

# CONNECTIVITY AND STREETSCAPE CONCEPTS

## OVERALL FRAMEWORK

During the previous phases of the Dix Edge Area Study, improving connectivity in the area was identified as a priority goal to accomplish. The following document outlines the method used to identify gaps in the multimodal network and provides recommendations to meet the connectivity goals.

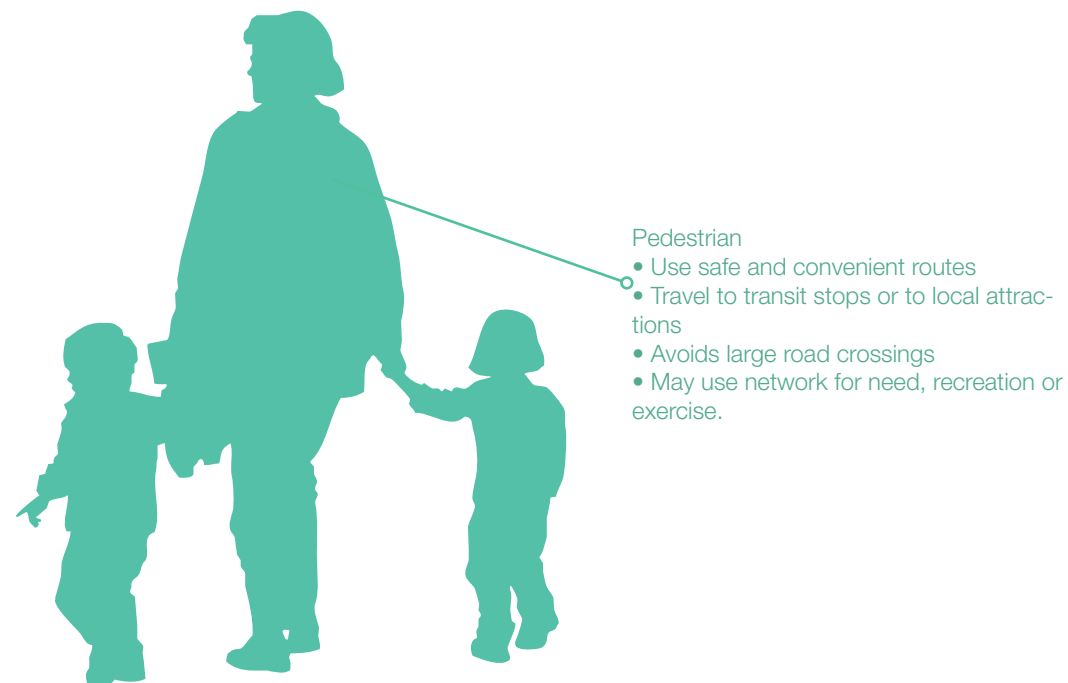
Fundamental to the growth of a safe, connected, and equitable Dix Edge is an integrated pedestrian, bicyclist, and street infrastructure system. Improving the multimodal facilities in Dix Edge can be accomplished through a two-pronged approach:

- An analysis of the existing transportation infrastructure in the study area

- The development of streetscape concepts (improvements to the physical design of streets)

Network analyses help identify gaps in existing infrastructure, while streetscape concepts provide the vehicle for the implementation of new multimodal transportation networks. When paired together, network analyses and streetscape concepts become a powerful tool to achieve effective, safe, and functional multimodal transportation networks.

This section provides an overview of pedestrian and bicycle networks in Dix Edge, explores potential multimodal network improvements, and illustrates streetscape concepts for two streets in the Dix Edge study area that are good candidates for a custom streetscape design.



## PEDESTRIAN NETWORK

In order to understand pedestrian connectivity and walkability in Dix Edge, multiple network analyses were performed. These analyses created walksheds (the specific geographic area that a pedestrian can walk to) from specific points of interest in and around Dix Edge.

Each iteration of the analysis made certain assumptions about how pedestrians move through the Dix Edge area. Examples include the assumption that pedestrians would travel from various points of interest (such as transit stops), would generally try to avoid major intersections, and would utilize safe and convenient routes when possible.

To provide a more nuanced understanding of how individuals may move through Dix Edge, the analyses created walksheds in varying intervals of both time and distance. Maps showing how far a pedestrian could walk within intervals of 5, 10, and 15 minutes, as well as distances of 1, 2, and 3 miles.

Mapping analysis indicates clearly that it is difficult for pedestrians to effectively and safely move through the Dix Edge area utilizing the existing sidewalk infrastructure. Potential improvements to increase sidewalk

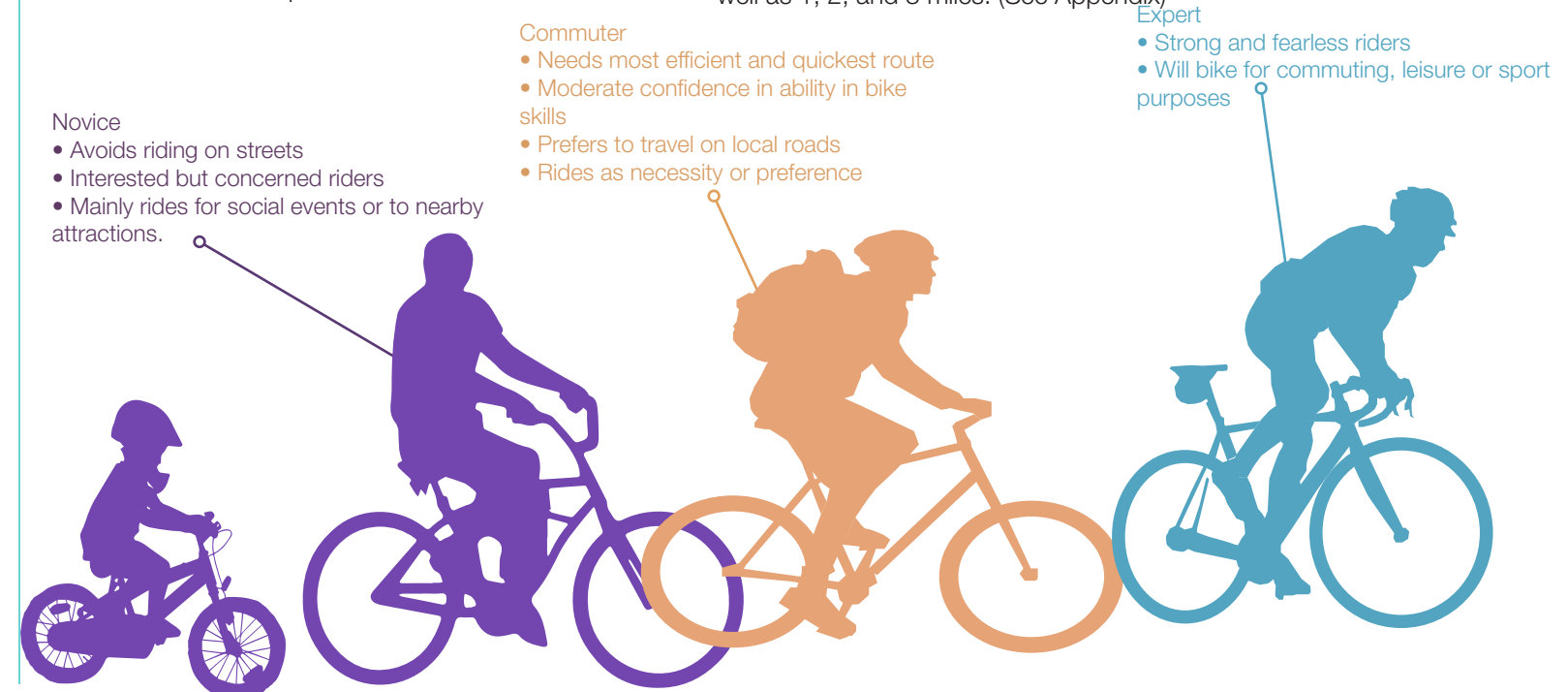
connectivity will result in larger walksheds between destinations and neighborhoods within the Dix Edge study area.

## BICYCLIST NETWORK

Network analyses were completed to understand bicycle connectivity in the Dix Edge area, similar to those completed for pedestrian connectivity.

Each iteration of the network analyses made certain assumptions about how bicyclists might move through the area. Specifically, analyses were completed for three groups of skill levels including novice, commuter, and expert bicyclists. Based on the characteristics of how each group behaves, different variables were input into the analyses to show how each group typically behave. This preference may include the avoidance of higher traffic streets or the preference to use streets with dedicated bike lanes.

Bikesheds were created from specific points of interest in Dix Edge study area and illustrates both existing conditions and a total build-out of planned infrastructure improvements. The bikesheds include representations of how far an individual can bike in intervals of 5, 10, and 15 minutes, as well as 1, 2, and 3 miles. (See Appendix)



## CONNECTIVITY CONCEPTS

The synthesis of individual walkshed and bikeshed data from the Dix Edge transportation network was completed, and provides a more complete and holistic understanding of how to create an effective multimodal network. Utilizing the information gathered in the pedestrian and bicycle network analyses, larger street plan concepts were developed to help guide targeted investment in future infrastructure.

## STREET PLAN

## Existing Planned (T1 Map)

## Proposed Additions to Planned T1 Map

Fuller St. Plan extension to Summit Ave.  
-Neighborhood Street

Mercury St. extension to Summit Ave.  
- Neighborhood Street

**Curfman St. extension to Mercury St.  
- Neighborhood Street**

Extend planned West Prospect Ave. to Daladams St. - Main Street

Extend Water Works St. to Wilmington St. -  
Avenue 2 Lane Divided

Extend Montrose St. to connect to Hubert  
and to mirror adjacent Penmarc Dr. - Main  
Street

## Change to Planned (T1 Map)

## Hammell Dr. - Change to Main Street

### West Prospect Ave. - Change to Main Street

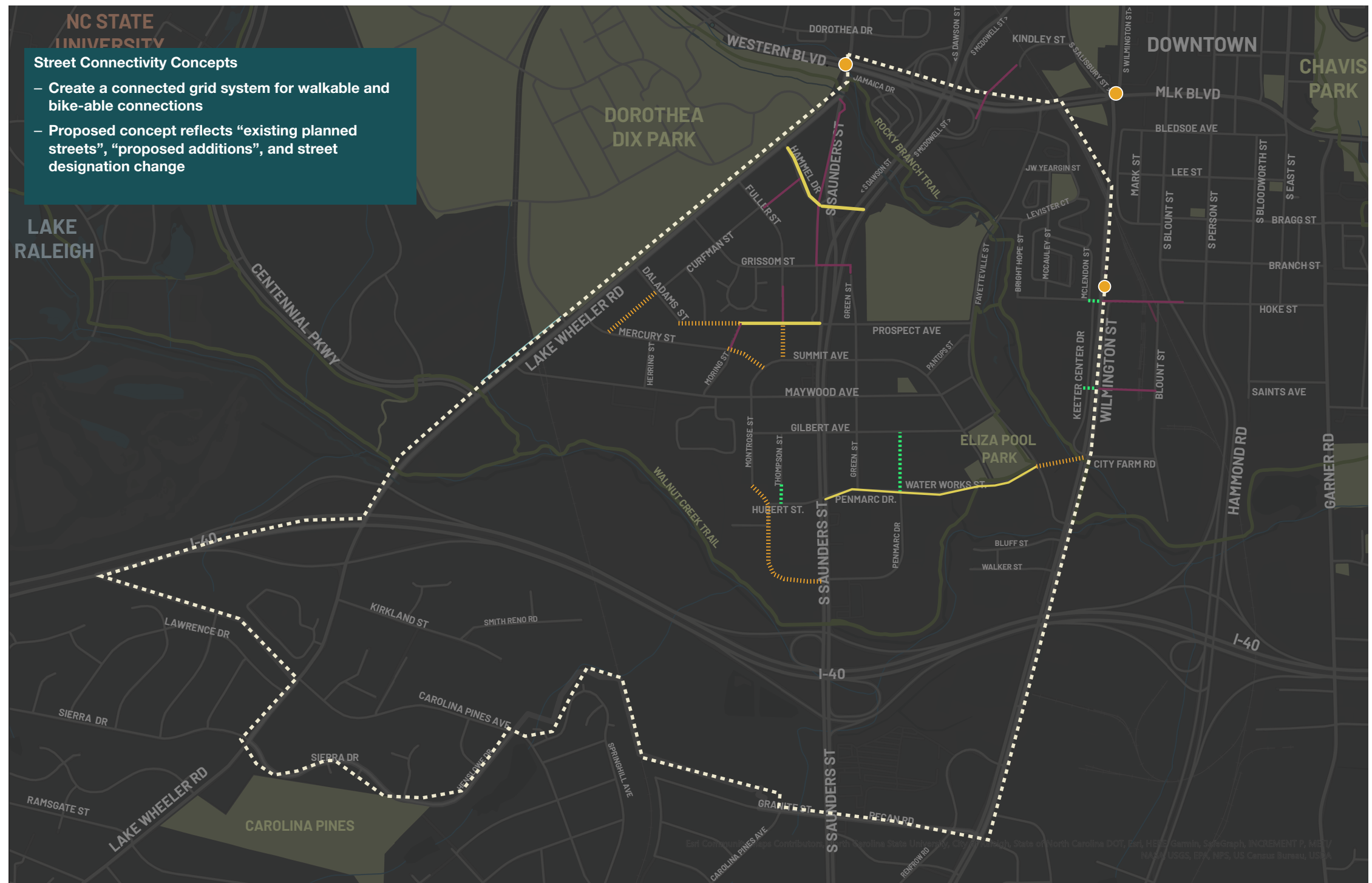
## Water Works Street & Penmarc Dr. - Change to Avenue 2 Lane Divided

## Area Specific Guidance

Extend Penmarc Dr. north to Gilbert Ave.

