Multi-Modal Transportation Study
Final

University of Carolina Wilmington
Wilmington, NC

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1.0 Introduction

The University of North Carolina Wilmington (UNCW) is the state’s coastal university and part of the University of North Carolina (UNC) System. UNCW enrolls approximately 14,000 students and is located on the east side of College Road between Randall Drive and MacMillan Avenue. Currently, UNCW has bachelor’s degrees in 52 majors, 38 master’s degrees, and offers two doctoral programs. Among UNCW’s many distinctions, the university was ranked fourth in the U.S. News & World Report “America’s Best Colleges” guidebook in 2012.

The main campus of UNCW is nearly 650 acres and is known for its neo-Georgian building style and beautiful landscaping. The campus has continued to experience growth since the university’s founding in 1947. Over the past decade, UNCW has constructed or renovated more than 40 buildings. The latest Master Plan Update, completed in 2010, provides plans for future growth including the addition of new buildings, the renovation of existing buildings, addition of parking decks, and addition of new on-campus roadways.

DAVENPORT has been retained by UNCW to provide short term and long term multi-modal transportation and safety recommendations. This study assesses opportunities for improvement for all modes of transportation including vehicular, bicycle, pedestrian, skateboard and transit. Also, this study identifies solutions to reduce bicycle/pedestrian/vehicle conflicts and enhance the mobility of all modes of transportation.

For the purposes of this study, “short term” refers to year 2014 and “long term” refers to the Master Plan horizon year of 2020.
The purpose of this study is to evaluate and provide transportation and safety recommendations for vehicular traffic, bike and pedestrian traffic, as well as transit. The following are the primary objectives of this study:

1. Review multi-modal transportation opportunities on the UNCW main campus and identify solutions to reduce bicycle/pedestrian/vehicle conflicts and traffic calming as necessary.
2. Determine effective locations for bike-share and bike racks on campus. Integrate regional bicycle access with campus, including Wooddale Drive, Rose Avenue, Randall Drive, Hoggard Way/Hurst Drive and Racine Drive.
3. Review integration of the campus with the environs on the opposite side of College Road.
4. Determine effective shuttle routes and stops on campus and within the one-mile radius.
5. Determine do’s and don’t’s for effective deployment of car sharing (Zip Car or similar) and bike sharing. Comment on feasibility of integrating these services with regional employers or destinations (such as downtown and Wrightsville Beach).
6. Comment on the feasibility and benefits of completing the road connection from Hurst to Riegel (as outlined in the 2010 Campus Master Plan Update).
7. Comment on the feasibility and benefits of completing a loop road on the back of campus (as outlined in the 2010 Campus Master Plan Update).

Figure 1 on the next page presents the current campus master plan. Our review and recommendations for multi-modal transportation opportunities are presented in the pages that follow. The recommended improvements are also presented in the figures provided at the end of this report. Details regarding the traffic capacity analysis can be found in the Technical Appendix.
Figure 1
UNCW 2010 Master Plan
2.0 Stakeholders Questionnaire

A questionnaire was provided and sent to stakeholders during the early stages of this study. These stakeholder groups include bicycle/pedestrian safety groups, Chancellor's Council on Safety and Security, Parking Traffic and Advisory Committee, Master Planning committee, Community Relations Task Force, and City of Wilmington TDM representatives.

The purpose of this questionnaire was to discern existing traffic issues on campus and to obtain input on potential traffic solutions. The questions addressed vehicle, transit, pedestrian, bicycle, and skateboard traffic on campus. The Supporting Documentation contains the sample questionnaire. Feedback received from the questionnaire was used in this study to further define existing issues, needs, and solutions.

3.0 Overall Recommendations

This study provides a review of the entire campus and recommendations for all modes of transportation including pedestrian, skateboard, bicycle, vehicular, and transit. Discussion of each of the study roadways is provided in the following sections. Overall recommendations for improvements for the campus are provided in this section.

3.1 Promote Safety Tips for all Modes

UNCW already has many guidelines and safety tips available for drivers, bicyclists, and pedestrians. *It is recommended to review, revise as needed, and promote the UNCW safety tips and rules for all users.* These safety tips and rules could be summarized in a single document/webpage for easy access at a central location.

Additional rules and safety tips should be considered for skateboarders. For example, skateboards are not considered vehicles, unlike bicycles, and should be prohibited from riding in the road. Some safety tips include skateboarders should yield to pedestrians and maintain a safe speed.

Another regulation to consider for bicycles is to prohibit wearing headphones while riding a bike, which was also observed on campus. Additional rules and safety tips could be developed for scooters as well.

As with any regulations, education and enforcement are necessary in order for the rules and safety tips to be effective. Based on feedback received from the stakeholders, it was recommended to engage students early during orientation and to no longer encourage a bicycle for everyone. It was also suggested to provide incentives for good behaviors and enforcement for bad behaviors. Some universities offer a safety class for bicycles, skateboards, etc., when issued a ticket and reduce the fine for taking the class.
3.2 Pedestrian Considerations

3.2.1 Crosswalks

UNCW has numerous crosswalks throughout campus, including crosswalks at intersections as well as midblock. Most crosswalks are textured with a brick pattern and pedestrian warning signs are provided. However, not all of the crosswalks were consistent – such as some crosswalks are painted with a ladder style as shown to the left.

In order to maximize the effectiveness of the crosswalks and enhance the safety of all users, it is recommended to provide crosswalks with consistent pavement marking and signage throughout campus. The ladder style crosswalks should be modified to be consistent with other crosswalks on campus with the textured and painted pavement and the diamond-shaped pedestrian warning signs (W11-2). Additional Design Standards can also be created for different applications such as parking lot crossings or driveway crossings were a typical ladder style crosswalk is sufficient.

3.3 Bicycle Considerations

3.3.1 Create Bike Routes Alternative to Chancellor’s Walk

One objective of this study is to enhance bicycle routes alternative to Chancellor’s Walk. Chancellor’s Walk is a busy pedestrian path which connects student housing and Wagoner Hall (dining) on the east side of campus to the campus’s core on the west side. According to UNCW staff, this path experiences many conflicts between the different users (bicycles, pedestrians, and skateboards). Improvement recommendations for bicycle routes on Cahill Drive and Price Drive are provided in this report. This has the potential to reduce bicycle traffic on Chancellor’s Walk and consequently reduce potential conflicts.
3.3.2 Bike Lanes

Only one striped bike lane is provided on many campus roadways. Some cyclists were observed to travel the wrong direction in the bike lane opposing traffic. It is recommended that two striped bike lanes are provided on roadways with bike lanes. Vehicle travel lanes can be narrowed to 10 feet in some locations in order to provide the bike lanes. If the required pavement width to accommodate two striped bike lanes is not available, then it is recommended to consider sharrows or multi-use paths instead.

