



FINAL



# HAGGARD AVENUE CORRIDOR STUDY

TRANSYSTEMS



TOWN OF ELON | 2023

# HAGGARD AVENUE CORRIDOR STUDY

## Phases 1 - 3

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**TRANSYSTEMS**



# 01 Issues & Opportunities

## 1.1 What We Know

### 1.1.1. Project Description

The Haggard Avenue Corridor Study is a 3-phase project, begun in 2020, that evaluated ways to improve the safety and multi-modal connectivity for the entire length of E. and W. Haggard Avenues in the Town of Elon's jurisdiction (approximately 2.65 miles). This corridor forms the primary east/west route through the Town of Elon, including Elon University's campus and Elon's downtown, connecting with the City of Burlington to the east and the Town of Gibsonville to the west (see Vicinity Map).

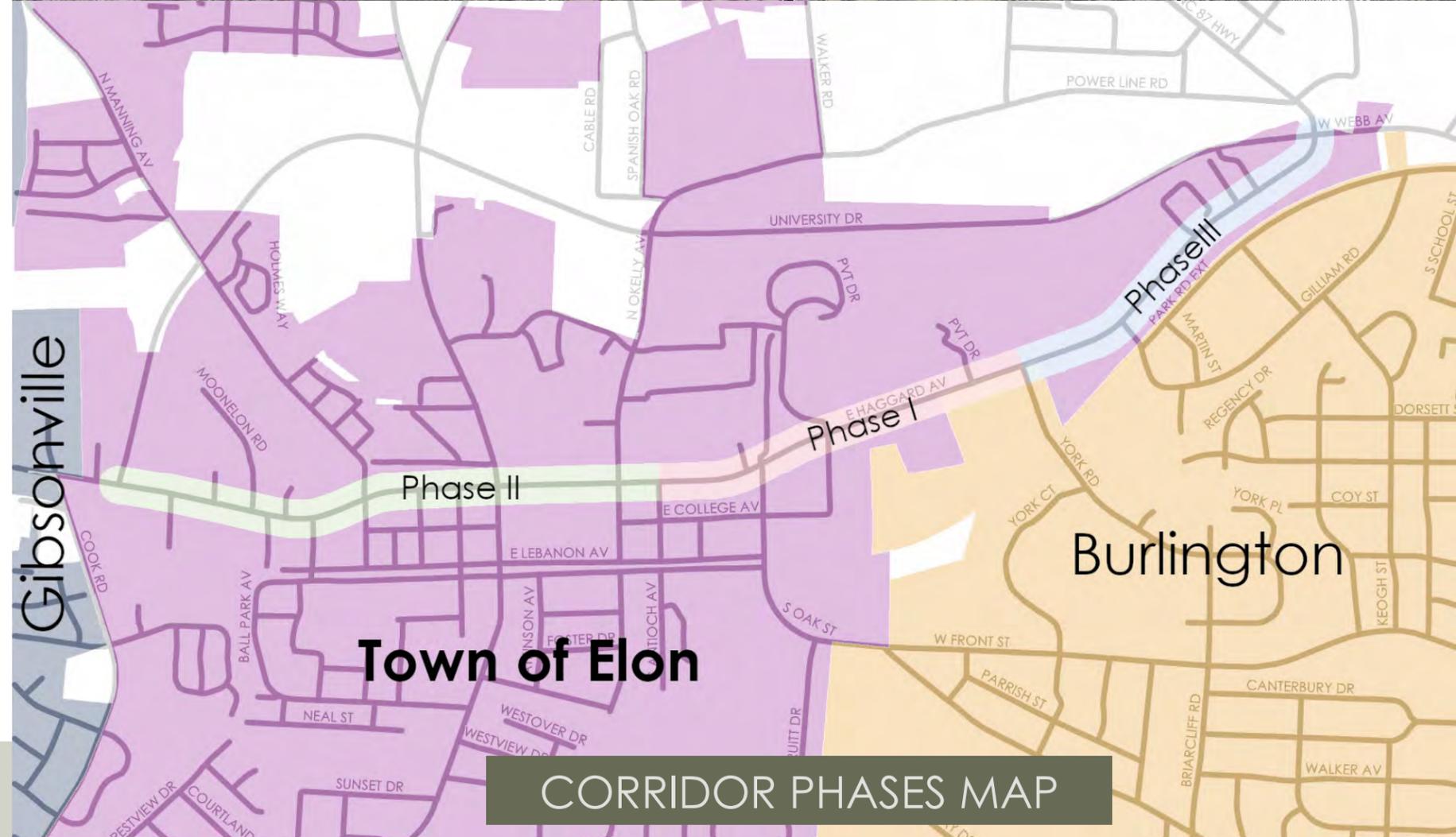
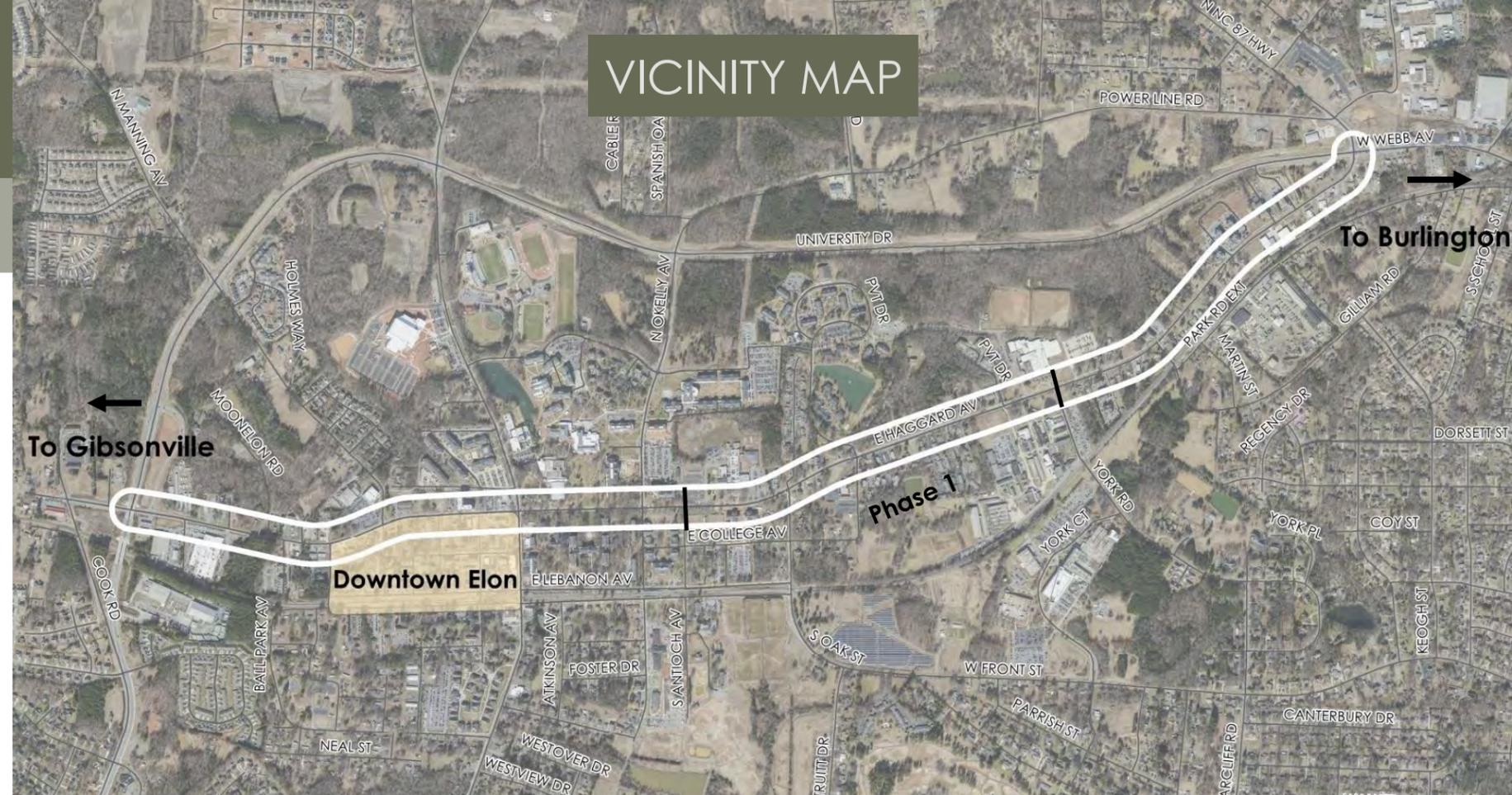
Phase 1 was the subject of the first study, and included 0.75 miles of East Haggard Avenue (SR 1455) between Antioch Avenue and York Road, within the jurisdictions of both the Town of Elon and City of Burlington (see Corridor Phases Map). Phases 2 & 3 were studied after the completion of Phase 1, and includes the Western and Eastern ends of the corridor. \*

From west to east, the corridor has been divided as follows:

- Phase 2 – Western Gateway - Antioch Avenue west to University Drive/ Burlington Avenue (1.1 miles)
- Phase 1 – Elon University Campus area, (0.75 miles)
- Phase 3 – Eastern Gateway - York Road east to University Drive/NC 87 (0.75 miles)

The Haggard Avenue corridor serves as a major access point for Gibsonville, Burlington, downtown Elon, Elon University, the old Elon Elementary School (being redeveloped over the next decade in accordance with the University Master Plan), and various industries and residential communities.

\* It should be noted that newer data may be available than represented in this report. Given the multi-year nature of the study and its initiation date, it was not feasible to continuously update all references or data presented herein.



### 1.1.2. Project Goals / Purpose and Need

The Town of Elon established the following **goals** for the full study of the corridor:



Explore reducing the 3-lane sections to 2-lanes, or road diet



Investigate opportunities for additional on-street parking in and near Elon's downtown core



Improve multi-modal access, uses and connectivity (especially bicycles)



Calm traffic and include complete street elements



Improve safety for all users

The **purpose** of the project is to improve safety and multimodal connectivity by addressing the following **needs** in the corridor:

- 1 Reduce multimodal conflict points and potential for crashes.
- 2 Improve multimodal connectivity and access.
- 3 Improve motor vehicle level of service and safety.
- 4 Create gateway themes at both the eastern and western edges of Elon.



### 1.1.3. Background / History

The Town of Elon adopted its new Future Comprehensive Land Use Plan (*Envision Elon 2040*) in February 2019 and continues to work on the Elon Land Management Ordinance (LMO) project, which will replace Elon's current *Land Development Ordinance* (LDO) with a new set of development regulations intended to implement the *Envision Plan*.

As described in *Envision*, improving the western and eastern gateways into the Town along Haggard Avenue are high priorities for improvement, as they make a first impression and shape visitor's image of the Town. "Streetscape, public art, and wayfinding signage are among the elements that contribute to creating a welcoming experience" at these gateways, as noted in the Plan.

Other long range land use, bike/ped, sustainability, and development plans for the area prepared by the Town of Elon, Elon University, City of Burlington, and Alamance County (some shown to the right), generally support the *Envision Plan* by calling for improved multi-modal opportunities (i.e. improved on-road bike and pedestrian facilities), improved parking, improved land use controls, and creation of a unified streetscape design and corridor theme along Haggard Avenue. In addition, the Town of Elon's *Bicycle, Pedestrian, and Lighting Plan* calls for on-road bicycle improvements and improvements to sidewalks along both East and West Haggard Avenues. Elon University's *Campus Master Plan* identifies streetscape improvements as a high priority for the corridor to address vehicle-pedestrian conflicts, reduce crossing distances, calm vehicular traffic as it transverses the campus core, and enhance the University's identity.

Conducting a Haggard Avenue Corridor Study was therefore identified as a Top 6 Priority Action Step in the *Envision Plan*, to "create a safe, comfortable environment for pedestrians and cyclists along Haggard Avenue with streetscape improvements and a better development edge." This project therefore

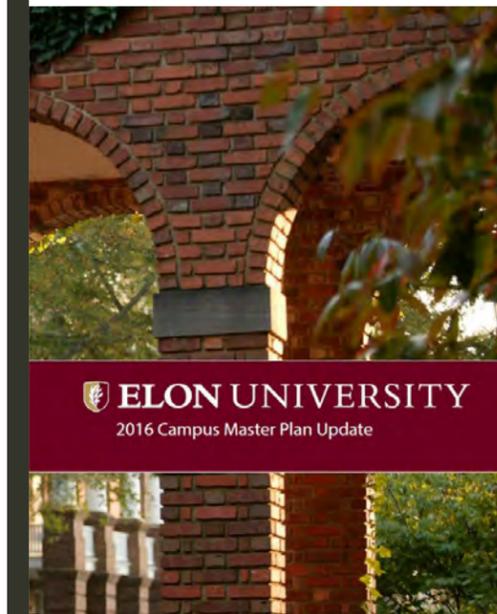
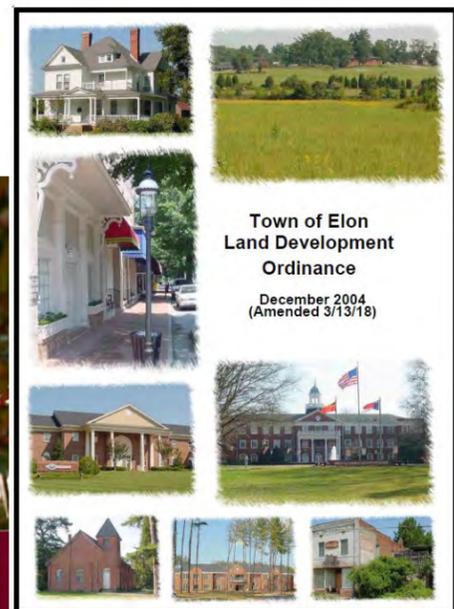
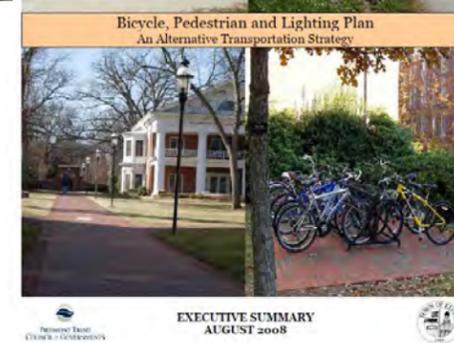
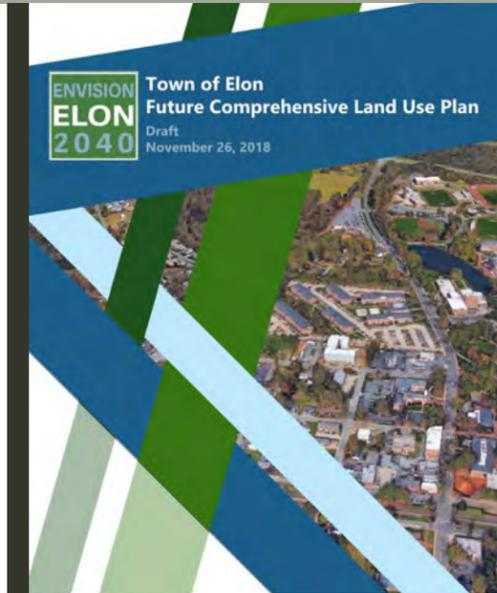
implements Recommendation Item IS-4.2 from this Plan, which states:

"An examination of this road corridor that links the Town of Elon to Gibsonville and Burlington will help define on a segment-by-segment basis ways to introduce safe bike and pedestrian connections, enhance the streetscape, better manage vehicular circulation, and improve the relationship of adjacent development to the street to create a highly accessible and safe place to live, work, dine, or shop."