Connect Keeter Center Drive to Wilmington to align to future streets and convert south portion to bike and pedestrian only.

Extend Thompson St. to Hubert St.

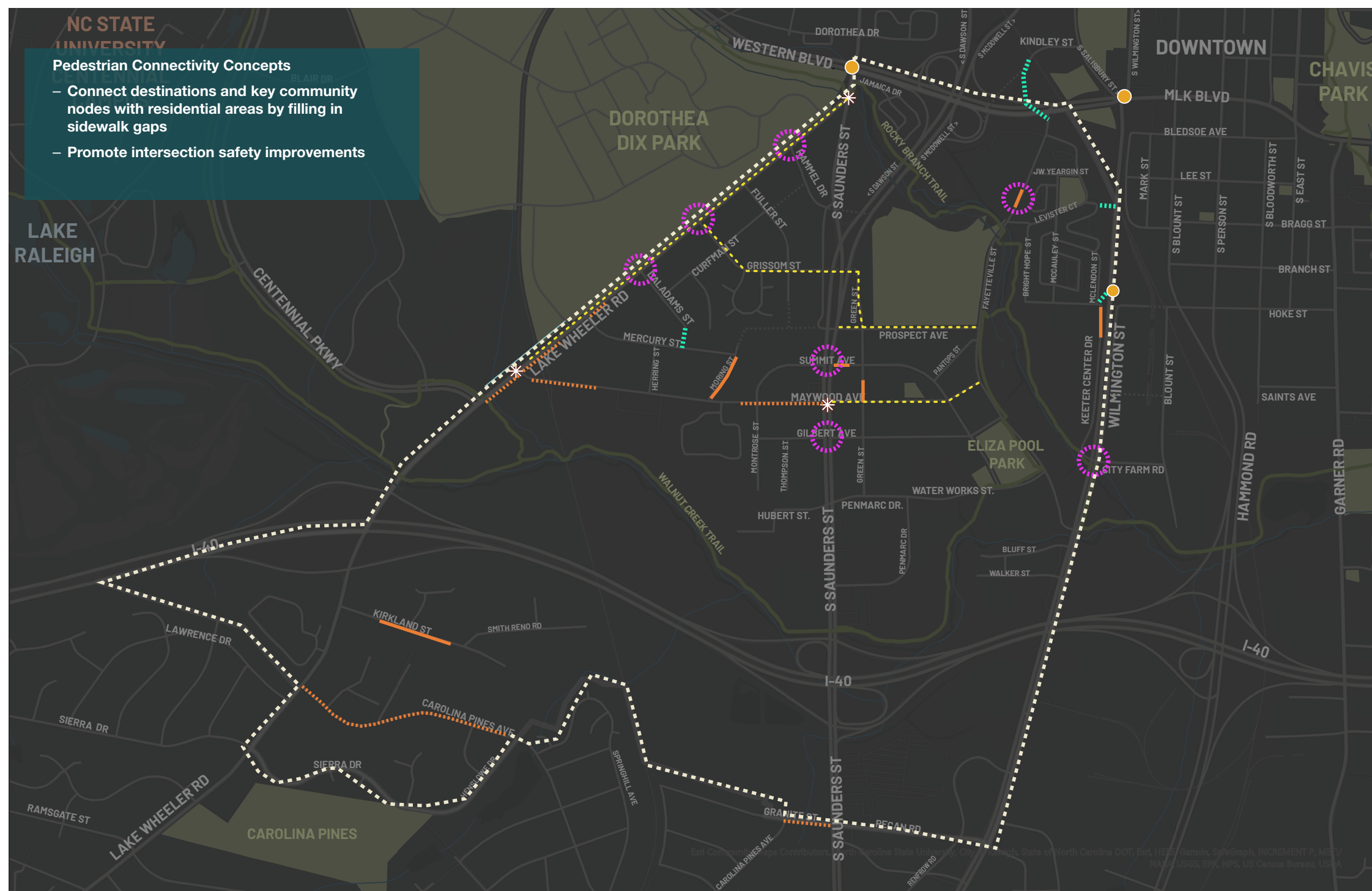






## PEDESTRIAN NETWORK

-  Recommended for COR Small Gaps Program
-  Programmed Sidewalks
-  Priority New Sidewalks
-  Bike/Ped Connection
-  Proposed Pedestrian Safety Improvements
-  Intersection Improvements for Advanced Study
-  Proposed BRT Stations



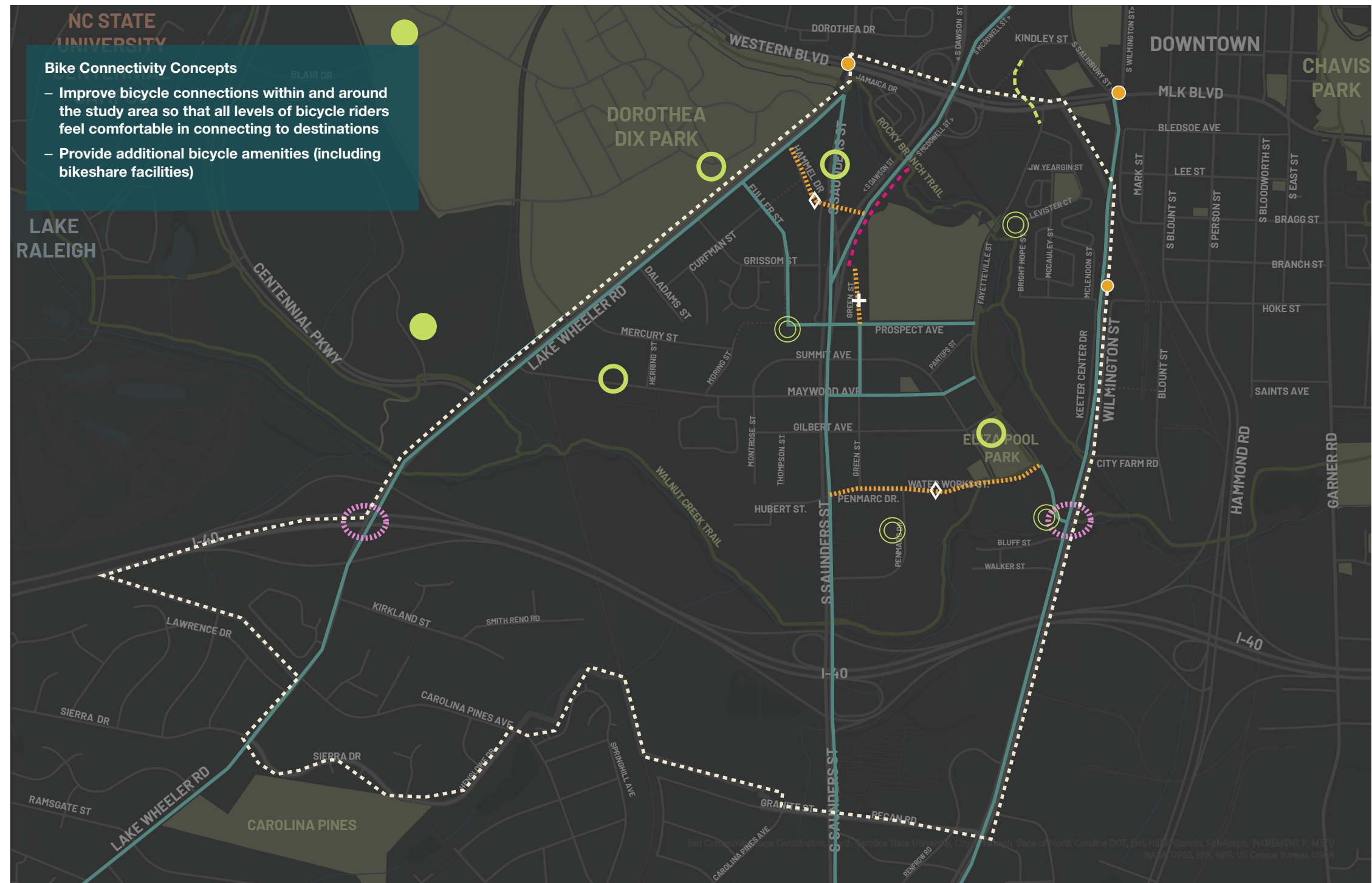
## BIKE & TRAIL CONNECTIVITY

Knitting the bike and trail networks together creates better connectivity for the study area by creating redundancy and it creates redundancy and alternate routes for bikers in case of closings along trail, or incomplete bike facilities. The majority of the trails are located in the floodplain and often flood, which leave their users without a safe, alternative route. Major trail additions are being proposed for portions of the study area to improve connectivity.

Bike facility additions include several separated bike facilities and a neighborhood bike facility. A separated bike facility will run parallel to S. Saunders St./S. McDowell St. from the north end of Green St. and connect to the Rocky Branch Trail. A custom streetscape design with a separated bike facility is proposed for Hammel Drive, creating protected bike travel between S. Saunders St. to Dix Park.

BIKE  
NETWORK

- Existing Planned
  - Proposed Additions to T3 Map
    - Separated Bikeway  
Hammel Street - Custom Streetscape  
Penmarc Drive & Water Works Street
    - Neighborhood Bikeway  
Green Street
  - Shared Use Path to Trail
  - Bike Crossing Improvements
  - Bike/Ped Bridge
  - Existing Bikeshare Sites
  - Priority New Bikeshare Sites
  - Potential Bikeshare Sites
  - Proposed BRT Stations





Portions of the Walnut Creek Trail east of S. Saunders Street experience a unique micro-climate and creek erosion, which have degraded existing trail infrastructure. In an effort to create redundancy in trail network, an alternate path is proposed to connect the future Downtown South development with a streetside path which crosses S. Saunders St. to connect back to the existing Walnut Creek Trail.

In order to further increase bike and pedestrian connectivity to areas in the south of the study area, consideration should be given to create a trail to transverse Dix Park and cross I-440 by running parallel to the existing Norfolk Southern railroad track. This trail, along with the Lake Wheeler Road's mixed-use path or bikeway, will create alternate routes connecting the trail network.

TRAIL NETWORK

Current Greenway Trail

Planned Greenway Trail

Existing Private Trails

Proposed Private Trails

Proposed Multi-use Path or Bikeway Trail

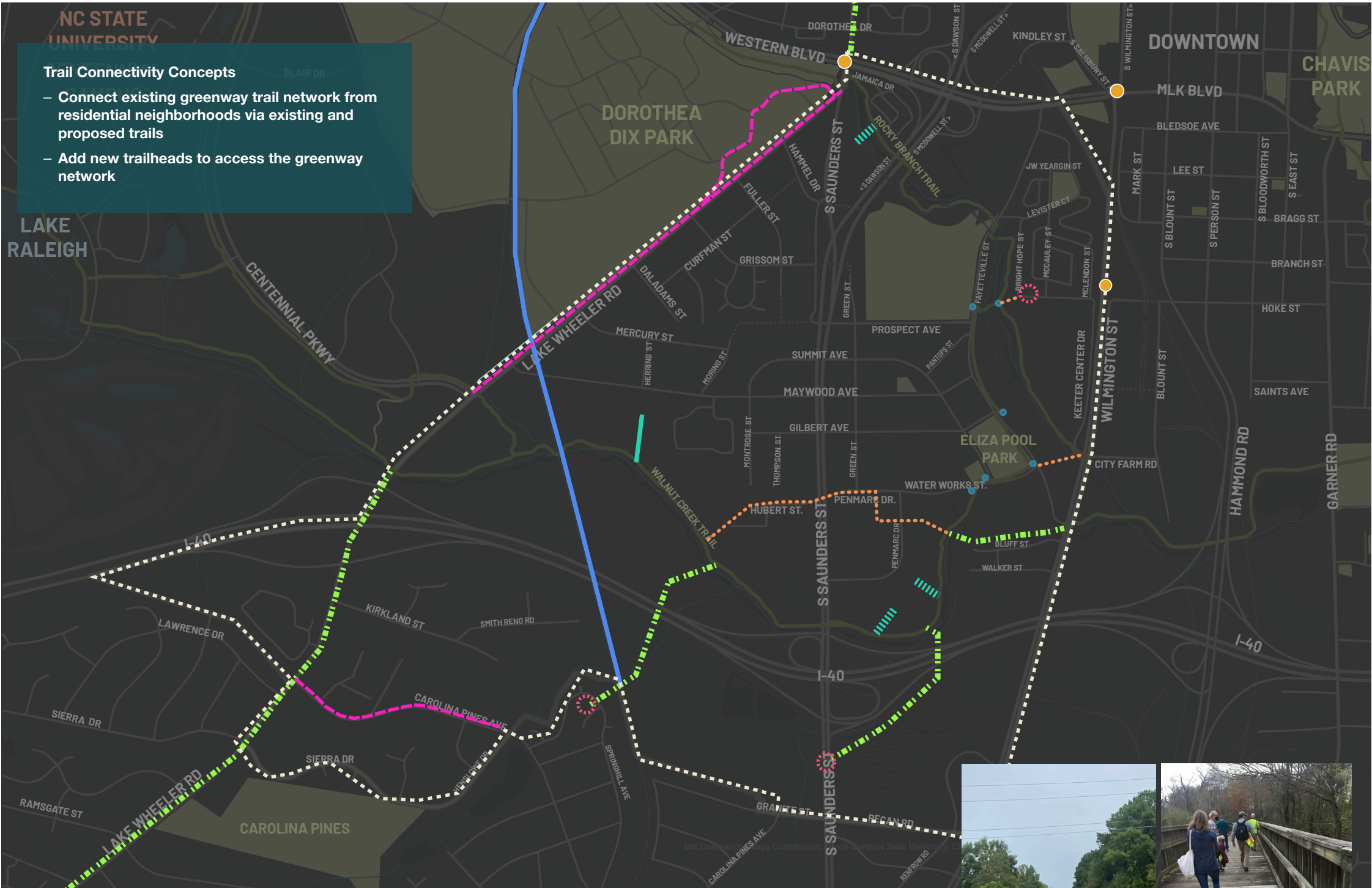
Proposed Addition to Greenway Trail Master Plan

Proposed Public Trail

Planned New Trail Signage

Proposed New Trail Entry

Proposed BRT Stations



**IMAGES**  
Rail line that runs from Rocky Branch Trail to Walnut Creek trail. Trail structure on Walnut Creek Trail has experience maintenance issues.





