian warning signs (W11-2) with arrow subplates (W16-7) at all key crossing locations	n/a	Short Term
Martin Village Road	Roadway Crossings	Install pedestrian refuge across driveway to Lot 5 on Martin Village Rd	n/a	Mid Term
Van Landingham Road	Roadway Crossings	Install pedestrian refuge on John Kirk Dr at Van Landingham	n/a	Short Term
WT Harris Blvd	Roadway Crossings	Install high visibility crosswalks, signal heads and pedestrian refuges on WT Harris at the intersection with North Tryon Street	n/a	Mid Term
Broadrick Boulevard	On-Road Bike	The new main entrance and reconstruction of Broadrick Boulevard should include bike lanes	5' wide	Mid Term
Campus-wide	On-Road Bike	Incorporate bike route and wayfinding signs to direct cyclists to routes and parking.	n/a	Long Term
Chancellor's Place	On-Road Bike	Designate as shared-use roadway. Install signage and sharrow pavement markings.	n/a	Mid Term
High-Rise Road	On-Road Bike	Stripe bike lanes from Broadrick Blvd to Lot 8. Once the full campus loop is created, connecting High-Rise Rd to Cameron Blvd, bike lanes should be included on all roadways.	5' wide	Long Term
John Kirk Drive	On-Road Bike	John Kirk Drive north of Van Landingham is a 38-foot wide, 2 lane road with a continuous center turn lane. Center turn lane should be removed and bike lanes striped on both sides.	5' wide	Short Term
John Kirk Drive	On-Road Bike	Bike lanes should be striped on John Kirk Dr, south of Van Landingham. Current roadway width will only allow for a 3' - 5' bike lane on the east side. Bike lane striping should be coordinated with restriping of left turn lanes to University City Boulevard.	5' wide	Mid Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
JW Clay Boulevard	On-Road Bike	4-lane road with raised median and turn lane pockets. Re-stripe to create 9'-10' wide turn lanes, 10' through lane, and 12'-15' wide outside lane. Include share the road signage	Wide outside lane	Long Term
Mallard Creek Church	On-Road Bike	Stripe bike lanes from student residential areas north of North Tryon Street to the intersection of Mary Alexander Road	5' wide	Mid Term
Martin Village Road	On-Road Bike	Designate as shared-use roadway (current road width of 23.5' will not accommodate bike lanes). Install signage and sharrow pavement markings and follow traffic calming recommendations. If road is reconstructed along with redevelopment of Martin Village, bike lanes should be included.	n/a	Mid Term
Phillips Road	On-Road Bike	Designate as shared-use roadway. Install signage and sharrow pavement markings and follow traffic calming recommendations.	n/a	Mid Term
Toby Creek Road	On-Road Bike	Stripe bike lanes	5' wide	Long Term
Van Landingham Road	On-Road Bike	Designate as shared-use roadway. Install signage and sharrow pavement markings and follow traffic calming recommendations.	n/a	Short Term
Campus-wide	Bicycle Parking	Add additional bicycle racks throughout campus.	n/a	Mid Term
Campus-wide	Bicycle Parking	Provide supportive bicycle racks; gradually replace existing rack style with U-racks.	n/a	Short Term
Campus-wide	Bicycle Parking	Provide covered bike parking or bike shelters in key locations on campus	n/a	Mid Term
Campus-wide	Bicycle Parking	Provide bicycle parking in vehicle garages	n/a	Long Term
Programmatic	Alt. Means of Mobility	Establish policy that addresses scooter and Segue use.	n/a	Mid Term
Programmatic	Bicycle	Establish a goal to raise the percentage of bicyclists commuting to campus or class to 5% over a 5-year timeframe.	n/a	Short Term
Programmatic	Bicycle	Develop a bike rental program.	n/a	Mid Term
Programmatic	Bicycle	Create a bicycling section on the UNC Charlotte website with prominent placement that promotes bicycling on campus and informs bicyclists.	n/a	Short Term
Programmatic	Bicycle and Pedestrian	Develop a guide for pedestrians, bicyclists, transit users and motorists on how to travel around campus safely.	n/a	Mid Term
Programmatic	Bicycle and Pedestrian	Develop a commuter encouragement program to raise awareness and encourage bicycle commuting.	n/a	Long Term
Programmatic	Bicycle and Pedestrian	Increase parking permit rates and restrict student parking.	n/a	Short Term
Programmatic	Bicycle and Pedestrian	Initiate a Commute Club or Commute Trip Reduction program for employees.	n/a	Long Term
Programmatic	Bus Transit	Provide information on CATS routes and stops on UNC Charlotte website.	n/a	Short Term
Programmatic	Lighting & Safety	Initiate contact locations on the UNC Charlotte website for reporting of lighting and safety issues.	n/a	Short Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
Craver Road	On-Road Bike	Designate as shared-use roadway/pathway. Follow recommendations for the Craver Rd re-design to restrict vehicles and create a roadway prioritizing bike/ped activity.	n/a	Mid Term
Craver Road	Parking	Eliminate the perpendicular parking along the north side of Craver Road, Eliminate the parking in the Cameron Lot.		Long Term
Craver Road	Roadway Crossings	Install raised crosswalks along Craver Road as per the concept design.		Long Term
Craver Road	Sidewalks and Pathways	Create a continuous and consistent roadway cross section and construct sidewalks the full length of the south side of the road.	10' min walk, 6' min buffer	Long Term
Craver Road	Vehicle Circulation	Provide a level (2% max slope) pedestrian plaza; use alternative surface and allow bus and delivery access only. Road will need regrading.	60' wide	Long Term
University City Boulevard	On-Road Bike	Designate existing 10'-16' shoulders as bike lanes with pavement markings. Follow Key Corridor recommendations to reduce vehicle speeds on University City Blvd.	5' minimum	Short Term
University City Boulevard	Pedestrian	Install pedestrian scaled lighting.	n/a	Mid Term
University City Boulevard	Roadway Crossings	Create an at-grade mid-block crossing at University Walk Apartments and East Deck 2.	n/a	Mid Term
University City Boulevard	Roadway Crossings	Create an at-grade mid-block crossing at Cameron Boulevard.	n/a	Long Term
University City Boulevard	Roadway Crossings	Include high visibility crosswalks, pedestrian signal heads, and refuges at the intersection with John Kirk Drive.	n/a	Short Term
University City Boulevard	Sidewalks and Pathways	Construct/reconstruct sidewalks on the southeast side of the roadway to meet design specifications.	6' min walk, 8' min buffer	Mid Term
University City Boulevard	Sidewalks and Pathways	On the northwest side of the roadway, construct a multi-use path from WT Harris to John Kirk Drive.	12' path; 8' min buffer	Mid Term
University City Boulevard	Vehicle Circulation	Reduce width of travel lanes.	11' wide	Short Term
University City Boulevard	Vehicle Circulation	Reduce speed limit from 50mph to 35-40mph.		Short Term
North Tryon Street	On-Road Bike	Provide bike lanes.	5' minimum	Long Term
North Tryon Street	Roadway Crossings	Include high visibility crosswalks, pedestrian countdown signals, and pedestrian refuges at the proposed signalized intersection at CRI.	n/a	Long Term
North Tryon Street	Roadway Crossings	The intersection with JW Clay Blvd should include high visibility crosswalks, pedestrian countdown signal heads, and pedestrian refuges.	n/a	Mid Term
North Tryon Street	Roadway Crossings	The intersection with W.T. Harris Blvd should include high visibility crosswalks, pedestrian countdown signal heads, and pedestrian refuges.	n/a	Mid Term
North Tryon Street	Roadway Crossings	The intersection with Mallard Creek Church Road should include high visibility crosswalks, and pedestrian refuges.	n/a	Mid Term
North Tryon Street	Sidewalks and Pathways	Upgrade existing sidewalks on the northwest side of the roadway to meet City standards.	6' min walk, 8' min buffer	Long Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
North Tryon Street	Sidewalks and Pathways	Construct sidewalks on the northwest side of the road from the existing to Mallard Creek Church Road.	6' min walk, 8' min buffer	Mid Term
North Tryon Street	Sidewalks and Pathways	On the southeast side, construct a multi-use path from Mallard Creek Church Road to WT Harris Boulevard.	12' path; 8' min buffer	Long Term
North Tryon Street	Vehicle Circulation	Reduce width of travel lanes.	11' wide	Long Term
North Tryon Street	Vehicle Circulation	Reduce speed limit from 50mph to 35-40mph.	n/a	Long Term
WT Harris Boulevard	Roadway Crossings	Construct a mid-block crossing of WT Harris Boulevard at the library.		Long Term
WT Harris Boulevard	Sidewalks and Pathways	Construct a sidewalk with a grass buffer on the northeast side of WT Harris from Toby Creek Road to North Tryon Street.	10' wide walk, 8' buffer	Long Term
WT Harris Boulevard	Sidewalks and Pathways	Construct a sidewalk with a grass buffer on the southwest side of WT Harris Boulevard from the shopping center entrance (across from the library) to the intersection of North Tryon Street.	10' wide walk, 8' buffer	Long Term
Cameron Boulevard	On-Road Bike	Stripe bike lanes from John Kirk Drive to Toby Creek Road.	5' wide	Short Term
Cameron Boulevard	Roadway Crossings	Create new crossing location from Phillips Rd to path leading to Barnhardt Lane. Include ped refuge.	n/a	Mid Term
Cameron Boulevard	Sidewalks and Pathways	Construct a sidewalk along the west side of the Cameron Boulevard from University City Boulevard to the existing sidewalk in front of the Belk Track and Field facility.	6' min walk, 10' min buffer	Mid Term
Cameron Boulevard	Sidewalks and Pathways	Construct a sidewalk on the east side of the road from University Road to the intersection of Toby Creek Road.	6' min walk, 10' min buffer	Long Term
Cameron Boulevard	Sidewalks and Pathways	Continue the existing sidewalk on the west side of Cameron Boulevard from Phillips Road to the driveway to Lot 25.	6' min walk, 10' min buffer	Mid Term
Cameron Boulevard	Sidewalks and Pathways	Construct a continuous sidewalk on both sides of Cameron Boulevard from the driveway to Lot 25 through to John Kirk Drive.	6' min walk, 10' min buffer	Short Term
Cameron Boulevard	Vehicle Circulation	Restrict left turns from Cameron Blvd on to University City Boulevard. Install signage.	n/a	Short Term
University Road	On-Road Bike	Designate as shared-use roadway. Install signage and sharrow pavement markings.	n/a	Short Term
University Road	Sidewalks and Pathways	Widen the sidewalk on south side of University Road.	10' min	Long Term
University Road	Sidewalks and Pathways	Construct a sidewalk connection on the north side of the road from the West Deck driveway to Cameron Boulevard.	8' min	Long Term
University Road	Sidewalks and Pathways	Construct a sidewalk connection on north side of the road from Reese to Cone Deck 1.	8' min	Mid Term