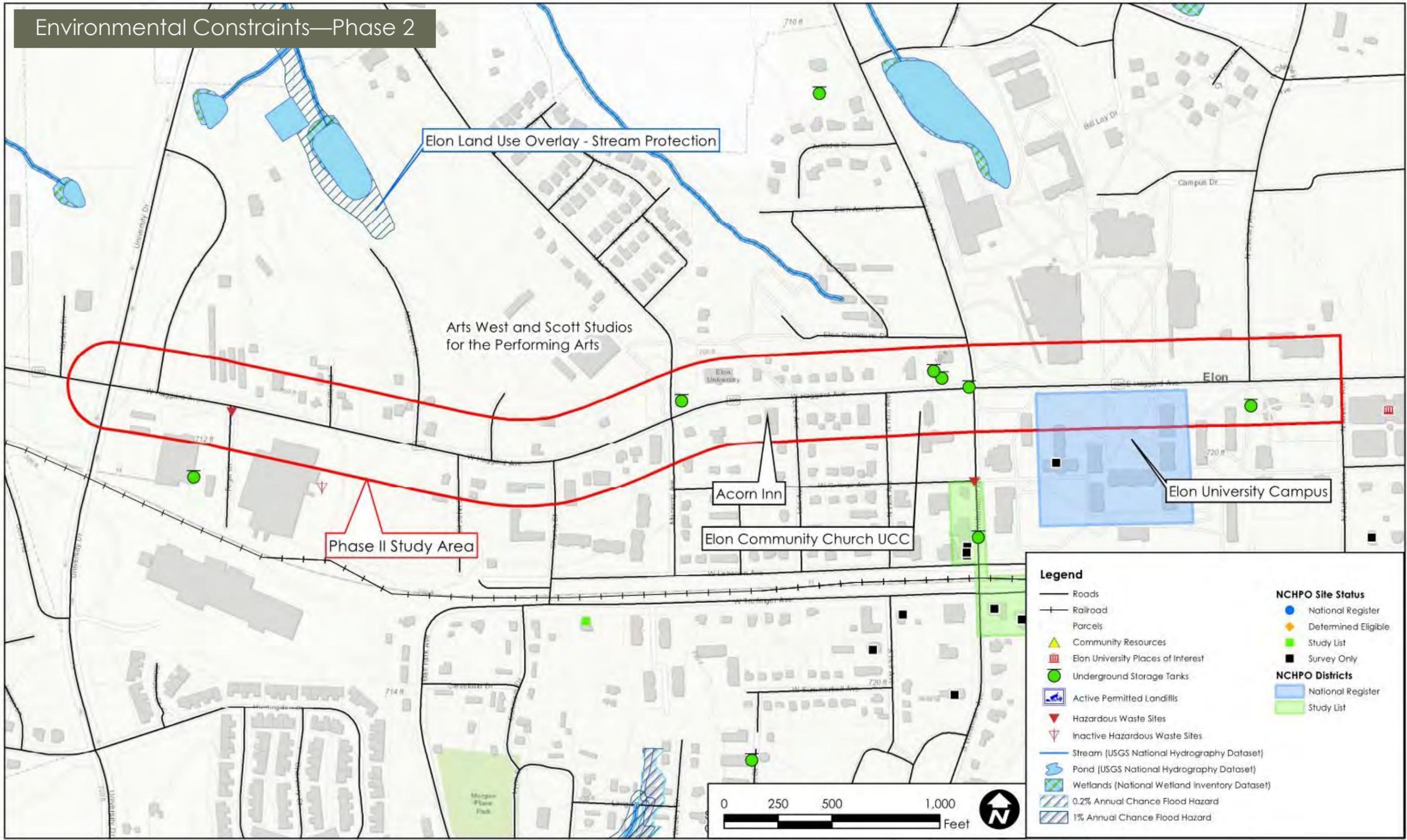
### 1.1.4. Environmental Constraints

Few environmental constraints are present in the Phase 2 section of the Haggard Avenue corridor. The Phase 2 Environmental Constraints map on the next page identifies multiple protected streams and wetland in the Town of Elon, with no stream crossings in Phase 2. A hazardous waste site is shown within the study area near Rego Industries and will need to be surveyed and avoided during design and construction. Similarly, several underground storage tanks are noted within the Haggard Avenue corridor boundaries, particularly at the intersections with Manning Avenue and Williamson Avenue.

The Phase 2 Environmental Map also shows the boundaries of the historic Elon University Campus between Williamson Ave. and Antioch Ave. The improvements proposed as part of this plan are designed in a way as to not impact the nationally registered historic district.



# Environmental Constraints—Phase 2



The Phase 1 Environmental Constraints map below shows two unnamed tributaries of Dry Creek that cross this phase of the corridor:

- One is within a culvert in front of Elon Village Homes and to the east of Danieley Center Drive/Lawrence Street. This tributary begins at a pond behind Elon Village Homes and drains north, where

it meets up with Dry Creek near the base of the dam at Lake Verona. As shown on the inset photo below, the sidewalk guard railing at this point is insufficient and dangerous.

- The other crossing is within a culvert that drains the pond within the Carolina Biological Supply Company and then continues

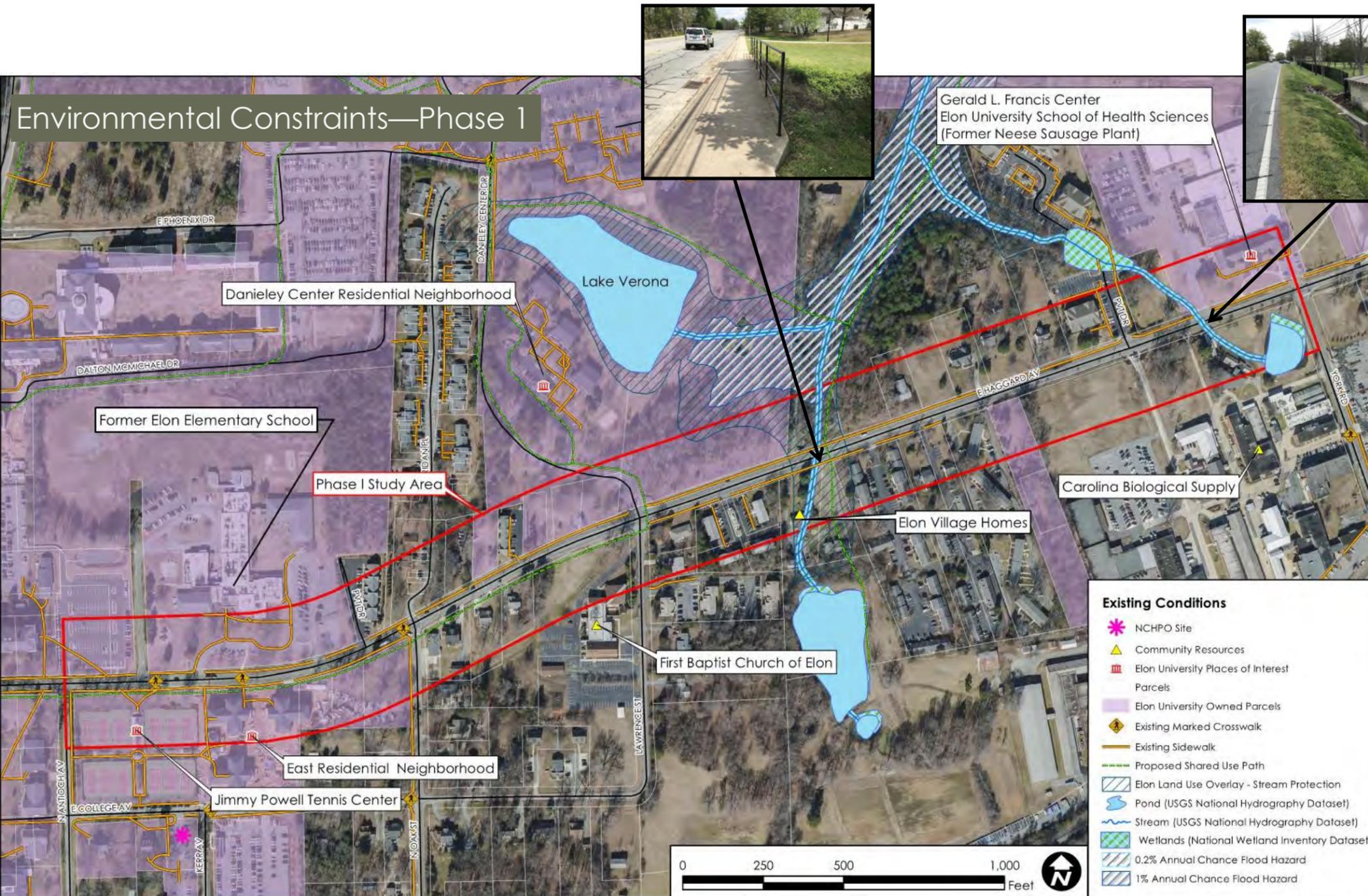
north through The Crest Apartments. As shown on the inset photo below, a building currently sits within the stream and drainage conveyances from the street need improvement.

These streams join within the largest undeveloped area in Phase 1, where it becomes Dry Creek and continues north and east from here, eventually draining to the Haw River in the City of Burlington's ETJ.

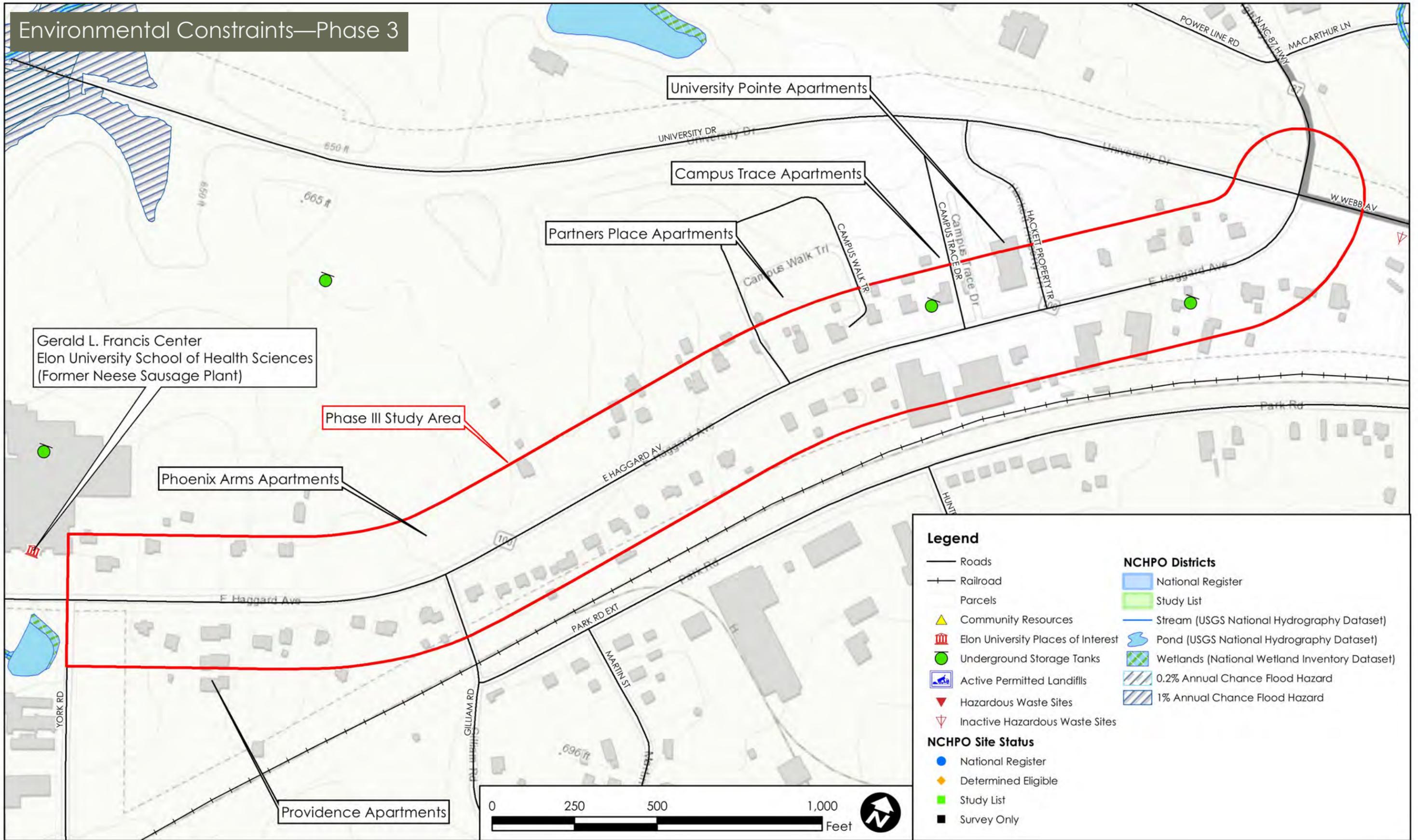
These drainage areas contain streams, wetlands and floodplains, which will create physical limitations to development in the project area in terms of topography/ steep slopes, hydrology and hydric soils. There are several regulatory limitations that accompany these natural areas, including but not limited to:

- Town of Elon - Stream Protection Overlay Zoning and Floodplain restrictions
- NC Division of Water Resources - Cape Fear River/ Jordan Lake Rules:
  - NSW (Nutrient Sensitive Waters) stormwater controls must meet specific nutrient loading rates
  - 50-foot stream buffer protection requirements
- Federal - Floodplain and wetland/stream protection regulations

Note that further project development will be required to address all potential environmental resources and impacts of the project.



# Environmental Constraints—Phase 3

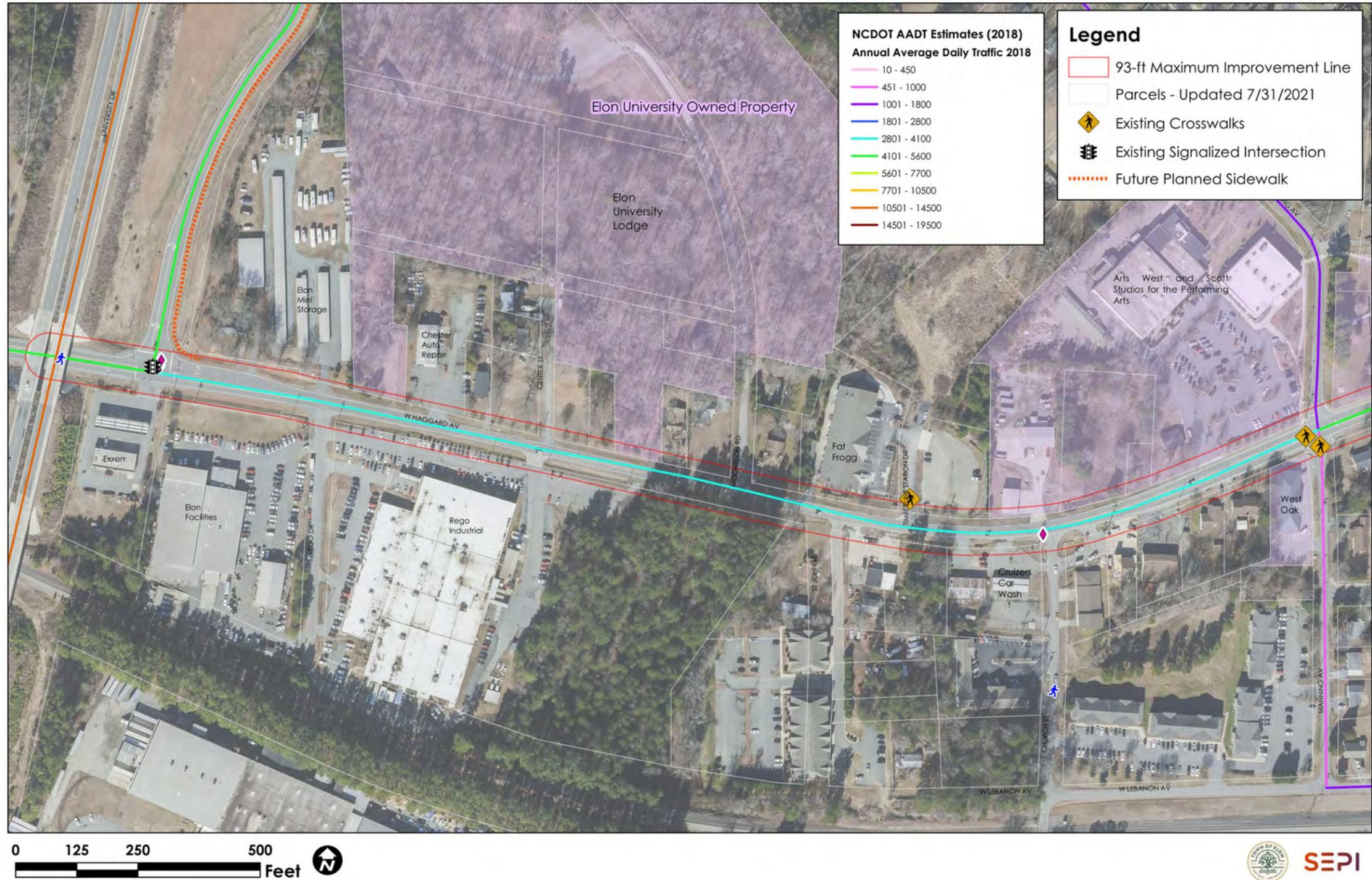


### University Drive to Manning Avenue (Phase 2)

Due to project funding restraints, no traffic forecasting or operational analyses have been completed for the project to date, though traffic data is available through the NCDOT. The segment of West Haggard Avenue that begins at the University Drive overpass and ends at the signalized intersection between West Haggard Ave. and the on/off ramp to University Dr. has a 2020 AADT of 3,600. The westbound approach on W. Haggard Ave. has 3 lanes and the eastbound approach has 2 lanes. The southbound approach has 2 lanes and a 2020 AADT of 3,500. This stretch of W. Haggard Ave. is classified as a minor arterial roadway and has a posted speed limit of 35 mph. University Dr. is a four-lane divided roadway and has a new sidewalk that ends at the off ramp to W. Haggard Ave.