# STREETSCAPE CONCEPTS

Streetscape concepts define and enhance pedestrian comfort, multimodal access, and visual appeal. The quality of streetscapes influence the extent to which the public realm can attract people, activity, and connections. Streetscape concepts provide a means for implementing the recommendations developed by the network analyses of both pedestrian and bicyclist infrastructure.

Two areas are identified for potential streetscape improvements: Lake Wheeler Road and South Saunders Street. The factors considered for these streetscape designs were derived from public comments, internal City of Raleigh stakeholder feedback, known safety concerns, and consideration for future developments in the Dix Edge Area.

Hammel Drive custom streetscape is also included and illustrates an alternate for the Main Street road designation. In the Unified Development Ordinance and the Street Design Manual, a Main Street is defined with a 73' right-of-way width with parallel parking, but no allocation for bike facilities. The alternate keeps the recommended right-of-way width for the street but substitutes a separated and elevated bike facility in the place of parallel parking.

STREETSCAPE DESIGN

KEY

Study Area Boundary

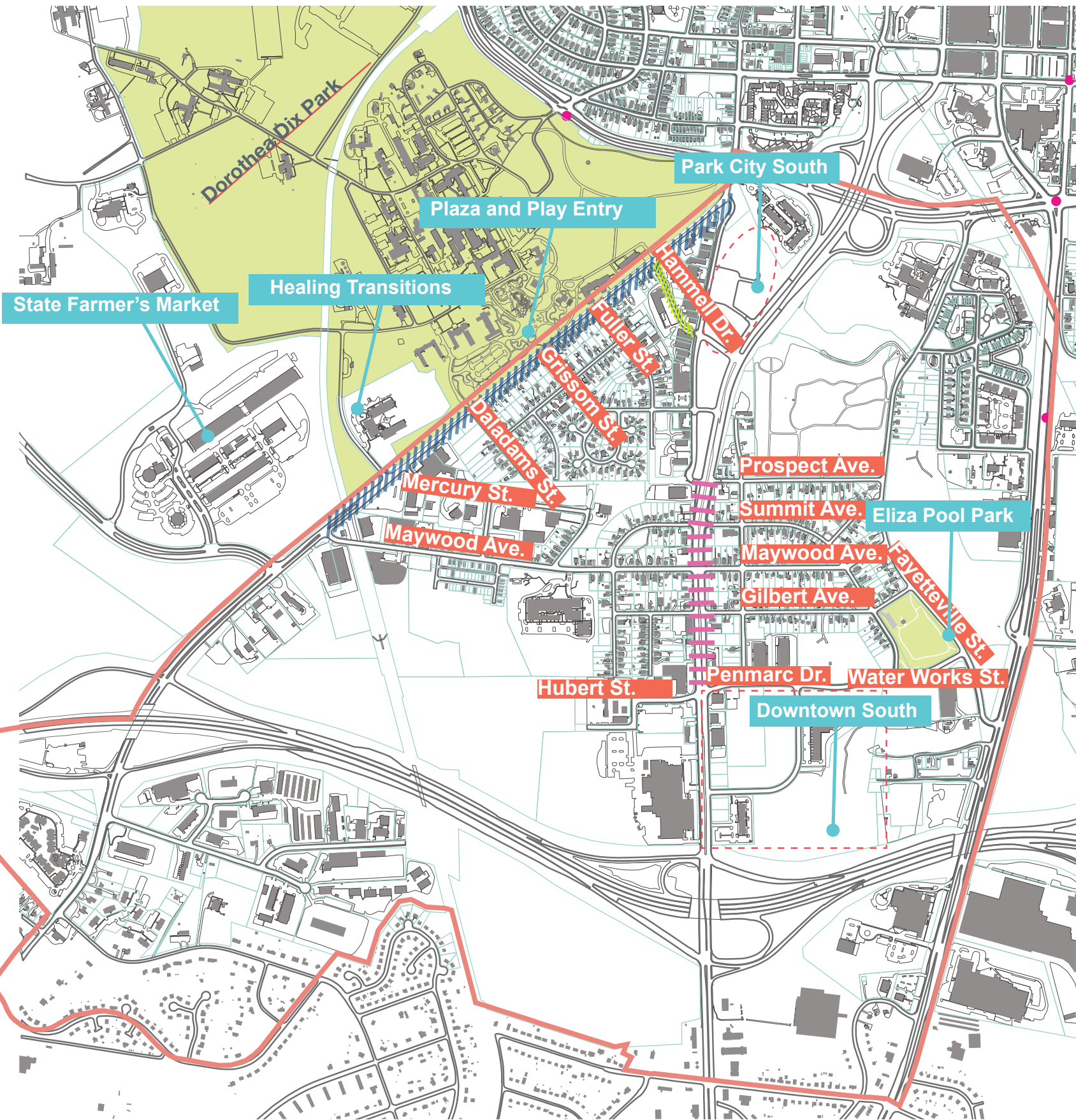
Parks

Lake Wheeler Streetscape Extents

South Saunders Streetscape Extents

Hammel Drive Custom Streetscape Extents

Bus Rapid Transit Station





# MULTIMODAL STREETS & PRECEDENTS

## LAKE WHEELER ROAD

The City of Raleigh is currently designing the first phase of Dorothea Dix Park. The Park is a major investment in the Dix Edge area and Lake Wheeler Road will become a primary new gateway into this new, major green space. In addition, several new developments are in the design or construction phase near Lake Wheeler Road, and several new master plans have been completed or are underway including the State Farmer's Market

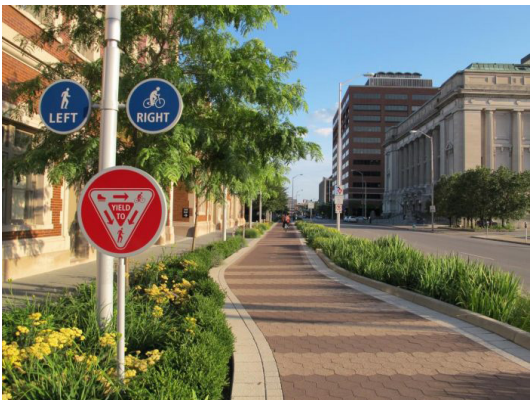
and Healing Transitions. Given the changing landscape around Lake Wheeler Road, there is a unique opportunity to implement a complete street design and create a strong connection between Dorothea Dix Park and the adjacent neighborhoods.

The streetscape concepts for Lake Wheeler Road were inspired by public input during previous phases of the study and precedents from around the country and are shown below.

**TOP LEFT**  
A Cycle Track at Cambridge, MA, provides ample separate paths.



**BOTTOM LEFT**  
Denver's Riverfront park has a series of formal and informal paths adjacent to park



**TOP RIGHT**  
Winston Salem Strollway

**BOTTOM RIGHT**  
Indianapolis' Cultural Trail provides separated paths for bicycle and pedestrian, which merge and split dependent on available right-of-way conditions.

## SOUTH SAUNDERS STREET

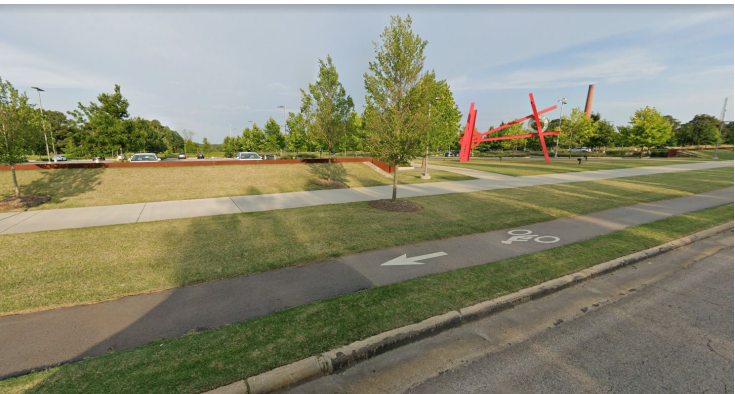
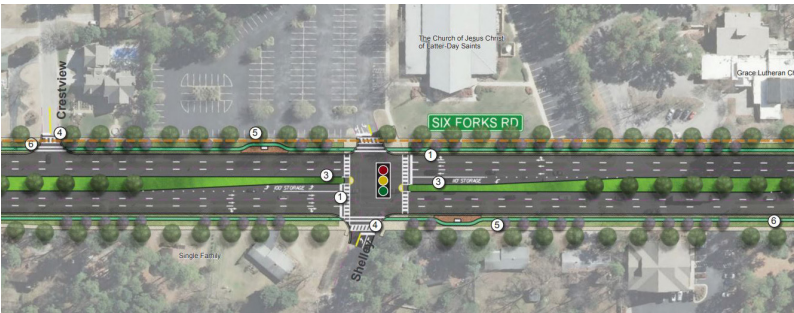
South Saunders Street is a major north- south route through the Dix Edge area. It connects and divides the study area to Downtown Raleigh located on the northside of the area while also connecting the southern neighborhoods and toward the southside of the area. The S. Saunders Street corridor currently has several major redevelopment projects proposed or in-progress including Downtown South at the southern end of

the street and Park City South anchoring the north. By leveraging the new growth and change along the corridor, the roadway is primed to be re-imagined as a safe, multimodal corridor for the Dix Edge area.

Inspiration for the S. Saunders Street streetscape concepts are conceived from the Six Forks Road in Raleigh, as shown below.



**LEFT & BOTTOM LEFT**  
Six Forks Road in Raleigh, NC. Improvements are currently in design; it provides examples on different ways to implement a complete streets design for a 6-lane divided street.



**ABOVE**  
Blue Ridge Road in Raleigh adjacent to the North Carolina Museum of Art (NCMA). This illustrates a local example of separated and elevated bike and pedestrian paths.

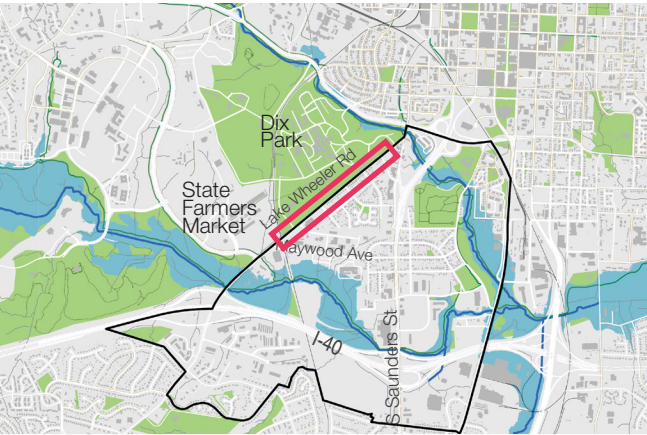


# LAKE WHEELER ROAD

## EXISTING CONDITIONS

Lake Wheeler Road is currently a 2-lane undivided street without sidewalks or bicycle lanes. Three potential streetscapes were developed using data gathered from the pedestrian and bicycle connectivity analyses, input from various stakeholders, organizations, and public comments. The following designs were created to meet the goals established from the top three priorities set by the community in the previous phase.

- 1) Provide buffering or separation for bike riders and pedestrians from Lake Wheeler Road traffic.
- 2) A streetscape design that is comfortable for users of all ages.
- 3) Separation between biker paths and sidewalks along the road.



Study Area Map (showing location of streetscape concepts)



Section 1: Dix Park edge with transmission lines and homes along Lake Wheeler Road.



Section 2: Existing transit stop along Lake Wheeler Road.