In addition, it is recommended that bike symbols and arrows are painted in the bike lanes, as shown in the figure below.
3.3.3 Bike Rack Locations

In order to promote the use of bicycles, typically bike racks are provided at every major entrance to every building. However, since UNCW desires to discourage bicycles from using Chancellor’s Walk and to encourage bicycles to use alternative routes, such as Cahill Drive and Price Drive, it is recommended to locate bike racks on the sides of the buildings away from Chancellor’s Walk. Any bike racks currently located along Chancellor’s Walk should be relocated at building entrances closest to Cahill Drive and Price Drive. In addition, a Walk Zone (discussed in more detail in this report) is recommended for the campus core. Bike racks should be located outside of the designated Walk Zone. See figure below for general recommended areas to remove or add bike racks.

Some possible bike rack locations based on stakeholder input include the Computer Information Systems building and the Teaching Laboratory at Price Drive, the Student Recreation Center, the Parking Deck, the Trihouse area, near Leutze Hall, Bear Hall, DeLoach Hall, Randall Library away from the Campus Commons, and the Warwick Center. It was also suggested to create a transit hub with covered bike storage, restrooms, showers, and a bus stop near the intersection of Hurst Drive & Hamilton Drive or near the baseball field.
3.3.4 Bike Share Program

The need for a bike share program was reviewed with stakeholders. While some stakeholders thought the program was not needed, others thought it would be beneficial. There are a few methods regarding various bike share programs including ad hoc, bike corral, automated key station, and kiosk-based. A description of these options is provided below:

- **Ad Hoc** – Bikes are distributed through the campus. They are typically painted or marked to indicate that they are for shared use. The bike are not locked or secured and they are free to use by anyone. This option is the least expensive, but provides no accountability.

- **Bike Corral** – Bikes are kept in a single location (or locations) and locked. Users check-in and check-out bikes at a central location managed by a person who provides a key or access to unlock bikes. This option is low cost, but relies on staff to manage bike check-in and check-out.

- **Automated Key Station** – Key stations, located in strategic locations on campus, electronically controls access to bikes by providing keys for shared bikes at designated locations. The automated key station is managed by a software system which monitors access and usage. This option is higher cost. The advantages are that it does not rely on a staff person to manage the check-in check-out procedure, and that the bikes are typically equipped with locks that allow them to lock the bikes to any bike rack while in use.

- **Kiosk-Based** – Kiosk stations store and secure the bikes. Bikes are electronically released by the system and also can be located and tracked. This option is the highest cost and provides less flexibility since bikes must be specifically designed for the kiosk and can only be locked to the kiosk. The advantages are bikes are highly secure and available 24/7.

Some potential bike share station locations suggested by stakeholders include: Dunkin Donuts and Fisher Union, the Student Recreation Center, near the bike racks by Galloway Hall and Belk hall, Wagoner Hall, and Student Union. It was also suggested by stakeholders to have 20+ stations and to expand to off campus to ensure the success of the program.

Each alternative has pros and cons associated with it. Prior to selecting an option, the goals and parameters of the program should be clearly defined according to UNCW's needs, capabilities, and budget.
3.3.5 Regional Bicycle Integration

One of the objectives of this study is to provide recommendations to improve regional bicycle integration with UNCW. According to the input received from stakeholders, some of the off campus target destinations include: Wrightsville Beach, Mayfaire Town Center, nearby shopping and restaurants, Trader Joes, the Cross-City Trail, and nearby apartment complexes and neighborhoods within one mile on Racine Drive, MacMillan Avenue, Rose Avenue, Wood Dale Drive, and Randall Parkway.

According to the input obtained from stakeholder groups, it was recommended that improvements be made to Wallace Avenue and Pine Hills Drive as an alternative safe route for bicycles. This could include providing sharrows on the roadway (sharrows are discussed later in this report in the Cahill Drive section). Additionally, crosswalks and improved pedestrian accommodations should be provided at the intersections of Wallace Avenue and Oleander Drive and Wallace Avenue and Wrightsville Avenue. These improvements would provide integration with the municipal golf course, Hugh MacRae Park, and the Cape Fear Hospital.

Other improvements to improve bicycle integration with the surrounding area include pedestrian and bicycle improvements on New Centre Drive to improve access to Target and the Forden Station; and improving bike paths on Wrightsville Avenue from Wallace Avenue to Hawthorne Drive.

3.3.6 Designate Walk Zones

In order to enhance the safety of all users, it is recommended to designate “walk zones” in the congested areas of campus, such as the campus core near Randall Library, Fisher Student Center, and the Warwick Center as shown below. This area can be denoted with signs, such as the one shown to the right. This will enhance the safety of all users in busy areas where through traffic traveling at a faster speed should be encouraged to travel an alternate route.
3.4 Transit Considerations

Wave Transit, which provides public transportation for the Cape Fear region, operates Seahawk Shuttle on campus and within a one-mile radius off campus. Currently, two on campus loop routes are provided: the Loop Shuttle and the Express Loop Shuttle. The Loop Shuttle operates on a 30-minute schedule and has 12 stops on campus. The Express Loop Shuttle operates on a 20-minute schedule and has 9 stops on campus. Seven (7) off campus routes are provided to connect campus to nearby off campus destinations. In addition a Point-to-Point After Hours Shuttle service is provided after 5:30 pm and operates within the one mile radius. According to Wave Transit staff, the Yellow Route will be modified starting Fall 2013 to include Randall Parkway to Marlboro Street to Emerson Street and back south on Kerr Avenue. The off campus routes generally operate on a 15-minute schedule from 7:00 am to about 6:30 pm.

Some improvement suggestions from stakeholders include providing Wi-Fi on the buses, tracking ability with smart phones, and TVs with UNCW news. Additional routes and connections were suggested to the beach, Independence Mall, and late night downtown routes. It was also suggested by stakeholders to ensure that the buses are staggered and avoid “bus bunching.”

3.5 Vehicle Considerations

3.5.1 Car Sharing

Car sharing, similar to car renting, allows users to rent a car for a short period of time. Car sharing can reduce the demand for on campus parking as well as reduce vehicular demand on roadways. Car sharing is estimated to reduce car ownership at a rate of about one rental car replacing 15 owned vehicles. Many universities successfully use car sharing, especially for on campus housing. The advantages include students do not need to bring a vehicle to campus and the need for parking is reduced.

The following factors are needed to provide an effective car sharing program:

- Effectively marketed and targeted program
- Sufficient funding and staff to support the program
- Supportive policies and regulations
- Convenient car share locations
- Competitive rates and fees
- Transit integration and/or membership programs

The stakeholders were surveyed on whether they thought there is a need for a car sharing program on campus. Some responded that they thought there was a need while others thought that there was not a need. Potential car share locations suggested by stakeholders include: Parking Lot N, Visitor Parking Lot M, Parking Lot H, Friday Hall, Trask Coliseum, Alderman Hall, the Physical Plant, Maybe Tin City, Randall Library, the Warwick Center, Parking Lot E, or near the Student Recreation Center.