Project Location	Project Type	Project Description	Facility Dimensions	Timeline/ Priority
Mary Alexander Road	On-Road Bike	Restripe road between Cameron Boulevard and Mallard Creek Church Road to accommodate bike lanes (and sidewalk).	10' travel, 5' bike lanes	Short Term
Mary Alexander Road	On-Road Bike	Stripe bike lanes from Broadrick Blvd to Cameron Blvd.	5' wide	Mid Term
Mary Alexander Road	Sidewalks and Pathways	Construct a sidewalk on both sides of the street from Mallard Creek Church Road to Broadrick Blvd with a buffer if space allows. Remove on-street parking.	6' min walk, 10' min buffer	Mid Term
Mary Alexander Road	Sidewalks and Pathways	Reconstruct and widen existing sidewalk on the east side of the road from Mallard Creek Church Road to Cameron Boulevard.	6' min walk, 10' min buffer	Long Term
Mary Alexander Road	Sidewalks and Pathways	Trim branches along the sidewalk.	n/a	Short Term
Mary Alexander Road	Vehicle Circulation	Construct a vehicle pick-up and drop-off turnaround area on Mary Alexander Road north of Fretwell.	n/a	Mid Term
Mary Alexander Road	Vehicle Circulation	Improve functioning of the gate on Mary Alexander Road at Cameron Boulevard.	n/a	Mid Term
Mary Alexander Road	Vehicle Circulation	Study functioning of the new traffic signals in the roundabout at Mary Alexander Road and Van Landingham.	n/a	Short Term
Campus-Wide	Alt. Means of Mobility	Introduce clear signage highlighting accesible and blind routes.	n/a	Short Term
Campus-Wide	Alt. Means of Mobility	Develop policies and rules to guide scooter and segway use on campus	n/a	Short Term
Campus-Wide	Bus Transit	Ensure circulation routes serving CATS bus stops are well lit and vegetation maintained for good visibility.	n/a	Short Term
Campus-Wide	Shuttle/Bus Transit	Work with CATS to provide bus shelters at each shuttle and bus stop.	n/a	Mid Term
Bookstore	Lighting & Safety	Add lighting or increase lighting levels around bookstore and ATM areas.	n/a	Short Term
Campus-Wide	Lighting & Safety	Hold campus safety walks quarterly.	n/a	Short Term
Colvard	Lighting & Safety	Add lighting or increase lighting levels on sidewalks between Colvard , Reese, and King.	n/a	Short Term
Cone Deck	Lighting & Safety	Add lighting or increase lighting levels between Cone Deck and Cone Center.	n/a	Short Term
CRI	Lighting & Safety	Add lighting or increase lighting levels on Pathway from Main campus to CRI.	n/a	Short Term
Mary Alexander Road	Lighting & Safety	Add lighting or increase lighting levels along Mary Alexander Road.	n/a	Short Term
Phillips Road	Lighting & Safety	Add lighting or increase lighting levels along Phillips Road.	n/a	Short Term
Campus-Wide	Signage & Wayfinding	Need permanent visible in-ground directional signage in central campus area for all buildings.	n/a	Short Term
Campus-Wide	Signage & Wayfinding	Evaluate all buildings for visible on-building identification signage.	n/a	Short Term
Campus-Wide	Signage & Wayfinding	Add wayfinding kiosks and directories at key pedestrian nodes leading from parking facilities to direct students and visitors to key destinations on campus.	n/a	Short Term
Campus-Wide	Signage & Wayfinding	Add wayfinding directories at key pedestrian nodes to direct students and visitors to key destinations on campus.	n/a	Short Term
Campus-Wide	Signage & Wayfinding	Add smaller directories at sidewalk crossing nodes to direct students and visitors to specific buildings.	n/a	Short Term
Off-Campus	Signage & Wayfinding	Add signage along major thoroughfares serving the UNC Charlotte area.	n/a	Short Term
US Hwy 29	Signage & Wayfinding	New entrance signage to CRI and campus from North Tryon Street.	n/a	Short Term