Beginning at the signalized intersection of University Dr. and ending at the intersection of Manning Avenue, W. Haggard Ave. has two travel lanes and a ditch on each side. This portion of W. Haggard Ave. has a 2020 AADT of 4,700 and a posted speed limit of 35 mph. At the intersection of Manning Ave., W. Haggard Ave. has an additional turn lane on both sides of the intersection and a pedestrian cross walk on the eastbound approach. A brick sidewalk begins along both sides of W. Haggard Ave. at this intersection with a crosswalk on the northbound approach on Manning Ave.

According to the BGMPO\*, mobility along this facility is hampered due to the discontinuity of the existing cross-section from a three-lane



section with a center turn lane to a two-lane section. In addition, DOT crash data for the entire corridor indicates nine bike crashes and 11 pedestrian crashes between 2007 and 2018, which highlights a safety issue and the need for additional pedestrian safety measures.

\*BGMPO Comprehensive Transportation Plan, Adopted Sept. 2010, Chapter II Problem Statements, 2030 LRTP Horizon Year, E. Haggard Avenue (SR 1454), Local ID: ALAM0010-H, pg. II-15.

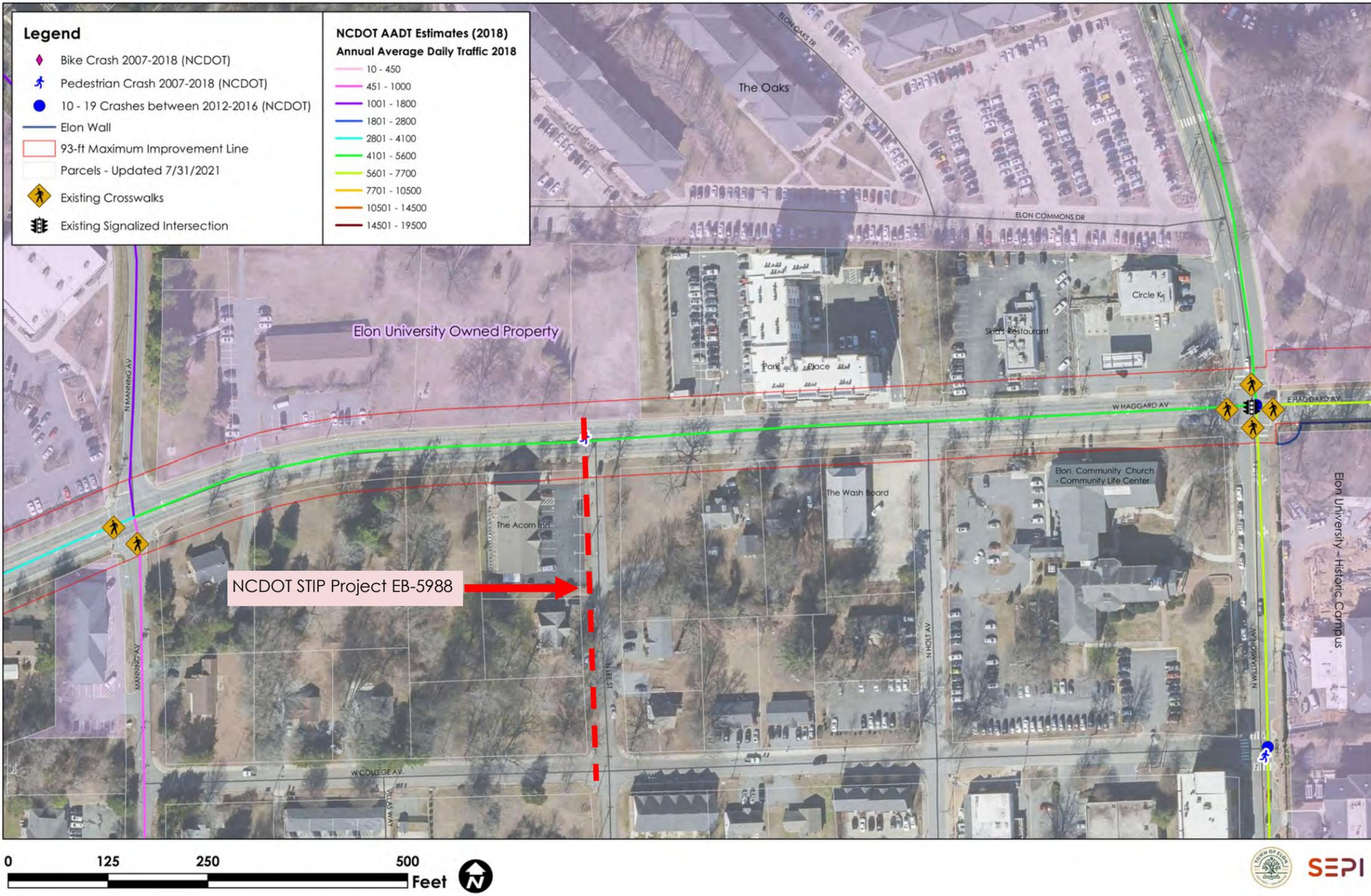
# Manning Avenue to Williamson Avenue

Between the intersections at Manning Ave. and Williamson Ave., W. Haggard Ave. has two travel lanes, a two-way turn lane, and a posted speed limit of 35 mph. The 2020 AADT for this portion of W. Haggard Ave. is 5,100 vehicles. At the signalized intersection at Williamson Ave., there are pedestrian crosswalks and crosswalk signals on all approaches in the intersection. At the intersection, W. Haggard Ave. has two lanes and a turn lane. The brick sidewalks continue along this stretch of W. Haggard Ave. and tie into the sidewalk along both sides of Williamson Ave.

In the Phase 2 segment of Haggard Avenue, crashes involving vehicles, are highest at the intersection of Williamson Avenue. Crashes involving pedestrians occurred at the intersection of Lee Street and W. Haggard Avenue.



Above: The portion of sidewalk adjacent to Park Place at Elon (former Mediterranean Deli) extends all the way to the edge of the building, allowing for outdoor dining space and pedestrian space. Existing sidewalks along W. Haggard Avenue are approximately 6 feet wide.



## Williamson Avenue to York Avenue (Phase 1)

The Phase 1 portion of East Haggard Avenue (SR 1455) is a minor arterial roadway with 2-3 travel lanes (each between 9 and 13 feet), posted speed limits between 25 and 35 mph, and right-of-way widths varying between 57 and 70 feet. As shown on the Traffic and Safety Map, the portion of Phase 1 between N. Antioch Avenue and N. Oak Street is owned and maintained by the Town of Elon, and the portion east of N. Oak Street to York Road is owned and maintained by NCDOT.

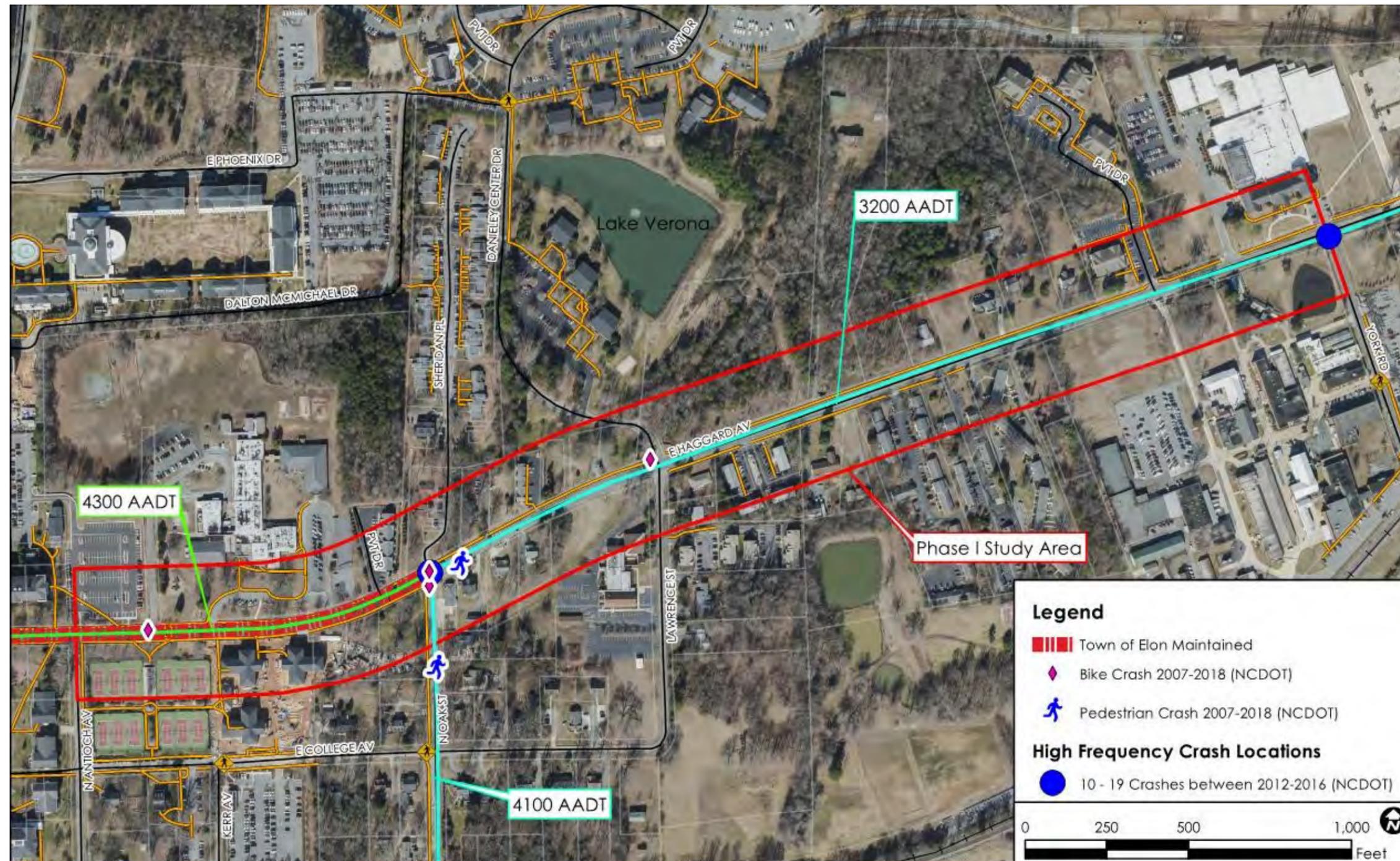
According to 2018 NCDOT traffic data, traffic volumes for the Phase 1 corridor range from 3,200-4,300 AADT (average annual daily trips) and future phase areas to the west have traffic volumes ranging from 3,900-6,200 AADT. Neither area appears to approach capacity for a two-lane roadway which is generally considered less than 18,000 AADT. This means that traffic volumes do not warrant a third lane. However, intersection operational issues, such as excessive delays for turn movements or the need for new or modified signals or other traffic controls, have not been evaluated.

The existing conditions of the Phase 1 corridor greatly impact the strategy to improve multi-modal connectivity. Despite a fair amount of pedestrian and cyclist activity between N. Antioch Avenue and the residential complexes on the south side of Haggard Avenue past Lawrence Street, the pedestrian environment in most areas is unsafe and inadequate, or non-existent.

\*BGMP O Comprehensive Transportation Plan, Adopted Sept. 2010, Chapter II Problem Statements, 2030 LRTP Horizon Year, E. Haggard Avenue (SR 1454), Local ID: ALAM0010-H, pg. II-15.

In areas where a sidewalk is present, it is narrow and located directly along the back of curb, with the periodic presence of a utility pole or fire hydrant in the middle of the sidewalk. A sidewalk does not exist on the south side of Haggard Avenue, between N. Oak Avenue and Lawrence Street. Bike lanes are not designated on the roadway, and the existing sidewalk width does not safely accommodate multiple modes of traffic.

In the Phase 1 segment of Haggard Avenue, crashes involving vehicles, cyclists and/or pedestrians are highest at the intersections of Oak Avenue and York Road, however crashes involving cyclists and pedestrians occurred at mid-block locations, and at the entry drive to the former elementary school\*. The speed of vehicular traffic between N. Oak Avenue and York Road is a significant factor in the safety and experience of pedestrians and cyclists. The lack of striping on the



outside of the vehicular travel lanes along with pavement covering the gutter pan influences the perception of the road's 'highway' character and allows vehicles to 'float' within a wider lane. Despite a typical 5-foot-wide sidewalk, its location directly along the back of curb combined with high pedestrian volumes, high-speed traffic, and obstacles in the middle of the sidewalk (i.e., fire hydrants, utility poles, trash receptacles) create an unfriendly and unsafe pedestrian environment that is not compliant with the American with Disabilities Act (ADA) or FHWA and NCDOT guidance, as discussed further in Chapter 2.1.1. Bike lanes are not designated on-street along the entire roadway. Bicycles travelling on-street seem to compete with vehicles for safe space within the roadway, and when on the sidewalk, create conflicts with pedestrians. The maps on the following 4 pages display existing conditions along the corridor.