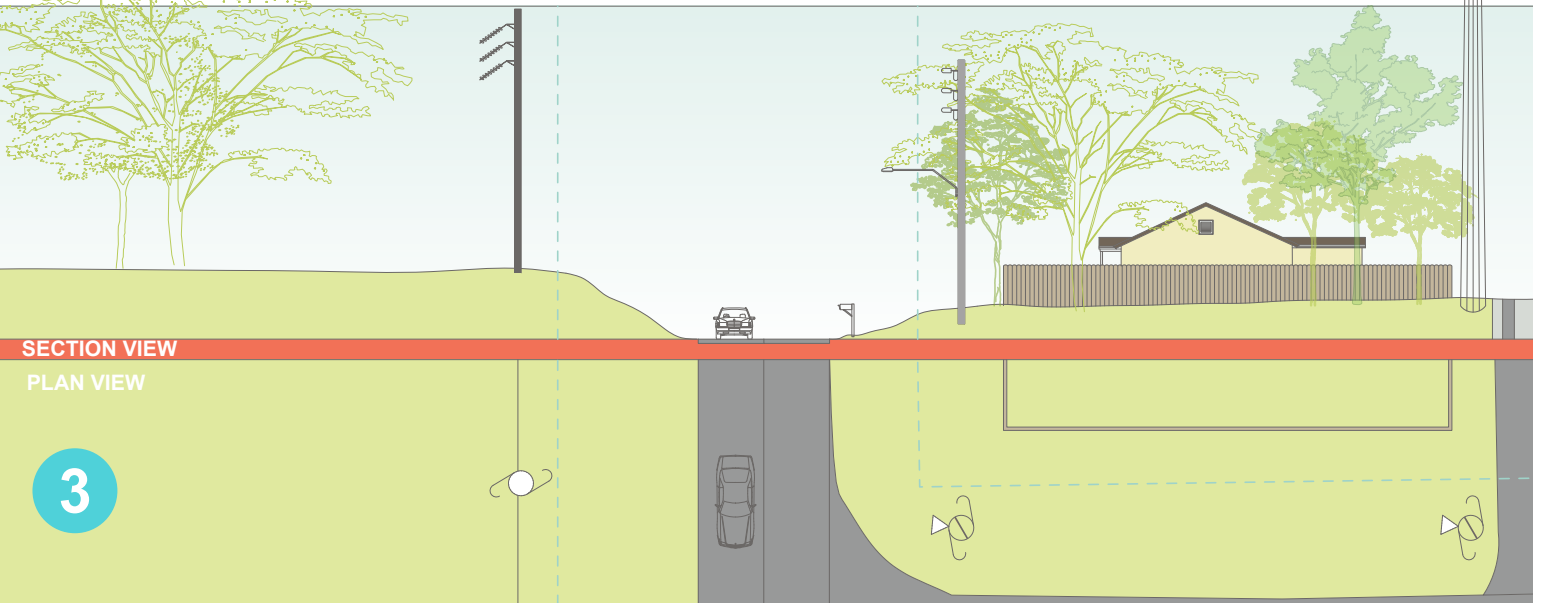
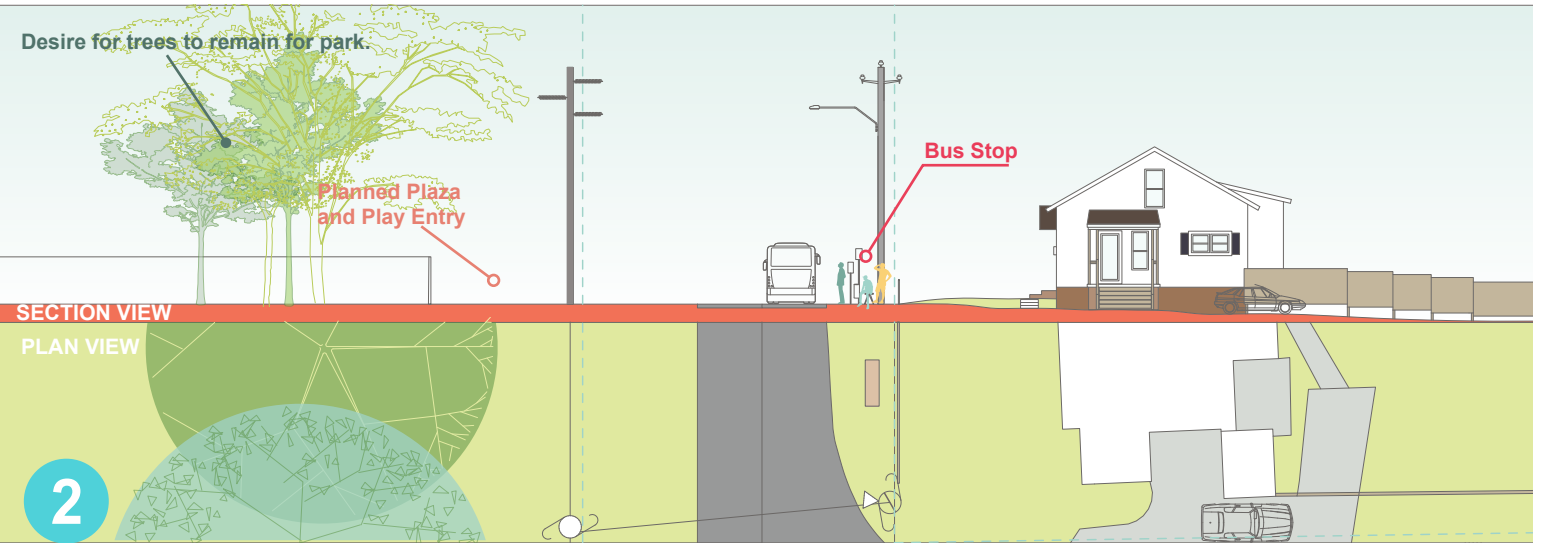
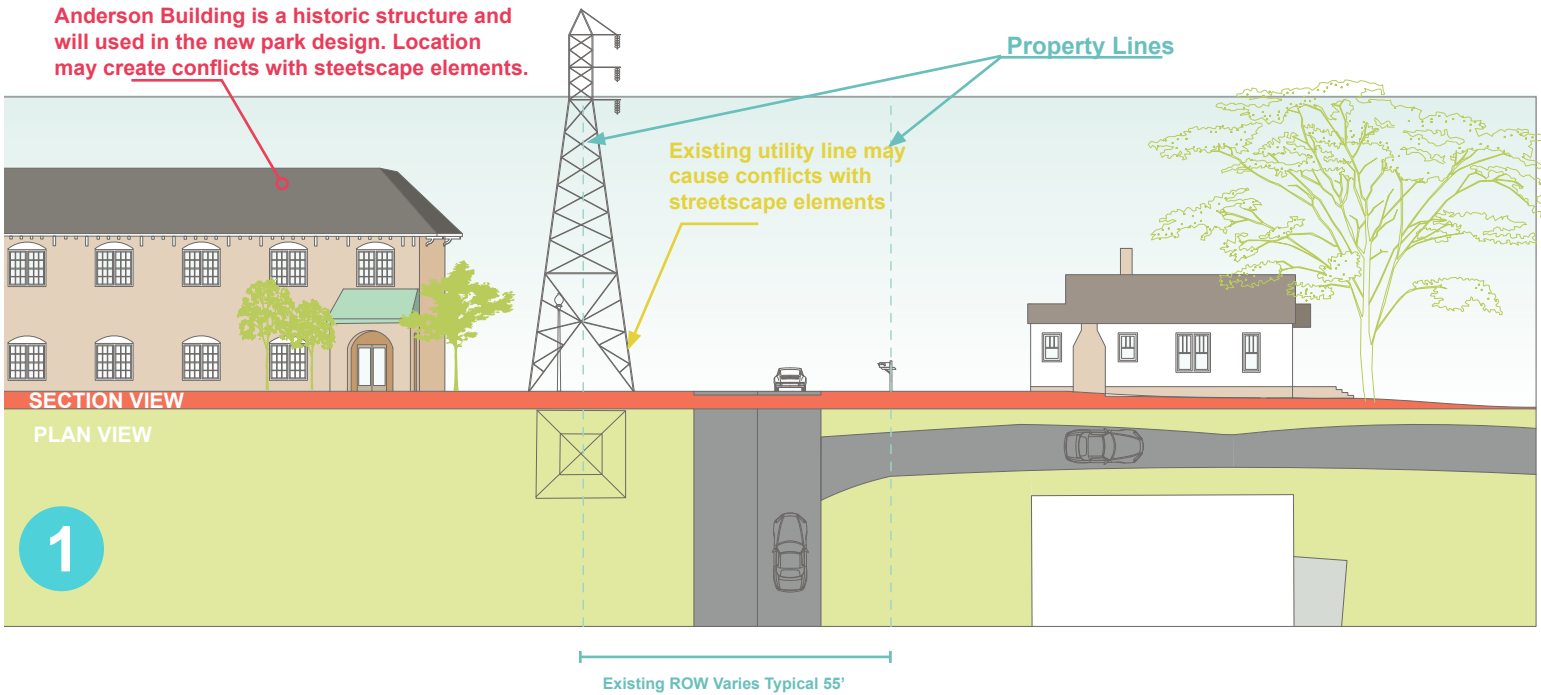


Map (showing location of streetscape cross-sections)



Existing homes in the Fuller Heights neighborhood along Lake Wheeler Road

Building will remain and the width for new streetscape will need to be less than 65' adjacent to building.

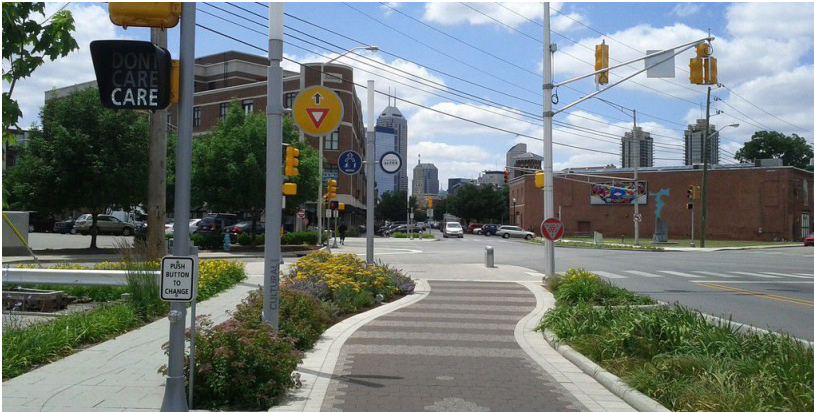


EXISTING STREETSAPES AT THE CROSS-SECTION LINES SHOWN WITHIN THE KEY MAP



LAKE WHEELER ROAD

**STREETSCAPE OPTIONS:** Three streetscape options were designed and presented to the public to determine the preferred section for Lake Wheeler Road.



Precedent image of Indy Cultural Trail that illustrates a design that separates and buffers the sidewalk and bikeway portions of the streetscape section. This concept is captured in all the options.



Precedent image from Denver, CO. This image shows how Option B could provide parkside promenade areas for activation.



Examples of streetside Green Stormwater Infrastructure (GSI)

Option A

- Landscaped median that allows left turn lanes near intersections
- 6’ landscape strip and 6’ sidewalk along community edge
- Separated 12’ Bikeway and 6’ sidewalk along Dix Park edge
- Similar to current planned designation for Lake Wheeler.

Phase Soon Public Survey 32% of votes

Option B

- 10’ Flexible amenity area could provide space for art, signage, seating or similar to create an active edge along the street.
- Landscaped median that allows left turn lanes near intersections.
- Separated 12’ Bikeway and 10’ sidewalk along Dix Park edge.
- Potential to include Green Stormwater Infrastructure along paths or in median.

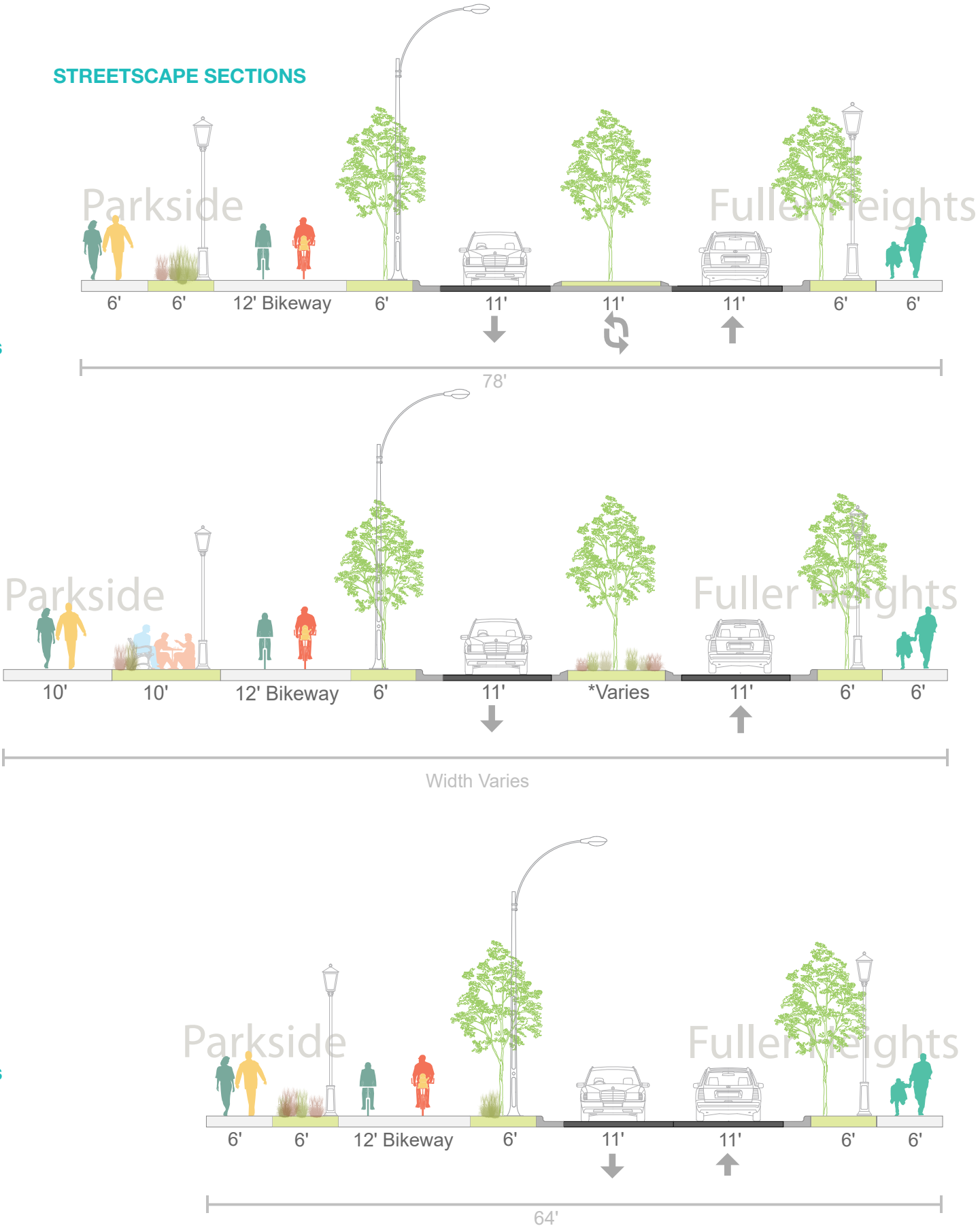
Phase Soon Public Survey 42% of votes

Option C

- No median
- 6’ landscape panel and 6’ sidewalk along community edge
- Separated 12’ Bikeway and 6’ sidewalk along Dix Park edge
- Smaller section allows more space dedicated to park