IX. CONCLUSION

This Campus Circulation Master Plan is only one element in addressing the fast moving expansion of the UNC Charlotte campus and its increasing enrollment as we begin the 21st Century. With the introduction of more students, faculty, staff and visitors to meet the growing needs of the campus community, the focus on connectivity throughout campus via walkways, bikeways and shuttles and being less dependent on the need for an automobile continues to be a critical focus of the direction in the growth of the campus.

The Circulation Master Plan is only one ingredient of a soon to be initiated Campus Facility Master Plan Update. In conjunction with the Parking Master Plan, initial Shuttle System plan, the “integrating Enrollment, Space, and Master Planning” CPC Conference; these elements will all help define the future of the UNC Charlotte Campus.

Circulation has become more than how people arrive and leave campus, especially via the automobile. This planning process has looked at students, faculty, staff and visitors as they arrive on foot, via bicycle, mass transit, etc., how they maneuver around campus, get to jobs, go off-campus for eating establishments and leave at the end of the day. The plan becomes a guide for getting people safely around campus and looks at improvements in making the campus more pedestrian and bicycle friendly.

The plan continues the direction as visualized in the 2000 Facility Master Plan:

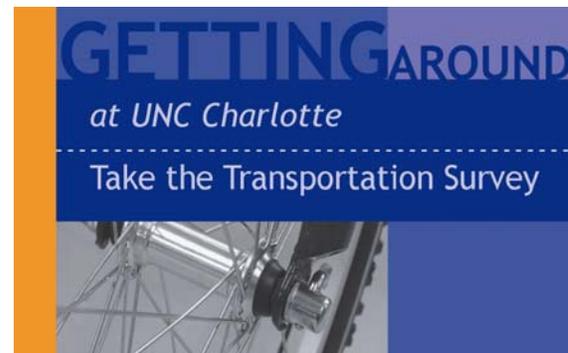
“The University shall establish the highest priority for pedestrians on campus while recognizing the need for a soundly reasoned system of circulation involving vehicles of various kinds, including bicycles. This shall be achieved through appropriate measures of circulation, separation and articulation.”