## Planned Improvements

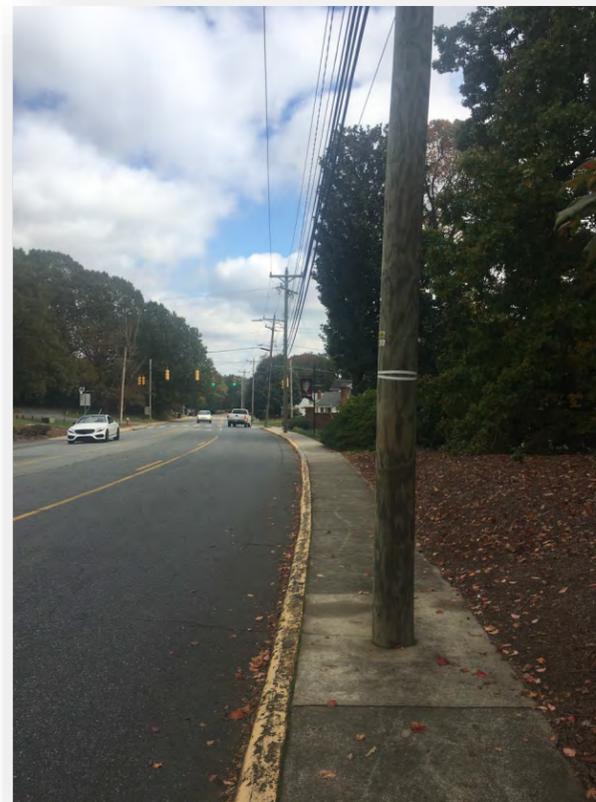
The BGMPO 2017 Amended Comprehensive Transportation Plan (CTP) shows widening of East Haggard Avenue between North Williamson Avenue and NC 87/100 to a four-lane major thoroughfare with curb and gutter. In addition, the June 2019 release of the BGMPO Draft 2045 Metropolitan Transportation Plan (MTP) shows two proposed Fiscally Constrained Projects over the full project corridor (MTP #Hwy-45 and #Hwy-46) for roadway modernization of West and East Haggard Avenues from University Drive to NC87/100, with a focus on traffic calming, bike/ped improvements, turn lanes, and complete streets. The Draft 2045 BGMPO MTP also proposes several other improvements in the vicinity of the project, including MTP #Bike-016 (a bike lane over 2.72 miles of East Haggard Avenue - no project start/end points were noted) and other improvements proposed on connecting roadways, including NC 87 (Webb Avenue). The listing of projects in the BGMPO plans are required before a project is approved for final design and construction in the State Transportation Improvement Program (STIP).

\* It should be noted that high levels of traffic resulting from the former elementary school have subsided since the closure of the school. It is reasonable to speculate that crashes involving pedestrians and bicyclists have proportionately decreased as well.



ABOVE: On the south side of Haggard Avenue looking east from Oak Avenue.

BELOW: On the south side of Haggard Avenue, east of Antioch Avenue, looking east in front of Elon University's East Neighborhood.



ABOVE: On the north side of Haggard Avenue looking east from Danieley Way.

BELOW: On the south side of Haggard Avenue at the corner of Oak Avenue, looking east.

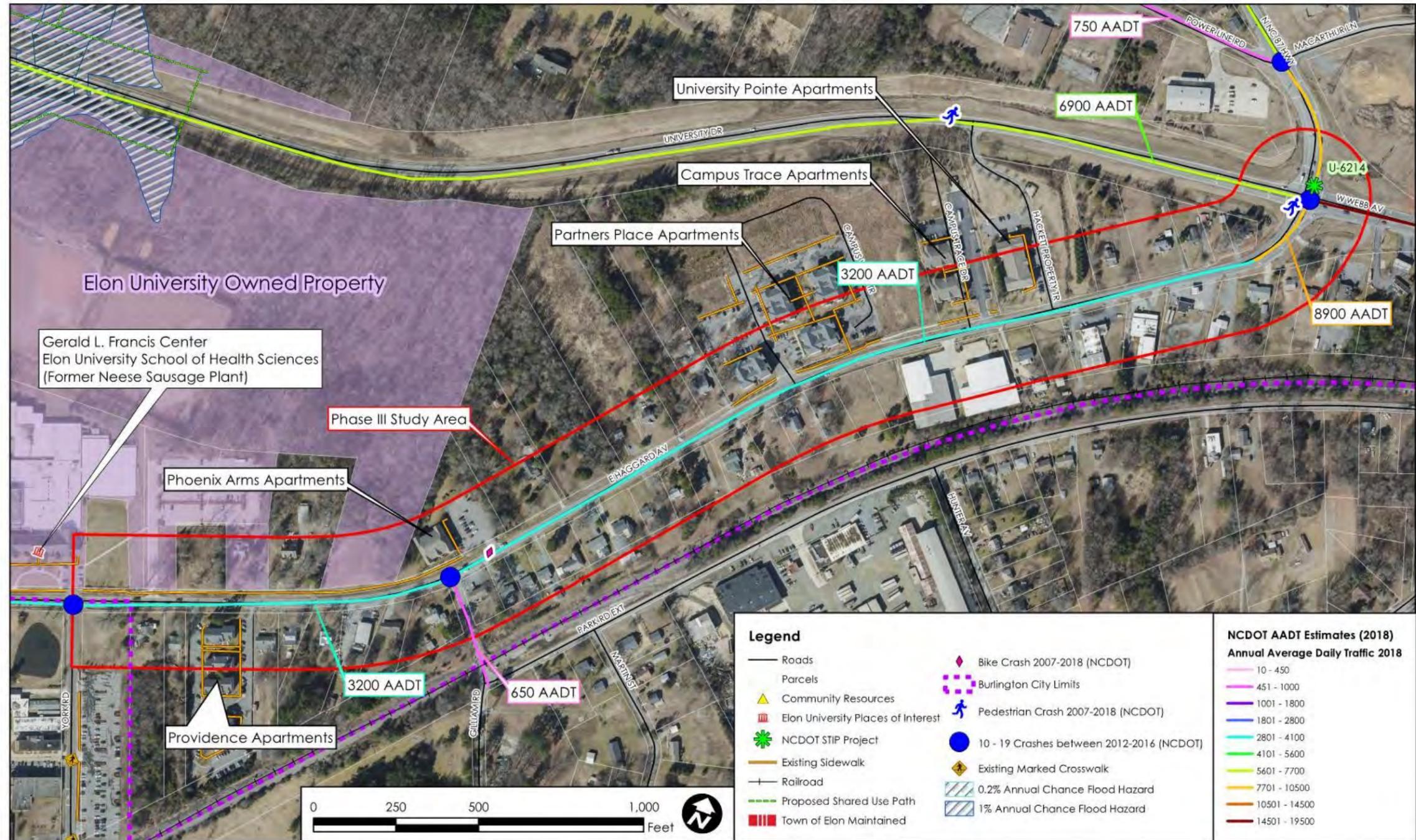


## York Road to NC 87 (Phase III)

Beginning at its intersection with York Road, East Haggard Avenue has two travel lanes and a concrete sidewalk along the eastbound side. This segment of E. Haggard Ave. has a 2020 AADT of 3,400, is classified as a minor arterial roadway, and has a posted speed limit of 35 mph. The sidewalk along E. Haggard Ave. ends at Phoenix Arms Apartments near Gilliam Road. Another existing sidewalk along the eastbound approach of E. Haggard Ave. begins near Partners Place Condominiums and ends at Campus Trace. There exists a brief turn lane on E. Haggard Ave. and it connects to the entrance to Partners Place Condominiums. At the signalized intersection with NC 87, E. Haggard Ave. widens to three lanes and its 2020 AADT increases to 7,000 vehicles.

In the Phase 3 segment of Haggard Avenue, crashes involving vehicles, cyclists and/or pedestrians are highest at the intersections of York Road, Gilliam Road and University Drive. However crashes involving cyclists occurred at a mid-block location between Phoenix Arms Apartments and Beer Republic.

Below: Beer Republic at the unsignalized "T" intersection of Gilliam Road and Haggard Avenue, the location of multiple automobile crashes between 2012 and 2016, and one bike crash between 2007 and 2018. Source: NCDOT

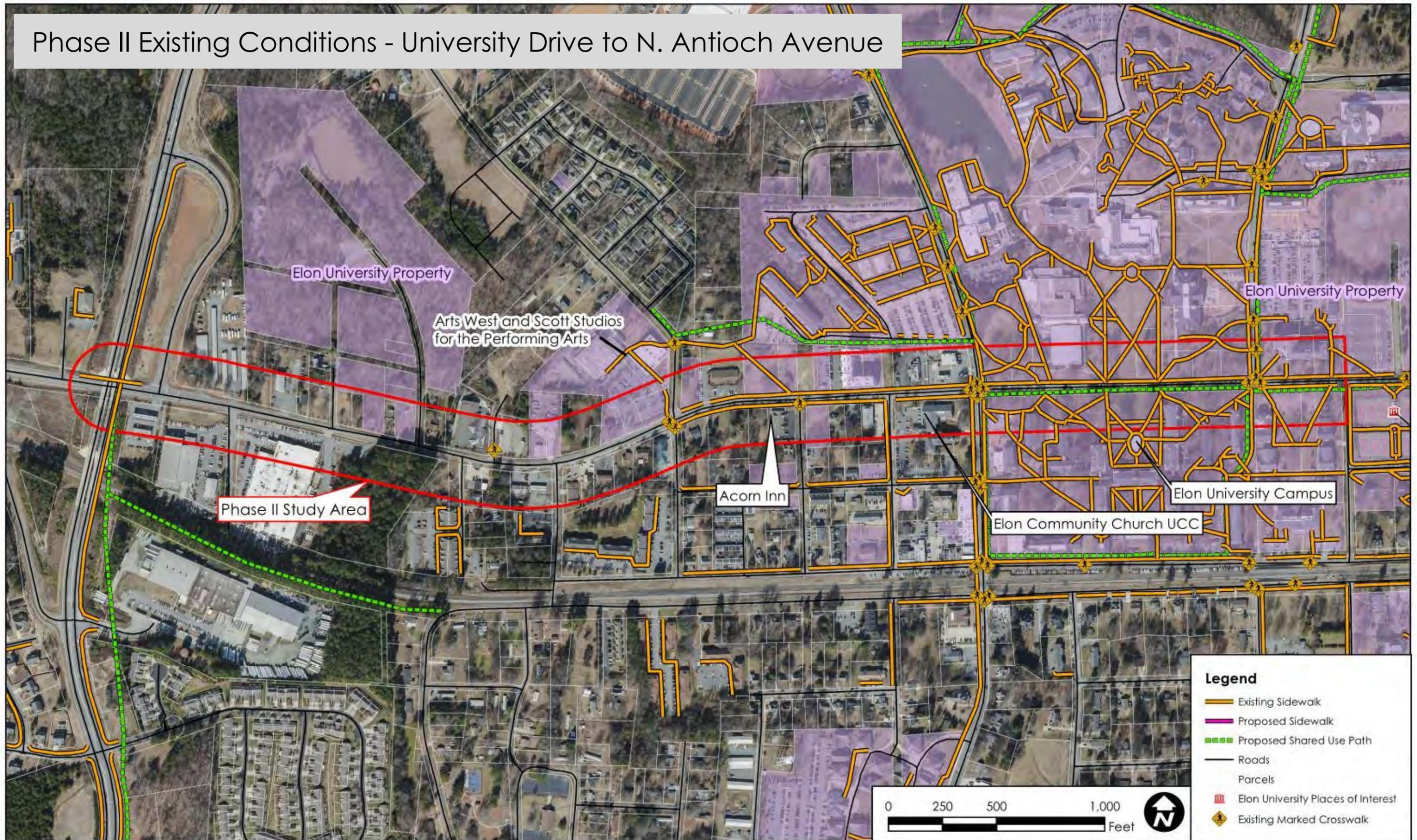


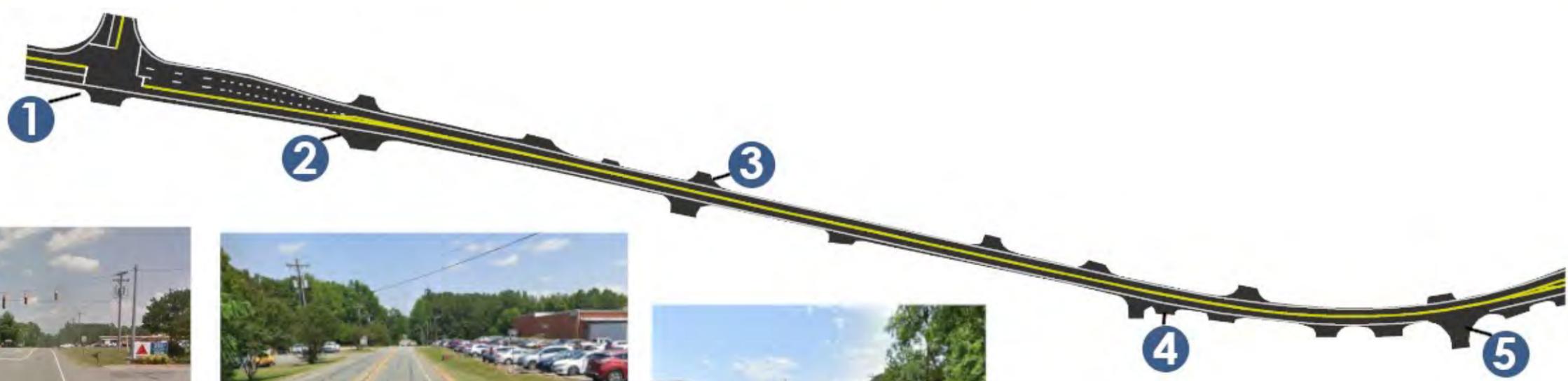
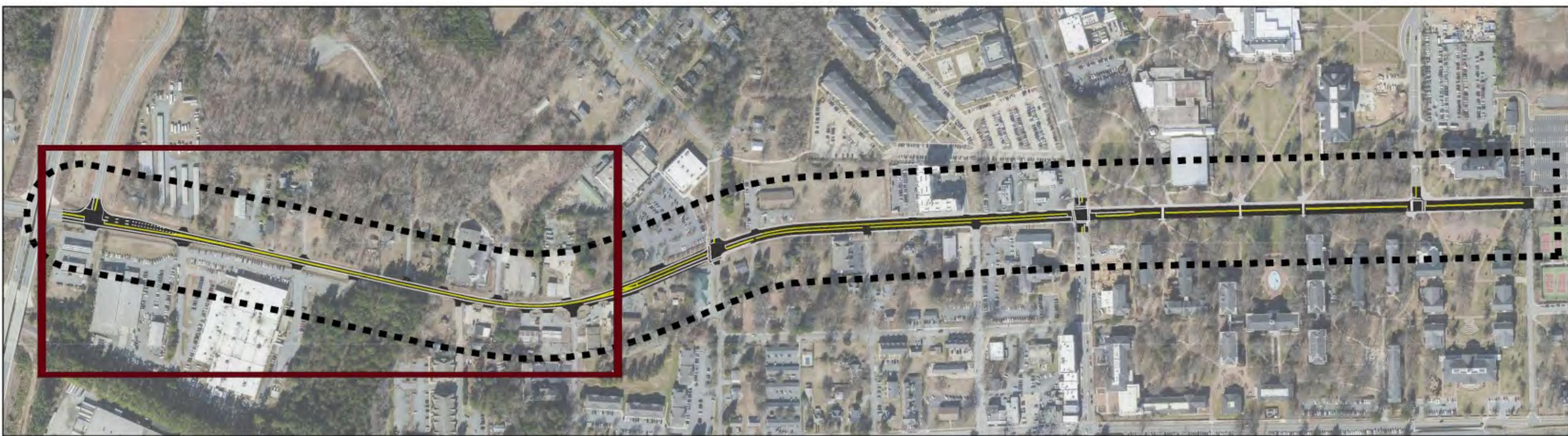
Right: A sidewalk gap along the northern side of E. Haggard Avenue adjacent to Partners Place Apartments.