A potential car sharing program could be integrated with off campus locations such as downtown, Cape Fear Hospital, frequently visited public schools, Mayfaire, the Independence Mall and Hanover Center.
4.0 Cahill Drive

Cahill Drive is a two-lane roadway which extends from the residence halls on the east side of campus to the Friday Annex. There are two signalized intersections along the roadway at Reynolds Drive and Walton Drive. A sidewalk is provided on one side for most of the roadway, and a sidewalk is provided on both sides near McNeill Hall.

4.1 Pedestrian Considerations on Cahill Drive

4.1.1 Cahill Drive East of Walton Drive

There is an existing crosswalk on Cahill Drive for non-vehicular traffic traveling between the residence halls and Wagoner Hall. From 1:00-2:00 pm, there were 257 pedestrians, 38 bikes, and six (6) skateboards observed at this crosswalk. This crosswalk, shown below, is unraised and textured. It is recommended to provide pavement marking and signage at this crosswalk consistent with other crosswalks throughout campus.

The crosswalk connects to an existing sidewalk on the north side to the residence halls. However, as shown in the photo below the crosswalk does not connect to a sidewalk on the south side to Wagoner Hall. It is recommended to provide a sidewalk to connect the existing crosswalk to Wagoner Hall at this location. In addition, a crosswalk across Parking Lot FF should be provided for pedestrians traveling to/from Wagoner Hall.

4.1.2 Cahill Drive from Walton Drive to Reynolds Drive

As shown in the photos below, many pedestrians were observed to cross Cahill Drive near the Shops at the Crossing (SAC) and McNeill Hall. From 1:00-2:00 pm, there were 150 pedestrians, 60 bikes, and 20 skateboards observed to cross at this location. It is recommended to provide a midblock crossing at this location just east of Parking Lot U and the Shops at the Crossing and connect to the existing sidewalks.
4.2 Bicycle Considerations on Cahill Drive

Bike lanes are striped from Reynolds Drive to Walton Drive and no bike lanes are striped east of Walton Drive. It is recommended to provide sharrows on Cahill Drive east of Walton Drive to the end of the roadway. The sharrows will alert drivers to share the road with bicyclists. An example of sharrows is shown to the right.

4.3 Cahill Drive Extension

4.3.1 Pedestrian Considerations on Cahill Drive Extension

The Cahill Drive Extension is the section of Cahill Drive west of Reynolds Drive to the end at near the Friday Annex. This is a two-lane roadway with an existing sidewalk on the south side of the roadway. Some pedestrians were observed to walk on the north side of the road where a sidewalk is not provided. It is recommended to provide a sidewalk on the north side of Cahill Drive from Reynolds Drive to the Friday Annex.

4.3.2 Bicycle Considerations on Cahill Drive Extension

One objective of this study discussed with UNCW staff is to enhance bicycle routes alternative to Chancellor’s Walk. The Cahill Drive Extension would serve as an ideal alternative for bicycles since it runs parallel to Chancellor’s Walk and bicycles could reach the same destinations and avoid the heavy congestion on Chancellor’s Walk.

Striped bike lanes currently exist on Cahill Drive east of Reynolds Drive, however they do not extend past the intersection onto the Cahill Drive Extension. In order to provide a route for bicycles alternative to Chancellor’s Walk, it is recommended to provide sharrows on the Cahill Drive Extension.
4.3.3 Missing Bike Segment at Cameron Hall

Near the end of the Cahill Drive Extension at Cameron Hall, many bicyclists (as well as pedestrians and skateboards) were observed to cut through near Cameron Hall and travel to/from Chancellor’s Walk and the remainder of campus. *It is recommended to provide a multi-use path at this location to complete this alternative route.* This path could also connect to Racine Drive to the west to provide a route to the academic buildings along Randall Drive.
4.3.4 Turnaround on Cahill Drive Extension

The Cahill Drive Extension currently ends near the Friday Annex where parking is provided, shown in the photo below. Currently, there is insufficient space for a vehicle to turn around at this location. *It is recommended to provide a turnaround area at this location for vehicles to complete their turn around maneuver.* This can be accomplished by creating a three-point turnaround area with yellow or white hash marks to delineate the area as an undesignated/no parking area. The existing parking should be shifted to the east and the handicap parking should be redesignated. If needed, signs could be added to indicate no parking or turnaround area.
5.0 College Road

College Road is a divided six-lane roadway. The campus has four (4) roadway connections to College Road: MacMillan Avenue, Hurst Drive, Crews Drive, and Randall Drive. Bike lanes are currently not striped on College Road, but wide paved shoulders are provided. Along the UNCW frontage, there are no existing sidewalks.

5.1 Integrate with Opposite Side of College Road

One of the objectives of this study is to provide recommendations for the campus to better integrate with the environs on the opposite side of College Road. Some possible improvements include providing a complete sidewalk along College Road, particularly on the western side of College Road where there are gaps in the existing sidewalk.

Crosswalks currently exist on College Road at the intersection with Randall Drive, University Drive, and at Hurst Drive/Hoggard Drive. Currently, standard marking (two white bars) are provided at these crosswalks. It is recommended to consider additional pavement marking, such as a ladder style crosswalk, and signage to increase the visibility of these crosswalks on College Road.

A signal upgrade is underway at the intersection of College Road and Randall Drive as a part of the Randall Parkway Capital Improvement Project; the final design is shown to the right. Ladder style crosswalks are included in the signal plans across the southern leg of College Road and across both approaches of Randall Drive / Randall Parkway.

At the intersection of College Road and Randall Drive, the Cross City Trail ties into the existing crosswalk to complete the path to campus. The intersection of College Road and University Drive also has a paved and landscaped area to connect the crosswalk at College Road to campus. However, there is no sidewalk to connect the crosswalk at the intersection of College Road and Hurst Drive/Hoggard Drive to campus. It is recommended to provide a sidewalk from the crosswalk at the intersection of College Road and Hurst Drive/Hoggard Drive and tie into the existing Gary Shell Cross-City Trail to the east. In addition, it is recommended to provide a sidewalk along the north side of Hoggard Drive for pedestrians traveling to/from Parking Lot U to campus.
5.2 Gary Shell Cross-City Trail Future Overpass

The Gary Shell Cross-City Trail is a multi-use trail that will extend from Wade Park in south Wilmington to the drawbridge at Wrightsville Beach when completed. The portion of the trail through UNCW has recently been completed and extends from UNCW’s entrance at Randall Drive and College Road, then borders the western, southern, and eastern sides of campus to Mallard Street at Hooker Road. A future phase is planned that will then connect the trail to Eastwood Road and provide access to the beach.