APPENDIX A - ONLINE SURVEY SUMMARY

INTRODUCTION

Input from members of the campus community is critical to the success of the *Campus Circulation Master Plan* at the University of North Carolina at Charlotte. Recommendations to improve access and mobility should meet the needs of those who walk, bike, drive and take transit to and from campus. A key element of the Public Participation Task for this study was to survey regular users of the campus (students, faculty and staff) and visitors to campus (such as local community members, alumni and parents). A web-based survey was developed to gain input from these distinct audiences. The goal of the survey was to measure habits, opinions and attitudes regarding transportation to and from campus. The study addressed topic areas such as:

- Commute trip patterns
- Availability of bicycle facilities including lanes and bicycle parking
- Adequacy of sidewalks/paths on and adjacent to campus
- Usage of CATS buses and opinions regarding a potential campus shuttle system
- Accessibility of campus facilities for those using assistive devices
- Feasibility and safety of roadway crossings
- Wayfinding and signage to campus facilities
- Adequacy of lighting on campus



Graphic posted on the UNCC website linking to the survey

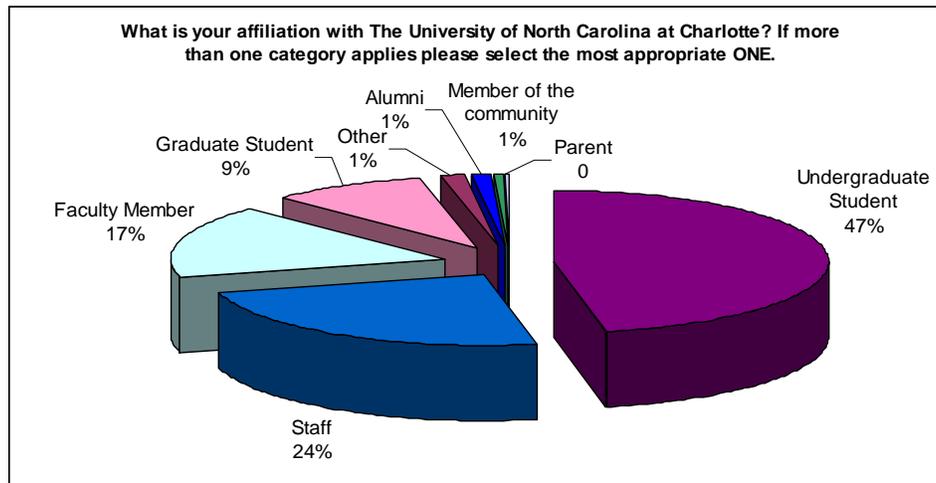
A link to the survey was posted on the UNC Charlotte website from March 15th through March 31, 2006.

Email notifications were sent to the campus community to promote the survey to a wide audience. During the two week period, more than 2,300 responses were received.

KEY FINDINGS

Nearly one half of the respondents were undergraduate students and one quarter were staff members. Faculty members accounted for more than 15% of respondents, while the remaining respondents comprised of graduate students, alumni, parents, and members of the community (See Figure 1).

Figure 1

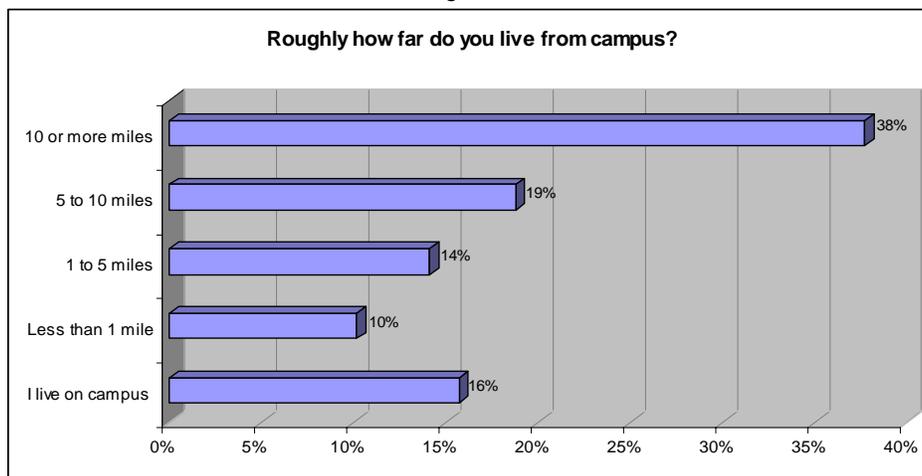


Students, Faculty and Staff Respondents

Commute Trip and Mode

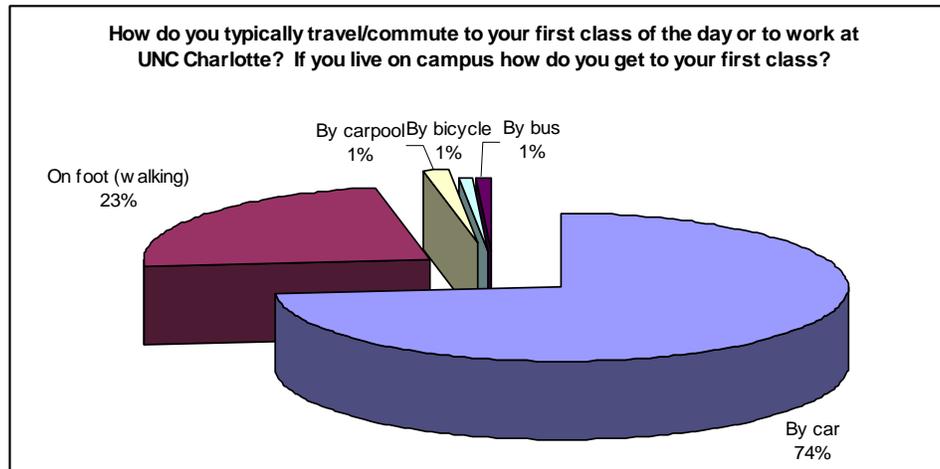
- One-fourth of student, faculty and staff respondents (586 respondents) live less than one mile from campus. Approximately 40% of respondents live ten or more miles from campus (see Figure 2).
- Of those respondents who live less than one mile away, 95% are students. 80% of these student respondents walk to campus and 16% drive. Of those who live more than 10 miles away, half are faculty or staff members.

Figure 2



- Three-fourths of student, faculty and staff respondents commute to UNC Charlotte by car. Nearly one-fourth of respondents walk, and a very small number commute by bike, bus, motorcycle, skateboard or carpool (see Figure 3). The survey suggests that the current bicycling mode share at UNC Charlotte is approximately 1%.