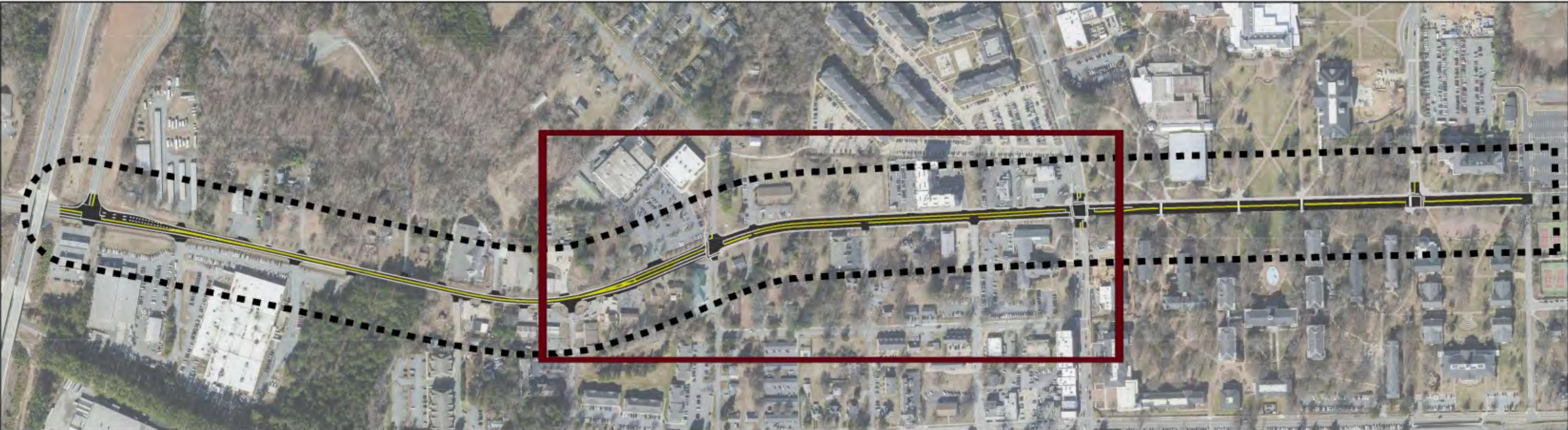
Right: A bicyclist traveling eastbound on E. Haggard Avenue along the striped shoulder.

# Phase II Existing Conditions - University Drive to N. Antioch Avenue

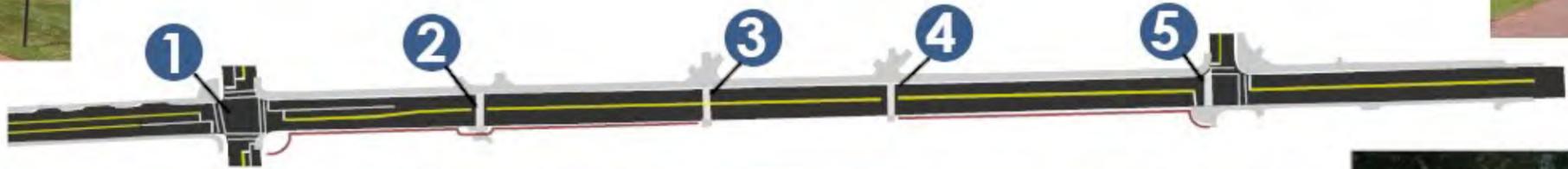
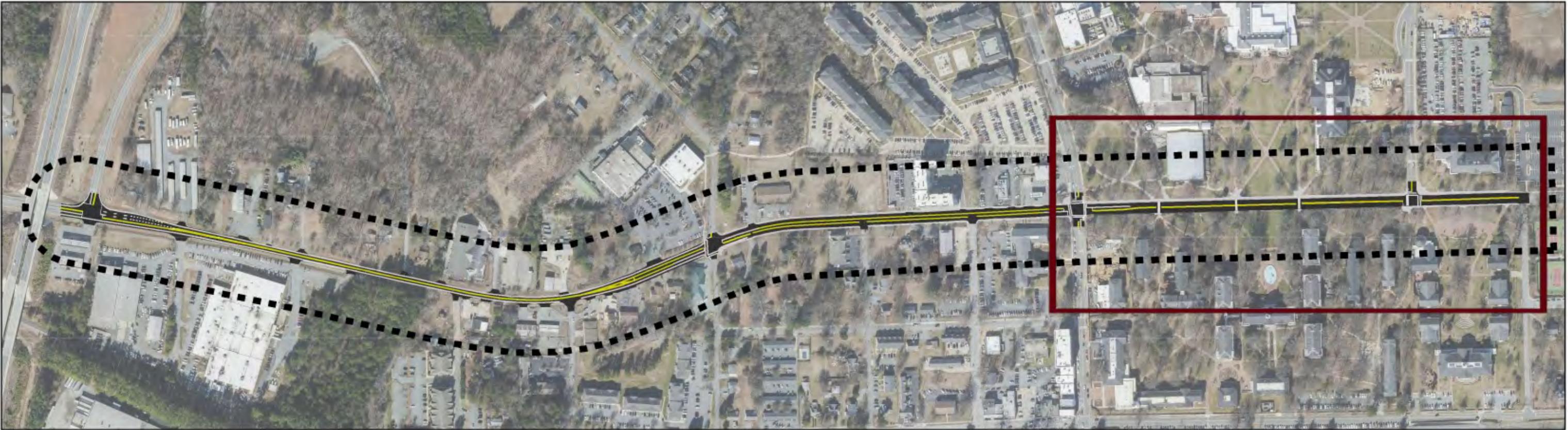


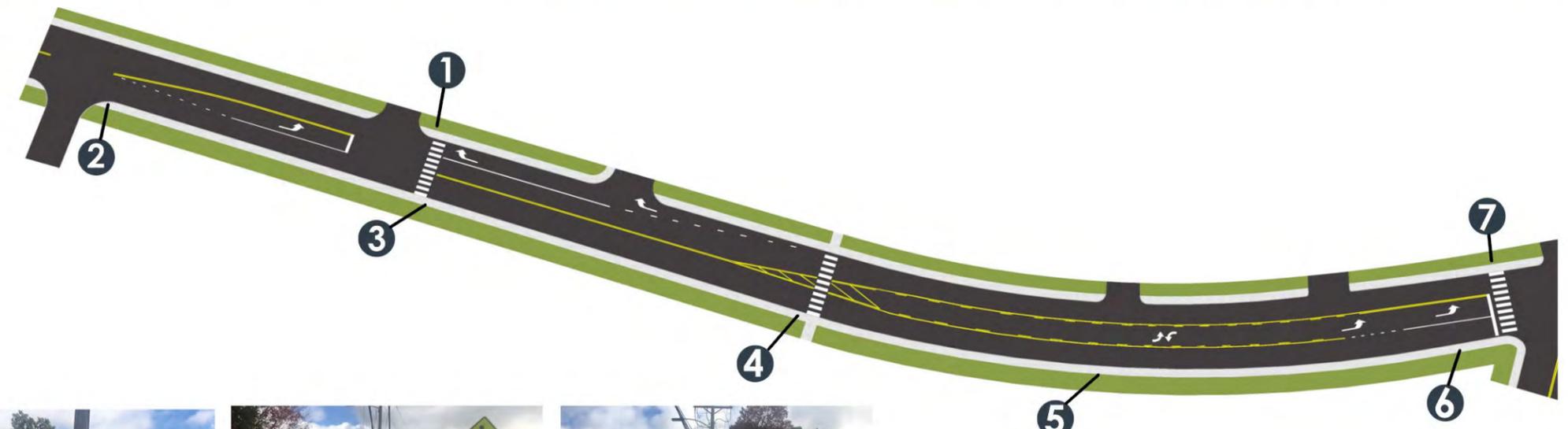
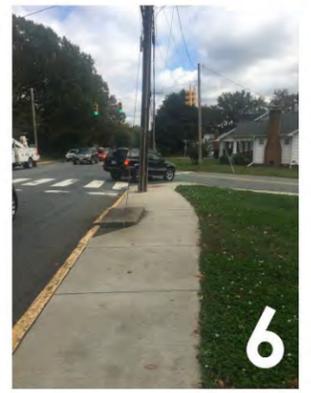
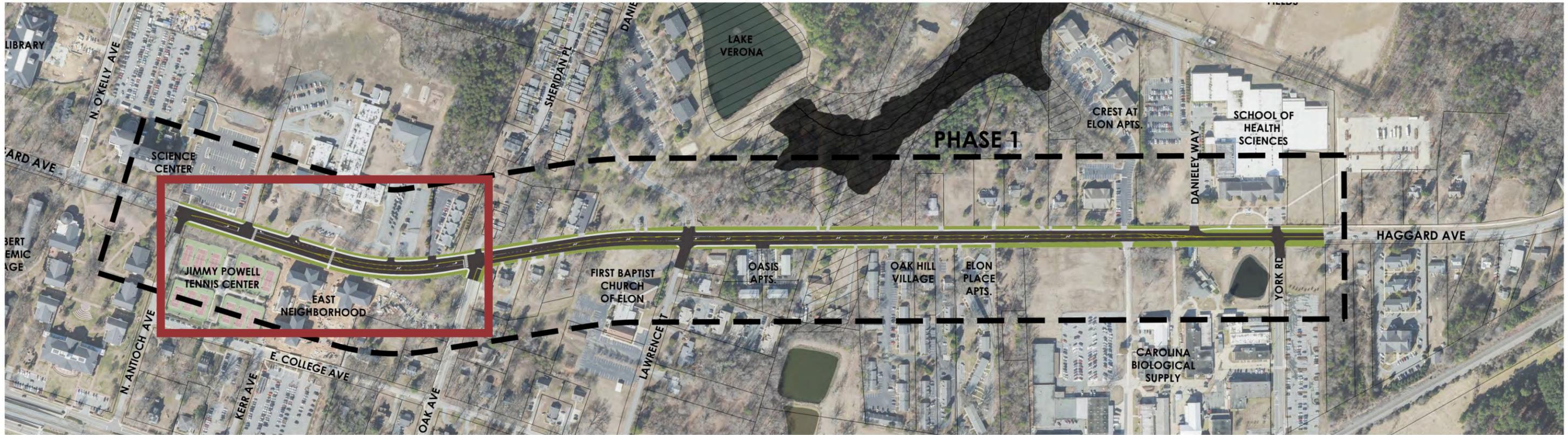


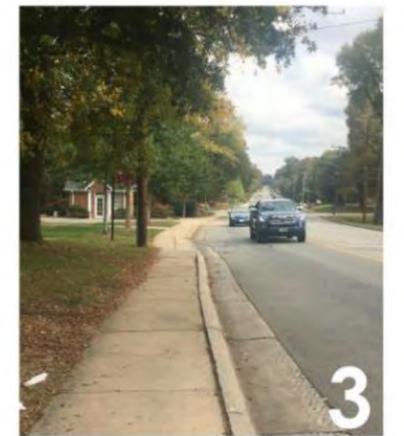
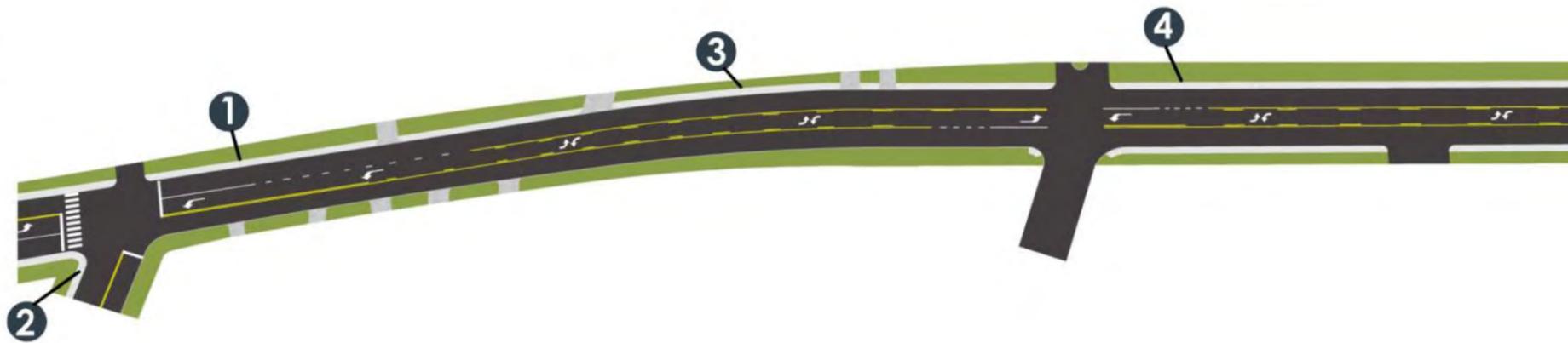
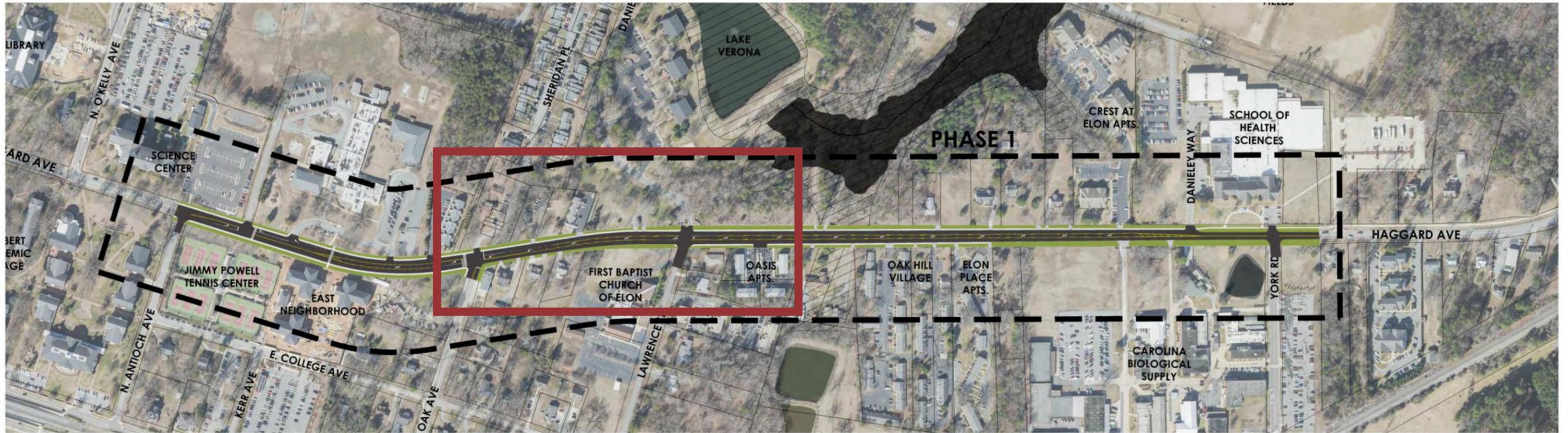
# Phase II Existing Conditions - Church Street to N. Williamson Avenue