According to the UNCW website, “while the trail connects parks, the beach and other amenities, it is also a source for daily recreation and exercise. As such, the UNCW portion of the trail, approximately 2.9 miles long is already seeing lots of activity.” A future phase of the trail will connect at the UNCW entrance at Randall Drive and College Road to the already completed segment at Rosemont Avenue. Another trail segment is planned along S. Kerr Avenue, to Hoggard Drive, to Hurst Drive.

The Wilmington MPO, in partnership with the City of Wilmington and New Hanover County, is developing a Comprehensive Greenway Plan which includes a future pedestrian overpass for the trail to allow safe crossing over College Road for trail users. The overpass will be located between Randall Drive and Hurst Drive. Currently, the plans for this potential overpass are preliminary and not available for inclusion in this report. However it is recommended that the UNCW Master Plan supports the effort for the construction of a bicycle/pedestrian overpass to improve the safety of crossing College Road. According to WMPO staff, the preliminary cost estimate of the overpass is $3.7 million.
6.0 Hamilton Drive

Hamilton Drive is a two-lane roadway with sidewalks. There are two striped bike lanes from MacMillan Avenue to Hurst Drive. There is only one striped bike lane from Hurst Drive to Riegel Road. It is recommended to provide two striped bike lanes for the entire roadway. For areas where the road may be too narrow to accommodate two dedicated bike lanes, such as near Parking Lot E, **sharrows should be provided.**

6.1 Angle Parking

Head-Out Angle Parking

Currently, angle parking is provided near the tennis courts for southbound traffic. It is recommended to **consider converting the existing angle parking to head-out angle parking** to enhance the safety of all roadway users. Head-out angle parking creates a sight line between the driver and other road users when pulling out of the parking space, as shown in the diagram to the right. Head-out angle parking would improve the driver’s ability to see pedestrian, bicycles, as well as other vehicles when pulling out of the parking space. Striped bike lanes could be provided adjacent to the vehicle travel lanes. From 1:00-2:00 pm, there were 116 pedestrians, 70 bikes, and 24 skateboards observed on Hamilton Drive near the tennis courts. Given the high volume of non-motorized traffic at this location, head-out angle parking has the potential to enhance the safety for all users on Hamilton Drive.

Other advantages include head-out angle parking directs passengers towards the sidewalks since car doors open facing the street, and loading and unloading from the back of the car occurs near the sidewalk and away from the roadway.
6.2 Intersection of Hamilton Drive & Riegel Road

It was noted by UNCW staff that there are pedestrians/vehicles and bicycles/vehicles conflicts at the intersection of Hamilton Drive and Riegel Road. The intersection is three-legged with a stop condition on Riegel Road and Hamilton Drive is free flowing. The intersection has a high volume of northbound right turns and westbound left turns (traffic traveling to/from the south on Hamilton Drive to/from the east on Riegel Drive). According to UNCW staff, there are many vehicle/bicycle and vehicle/pedestrian conflicts with the northbound vehicles on Hamilton Drive turning right onto Riegel Road.

Currently, the northbound bike lane on Hamilton Drive ends at Riegel Road and does not extend through the intersection, as shown in the photo above. There is a crosswalk provided on the eastern leg of Riegel Road. A sidewalk is provided on both sides of Hamilton Drive and there are several midblock crosswalks on Hamilton Drive north of Riegel Road which connects to Parking Lot E.

In order to enhance the safety and operation of the intersection, the following improvement options are recommended:

- **Option 1** All-Way Stop – Modify the intersection of Hamilton Drive & Riegel Road to an all-way stop and provide crosswalk treatments. An all-way stop control has the potential to reduce right turning conflicts by providing a more orderly movement of traffic through the intersection, and by reducing through and turning travel speeds.

- **Option 2** Intersection Realignment – Modify the intersection to place the stop condition on the southbound approach of Hamilton Drive, and realign to provide a wider turning radius (curve) for the free-flowing northbound and westbound approaches. This will accommodate the high volume of traffic traveling to/from the south on Hamilton Drive to/from the east on Riegel Drive with a free-flow condition. The southbound approach of Hamilton Drive would form a "T" at the intersection and all southbound traffic approaching the intersection must stop. This improvement option will involve more detailed design. In addition, the existing pedestrian crosswalk should be shifted to the east outside of the intersection area. As discussed later in this report, a midblock crossing is recommended on Riegel Road near Union Drive which could serve this intersection as well.

It is anticipated that both improvement options will improve the level of service and delay at the intersection (more information regarding the capacity analysis can be found in the Technical Appendix.) Should operational issues develop in the future at the intersection, a roundabout may serve as a long term solution. If implemented, the roundabout design should provide accommodations for bicycles and pedestrians.
6.3 Parking Lot E

Hamilton Drive terminates at Parking Lot E to the north. This parking lot is adjacent to the campus core and experiences high volumes of non-vehicular traffic. From 1:00-2:00 pm, there were 288 pedestrians, 60 bikes, and 21 skateboards observed on the crosswalk at the entrance to Parking Lot E. The parking lot currently has some raised and unraised crosswalks. The crosswalks have ladder pavement marking and the unraised crosswalks are separated from traffic by either speed bumps or concrete wheel stops. Photos of the existing crosswalks within Lot E are provided below.

The latest Master Plan shows Parking Lot E to be removed in the future and converted to a green space. This would be an ideal use of this area due to the close proximity to the campus core and the high pedestrian and non-vehicular traffic. In the interim, crosswalks should be marked and signed consistent with other crosswalks on campus. *The crosswalk at Hamilton Drive at the entrance to Parking Lot E should be raised, consistent with other raised crosswalks on campus.* In addition, *it is recommended to include Parking Lot E in the Walk Zone to slow non-motorized traffic in this area and encourage use of sidewalks and crosswalks.*
7.0 Hurst Drive

Hurst Drive serves as one of the main access points to the campus connecting to College Road. It is a two-lane roadway and ends at Hamilton Drive to the east. There are two striped bike lanes from Hamilton Drive to Wagoner Drive and no bike lanes from Wagoner Drive to College Road. It is recommended to stripe the bike lanes through the driveways on Hurst Drive and to restripe the bike lanes at the intersection with Hamilton Drive.

It was noted by UNCW staff that there are conflicts between bicycles and vehicles at the intersection of Hurst Drive and Wagoner Drive. The existing westbound bike lane on Hurst Drive currently ends at Wagoner Drive. It is recommended to consider providing bike lanes on Hurst Drive through the intersection with Wagoner Drive to College Road. If bike lanes are not provided on this segment, then the existing westbound bike lane on Hurst Drive should be tied into the Gary Shell Cross-City Trail prior to the intersection with Wagoner Drive.