Figure 3



Bicycling

- Buildings or facilities on campus cited most often by bicycle commuters as needing additional bicycle parking include:
 - Science and Technology
 - College of Education
 - Fretwell
- Roads on or near campus most often cited by bicycle commuters as needing improvements for bicyclists (bicycle lanes, wide shoulders, separate path).
 - Mary Alexander Road
 - University City Blvd (NC 49)
 - Mallard Creek Church Road
 - Tryon (US 29)
- Approximately 40% of student, faculty and staff respondents cited that dedicated bike lanes, trails and pathways and financial incentives would most encourage them to bike to and around campus (see Table 1). Approximately half stated that they have no interest in biking or could not use a bike to commute or travel around campus.

Table 1

What would encourage you to ride a bicycle for traveling to and around the UNC Charlotte campus? Please select your top two responses.				
	Choice #1	%	Choice #2	%
Dedicated bike lanes on campus or city streets	358	17%	214	15%
Trails and pathways separated from the road	279	13%	215	15%
Financial incentive to bike instead of drive	143	7%	150	11%
Greater enforcement of traffic laws to protect bicyclists on the road	33	2%	56	4%
A campus map showing bicycle routes	10	0%	24	2%
More convenient bike parking	41	2%	89	6%
Better bicycle racks or covered bike parking	35	2%	107	8%
More police patrolling to ensure safety	38	2%	52	4%
Better lighting around campus for traveling safely at night	72	3%	111	8%
A convenient place to shower/change clothes	27	1%	76	5%
A bicycle station on campus providing repairs supplies etc.	18	1%	57	4%
Nothing – I have no interest in biking or cannot use a bike to commute or travel around campus	1040	49%	130	9%
Other	46	2%	123	9%
Total Respondents	2178			

Accessibility for Persons with Disabilities

- Twenty respondents to the online survey use assistive devices such as a wheelchair, walker, cane or walking stick to travel around campus.
- Buildings on campus cited by these 20 respondents as being the most difficult to access include:
 - Administration (King and Reese)
 - College of Education
 - Denny
 - Fretwell
 - Colvard
- Half of these respondents stated that there are areas on campus that are difficult to traverse due to grade changes or indirect/inaccessible walkways. Examples of areas cited include East Deck 1 and the College of Education.

Public Transportation

- Only 15% of student, faculty and staff respondents have ever taken a CATS bus to travel to or from UNC Charlotte. Of those who have used CATS, most trips have been to run errands, or for transportation when their personal vehicle has been under repair.
- One-third responded that nothing would encourage them to take a CATS bus more often (see Table 2). More than 30% responded that more convenient bus stops and a faster more direct trip would encourage them to take a CATS bus.

Table 2

What would encourage you to take a CATS bus more often? Please choose your top two responses.				
	Choice #1	%	Choice #2	%
Nothing. I cannot use CATS or have no desire to take a CATS bus	831	38%	116	6%
More convenient bus stop to my permanent home	396	18%	224	11%
Faster more direct trip	277	13%	257	12%
More convenient bus stops on campus	117	5%	121	6%
Bus schedule that coincides with class start/end times	109	5%	203	10%
More convenient bus stop to my residence at UNC-Charlotte	87	4%	69	3%
Financial incentive to use the bus instead of my car	73	3%	222	11%
If more UNC-Charlotte students/faculty rode the bus	62	3%	114	5%
Shorter wait for buses	56	3%	135	6%
Other	53	2%	394	19%
Lower fares	43	2%	96	5%
A map clearly showing routes	43	2%	83	4%
The current bus system meets my needs	20	1%	33	2%
Bicycle storage on bus	9	0%	24	1%
	2176		2091	
Total Respondents	2177			

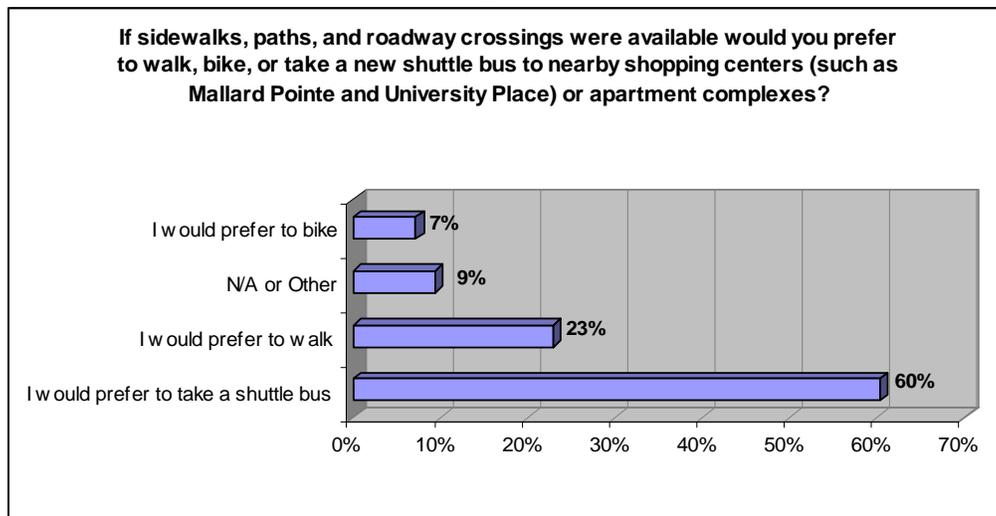
- When asked which routes respondents would use if a campus shuttle system was developed, 70% of respondents replied that they would use a route that makes a loop around campus. A route to and from commuter parking lots was also frequently cited (see Table 3).