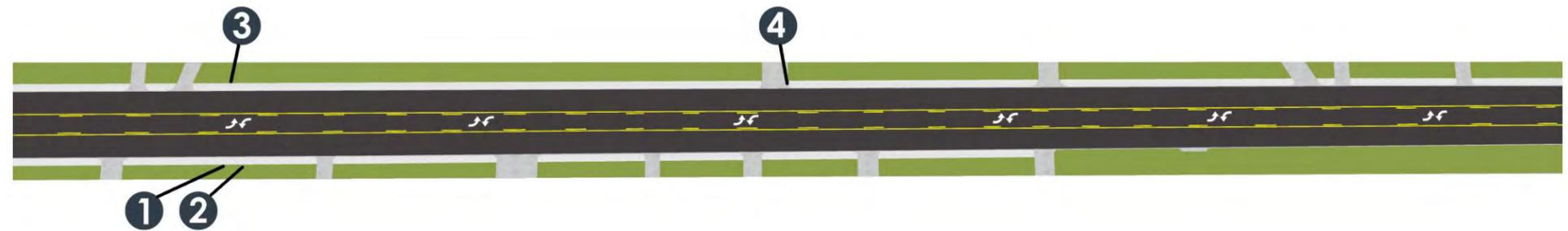
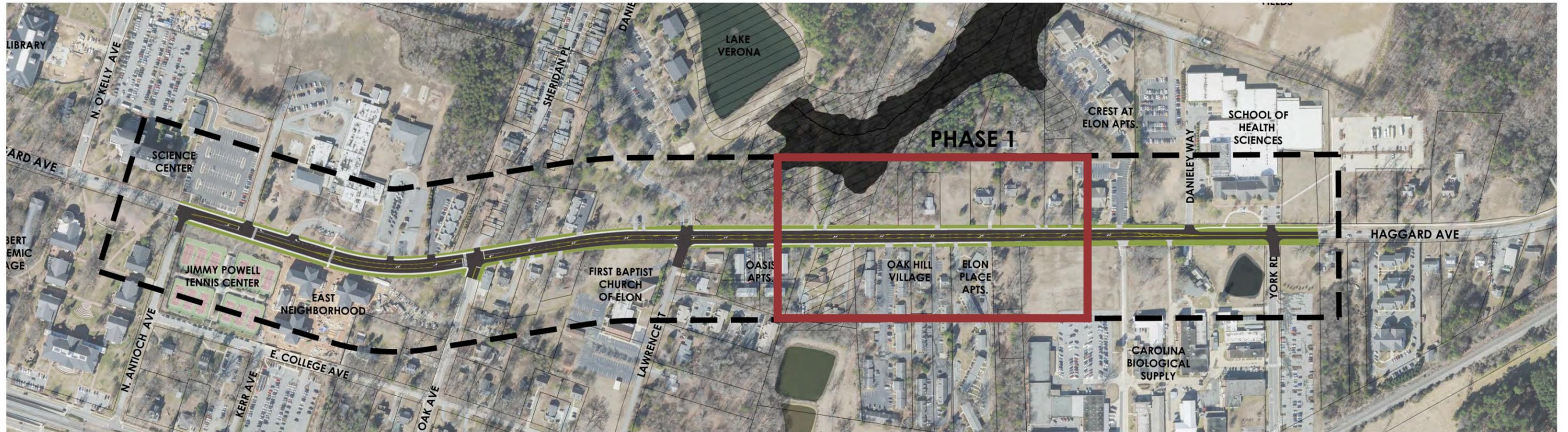


# Phase II Existing Conditions - N. Williamson Avenue to N. Antioch Avenue

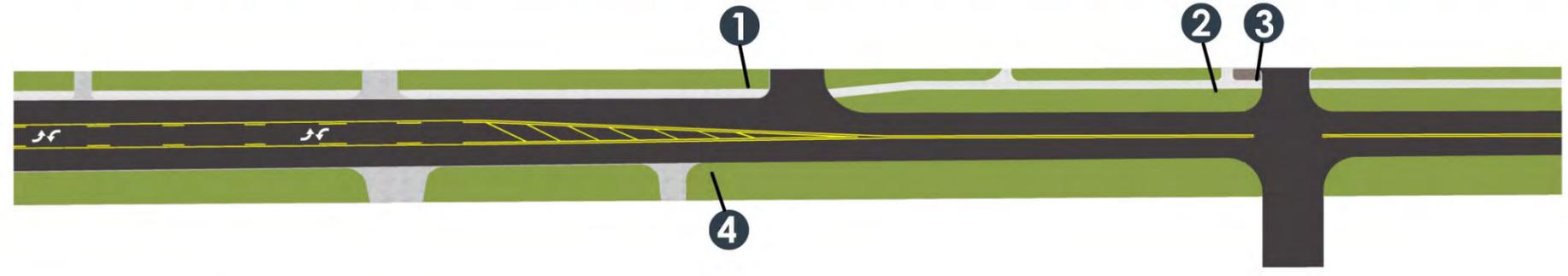
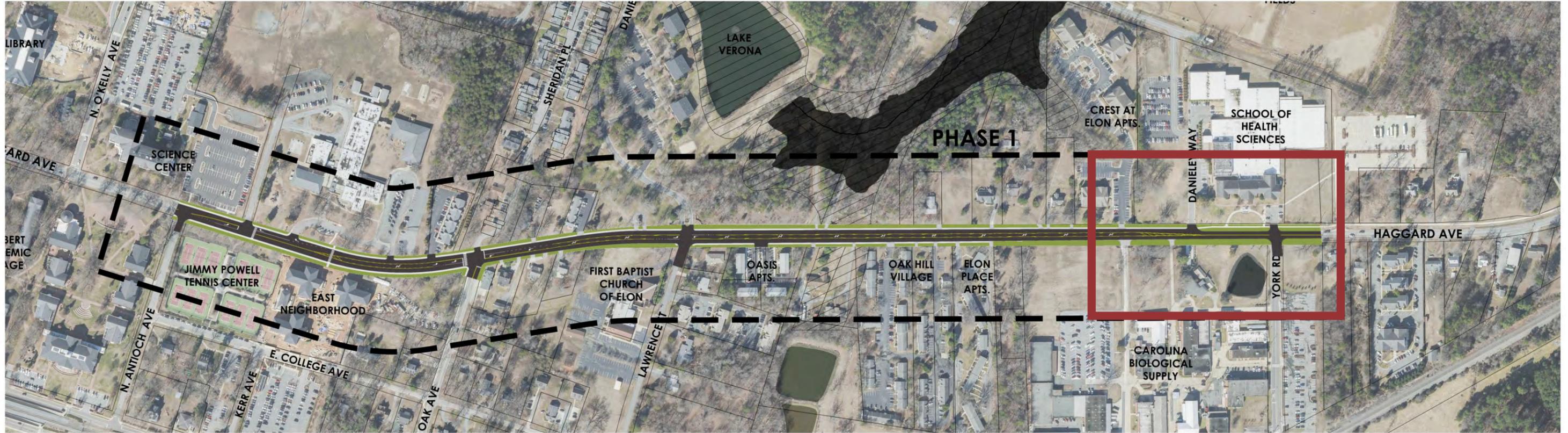




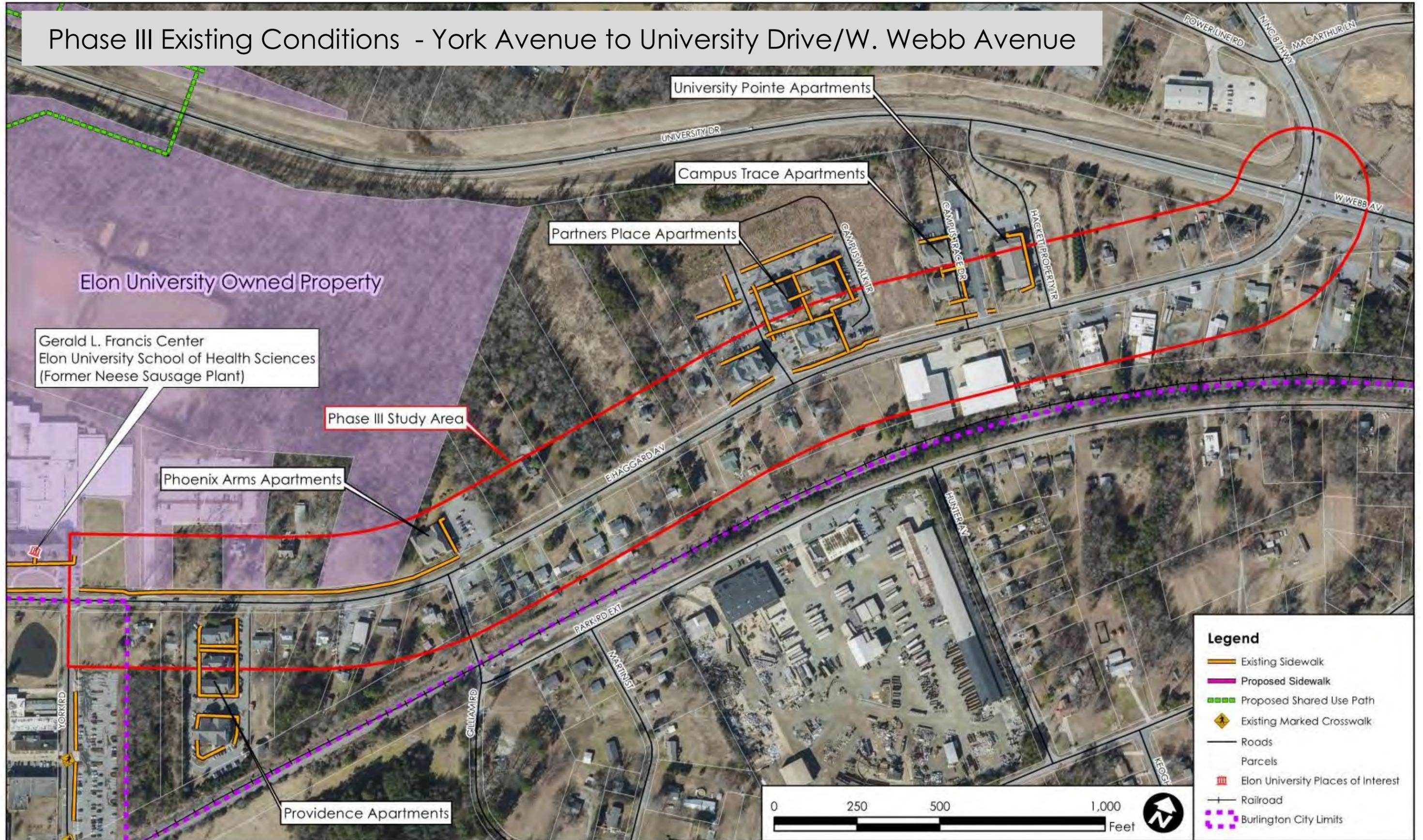




Existing Conditions - Crest at Elon Apartments to York Road



# Phase III Existing Conditions - York Avenue to University Drive/W. Webb Avenue

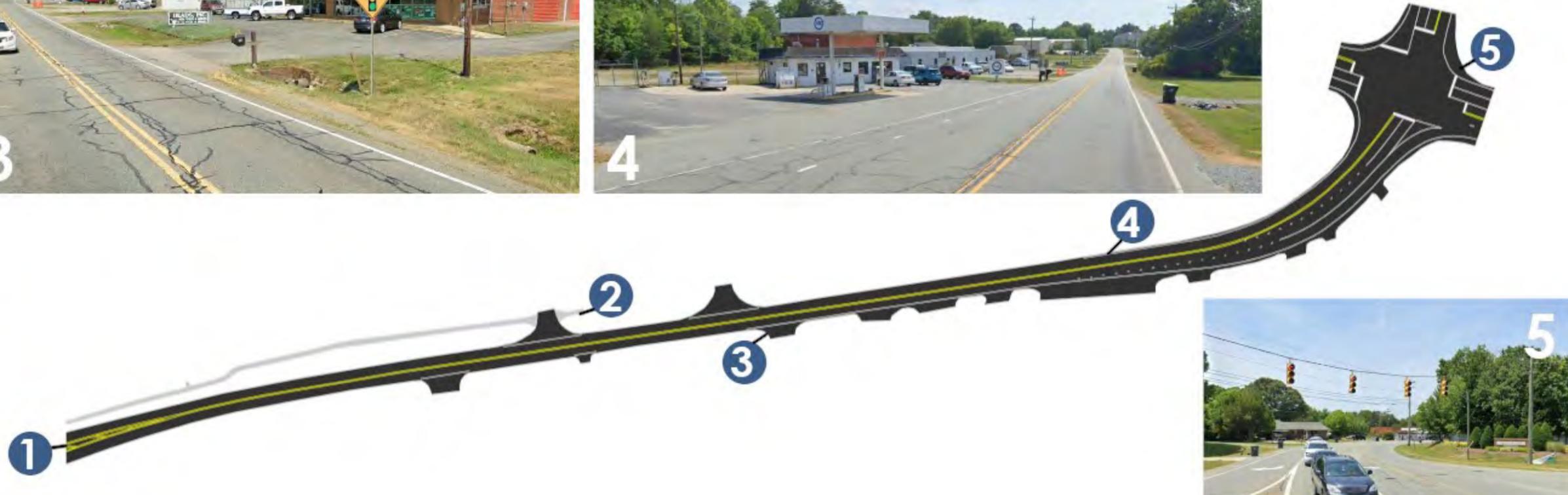


# Phase III Existing Conditions - York Avenue to Gilliam Road





# Phase III Existing Conditions - Partners Place Apartments to University Drive/W. Webb Avenue

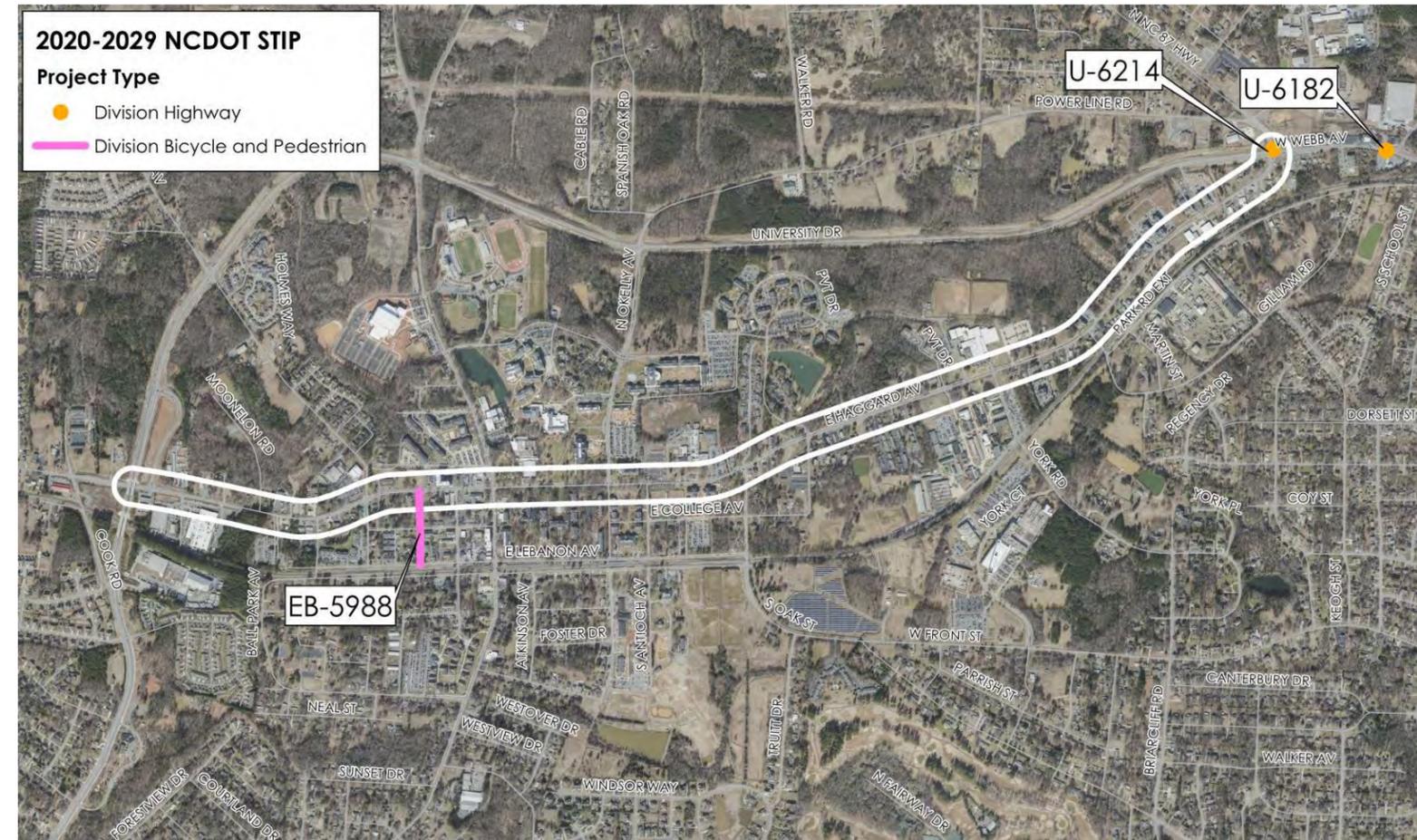


The following projects in the study area are currently programmed for construction in the latest approved STIP (2020-2029):

This Study is intended to inform decisions made by the Town of Elon, BGMPO and NCDOT on which improvements to carry forward with committed funding and schedules for design and construction in a future State Transportation Improvement Plan (STIP).