8.0 Plyler Drive

Plyler Drive is on the east side of campus and connects Riegel Road to Parking Lot EE. It is currently two-lane, has one striped bike lane and no sidewalks. Vehicles were observed parking on the side of the road, as shown in the photo to the right.

There are future plans to extend Plyler Drive to the north and connect to Seahawk Village Loop to the north. Consideration to complete streets, including bike lanes and sidewalks, should be given as plans for this extension are made.
9.0 Price Drive

Price Drive is a two-lane roadway that traverses the center of campus from Riegel Road to the end where it loops at the Student Recreation Center.

9.1 Pedestrian Considerations on Price Drive

There are sidewalks on both sides of Price Drive from the turnaround to Parking Lot R1. One sidewalk is provided from Parking Lot R1 to Riegel Road which changes sides of the road at the Computer Information Systems Building. As shown in the photo to the right, pedestrians were observed to travel in the bike lane on the north side of the roadway where a sidewalk is not provided. It is recommended to provide a sidewalk on both sides of the roadway from Riegel Road to the Computer Information Systems Building.

The photo to the right shows the raised crosswalk provided near the Computer Information Systems Building where the sidewalk changes sides of the road. As shown, the crosswalk connects to the inside of the driveway to the Computer Information Systems Building. In order to enhance the safety of the pedestrians, it is recommended to shift the raised crosswalk to the west of the driveway and connect to the recommended sidewalk on the north side of Price Drive.

9.2 Bicycle Considerations on Price Drive

There are two striped bike lanes from Riegel Road to the curve near the Social and Behavioral Sciences building. There is one striped bike lane from the curve which ends west of the Teaching Laboratory. There are no striped bike lanes from the Teaching Laboratory to the end loop. It is recommended to provide two striped bike lanes along the entire roadway up to the turnaround and then provide sharrows through the turnaround.

As previously discussed, one of UNCW’s goals is to provide bicyclists with routes alternative to Chancellor’s Walk. The recommended bike lanes along the full extent of Price Drive would accomplish this along with providing connections at the ends of the route. On the east end of Price Drive where the roadway loops at the Student Recreation Center, a dedicated bike path should be provided to connect to Walton Drive and complete this bike route. This could involve designating a portion of the existing sidewalk near the Student Recreation Center as bike path. To complete the route on the western end and tie back into the campus core, a key destination for bicyclists, a multi-use path should be provided from the curve near the Computer Information Systems Building to near the Fisher University Union.
10.0 Randall Drive

Randall Drive serves as one of the primary access points to UNCW and is the northernmost access on College Road. It is a two-lane roadway which extends from College Road to Reynolds Drive. There is one bike lane striped from Reynolds Drive to Parking Lot H. There are no striped bike lanes from Parking Lot H to College Road. There is a sidewalk along the southern side of the roadway as well as raised and unraised crosswalks.

10.1 Pedestrian Considerations on Randall Drive

Based on feedback from UNCW staff, many pedestrians do not use the provided crosswalks on Randall Drive from Racine Drive to Reynolds Drive to cross. Parking Lots H and I are along the northern side of this section of roadway and the remainder of campus is to the south. Three midblock crossings are currently provided. Pedestrians can be encouraged to utilize the crosswalks by providing landscaping or fencing along the northern and southern sides of Randall Drive to hinder crossing outside of the crosswalks. Additionally, signs could be provided such as Cross Only at Crosswalks (R9-2).

10.2 Bicycle Considerations on Randall Drive

In order to accommodate bicyclists and other non-motorized traffic along Randall Drive, a multi-use path should be considered west of Racine Drive. The multi-use path could replace the existing sidewalk on the southern side of the roadway and tie into the existing crosswalks provided along Randall Drive. Alternatively, the multi-use path could be located on the north side of Randall Drive where there are fewer conflicts with driveways. The multi-use path could also connect to the Gary Shell Cross-City Trail on the western side of campus, which would further integrate regional bicycles access with the campus. It is recommended to stripe two bike lanes on Randall Drive east of Racine Drive.

Another option suggested by a stakeholder is to provide a multi-use path south of Kenan Auditorium and DeLoach Hall that parallels Randall Drive. This could also connect to the Gary Shell Cross-City Trail.
11.0 Reynolds Drive

Reynolds Drive is a two-lane roadway which connects Randall Drive to Cahill Drive. One bike lane is provided, as well as two sidewalks near the East Parking Deck and one sidewalk north of the deck. In order to accommodate bicyclists, it is recommended to provide a striped bike lane for both travel directions. Alternatively, the existing sidewalk on the western side of the road could be converted to a multi-use path and the single striped bike lane removed. It is also recommended to provide a sidewalk on the east side of Reynolds Drive north of the East Parking Deck.

11.1 Traffic Calming

Additional traffic calming measures could be considered for Reynolds Drive, especially near the Parking Deck. Potential traffic calming measures include impellers, mini-roundabouts, chokers, and center island narrowings. Each measure has benefits and disadvantages associated with it. Appropriate application and design is key to achieve the desired traffic calming effect. In addition, roadway widening may be required in order to accommodate the traffic calming measures.
12.0 Riegel Road

Riegel Road is a two-lane roadway which extends from Hamilton Drive to Rose Avenue on the eastern end of campus. Angle parking is provided for both directions of traffic near the intramural fields.

12.1 Pedestrian Considerations on Riegel Road

A sidewalk is provided on the northern side of Riegel Road from Union Drive to about Parking Lot J. From Parking Lot J to the eastern end of campus, the Gary Shell Cross-City Trail is provided. Many pedestrians were observed to travel in the roadway near the intramural fields and the angle parking. It is recommended to provide a sidewalk on the south side of Riegel Road along the parking area to accommodate pedestrians accessing vehicles parked along Riegel Drive as well as the intramural fields. From Hamilton Drive to Union Drive, no sidewalks are provided. The sidewalk provided on Hamilton Drive ends at Riegel Road. Many pedestrians were observed to cut through northeastern corner of the intramural field to travel from Hamilton Road to Price Drive, shown in the second photo. Many pedestrian would then cross Riegel Road near Union Drive, as shown in the third photo. To better accommodate pedestrian traffic, it is recommended to provide a sidewalk on Riegel Road from Hamilton Drive to Union Drive on the southern side of the roadway then provide a midblock crossing near Union Drive and tie into the existing sidewalk on the northern side of the road.

In addition, the crosswalks were inconsistent in pavement marking and signage. As previously discussed, it is recommended to provide consistent signage and pavement markings on crosswalks throughout campus.