Table 3

UNC Charlotte is considering developing a shuttle system for the campus. Which of the following routes would you use?						
	Yes		No		Don't Know	
	Count	Percentage	Count	Percentage	Count	Percentage
A route that makes a one-way loop all around campus. The shuttle would follow Cameron Blvd. to University Road to Mary Alexander and back to Cameron stopping at key destinations along the way	1284	70%	295	16%	248	14%
A short shuttle route that runs directly from commuter parking lots at the edge of campus to the core and back	1007	59%	486	29%	208	12%
A shuttle route from campus to Mallard Pointe on Tryon (Kohls Bloom Starbucks Bruegger's).	919	55%	498	30%	258	15%
A shuttle route from campus to Grande Promenade on W.T. Harris (FedEx Kinkos Walgreens Chen's Bistro)	882	54%	515	31%	249	15%
A shuttle route from campus to University Place at W.T. Harris and Tryon (Old Navy TJMaxx)	886	53%	520	31%	262	16%
A shuttle route from campus to Towne Center Plaza on University City Boulevard (Subway Grocery)	846	52%	549	34%	239	15%
A shuttle that travels to several apartment complexes near school and brings students to the campus core	682	42%	746	46%	185	11%
A route that runs directly from the new applied physics and engineering research buildings to the center of campus	660	41%	671	42%	279	17%
Total Respondents	2060					

- Student, faculty and staff respondents indicate that they would prefer to take a shuttle bus to nearby shopping areas rather than walk or bike. Most who selected "other" responded that they would prefer to drive their personal vehicle (see Figure 4).

Figure 4



Wayfinding

- Twenty percent of student, faculty and staff respondents stated that all UNC Charlotte facilities were easy to find their first few times on campus. Buildings cited most often as being difficult to find include:
 - Administration (King and Reese)
 - Denny
 - Burson
 - College of Education

Lighting

- One-third of respondents believe there are areas on or adjacent to campus which do not have adequate lighting at night. Examples of locations frequently cited include: parking lots and decks, wooded pathways, the crossroads areas.

Roadway Crossings and Sidewalks/Pathways

- More than half of respondents believe there are locations on or near campus where it is difficult or feels unsafe crossing the road on foot/bike/wheelchair
- Nearly 40% of respondents selected University City Boulevard as the most difficult to cross (see Table 4).

Table 4

Please indicate which roadways are most difficult to cross. Select up to three.		
	Choice #1	%
University City Blvd (NC 49)	564	36%
Tryon (US 29)	195	12%
W.T. Harris Blvd	190	12%
Don't Know	176	11%
Craver Road	85	5%
Cameron Blvd	74	5%
John Kirk Drive	72	5%
Mallard Creek Church Road	53	3%
Mary Alexander Road	44	3%

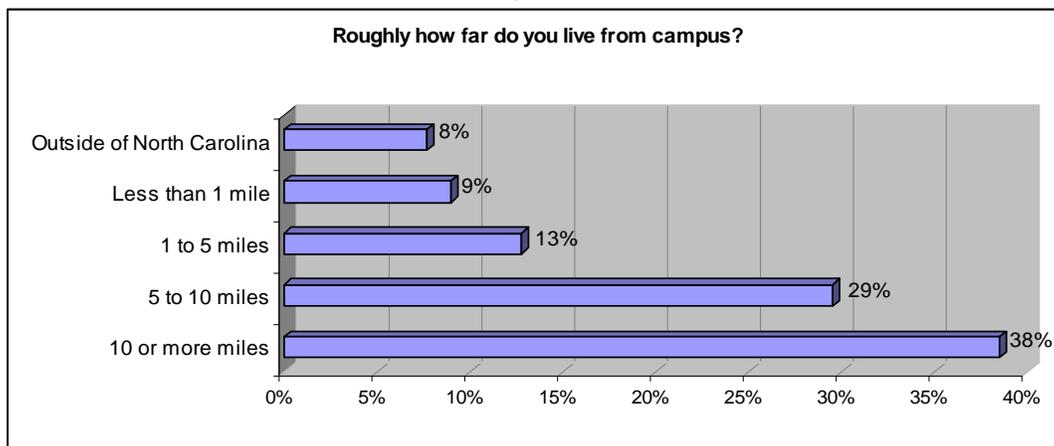
- Roadways cited as needing sidewalks or pathways most often include:
 - University City Boulevard (30% of respondents)
 - Tryon (US 29)
 - Cameron Boulevard

Visitor, Alumni, Parent, Member of the Community Respondents

Trip Information

- Most respondents who are not daily users of the campus live in state, more than five miles from campus (see Figure 5).
- More than 40% of visiting respondents visit the campus more than once a month. Half of these respondents are alumni.
- Visitors' on-campus destination most often are:
 - Student Activity Center
 - Colvard
 - Atkins Dalton Tower

Figure 5



Wayfinding

- Slightly more than 10% of visitors found visitor parking the most difficult to find their first few times on campus. Just less than 10% responded that all UNC Charlotte facilities were easy to find (see Table 5).

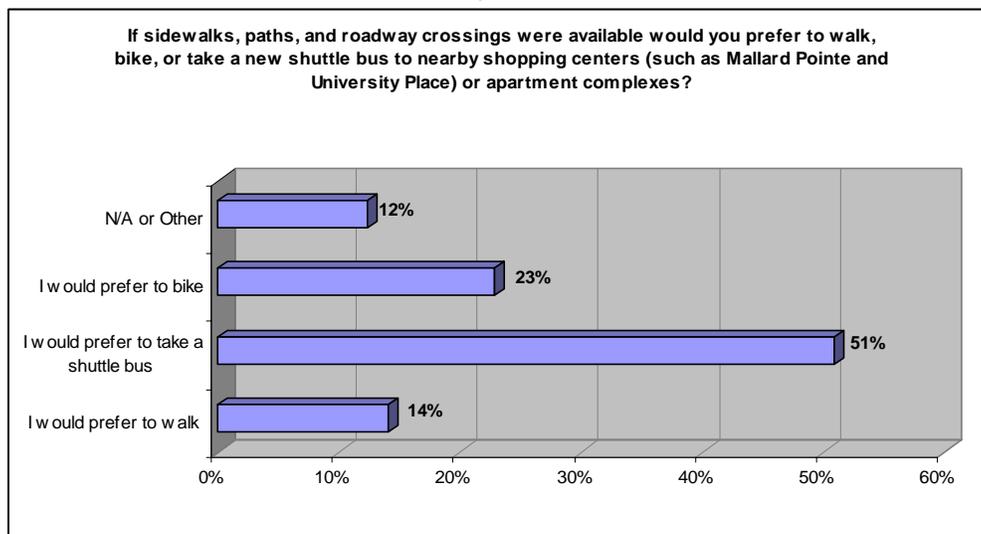
Table 5

Which UNC Charlotte facilities were the most difficult to find your first few times on campus? Please choose your top two responses.		
Visitor Parking	11	11%
None - all were easy to find	9	9%
Administration (King and Reese)	7	7%
Smith	7	7%
Bookstore	6	6%
Denny	5	5%