Phase Soon Public Survey 26% of votes

STREETSCAPE SECTIONS





# LAKE WHEELER ROAD

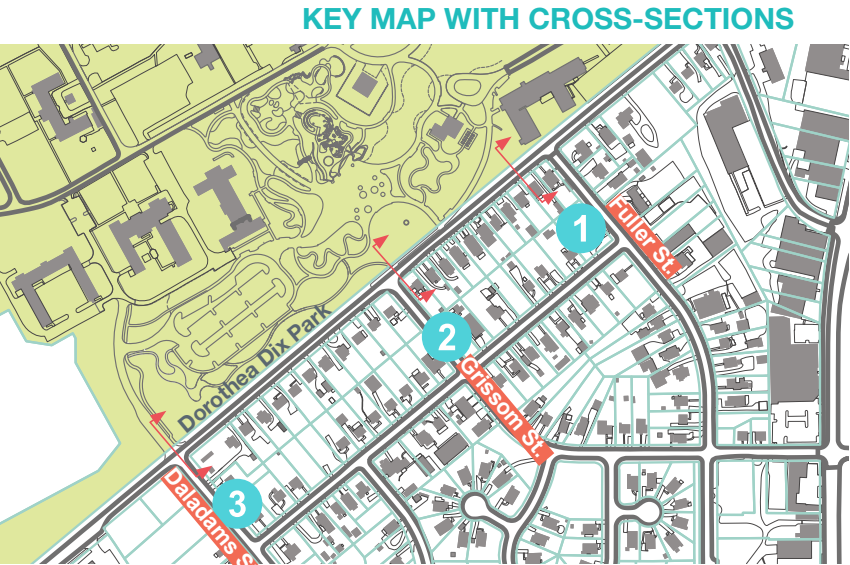
**OPTION B:** 2-Lane divided with 12' Bikeway and 10' formal and landscaped buffer.

This street cross-section received 234 votes of 557 in the Phase Now Public Survey. This section will be recommended for implementation by this study. The City of Raleigh will take this conceptual plan and develop a design based on stakeholders input, citizen's input and technical analysis of site constraints. The City of Raleigh staff will coordinate with Dix Park Plaza and Play to ensure a seamless transition with the park. The City of Raleigh will also consider other adjacent properties and capital improvement projects along Centennial Parkway, Maywood Avenue, and S. Saunders Street.

This preferred section requires the most width as compared to Options A and C. As the intent of the design was to make sure that the required areas needed for the streetscape will be taken from the parkside to minimize encroachments on the residents' property. Certain cross-sections identified in the key plan will need additional analysis and will consider alternate designs in these areas to accommodate the restrictions.

Cross-section 1- Existing historical building in the park will remain and a smaller streetscape section will need to be designed as an alternate.

Cross-section 2- Existing old growth trees are incorporated into the Dix Plaza and Play design for the Lake Wheeler Road pedestrian entrance. The section will need to further coordinate with the park design to ensure goals are reached to achieve a seamless transition from streetside

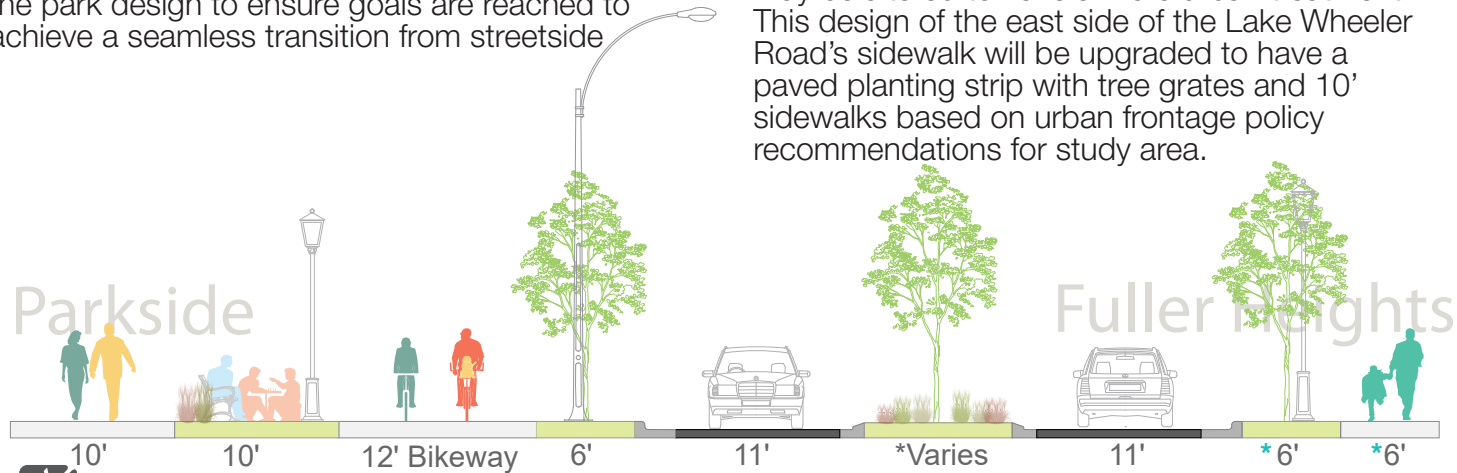


sidewalks and bikeways to the park entry. An entry plaza may be considered as an alternate in this section.

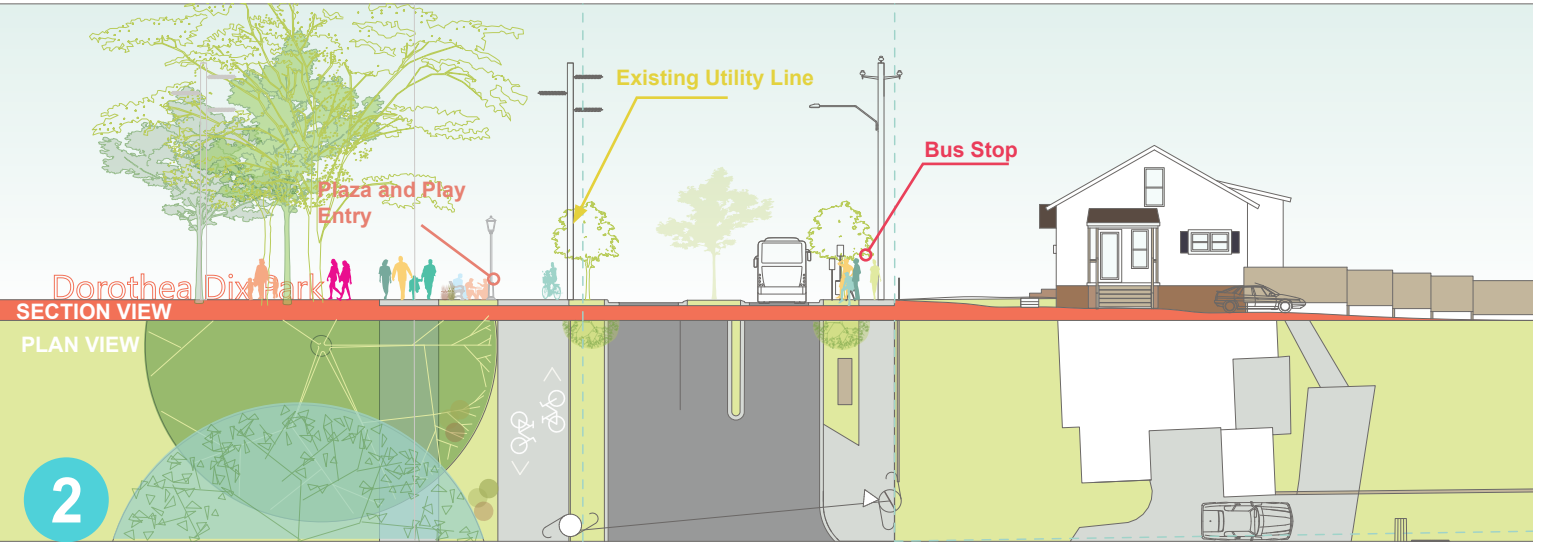
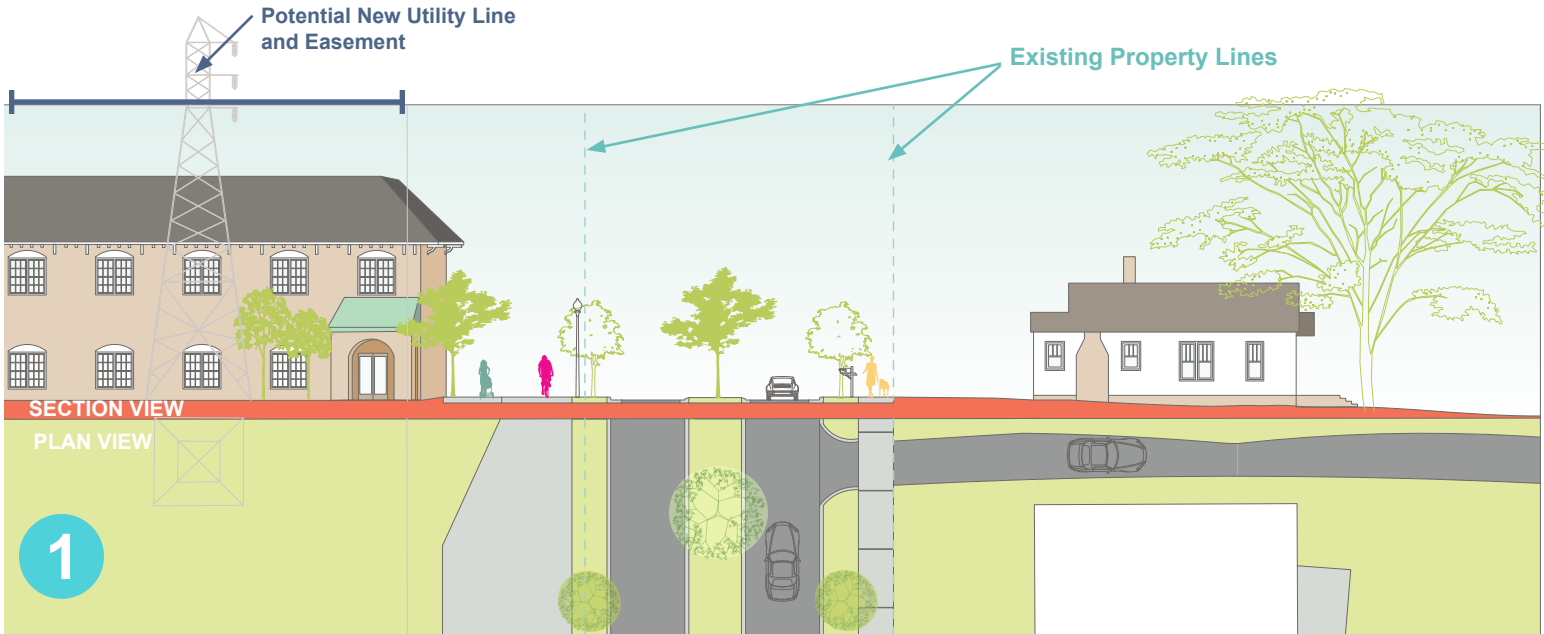
Cross-section 3- Ground elevation in this section has around 10 feet difference from street center to adjacent property of the park and on the residential side. Since this area will have a future vehicle entry at this location, how the streetscape section will be accommodated will require alternate designs, which may include retaining walls, terraces, or a smaller streetscape section.

Along the corridor a major transmission line will need to be considered when designing and may require relocation or reduction in power poles in the park.

The illustrated median is 11' but this final dimension may be smaller based on the selected intersection treatment for Lake Wheeler Road. Intersection treatments will be determined in the future design phases. Streetscape design may be altered to have a more urban treatment. This design of the east side of the Lake Wheeler Road's sidewalk will be upgraded to have a paved planting strip with tree grates and 10' sidewalks based on urban frontage policy recommendations for study area.



\*DESIGN MAY BE ALTERED IN CASE OF URBAN FRONTAGE RECOMMENDATIONS.



STREETSCAPE CONCEPTS AT THE CROSS-SECTION LINES SHOWN WITHIN THE KEY MAP



## LAKE WHEELER ROAD

Lake Wheeler Road's recommended section incorporates needed sidewalks with a larger 10' sidewalk on the parkside to accommodate larger volumes of pedestrians visiting the park. Vital connections between the sidewalks will have marked and protected crossings across the road. An elevated two-way bikeway will be buffered in-between the sidewalk and Lake Wheeler Rd. on Dix Park property. This bikeway is a protected bike facility that will connect riders to Walnut Creek Trail and Rocky Branch Trail. It also provides needed bike infrastructure for local residents and park visitors. Buffering the sidewalk and the bikeway is a flexible amenity space that can decrease in areas of restricted space or can be expanded up to 10' to provide unique spaces. This amenity area can provide spaces for leisure, park activities, transit infrastructure, or art installations that can define the promenade and create an active edge along the park.

The median width will vary along Lake Wheeler Road, based on allowable width in right-of-way and based on intersection treatments. The median will have pedestrian crossings and may allow for landscape plantings or installation of Green Stormwater Infrastructure (GSI).