12.2 Bicycle Considerations on Riegel Road

From Hamilton Drive to Union Drive, one striped bike lane is provided. There are no striped bike lanes provided east of Union Drive to Parking Lot J, and then one striped bike lane is provided east of Parking Lot J. The Gary Shell Cross-City Trail crosses Riegel Road near Parking Lot J then parallels Riegel Road to the eastern end of campus. It is recommended to provide sharrows or widen the roadway to provide striped bike lanes on Riegel Road for both directions. For the section of Riegel Road where the Gary Shell Cross-
City Trail parallels the roadway, either a second bike lane should be striped so that bike lanes are provided for both travel directions, or the existing single bike lane should be removed.

12.3 Head-Out Angle Parking

Head-Out Angle Parking
It is also recommended to consider converting the existing angle parking on Riegel Road to head-out angle parking to enhance the safety of all roadway users. The benefits of head-out angle parking were previously discussed for Hamilton Drive. Head-out angle parking would improve the driver’s ability to see pedestrian, bicycles, as well as other vehicles when pulling out of the parking space. Striped bike lanes could be provided adjacent to the vehicle travel lanes.

Angle Parking
If the existing angle parking is maintained, it is recommended to provide striped bike lanes away from the roadway on the other side of the parking.
13.0 Wagoner Drive

Wagoner Drive runs parallel to College Road on the west side of campus and connects Hurst Drive to Randall Drive. The Gary Shell Cross-City Trail runs along the west side of the road and striped bike lanes are not provided. Other than the trail, a few sidewalks segments are provided along the roadway and are not connected. The roadway has bus pull-outs and several crosswalks. As previously discussed, it is recommended to provide consistent signage and pavement markings on crosswalks throughout campus.

13.1 Parking Lot B

It was noted by the UNCW staff that there are conflicts between pedestrians and vehicles in Parking Lot B, which is located off of Wagoner Drive. Currently, there is an existing sidewalk along Wagoner Drive. As shown in the first picture to the right, the sidewalk intersects Parking Lot B offset from Wagoner Drive and internal to the parking lot. Pedestrians traveling on the sidewalk must cross between parked cars in the parking lot to reach the other side. There is currently no crosswalk provided at this crossing. According to UNCW staff, the parked cars obstruct the driver’s view of pedestrians, bicycles, and skateboarders crossing here, creating an unsafe situation.

It is recommended to provide a crosswalk at the entrance of Parking Lot B, between the stop bars and Wagoner Drive, and provide connections to the sidewalks on both sides. This will allow pedestrians to cross in a more visible location outside of the parking lot and reduce the potential for conflict.

14.0 Walton Drive

Walton Drive is a two-lane roadway internal to campus. Only one bike lane is striped from Riegel Road to Chancellor’s Walk. The bike lane is not striped through the intersection with Lionfish Drive nor the bus pull out near Chancellor’s Walk. There are no striped bike lanes from Chancellor’s Walk to Cahill Drive. It is recommended to provide complete bike lanes on Walton Drive from Riegel Road to Cahill Drive. The bike lanes will provide connections to the recommended bike routes on Price Drive and Cahill Drive which will serve as alternate routes to Chancellor’s Walk.

Sidewalks are provided north of Suites Service Loop and no sidewalks are provided to the south. It is recommended to provide a sidewalk south of Suites Service Loop to Riegel Road. It was noted that the sidewalk was touching the roadway pavement at some sections. As previously discussed, it is recommended to provide consistent signage and pavement markings on crosswalks throughout campus.
14.1 Chancellor’s Walk Crosswalk at Walton Drive

Chancellor’s Walk experiences high volumes of non-motorized traffic throughout the day. Currently, a raised crosswalk is provided at Walton Drive, as shown below. According to UNCW staff, there are many conflicts between motorists and pedestrians, bicycles, and skateboarders at this location. From 1:00-2:00 pm, there were 287 pedestrians, 103 bikes, and 33 skateboards observed crossing at this location.

In order to enhance the safety of this intersection, it is recommended to provide yield lines and Yield Here to Pedestrians signs (R1-5a). The MUTCD figure below shows an example. In addition, a “LOOK!” pavement stencil could be painted on the both sides of the crosswalk to encourage users to look for traffic before crossing.

![Source: Manual on Uniform Traffic Control Devices 2009 Edition](Image)
Center Island Narrowing & Pedestrian Refuge
A center island narrowing could also be considered at this crosswalk to provide traffic calming as well as a pedestrian refuge. This feature, such as the one shown to the right, would help differentiate this major pedestrian crossing on campus. It should be noted that roadway widening may be required in order to accommodate this feature along with dedicated bike lanes.

14.2 Crosswalk at Walton Drive Student Recreation Center
Similar to the crosswalk at Chancellor’s Walk, there is a raised crosswalk located at the Student Recreation Center. According to UNCW staff, conflicts between pedestrians, bicycles, skateboards, and vehicles occur here. From 1:00-2:00 pm, there were 193 pedestrians, 28 bikes, and 7 skateboards observed crossing at this location.

Consistent with the recommendation for the crosswalk at Chancellor’s Walk, it is recommended to provide yield lines and Yield Here to Pedestrians signs (R1-5a).

Furthermore, new field designs are planned for the recreational fields near the Student Recreation Center. Should conflicts at the existing crosswalk near the volleyball and basketball courts increase, it is recommended to provide yield lines and Yield Here to Pedestrians signs (R1-5a).
14.3 Walton Drive North of Cahill Drive

According to input from the stakeholders, vehicles currently travel too fast on Walton Drive north of Cahill Drive. This section of Walton serves student housing located in the northeast section of campus. Additionally, as indicated in the Master Plan, UNCW has future plans to create an outer loop road to connect Riegel Road on the east end of campus, behind the student housing, to Randall Drive. With this loop road in place, one concern discussed with UNCW staff is cut through traffic on this section of Walton Drive. In order to slow vehicles on this section of Walton Drive and discourage cut through traffic once the loop road is in place, it is recommended to install three raised crosswalks north of Cahill Drive. These crosswalks will also provide safer crossing for pedestrians at these locations.

14.4 Traffic Calming

Additional traffic calming measures could be considered for Walton Drive, especially south of Service Suite Loop and north of Cahill Drive. Various traffic calming measures were discussed previously in the Reynolds Drive section. Potential traffic calming measures include impellers, mini-roundabouts, chokers, and center island narrowings. As previously discussed, appropriate application and design is key to achieve the desired traffic calming effect. Roadway widening may be required in order to accommodate the traffic calming measures.
Chancellor’s Walk is a heavily trafficked pedestrian path which connects student housing and Wagoner Hall (dining) on the east side of campus to the campus’s core on the west side. It is approximately one-half mile long, 30 feet wide, and many academic buildings are located along the path. From 1:00–2:00 pm, there were 450 pedestrians, 147 bikes, and 42 skateboards observed on Chancellor’s Walk near the Social Behavioral Sciences building.