Public Transportation

- Visitors agreed with students, faculty and staff that they would most likely use a campus shuttle system with a route that makes a one-way loop all around campus.
- Approximately half of visitor respondents would also prefer to take a shuttle bus to nearby shopping centers or apartment complexes rather than walk or bike (see Figure 6).

Figure 6



Roadway Crossing and Sidewalks/Pathways

- More than 80% of visitor respondents feel there are locations on or near campus where it is difficult or feels unsafe crossing the road on foot/bike/wheelchair. They cited the same three roadways as students, faculty and staff as being the most difficult to cross (see Table 6).

Table 6

If yes please indicate which roadways are most difficult to cross. Select up to three.		
	Response	%
University City Blvd (NC 49)	32	28%
W.T. Harris Blvd	24	21%
Tryon (US 29)	22	19%
Mallard Creek Church Road	10	9%

- Roadways cited by visitors as needing sidewalks or pathways most often include:
 - University City Boulevard
 - Tryon (US 29)
 - Cameron Boulevard

APPENDIX B - OPEN HOUSE SUMMARY

Haden Stanziale and Toole Design Group held an open house on March 1, 2006 for students, faculty and staff to receive input and ideas on circulation deficiencies and opportunities. The open house was held during two time periods: 12:00 - 2:00pm and 4:00 - 6:00pm in the Lucas Room in Cone Center. Additionally, a presentation was made during the weekly Student Government Association that evening in Room 210 of the Cone Center to receive additional input. 49 people attended the two open house sessions.

The open house consisted of four stations for participants to visit to write or draw on campus maps for input on issues and ideas for bicycling, vehicular circulation, pedestrian circulation and shuttle system. There were also flip charts at each location for further commentary. A fifth station for the parking master plan was also established.

A subsequent open house was held on April 3, 2006 in the gallery at Storrs, in conjunction with CATS and the campus parking master plan. 32 people attended this open house.

The following comments were received:

Bicycling Issues & Ideas

- Wider lanes on entrance roads
- Covered parking
- Connect to greenway
- Parking stands
- Storage for bikes, for residents
- Need to be able to get on other side of Mallard Creek. For connectivity to greenway from Toby Creek. Need bridge over Mallard Creek just past Toby Creek. Joins Mallard Creek, so that bikes are on University side. Make path to connect with Mary Alexander Road.
- Bike parking around perimeter of campus core - minimize bikes on internal sidewalks
- Some campuses have tried free pink "clunker" bikes that you can take, use, & leave - to aid circulation.
- Bike racks are needed at Denny Hall
- Bike racks are needed at the recreational facilities
- Will need bike parking at the future Student Union
- Consider bike rental program
- Bicycle Facilities needed along:
 - W.T. Harris Blvd.
 - NC 49
 - US 29
 - J.W. Clay Blvd.
 - Craver Rd.
 - Cameron Blvd.
 - Toby Creek Rd.
 - Broadrick Blvd.
 - Mary Alexander Rd.
 - John Kirk Drive
- Potential bike path connections:
 - Credit Union Rd. to Parking Lot 8 at Hunt Village Lane
 - NC 49 to Broadrick Rd.
 - College of Education Bldg. to Squires Hall

Parking Issues

- Residents can park anywhere (this is a problem, they shouldn't be able to do this)
- One sticker for all
- Motorcycle parking needed on east side
- Signage on Cone Deck confusing, especially for visitors.
- Cost incentives? Pay less if you carpool?
- Parking services must be courteous, helpful at all times
- Avoid an us vs. them mentality
- Designated visitor lots w/o hassle would create a sense of hospitality & ease of access. NCSU no charge for visitors & the lot is in the center of campus.

Vehicular Circulation Issues & Ideas

Book Store	\	Delivery Access
Dining	>	Difficult for vendors
Mail	/	to access

- Considerations for access by emergency vehicles
- Considerations for campus evacuation
- Handicap parking for west side
- * Traffic circle does not seem to be working - conflicts w/ peds
- Accessibility signage
- Specific communication with external parties - infrequent visitors
- High-value communication: ex. Visitor to Robinson Hall for perf. Could get specific info
- Need value - added permits with varying prices
- Close parking for physically challenged or on-demand shuttle 24/7
- Limit student vehicle tags - i.e., within ¼ mile
- Consider roundabout at Cameron Blvd. and University Rd.
- Better wayfinding for visitors
- Speeding issues a concern around CRI
- Bonnie Lane residents are concerned about cut through traffic when main entrance is shifted down 49.
- Existing traffic issues:
 - Cameron Blvd/NC 49
 - University Rd. @ West Deck and Brocker Parking
 - Cameron Blvd/Craver Rd
 - Van Landingham Rd/John Kirk Drive
 - Broadrick Blvd/Broadrick Blvd East/University Rd
 - Mary Alexander Rd/Storrs Lane
 - Mary Alexander Rd/Van Landingham Rd (existing traffic circle)
- Existing visibility issues:
 - Phillips Rd/Cameron Blvd/Barnhart Lane
 - High Rise Rd/Broadrick Blvd.