The following projects in the project area are currently programmed for construction in the latest approved STIP (2020-2029):

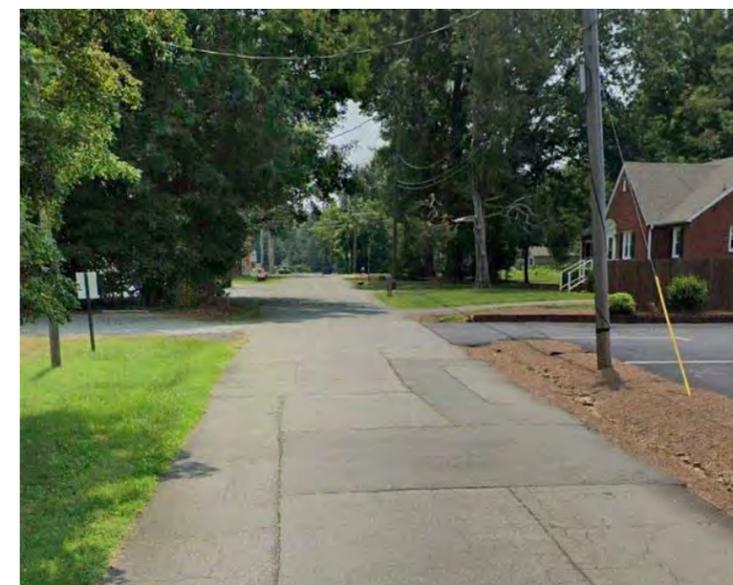
STIP Project No.	Description	Right of Way Scheduled to Begin (NCDOT FY)	Construction Scheduled to Begin (NCDOT FY)
EB-5988	West Lebanon Avenue to SR 1454 (West Haggard Avenue) in Elon. Construct sidewalk.	2025	2026
U-6214	NC 87 (West Webb Avenue) / NC 100 (University Drive) in Elon. Improve intersection.	2027	After 2029
U-6182	SR 1515 (Flora Avenue). Install traffic signal and turn lanes.	2027	After 2029



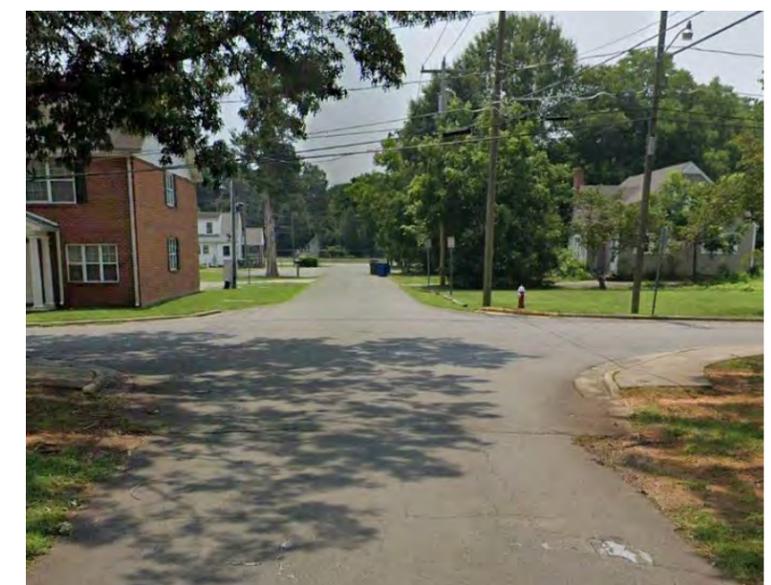
This Study is intended to inform decisions made by the Town of Elon, BGMPO and NCDOT on which improvements to carry forward with committed funding and schedules for design and construction in a future State Transportation Improvement Plan (STIP).



Left: Looking East along E. Haggard Avenue from University Drive, the future location of NCDOT STIP Project U-6214.



Right: Looking south along Lee Street from W. Haggard Avenue and W. College Avenue (far right). A sidewalk is proposed here as a part of NCDOT STIP project EB-5988.



## 1.2. What We Heard

### 1.2.1. Stakeholder Committees

The Haggard Corridor Stakeholder Committee was formed at the onset of the project to provide feedback to the Town of Elon. It was lead by the Town of Elon with assistance from TranSystems. The Committee is composed of the following representatives, which notes those groups and/or individuals who participated in only one of the phases:

Group / Organization / Agency	Representative
Town of Elon, Admin./Planning	Lori Oakley (Ph 2/3), Pam DeSoto (Ph 1, 2/3)
Town of Elon, Downtown Development	Jill Weston
Town of Elon, Public Works (Ph 1)	Ed Madren (Ph 1)
Elon University, Physical Plant	Tom Flood
Elon University Campus Architect (Ph 2/3)	Brad Moore (Ph 2/3)
Elon University, Student Representative (Ph 2/3)	Jack Corby (Ph 2/3)
City of Burlington, Planning	Mike Nunn (Ph 1), Andy Lester (Ph 2/3)
Town of Gibsonville, Planning	Brandon Parker
Town of Elon resident and walkability advocate	Margaret Skulnik (Ph 1), Phyllis Chambers (Ph 2/3)
Burlington Velo Club President (bike club) (Ph 1)	Tim Johnsey (Ph 1)
Town of Elon bicycle advocate (Ph 2/3)	Kelly Blackwater (Ph 2/3)
Piedmont Triad Regional Council (PTRC)	Matthew Dolge, Jesse Day
Burlington Graham MPO	Wannetta Mallette
NCDOT, Div 7 Corridor Development Engineer (Ph 1)	Tamara Njegovan (Ph 1)
NCDOT, Hwy Div 7, Div. Planning Engineer	Stephen J. Robinson, PE

### Phase 1 Stakeholder Kickoff Meeting

On July 27, 2020 TranSystems and the Town held a virtual meeting via GoToMeeting with the Stakeholder Committee to introduce the project, gather information and discuss the project goals and objectives. The existing roadway conditions were presented including current roadway profile, traffic counts, and crash data. The project goals and proposed plan elements were outlined, including an explanation of the intended project deliverables including: (a) roadway / streetscape schematic level design, and (b) land use and design recommendations for a Corridor Overlay Zoning District. Existing Conditions maps were reviewed, including zoning, pedestrian facilities, and community points of interest. The team discussed the existing conditions during a “fly through” of the corridor using Google Earth.

The TranSystems Team explained the streetscape design approach, which emphasized the importance of understanding and integrating the user into the design of the roadway and streetscape. It was noted that the character of the corridor varies and this will not be a “one size fits all” approach; rather the streetscape design will respond to the surrounding uses (current / future), with the intent to unify the corridor and create safe modes of travel for all users.

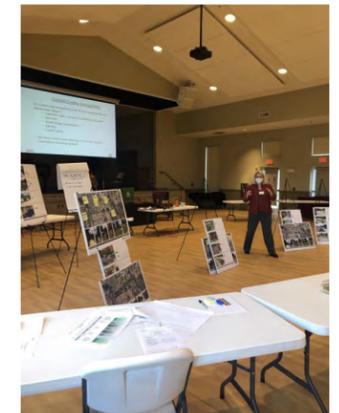
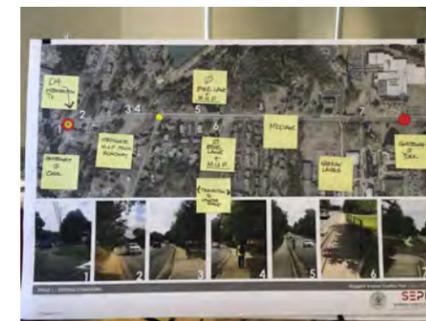
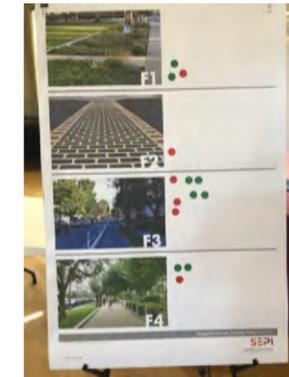
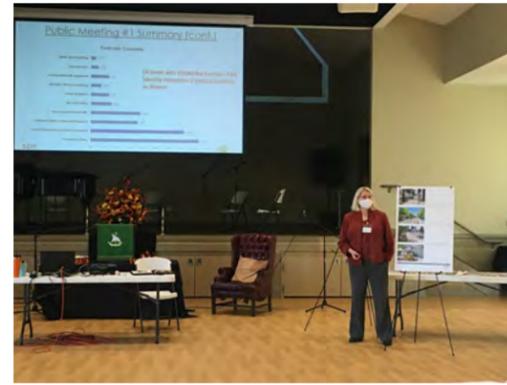
#### **The following are the most significant comments made by the Stakeholder Committee:**

- a. The high incidence of accidents at the intersection of Oak Street may be exacerbated by the extreme angle of that intersection.
- b. The University developed a Bike/Ped Plan for a section of Haggard Avenue between Oak and York Streets that evaluated/recommended a roundabout at York Road.
- c. The waterline in Haggard Avenue is currently in the planning stages for replacement and its construction should (if possible) be coordinated with constructing any road improvements.
- d. The Town of Elon encouraged the team to consider burying overhead utilities as part of this project, especially in the downtown core.
- e. The Town provided clarification that the Overlay District recommendations included in the scope of this project are intended to be a framework that will be used by the Town of Elon in developing the overlay district zoning language.
- f. BGMPO inquired if a cost estimate and statement of purpose and need (for SPOT 7.0 funding) will be provided. A high-level cost estimate is currently under development and will be provided by the Final Draft (i.e. cost per mile).

## Phase 1 Stakeholder Design Charette #1

The Phase 1 design charette was held on November 16, 2020, at the Elon Community Church Life Center. The in-person charette was facilitated by the TranSystems Design Team and Project Manager in a format that respected the guidelines for gatherings and social distancing established by the State of North Carolina, and the Town of Elon to mitigate the spread of COVID-19. Since these guidelines limited indoor gatherings to 10 people, the Design Team held two sessions for the charette – morning and afternoon. The morning session was attended by 5 stakeholders, and the afternoon session by 3 stakeholders, and each session also included 4 members of the Design Team.

The charette's intent was to engage the stakeholders to further develop design ideas for the corridor, present the feedback generated from the first public meeting, and discuss options for a potential Corridor Overlay District. A presentation, coupled with interactive, yet socially distanced activities generated discussion to inform the scale, and arrangement of streetscape elements for the corridor. Detailed notes from the Charette are presented in the Appendix. For recommendations from the charette regarding the Schematic Designs, please refer to Chapter 3 and for recommended implementation measures (including recommended standards for the new Corridor Overlay Zoning District and Roadway Design Standards, please see Chapter 4.



## Phase 1 Public Meeting

A public meeting for Phase 1 of the Elon – Haggard Avenue Corridor Study was held virtually on Thursday September 10, 2020 (Via GoToMeeting). The purpose of the meeting was to introduce, educate and receive public comment on improving the safety and multi-modal connectivity/access of 0.75 miles of East Haggard Avenue (SR 1455) between N. Antioch Avenue and York Road in the Town of Elon, NC. In total, 85 comments were received between 9/25/20 and 10/6/20 through an online survey available on the Town's Project Website. (<https://www.townofelon.com/haggard-avenue-corridor-study/> )

The main results of the survey are shown through the following graphics and summaries. Additional details are provided in the Appendices.

### *Road Improvement Comments*

#### **What existing elements should be eliminated?**

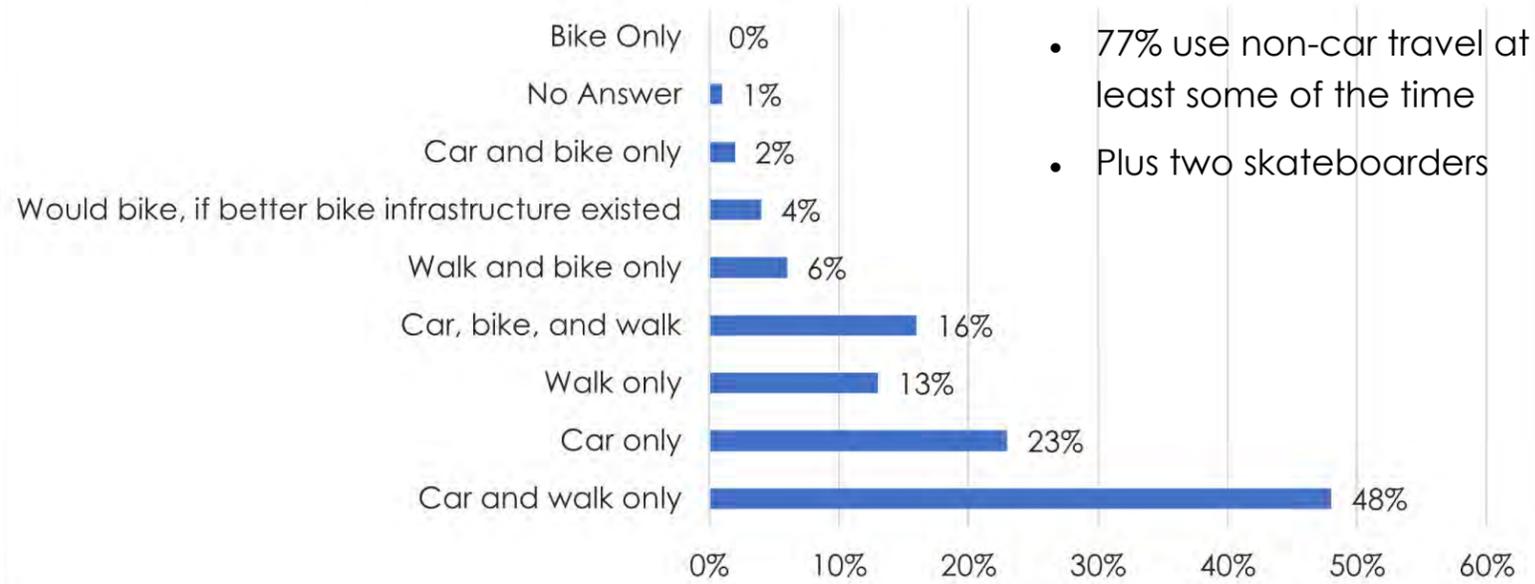
- Extra lane in the 3-lane section
- Overhead power lines
- Speed bumps – they damage cars

#### **What existing elements should be retained?**

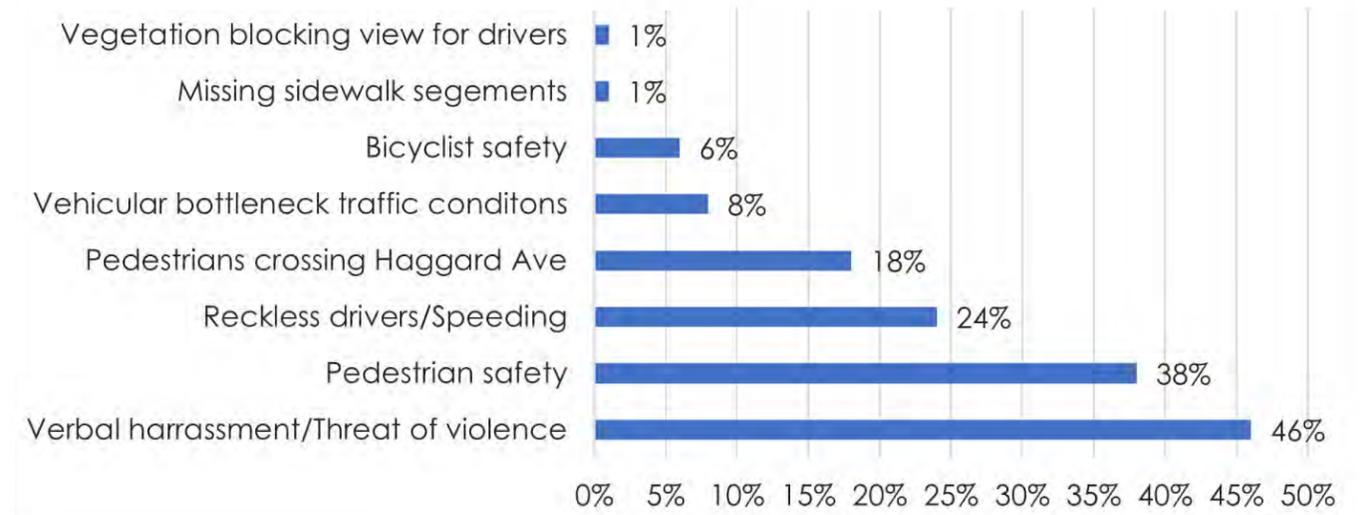
- Scenic views of architecture / downtown / campus
- Gateway to / from Town and to/through University
- Street trees
- Sidewalks
- Streetlights
- Traffic lights / signals (to protect pedestrians and slow traffic)
- Good signal timing
- Existing crosswalks
- Raised crosswalks/ speed humps that help slow vehicular traffic



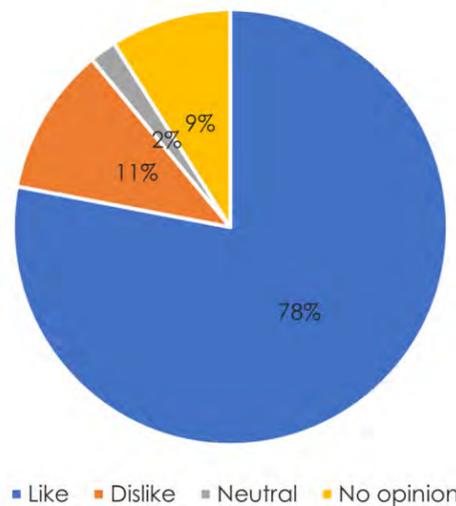
### How do you use the existing corridor?