UNCW staff has reported that there are many conflicts on Chancellor’s Walk between the different users (bicycles, pedestrians, and skateboards). This is likely due to the high volume of users on Chancellor’s Walk and that those users travel at different speeds and share the same path. In addition, the wide geometry and straight alignment of the path likely promotes higher travel speeds for the wheeled modes, which increases the potential for conflict.

As previously discussed, recommendations have been made for Cahill Drive and Price Drive, which run parallel to Chancellor’s Walk, in order to provide alternate routes for bicyclists. This has the potential to reduce the volume of bicycles on Chancellor’s Walk. Other improvement considerations are discussed below.

### 15.1 Create Separate Paths

According to the FHWA *Designing Sidewalks and Trails for Access*, it is desirable to provide different lanes for users who travel at different speeds on busy paths. Therefore, *it is recommended to consider separate bike and skateboard paths on Chancellor’s Walk*. This can likely be accommodated within the existing pavement width of about 30 feet.

A few examples of separated paths are shown on the following page.
Separated path examples:

- Demindre Cut Greenway in Detroit
- University of Arizona
- Orange Line Bike Path in Los Angeles
- Lasuen Mall, Stanford University
15.1.1 Skateboard Considerations

With regards to skateboard traffic, many universities prohibit skateboard use on campus. However, some universities have implemented innovative solutions to accommodate the green mode of transportation. The University of California Santa Barbara striped a skateboard lane along the main campus corridor in 2009. It is five-feet wide and consists of paint and graphics, as shown to the right. According to a survey conducted by the school, the safety between skateboards and other users improved after the installation of the lane.

San Diego State University installed a shared bike-skateboard lane which was the first of its kind. Prior to installation of the lane, the school had a “no wheels” policy on campus. In the spring of 2010, the school constructed a trial bike/skateboard lane on Campanile Walkway. After a one year trial of the lane, the university determined that conflicts due to skateboards actually increased during this time since prohibited skateboard usage outside of the designated lanes increased. Ultimately, the university made this bike lane permanent, but prohibited skateboards, and developed a more extensive bike path system throughout the campus.

15.2 Reduce Travel Speeds

Another option to decrease the potential for conflicts on Chancellor’s Walk is to reduce bicycle and skateboard travel speeds. This can be accomplished by different measures including installing obstructions along Chancellor’s Walk to create choke points (such as planters, fountains, benches, etc.) In addition, trees could be planted along both sides of the path to provide a canopy which creates a sense of enclosure and has a narrowing effect to slow traffic. Users desiring to travel faster could use an alternate route, such as Cahill Drive or Price Drive with the improvements recommended in this report.

In addition, stencils can be used along Chancellor’s Walk to indicate a “Pedestrian Zone” and bicycles must yield to pedestrians. Stencils currently being considered by UNCW are shown to the right.
16.0 Vehicle Circulation

As a part of this study, the on campus traffic circulation and capacity was analyzed for short term and long term study years. The following scenarios were studied: 2013 Existing, 2020 Future with Partial Loop Road, 2020 Future with Master Plan Roadway Improvements.

16.1 2013 Existing

In general, all of the analyzed intersections currently operate at an acceptable level of service, with the exception of the intersection of College Road & Randall Drive. The capacity analysis results for the existing conditions are provided in Figure 2. As previously discussed in this report, it is recommended to modify the intersection of Riegel Road & Hamilton Drive to an all-way stop. This is anticipated to improve the level of service in both short term and long term conditions. In addition, this improvement is anticipated to enhance the safety of the intersection for all modes of transportation.

16.2 Long Term – 2020 Future

The latest Master Plan Update, completed in 2010, provides plans for future growth including the addition of new buildings, the renovation of existing buildings, addition of parking decks, and addition of new on-campus roadways.

There are plans for new roadways on campus, as shown in the Master Plan, including a new loop road that will connect Randall Drive to Plyler Drive. It is anticipated that two segments of the loop road will be constructed initially: one segment connecting Plyler Drive to Seahawk Village, and one segment connecting Randall Drive to Seahawk Landing. When the entire loop road is complete, it will likely reduce the vehicular traffic internal to campus on roadways such as Walton Drive and Cahill Drive. Recommendations were previously made for Walton Drive north of Cahill Drive in order to slow traffic and reduce cut through traffic after the loop road is in place.

Another new roadway included in the Master Plan is an extension of Hurst Drive to connect to Riegel Road. This extension will greatly benefit the campus by completing an outer roadway loop around the campus’s perimeter. This is anticipated to reduce vehicular traffic on roadways internal to campus, including Price Drive, Hamilton Drive, and Riegel Road.
For the long term analysis year of 2020, a capacity analysis was carried out for two scenarios. One scenario involved building two segments of loop road on the east end of the campus; the capacity analysis results are provided in Figure 3. The other scenario included the entire loop road on the east end of the campus and the Hurst Drive extension; the capacity analysis results are provided in Figure 4.

In general, the new roadways are anticipated to reduce the traffic volume on roadways internal to campus and, thus, improve the level of service at the internal intersections. Conversely, the volume of traffic along the perimeter roadways is anticipated to increase and the level of service is anticipated to worsen. As further discussed in the Technical Appendix, it is recommended to provide an eastbound right turn lane on Randall Drive at Reynolds Drive to accommodate future traffic volumes.

The Master Plan shows the addition of three (3) parking decks on the east end of campus. They are located near Randall Library, Hoggard Hall, and at the intersection of Hamilton Drive & Hurst Drive. In order to reduce vehicular traffic internal to campus, it is recommended to provide access to the new parking decks along the perimeter roadways. These roadways include Wagoner Drive, Randall Drive, and Hurst Drive.
FIGURE 2
INTERSECTION LEVEL OF SERVICE
(2013 EXISTING PM PEAK)
FIGURE 3
INTERSECTION LEVEL OF SERVICE
(2020 FUTURE BUILD PM PEAK WITH PARTIAL LOOP ROAD)
FIGURE 4
INTERSECTION LEVEL OF SERVICE
(2020 FUTURE MASTER PLAN PM PEAK)
17.0 Conclusion

DAVENPORT has been retained by UNCW to provide short term (2014) and long term (2020) multi-modal transportation and safety recommendations. This study assesses opportunities for improvement for all modes of transportation including vehicular, bicycle, pedestrian, skateboard and transit. Also, this study identifies solutions to reduce bicycle/pedestrian/vehicle conflicts and enhance the mobility of all modes of transportation.