The sidewalk shown in the rendering for the Fuller Heights side of the street is appropriate for low-density residential sections of the street. Higher density, urban development will necessitate larger sidewalks based on zoning frontage.



DESIGN MAY BE ALTERED BASED ON TECHNICAL ANALYSIS IN LATER PHASES OF STREETScape DESIGN AND IMPLEMENTATION.



Existing section along Lake Wheeler Road. Currently the street does not have bike lanes or sidewalks.



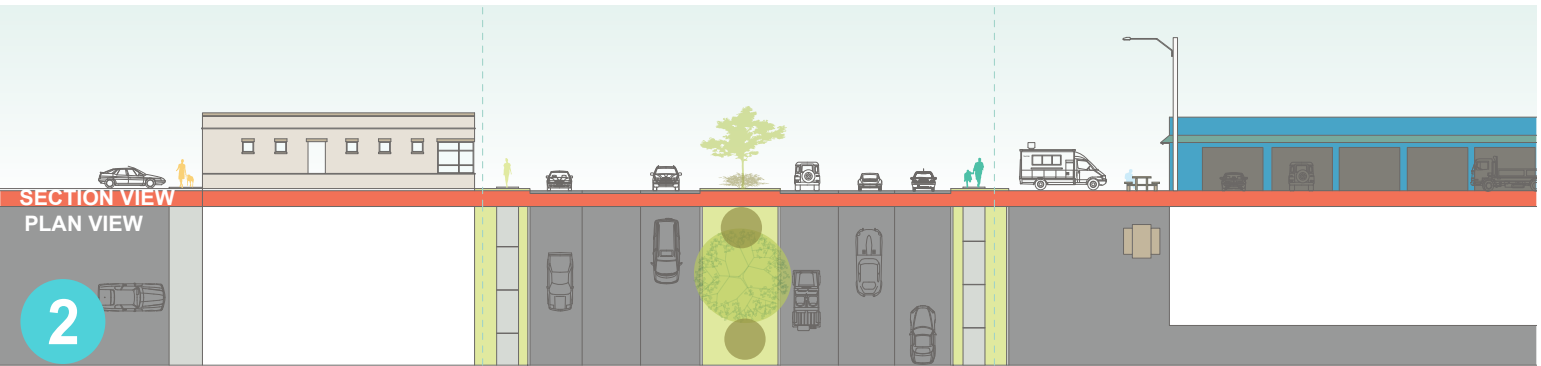
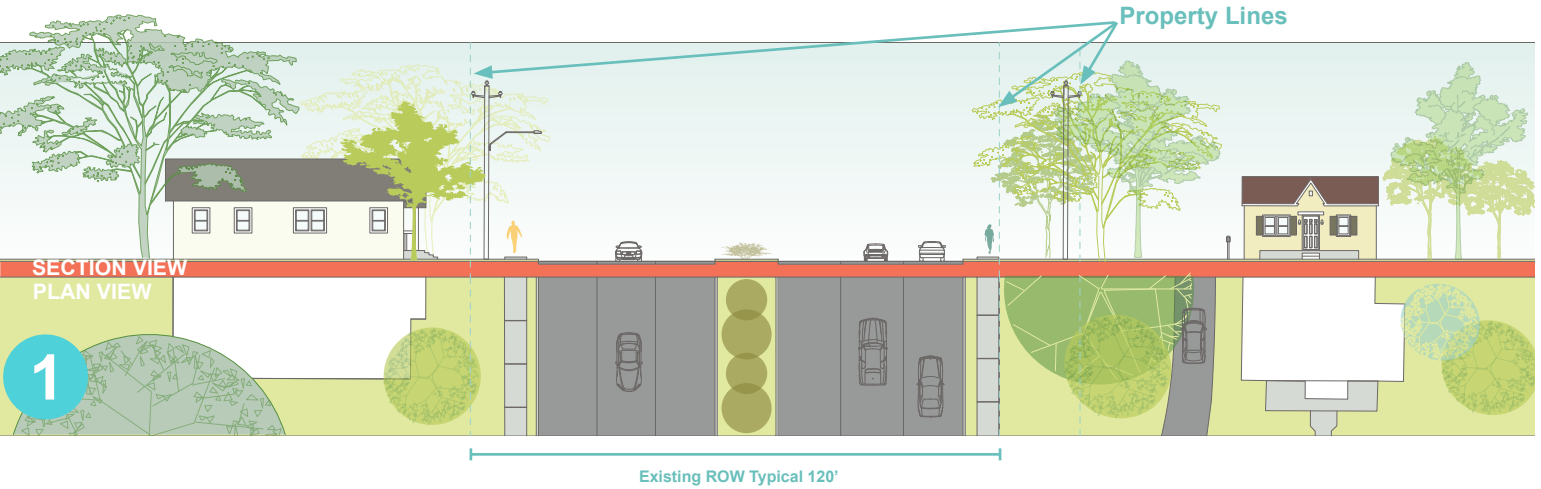
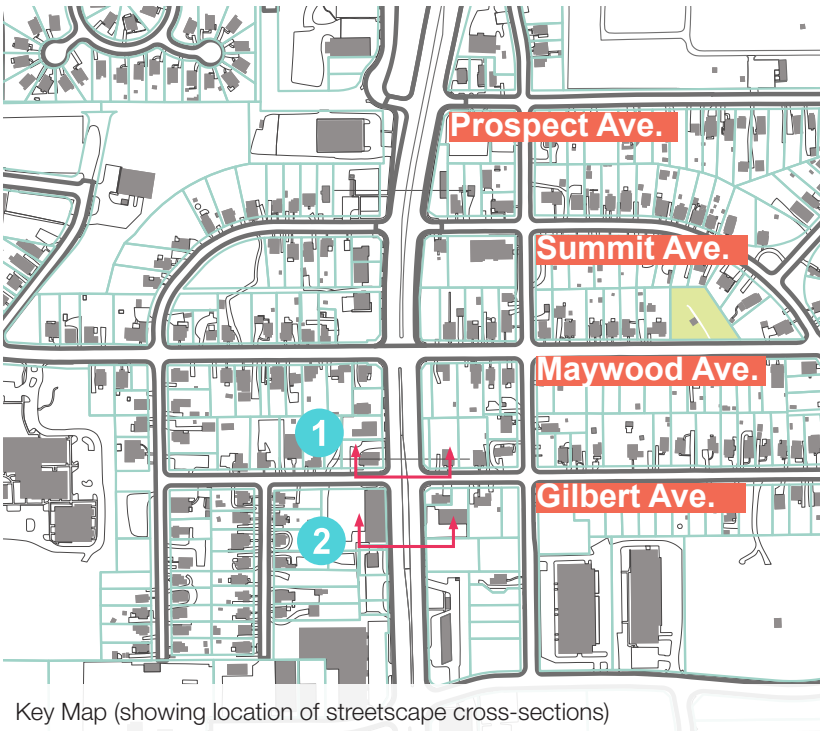
**RIGHT**  
Example of a tree grate treatment in the planting strip location. This may be used in areas of higher use.



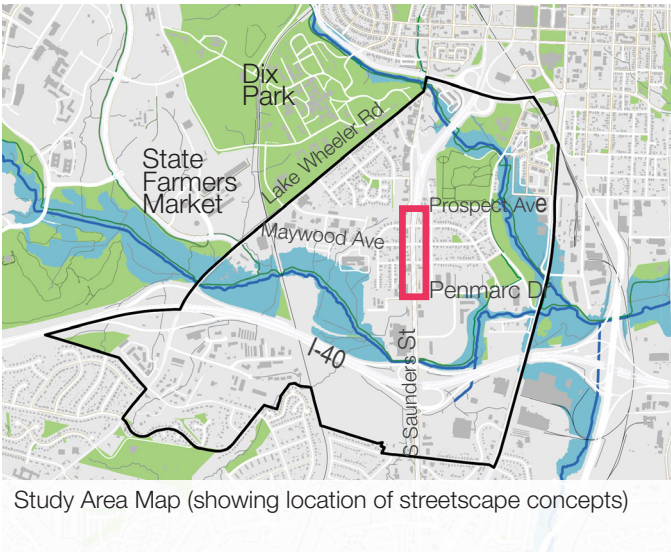
# SOUTH SAUNDERS STREET

## EXISTING CONDITIONS

Improved bike and pedestrian infrastructure is necessary on S. Saunders Street in order to adequately address increased foot traffic associated with planned and future mixed-use developments in this area. This section is currently a 6-lane, divided street with 5-foot sidewalks and minimal pedestrian crossings. Existing pedestrian crossings lack areas of refuge and can be difficult to navigate. As a result, the proposed streetscapes place a strong emphasis on multimodal safety for pedestrians and bicyclists along and across the roadway. Three potential streetscapes were developed for S. Saunders St. taking into account data gathered from the pedestrian and bicycle connectivity analyses, input from stakeholders, organizations, and the public, and precedent streets throughout the country.



## EXISTING STREETScape AT THE CROSS-SECTION LINES SHOWN WITHIN THE KEY MAP





SOUTH SAUNDERS STREET

**STREETSCAPE OPTIONS:** Three streetscape options were designed and presented to the public to determine the preferred section for S. Saunders Street.



Multi-use path with lane markings, Bronx River Greenway .



Example of a bike lane with buffer.



Image shows separated and buffered path in San Francisco, CA.

Option A

- 6 automobile drive lanes
- 17’ landscaped median replaced by left turn lanes near intersections
- East and west edges: 12’ Mixed Use Path (MUP) along 6’ landscape strip
- The MUP is elevated and buffered from traffic. This section would easily fit into available right-of-way.

Phase Soon Public Survey 31% of votes

Option B

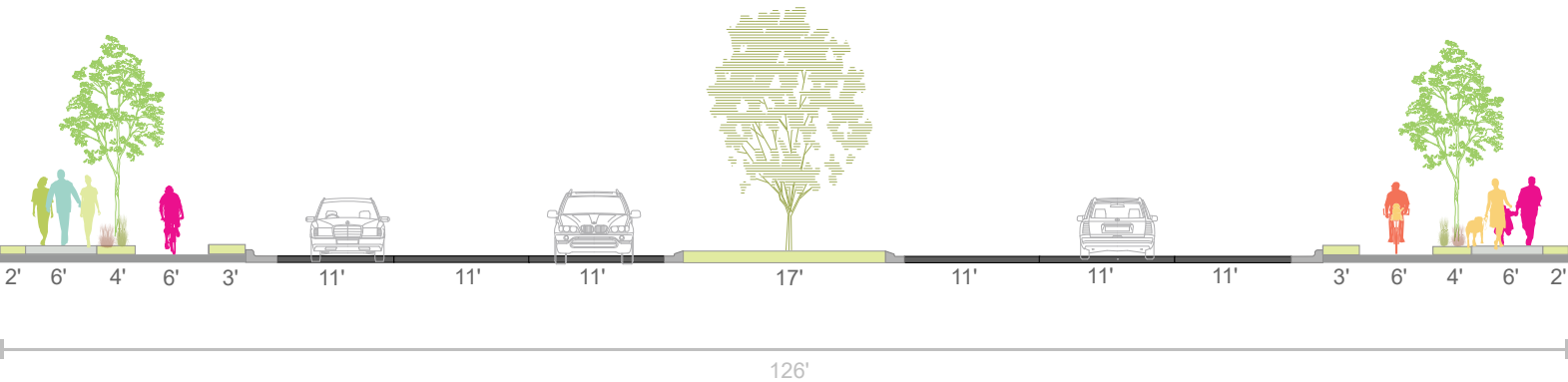
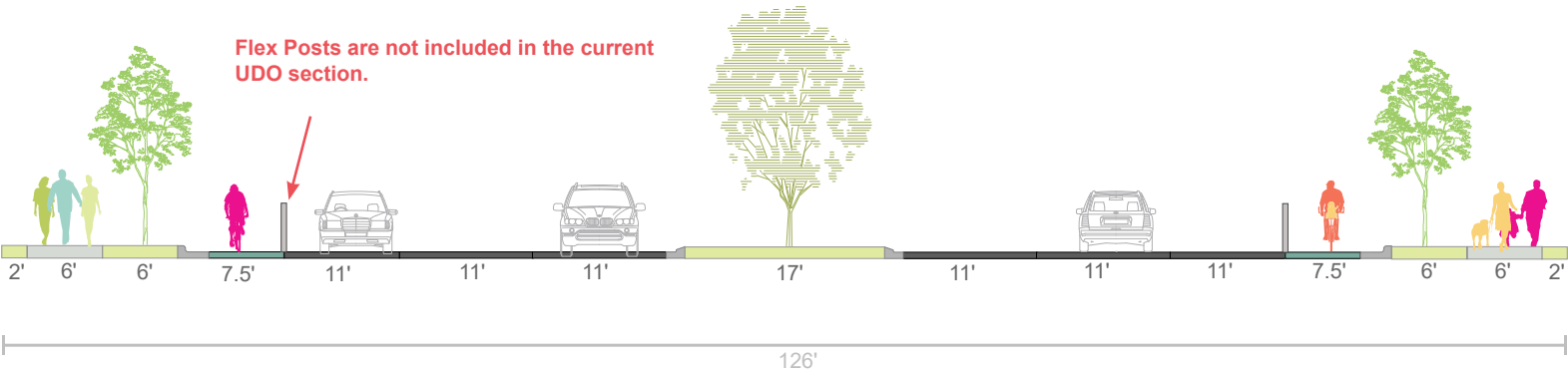
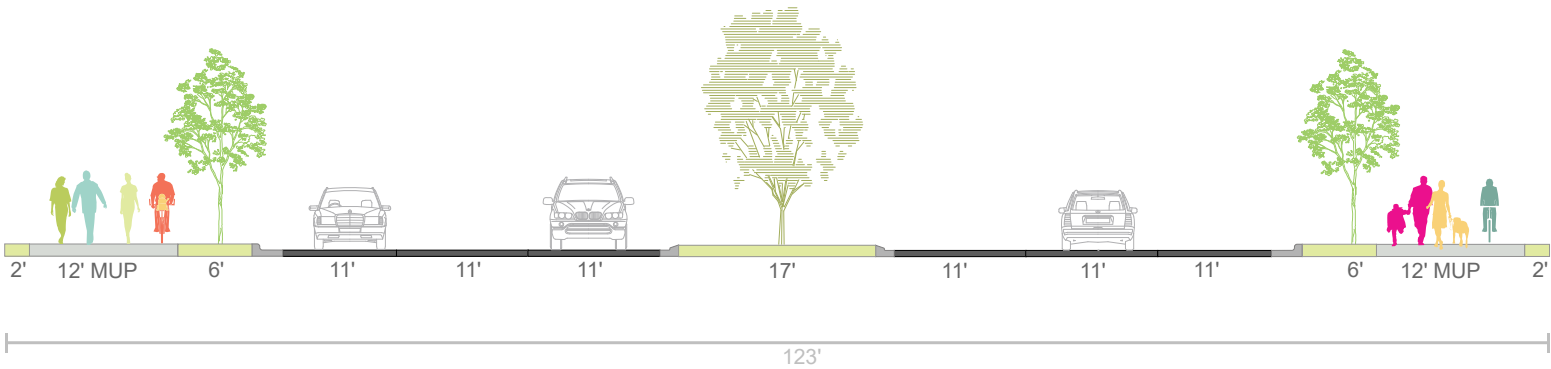
- 6 automobile drive lanes
- 17’ landscaped median replaced by left turn lanes near intersections
- The illustration shows vertical buffers which is currently not in the standard detail but is a planned to be added.
- Typical streetscape standard in the Street Design Manual