Shuttle System Ideas

- Need to serve wheelchair users
- 24 / 7 "On demand" service from parking lot to building for physically challenged
- Some university subsidy to encourage use of existing city bus routes (get tickets on campus with percentage absorbed by university.) Example: monthly pass for \$40 with university support = \$30/month
- Check with proposal development / research services to see if grants may be available for shuttle service, i.e. CATS electric buses
- Construction workers parking

- Dependable - absolutely!
- More CATS routes, more shuttle, less cars
- Provide alternatives to necessary routes (prioritized)
- Potentially outsourced - capital and operating costs, plus space, are significant
- ADA accessible
- Potential shuttle from general parking areas to athletic facilities (i.e., West Deck to baseball/softball) or East Deck to SAC
- Point to any other point during class break (10 min) schedule and walk time to class
- Park and Ride with CATS on Harris Blvd. corridor. High traffic here could be avoided and campus parking problems avoided. Early and late times needed. This system works well at NCSU.
- Connect all surrounding residential areas to campus with shuttle service
- Connect all surrounding shopping areas to campus with shuttle service
- Have shuttle run 7 days a week
- Proposed Key Origin/Destination Paths:
 - Town Center Plaza to Southwest Residential Halls
 - CRI to future Student Union Site
 - Fretwell to Phillips Road/Cameron Blvd. area
- Proposed Campus Shuttle Stop Needs:
 - Charlotte Research Institute
 - Phillips Rd./Cameron Blvd.
 - Scott/Holshouser Halls
 - Cone Center
 - Fretwell
 - Van Landingham Rd. @ Parking Decks
 - Future Student Union
 - Squires Hall
 - Mary Alexander Rd./Cameron Blvd.
 - Cameron Blvd. @ Campus Edge Connector
 - Sycamore Hall
 - WT Harris Blvd. across from University Hospital
 - US 29/J.W. Clay Blvd.
 - Town Center Plaza
 - Mark Twain Blvd.
 - Suther Rd.

Pedestrian/ADA Issues & Ideas

- Change character of NC 49 - NOT highway
- Lower ped-vehicle conflicts
- Important to remember that even the walking healthy students and faculty are carrying packs/briefcases.
- Also safety. The West Deck feels creepy after a 9:00 p.m. class. Evening can be a different experience for women than men.
- Any chance for a walk-thru between front and back of Atkins? It's a long walk around either end.
- Night time pedestrian traffic at Baseball fields; need lighting
- Lighting is an issue throughout, especially at:
 - North side of Storrs
 - Barnhart SAC
 - Parking lots 10 & 15 to Oak/Elm Halls
- Connect to Greenway
- ADA accessibility from main campus to northwest area
- Better wayfinding for visitors
- Improve lighting condition at all crosswalks
- Check on placements of blue emergency lights
- Maintain NC 49 crossing after main entrance is realigned

- Need sidewalk for students at East Deck 2; students now use exit ramp.
- East Deck 2 is used as a cut through to Fretwell.
- Sidewalks/paths are needed along:
 - NC 49 (north side)
 - Cameron Blvd. (both sides) from NC 49 to track facility
 - Toby Creek Rd. (both sides)
 - W.T. Harris Blvd. (campus side)
 - US 29 (campus side)
 - Barnhart Lane (north side) from West Deck to Miltmore-Willis
 - University Rd. to quad, between Cone Deck and Cone Center
 - Library Lane from Library Lane South to Craver Rd.
 - Parking lot 17 to Squires Hall and Cypress Hall
 - Mary Alexander Rd. (east side) from Fretwell to Cameron Blvd.
- Crossing facility needs:
 - W.T. Harris Blvd. at University Hospital
 - W.T. Harris Blvd / US 29
 - US 29 between University Hospital and University Place entrances
 - End of trail on US 29 east of hospital
 - US 29 at entrance to Charlotte Research Institute
 - Town Center Plaza/NC 49
 - South Entrance (Cameron Blvd.)/NC 49
 - Suther Rd./Main Entrance
 - Mid-blocks on NC 49 @ Alumni House and East Deck 2
 - Phillips Rd/Cameron Blvd.

APPENDIX C - CRAVER ROAD CONCEPTUAL DESIGN

The AASHTO Policy on Geometric Design of Highways and Streets was generally used to establish geometric design parameters for the Craver Road conceptual design. It should be noted that in order to accomplish the proposed improvements, AASHTO Guidelines may not be met in all situations. Following are the AASHTO and other design parameters used in the conceptual design:

- Local Urban Roadway Classification
- Design Speed = 20 mph
- Maximum Grade = 15%
- Minimum Stopping Sight Distance = 115 feet
- Minimum Horizontal Curve Radius = 100 feet
- Curb Radius Minimum = 10 feet
- Minimum travel lane width = 10 feet
- Maximum cross slope = 2%
- Parking restricted to parking lot
- Minimum sidewalk width = 10 feet
- Minimum buffer width = 8 feet

The conceptual design drawings on the following pages were developed utilizing a combination of the following provided CAD files:

1. Campmap2.dwg - Utilized as a base to display buildings, curbs, and to develop a 3D surface between Station 15+50 to Station 21+72 (Mary Alexander Road). Curbs replaced between Station 0+00 to 9+00 with surveyed curb files from Deck G Student.dwg to develop composite base.
2. Philips Rd Reali.dwg - Utilized only as a reference to show proposed alignment of Philips Road as it approaches Craver Road.
3. Deck G Student.dwg - Utilized to show new Student Union building. The contours from this file were utilized to develop a 3D surface between Station 0+00 (Cameron Boulevard) to Station 15+50. Surveyed curb and building edges between Cameron Boulevard and the Student Union were used to develop updated base file.
4. Craver-sec-prof.dwg - Utilized only as a reference of another proposed vertical profile of Craver Road. Not shown in concept.
5. Craver horz alignment.dwg - Utilized only as a reference of another proposed horizontal plan of Craver Road. Not shown in concept.
6. CCHS Plaza51706.dwg - Utilized as a base to display new pedestrian plaza between Student Union and X.