The purpose of this study is to evaluate and provide transportation and safety recommendations for vehicular traffic, bike and pedestrian traffic, as well as transit. The following are the primary objectives of this study:

1. Review multi-modal transportation opportunities on the UNCW main campus and identify solutions to reduce bicycle/pedestrian/vehicle conflicts and traffic calming as necessary.
2. Determine effective locations for bike-share and bike racks on campus. Integrate regional bicycle access with campus, including Wooddale Drive, Rose Avenue, Randall Drive, Hoggard Way/Hurst Drive and Racine Drive.
3. Review integration of the campus with the environs on the opposite side of College Road.
4. Determine effective shuttle routes and stops on campus and within the one-mile radius.
5. Determine do’s and don’t’s for effective deployment of car sharing (Zip Car or similar) and bike sharing. Comment on feasibility of integrating these services with regional employers or destinations (such as downtown and Wrightsville Beach).
6. Comment on the feasibility and benefits of completing the road connection from Hurst to Riegel (as outlined in the 2010 Campus Master Plan Update).
7. Comment on the feasibility and benefits of completing a loop road on the back of campus (as outlined in the 2010 Campus Master Plan Update).

The recommended improvements are also presented in the following figures:

- Figure 5: Short Term Pedestrian Improvements
- Figure 6: Short Term Bicycle Improvements
- Figure 7: Short Term Vehicle Improvements
- Figure 8: Long Term Pedestrian Improvements
- Figure 9: Long Term Bicycle Improvements
- Figure 10: Long Term Vehicle Improvements
- Figure 11: Multi-Modal Recommended Improvement

The general recommendations not included in the figures are summarized in Table 17.0 Details regarding the traffic capacity analysis can be found in the Technical Appendix.
### Table 17.0 – Overall Recommendations

<table>
<thead>
<tr>
<th>Category</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Review, revise as needed, and promote the UNCW safety tips and rules for all users.</td>
</tr>
<tr>
<td></td>
<td>UNCW Master Plan to provide support for the effort of the construction of a bicycle/pedestrian overpass on College Road.</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>Provide crosswalks with consistent pavement marking and signage throughout campus.</td>
</tr>
<tr>
<td></td>
<td>Designate “walk zones” in the congested areas of campus, such as the campus core.</td>
</tr>
<tr>
<td>Bicycle</td>
<td>Provide a striped bike lane for each direction of travel on roadways with bike lanes, or provide sharrows when there is not sufficient pavement width.</td>
</tr>
<tr>
<td></td>
<td>Provide bike symbols and arrow pavement marking in the bike lanes.</td>
</tr>
<tr>
<td></td>
<td>Locate bike racks on the sides of the buildings away from Chancellor’s Walk and outside of the Walk Zone.</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Provide access to the new parking decks along the perimeter roadways</td>
</tr>
</tbody>
</table>
FIGURE 5
SHORT TERM PEDESTRIAN RECOMMENDED IMPROVEMENTS

- Install sidewalk to connect to crosswalk
- Provide midblock crossing
- Provide raised crosswalk at Lot E entrance
- Provide sidewalk on north side of Cahill Dr. from Reynolds Dr. to Friday Annex
- Provide sidewalk from College Road to Cross City Trail
- Designate a Walk Zone at the campus core
- Provide sidewalk on north side of Cahill Dr. from Reynolds Dr. to Friday Annex
- Provide yield lines and “Yield Here to Pedestrians” signs at crosswalks. Consider “LOOK!” stencils. Consider a center island narrowing for traffic calming and pedestrian refuge.
- Provide yield lines and “Yield Here to Pedestrians” signs at crosswalks.
- Provide crosswalk at entrance of Parking Lot B and provide connections to sidewalks on both sides
- Consider additional pavement marking and signage at existing crosswalks
- Provide crosswalk to connect sidewalk to Wagoner Hall
- Provide landscaping or fencing along the northern and southern sides of Randall Drive to hinder crossing outside of the crosswalks
- Provide crosswalk to connect sidewalk to Wagoner Hall
- Consider additional pavement marking and signage at existing crosswalks
- Provide crosswalk to connect sidewalk to Wagoner Hall
FIGURE 6
SHORT TERM BICYCLE RECOMMENDED IMPROVEMENTS
Figure 7
SHORT TERM VEHICLE RECOMMENDED IMPROVEMENTS

- Convert existing angle parking to head-out angle parking
- Provide vehicle turnaround at end of Cahill Dr. Ext.
- Modify the intersection of Hamilton Drive & Riegel Road to a all-way stop and provide crosswalk treatments
FIGURE 8
LONG TERM PEDESTRIAN RECOMMENDED IMPROVEMENTS

- Fill in sidewalk gaps along College Road between Hurst Drive and New Centre Drive.
- Shift crosswalk to west of CIS driveway.
- Provide sidewalk on east side of Reynolds Drive.
- Provide sidewalks on both sides of Price Dr. between CIS Building and Riegel Rd.
- Provide sidewalks on south side of Riegel Rd. along parking area, crosswalk at Union Dr.
- Provide sidewalks on north side of Hoggard Dr.
- Provide midblock crossing.
- Consider yield lines and “Yield Here to Pedestrians” signs at crosswalks.
- Provide sidewalk on south side of Riegel Rd. along parking area, crosswalk at Union Dr.
- Provide sidewalk on west side of Walton Drive south of Suites Service Loop.
- Shift crosswalk to west of CIS driveway.
- Provide sidewalk on south side of Riegel Rd. along parking area, crosswalk at Union Dr.
- Provide sidewalk on west side of Walton Drive south of Suites Service Loop.
- Provide sidewalk on the north side of Hoggard Dr.
Consider bike lanes on Hurst Dr. from Wagoner Rd. to College Rd.

Consider a multi-use path south of Kenan Auditorium.

Provide sharrows or widen and stripe bike lanes on both directions of Riegel Rd.

Consider a multi-use path along Randall Drive – option to create on north side of Randall Drive or widen existing sidewalk on south side.

Consider separate bike paths and skateboard paths on Chancellor’s Walk or traffic calming methods.

FIGURE 9
LONG TERM BICYCLE RECOMMENDED IMPROVEMENTS
FIGURE 10
LONG TERM VEHICLE RECOMMENDED IMPROVEMENTS

- Construct section of New Loop Road from Randall Dr. to Seahawk Landing
- Provide an eastbound right turn lane on Randall Dr.
- Consider a roundabout with pedestrian/bicycle accommodations at Hamilton Drive & Riegel Road if operational issues develop
- Construct section of New Loop Road from Plyler Drive to Seahawk Village
- Provide an eastbound right turn lane on Randall Dr.

Note: The map shows the layout of the area with recommended improvements highlighted.
Consider separate bike paths and skateboard paths on Chancellor's Walk or traffic calming methods.

Provide landscaping or fencing along the northern and southern sides of Randall Drive to hinder crossing outside of the crosswalks.

Provide vehicle turnaround at end of Cahill Dr. Ext.