Phase Soon Public Survey 31% of votes

Option C

- 6 automobile drive lanes
- 17’ landscaped median replaced by left turn lanes near intersections
- East and west edges: 6’ buffered one-way bicycle lane and 6’ of sidewalk separated by 4’ of landscape panel/strip

Phase Soon Public Survey 38% of votes



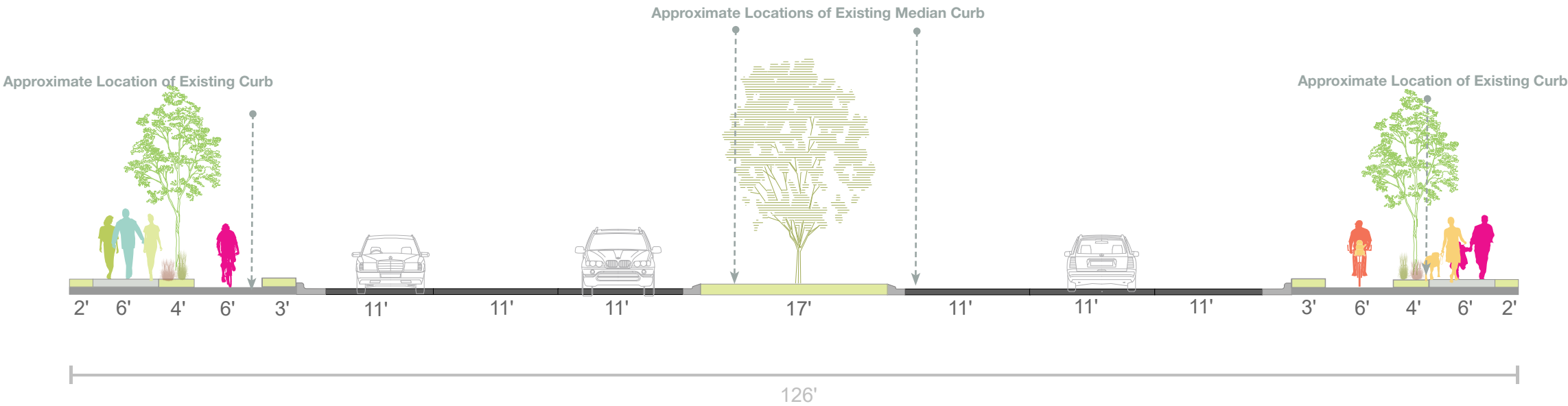
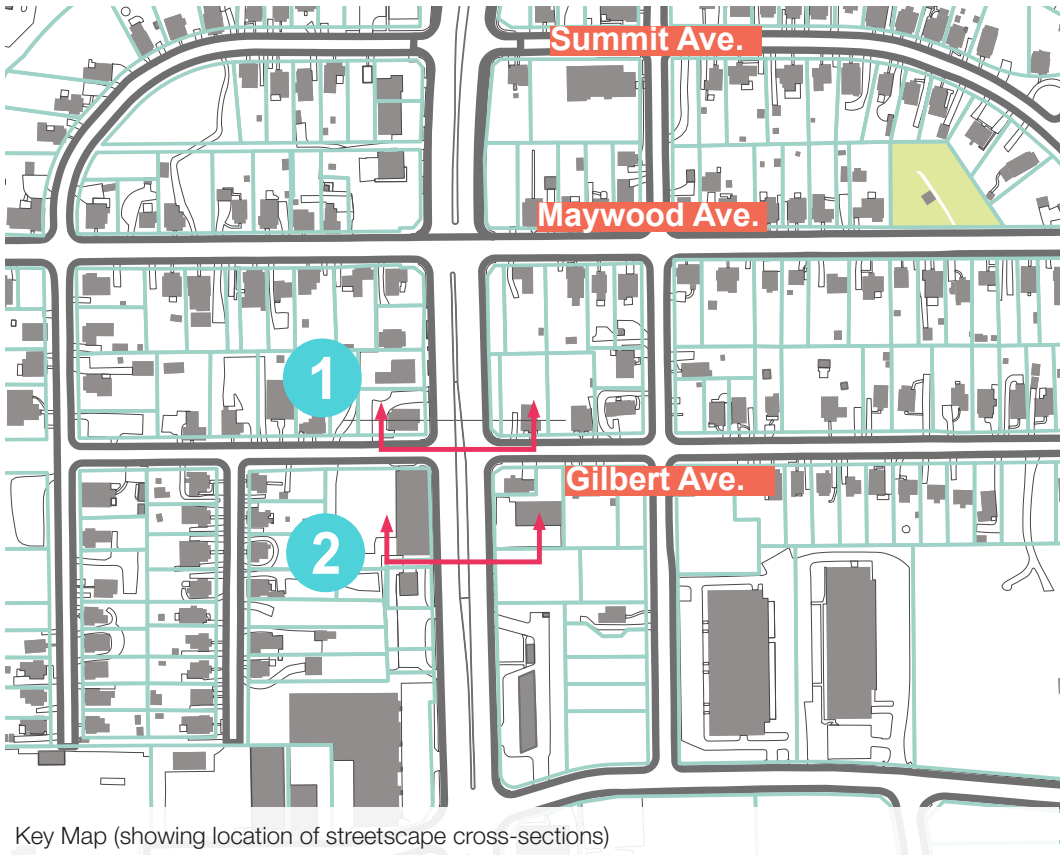
\* Street trees are shown in illustration but NCDOT will make the final approval or denial for S Saunders Street section.

# SOUTH SAUNDERS STREET

## OPTION C: Elevated and Separated Bike Path

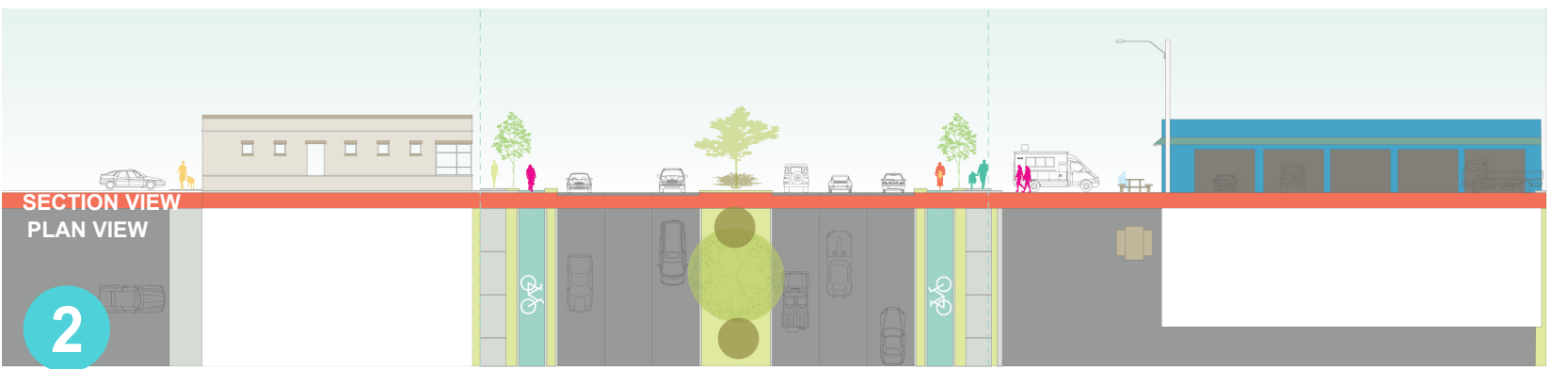
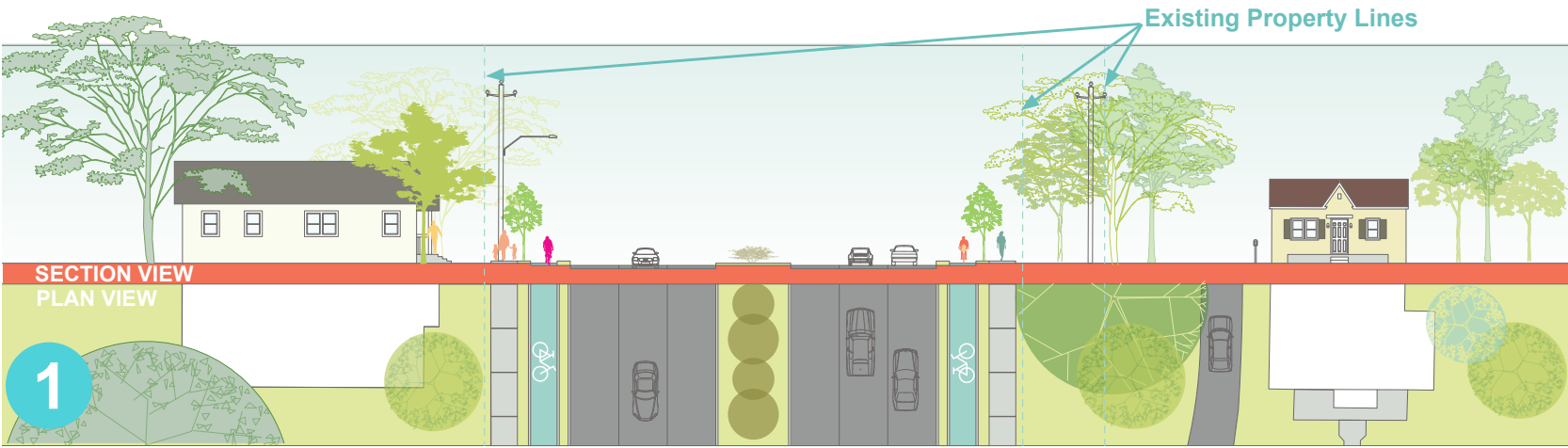
This option received the most votes in the Phase Now Public Survey, 202 out 535. The selected section allows for separation of bicycle lanes and sidewalks. The protected one-way bicycle facility is slightly elevated and buffered by a curb that runs along the automobile traffic lane. The sidewalk is elevated slightly more than the bicycle lane and allows for a buffered edge between it and the bicycle lanes, which could allow for incorporation of landscape elements.

Conceptual design for this streetscape will require coordination with North Carolina Department of Transportation (NCDOT). This new section is slightly larger than the existing conditions, so minimal impacts may occur with surrounding properties. Consideration of improved pedestrian crossings will also need to be coordinated with NCDOT in the future phases of design and implementation.



## STREETSCAPE SECTION

\* Street trees are shown in illustration but NCDOT will make the final approval or denial for S Saunders Street section.



## STREETSCAPE CONCEPTS AT THE CROSS-SECTION LINES SHOWN WITHIN THE KEY MAP



# SOUTH SAUNDERS STREET

The new vision for South Saunders Street includes a separated and buffered bike lane on both sides of the street. A separated sidewalk is buffered from the bikeway with a planting strip that may be landscaped to provide protection from environmental elements and provide additional buffer from traffic. A planted median dividing the direction of traffic will remain as a safety element that also will be landscaped. These elements of the streetscape will provide improved connectivity along the corridor and provide better vistas streetside for one of the main gateways to downtown.

Conceptual rendering shows the curb buffer and planting strip as a lawn, but could be interchanged with paved hardscape and tree grate system.



DESIGN MAY BE ALTERED BASED ON TECHNICAL ANALYSIS IN LATER PHASES OF STREETScape DESIGN AND IMPLEMENTATION.



Existing section along South Saunders Street. Currently the street does not have bike facilities.

CONCEPTUAL  
RENDERING TO  
ILLUSTRATE  
ELEMENTS OF  
THE PREFERRED  
STREETScape  
SECTION.



# HAMMEL DRIVE CUSTOM STREETScape

Currently Hammel Drive is designated as an Industrial Road in exists now as and unpaved road. New development interest on Hammel Drive and South Saunders Road is driving new infrastructure investments in the area, including implementing portions of the street plan. Hammel Drive's proximity of to a future Dorothea Dix Park vehicular entry on Lake Wheeler Road, indicates that Hammel Drive will see an increase in vehicular traffic from S. Saunders St. to the Dorothea Dix Park. For these reasons the road is recommended to change designation to a Main Street as a part of this study. Considering the need to have bike infrastructure included along the road, it is recommended that Hammel Drive adopt a custom streetscape that will allow for bike lanes to be incorporated in the street section. This custom streetscape illustrates an elevated and buffered bike lane along the street. The urban streetscape includes a tree grate option for the planting strip that buffers the sidewalk from the bike lane. Tree plantings in the streetscape will provide shade to pedestrians and bike riders.

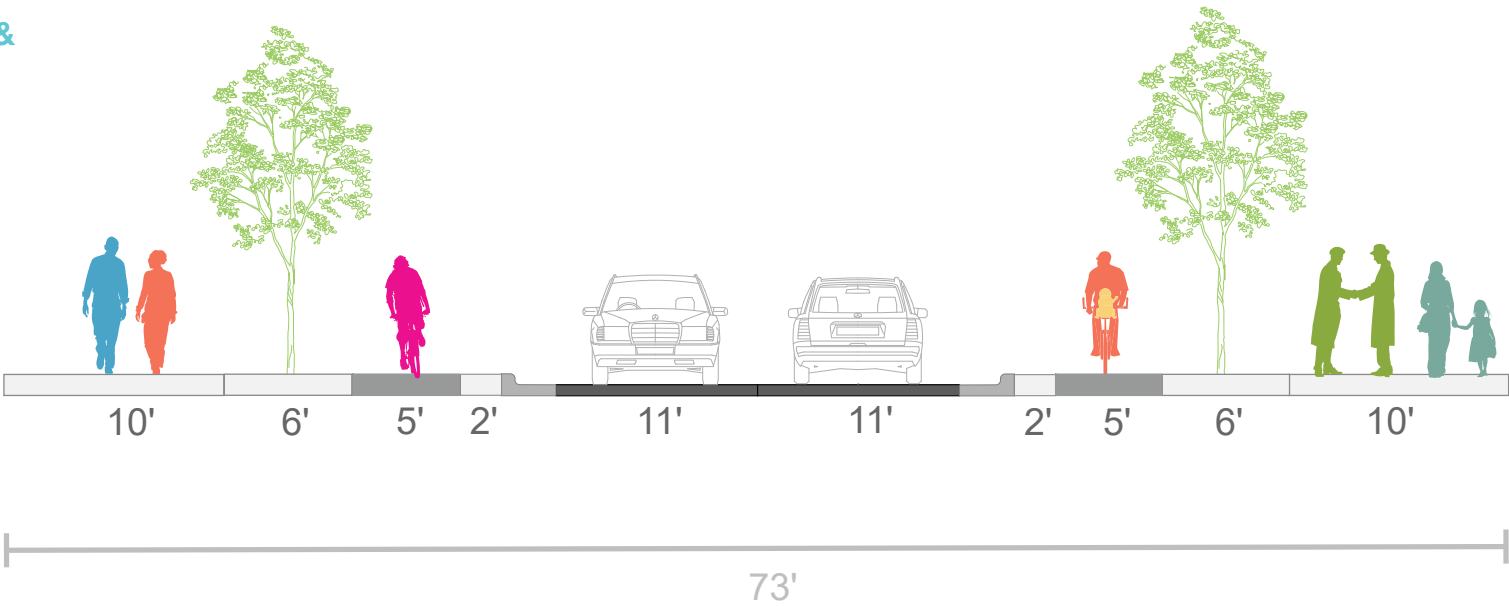


DESIGN MAY BE ALTERED BASED ON TECHNICAL ANALYSIS IN LATER PHASES OF STREETScape DESIGN AND IMPLEMENTATION.

Planned Future Park Entry



New Developments & Planned Street Realignment



KEY MAP



ADDITIONAL STREETScape CONCEPTS

LAKE WHEELER ROAD: Safety Improvements

Since Lake Wheeler Road is located along side the Fuller Heights residential neighborhoods, it is important to improve pedestrian safety by slowing down the automobile traffic and creating a better pedestrian and bicyclist environment. Potential improvements may include curb ramps to meet with residential driveways and sidewalks, median refuge and drive tables that slow traffic turning in drive.



**TOP**  
Sidewalk detail over residential driveways

**BOTTOM LEFT**  
Median refuge provides safe crossings

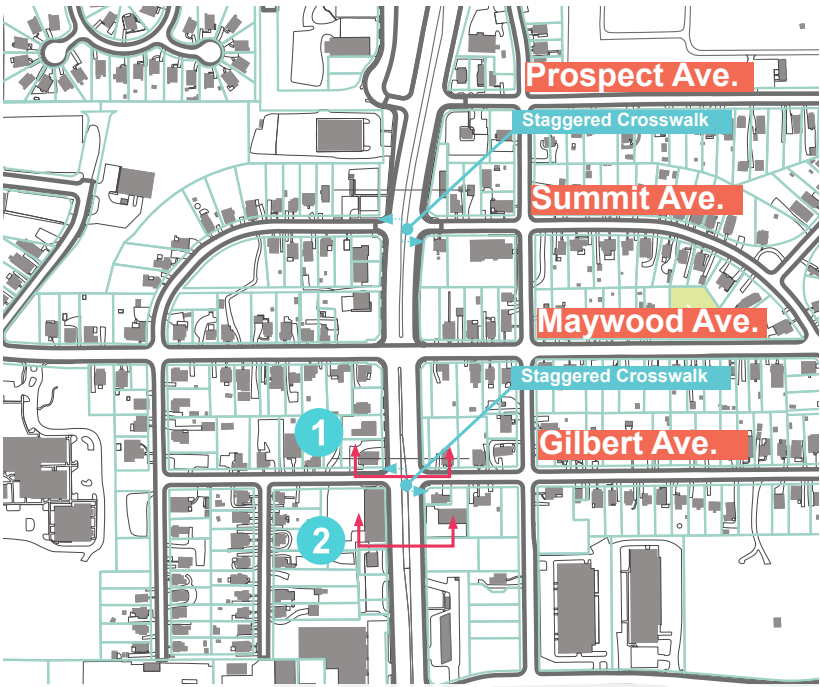
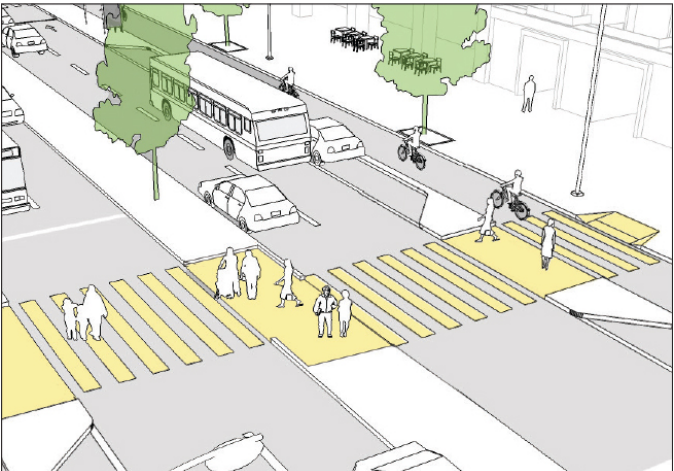
**BOTTOM RIGHT**  
Drive tables that slow the turning movement of automobile traffic



SOUTH SAUNDERS STREET: Staggered Crosswalks

There is heavy traffic volume in this section of South Saunders Street (see map) while there are only a couple of places for pedestrians and bicyclists to safely cross the street.

Addition of staggered crosswalks will provide additional pedestrian and bicycle crossings. These crossings allow a safe passage by crossing one-way traffic at different and safer locations. This type of crossings would also allow a larger refuge area for bicyclists compared to a typical crossing.



Key Map (showing location of staggered crosswalk locations)

**UPPER AND BOTTOM LEFT**  
Examples of staggered crosswalks



# TRANSIT RECOMMENDATIONS

## SHORT-TERM RECOMMENDATIONS (NOW – FY30)

- Ensure transit stops are improved in a timely manner when they meet thresholds established by City bus stop improvement policies. Stop amenities that have been shown to improve rider comfort levels and encourage transit use include seating, shelter, trash receptacles, lighting, and real-time arrival information. Request capital improvement funding through the Wake Transit Plan to provide this infrastructure.
- At all bus stops, provide an ADA-compliant landing pad per the City standard details, to improve the boarding experience for limited mobility riders.
- All new transit facilities should incorporate Crime Prevention Through Environmental Design (CPTED) techniques in their designs, to further enhance the level of comfort and security for community members utilizing these facilities.
- To improve safety where transit vehicles must enter a bike lane to serve a stop, City staff should consider the use of high-visibility green paint pavement markings. Maywood Ave (west of S. Saunders St) is an example where this type of conflict zone currently exists in the study area. Internal coordination should take the form of a technical committee, who will study this pavement marking design approach and, if deemed appropriate, seek to update relevant City standard design details.
- If an enhanced standard design approach is adopted for pavement markings where a transit stop is adjacent to a bike lane, transit staff will update their standard details and provide these markings with future bus stop improvement projects.
- To improve first-mile/last-mile connectivity with public transit, study the viability of dedicating space at transit facilities for bikeshare and scooter parking. This should include criteria for determining suitable stop locations and how the parking should be integrated into the facility's design. If recommended, update City standard details and incorporate in transit facility designs (both new construction and retrofits). Consider a text change to the City's Unified Development Ordinance to require this infrastructure when a transit stop improvement is required to be built by private developers through the City's development review process.
- Conduct a feasibility study for requiring bus stop improvement projects to install a sidewalk connection when the stop is located less than 100' from an intersection. Implementation would occur by updating the City's bus stop improvement policy, design process, and project prioritization.
- When bus stops in the study area reach >75 average boardings per day, enhance shelter amenities to the level of a "High Volume Bus Stop." This ridership threshold and facility type are described in the Wake Transit Plan Service Guidelines & Performance Measures.
- When stops qualify for a standard shelter buildout, where appropriate, consider incorporating a "bus stop bulb" in the design. A bus stop bulb is a curb extension that aligns the bus stop with a parking lane, allowing buses to stop and board passengers without ever leaving the travel lane. They provide ample space for bus stop amenities, improve ADA access, and keep amenities in the streetscape and off private property. Based on current streetscape conditions, unimproved stops in the

study area where a bus stop bulb may be appropriate include:

- Stop 8830 – Caraleigh Park
- Stop 8832 – Maywood Ave at Summit Ave
- Stop 8833 – Maywood Ave at Moring St
- Stop 8839 – Maywood Ave at Green St
- As of mid-2021, almost half of the GoRaleigh bus fleet has been converted to Compressed Natural Gas or All Electric vehicles. Continue conversion of the fleet until 100% of vehicles have low or no tailpipe emissions, thereby reducing air and noise pollution in the study area and improving rider experience.
- Where Bus Rapid Transit (BRT) and fixed-route transit lines converge, enhance stop/station facilities using the Wake Transit Plan Service Guidelines and Performance Measures. Examples of facility types best suited to accommodate multiple forms of transit include "Transit Stations" and "Transit Centers." In order to promote and improve multimodal connectivity, these facilities should also integrate space for bike storage, bike share stations, scooter rentals, and other emerging forms of first-mile/last-mile transportation. They should also include connections to adjacent sidewalk and greenway trail systems.

## LONG-TERM RECOMMENDATIONS (FY30 – FY50)

- Study adding frequency to existing and planned routes in the study area. Adding frequency would reduce travel times for riders, especially when their trip involves connections. This would ultimately make transit a more desirable alternative to driving.
- The following specific transit service improvements should be studied, as they could enhance multimodal connectivity and reduce overall travel times:
  - i. Adding bi-directional service for Route 21, which is currently one of the highest ridership routes (by boardings per revenue hour) in the GoRaleigh system. This would provide more direct access between downtown and destinations in the western section of the study area, such as Dix Park, NC Farmers Market and the Maywood Ave corridor.
  - ii. New route from Downtown to Tryon Rd (along Lake Wheeler Rd). This would provide more direct access to downtown for riders with origins or destinations along the Lake Wheeler corridor outside I-40. It would also ensure transit coverage for a ¾ mile segment of Lake Wheeler Rd south of I-40 that will not be served by the planned Route 31 (will replace existing Route 7L). The Wake Transit Plan's "Potential Post-2030 High-Capacity Transit Corridors" map indicates low to medium transit propensity for the southern section of the Study area and the neighborhoods immediately to the south approaching Tryon Rd.
  - iii. New east/west route inside the beltline, which could connect the



southern corridor BRT to western corridor BRT. A potential route path would travel through Downtown South, NC Farmers Market, NCSU Centennial Campus, NCSU West Campus, and the Method neighborhood. The Wake Transit Plan's "Potential Post-2030 High-Capacity Transit Corridors" map indicates medium to very high transit propensity for most of the service area.

- Should the Downtown South area redevelop with a mix of commercial uses and high-density residential, study the viability of a streetcar line connecting Downtown South with Downtown. An example route path could be a 2.25-mile route from the intersection of Fayetteville St. & S. Wilmington St. to E. Peace St & N. Wilmington St. This would expand mobility options, increase economic development, and serve a more local ridership base (typical stop distancing less than one-quarter mile) than the future southern corridor BRT (typical stop distancing of one-half mile).
- For private transit services emerging in the area, such as the existing Village Green shuttle, GoRaleigh staff should collaborate with these partners to ensure service information is synchronized. Where possible, facilities should be co-located and/or shared, to further promote multimodal connectivity and access.