### Safety issues noted by respondents (% of total responses)



### Overall like or dislike of corridor

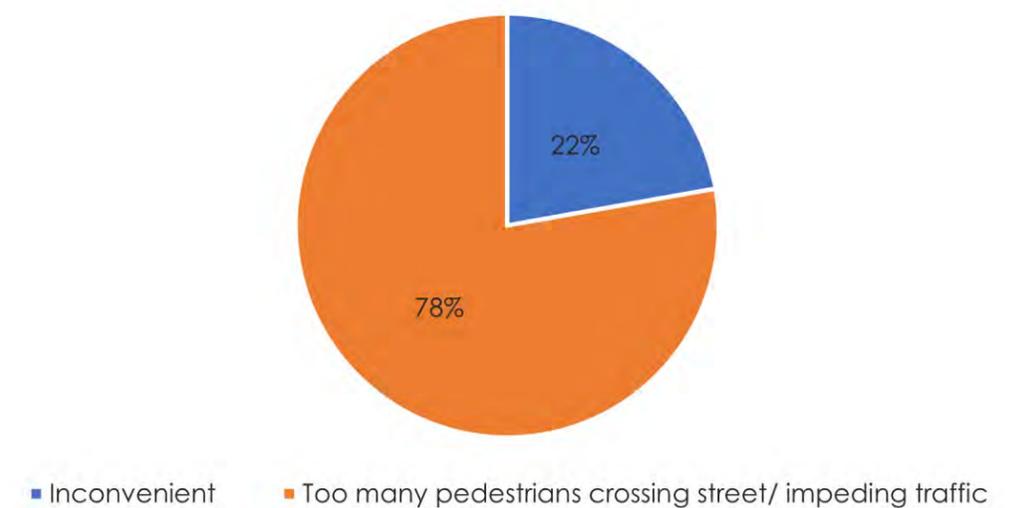


Majority (78%) Like the Existing Corridor

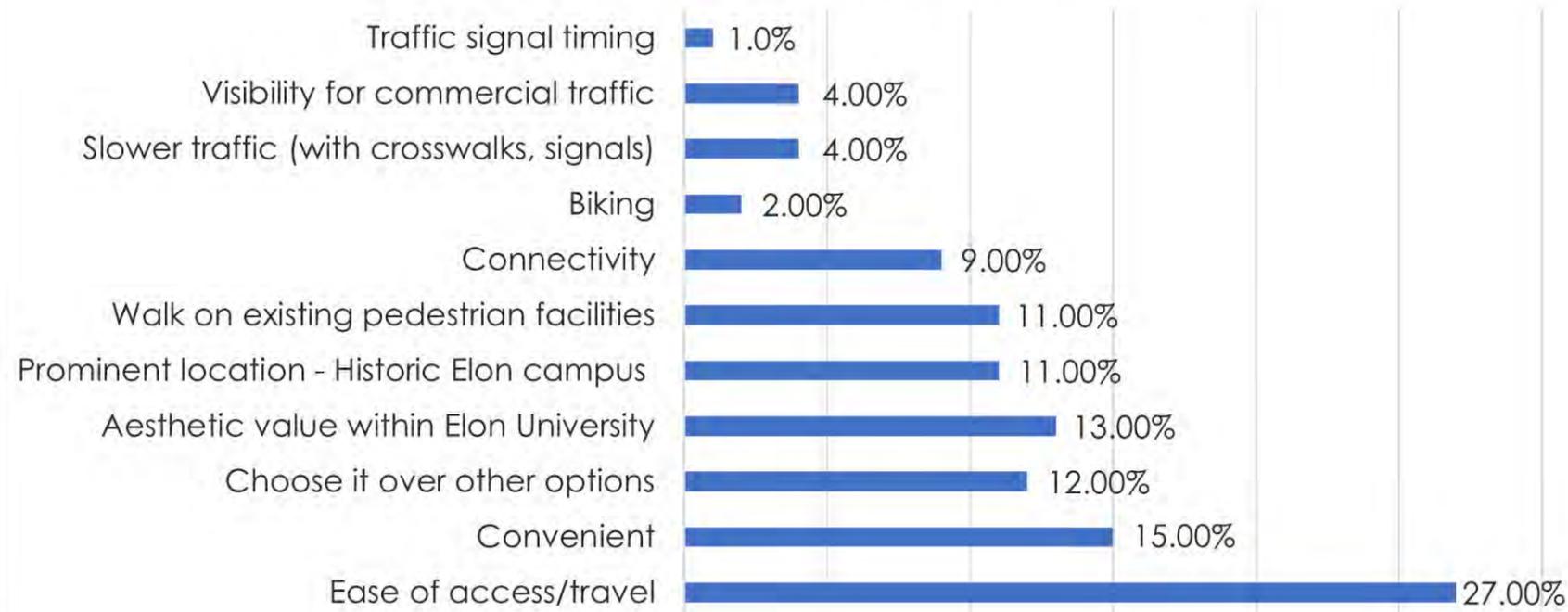
AND YET....

92% of Respondents were Concerned with the Existing Corridor

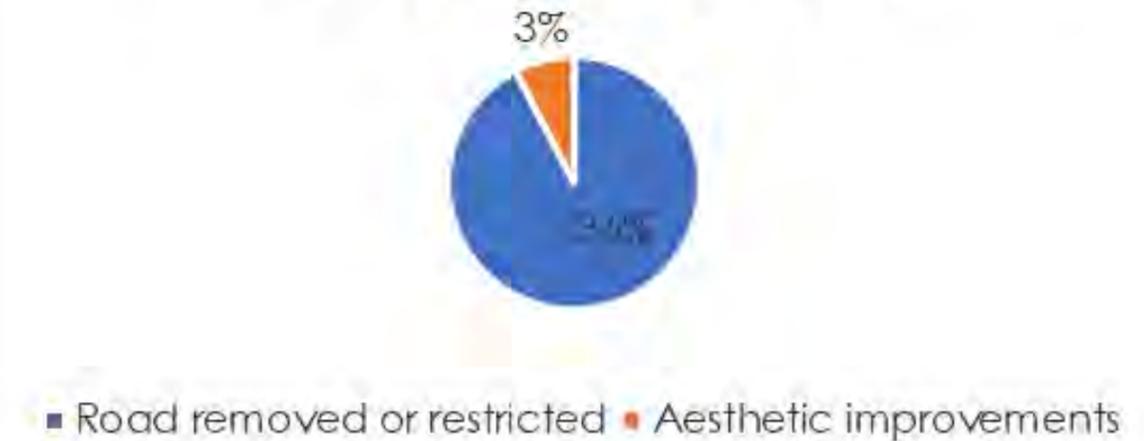
### Why dislike?



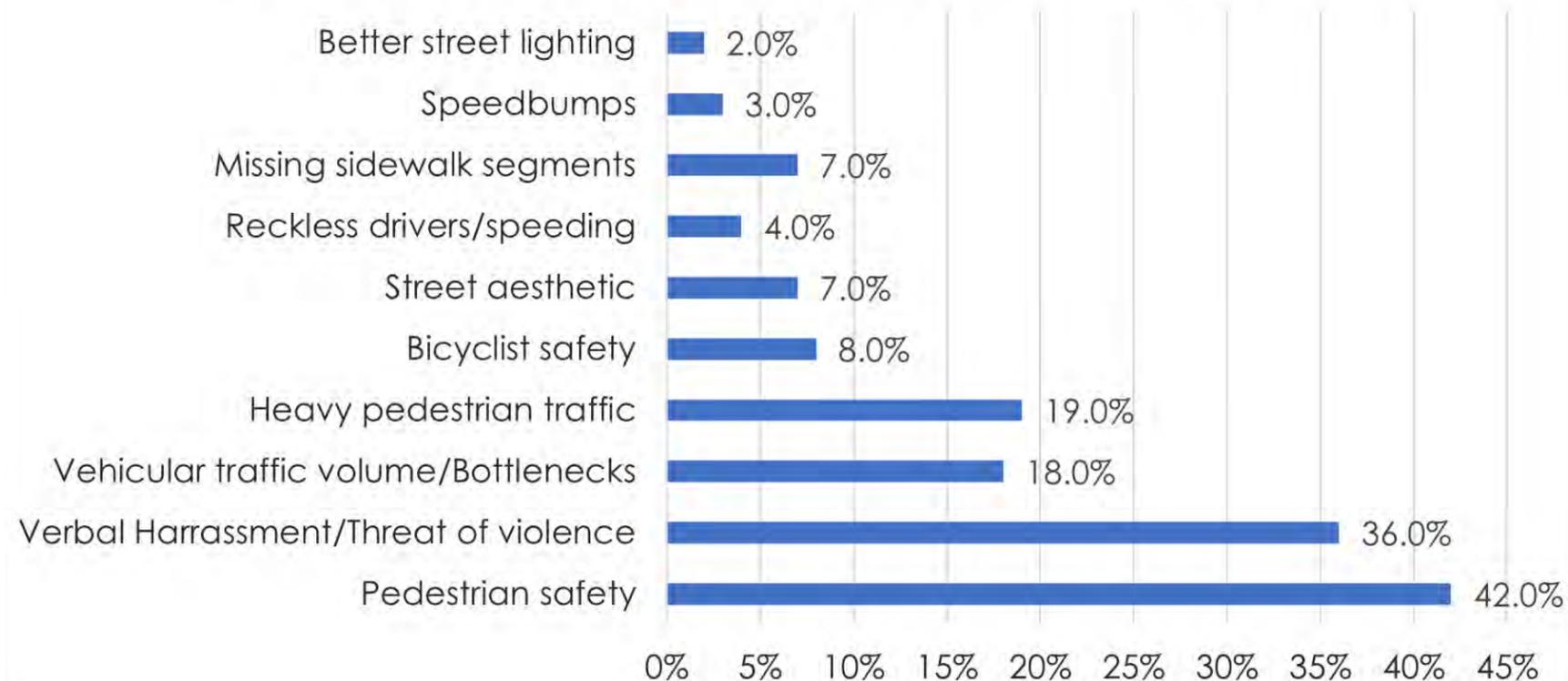
### Of those who liked the existing corridor, why?



### Of those who indicated some concern, they would like to see ...



### Particular concerns (of those who mentioned any)?



Of those who dislike the Corridor, 73% Identify Pedestrian/Vehicle Conflicts as Reason

## Road Closure Comments

It should be noted that right before this project was publicly announced and the public comment questionnaire made available for Phase 1, some events occurred in Elon that affected the survey results. This included a political rally that consisted of a caravan of vehicles that traveled along Haggard Avenue on the west end of the project area. Due to the harassing behaviors experienced, survey submissions went from one to over 30. Most of the comments at that time came from students who witnessed or are aware of the incidents (apparently some of the participants came through a second time later in the day). Consequently, the number of early comments received were largely focused on this experience and expressed strong support for closing the road to vehicular traffic as the primary solution to the problem.

While fewer of the comments received closer to October 6, 2020 (the end of the survey) were a response to these pre-election protests and events, the Town reports a history of catcalling and other types of harassment from drivers along Haggard in the past, so these activities are not isolated.

The following summary of public comments received regarding the positives and negatives of closing the roadway is provided to reflect a transparent discussion of the merits/detriments of closing any portion of the corridor. While discussions regarding the use of the portion of Haggard Avenue that abuts University property will be ongoing, permanent closure of the corridor to public traffic is not considered a viable option at this time. This action is not recommended by the Town's Comprehensive Plan or the Elon University Master Plan, and would require support from NCDOT, the entity responsible for maintenance of the vast majority of the corridor. This initial phase of the corridor study is tasked with recommending measures that improve multi-modal use and enjoyment of Haggard Avenue, a goal that is consistent with both Plans and is further supported by NCDOT's Complete Streets policy.

### Reasons Expressed for Closing East Haggard Avenue to Public Traffic:

- Open roadway is a safety issue / danger to students, faculty, staff and pedestrians:
  - Lack of adequate pedestrian and bicycle facilities
  - Unsafe due to non-university vehicles using road
  - Lots of crashes and near misses / very unsafe - high pedestrian volumes and speeding vehicles.
- Would eliminate traffic congestion/improve traffic flow from waiting for large groups of students to cross the road.

- Closing of adjacent Elon Elementary School makes it a less important street for local traffic. With new East Dorms there now, and a large new quad in near future, now is the time to reimagine this section altogether.
- Speeders are common (in spite of speed bumps).
- "The hill and the curve in this section make it difficult to see pedestrians".
- Roadway perceived as part of campus, not public road and should not be open to public vehicle traffic:
  - Busy road through "the center of campus" is unnecessary
  - This is "the busiest / main part of campus"
  - "Public access prevents the University from fully securing the campus"
  - Roadway "breaks up campus feel"
  - Making it pedestrian only would "enhance the campus climate"



**Reasons expressed for Haggard Avenue remaining open and retaining vehicular traffic:**

- Traffic volumes have decreased with the opening of University Drive.
- University Drive is an acceptable bypass for traffic concerns.
- Retain easy access from downtown Elon to businesses on the far end of W Haggard and housing of many Elon students who live in the apartments and houses on E Haggard.
- Road belongs to all of Town, not just University.
- University controls too much of Town.
- Road should be upgraded, not closed, to make a welcoming entrance / gateway into the community and Town.

**Specific reasons mentioned for keeping Haggard Avenue open:**

- To avoid other alts that require crossing train tracks.
- To provide delivery access to Univ facilities, businesses and churches.
- To provide convenient access to and through campus and to surrounding areas/towns.
- To avoid moving traffic (and harassing conflicts) to surrounding neighborhoods.

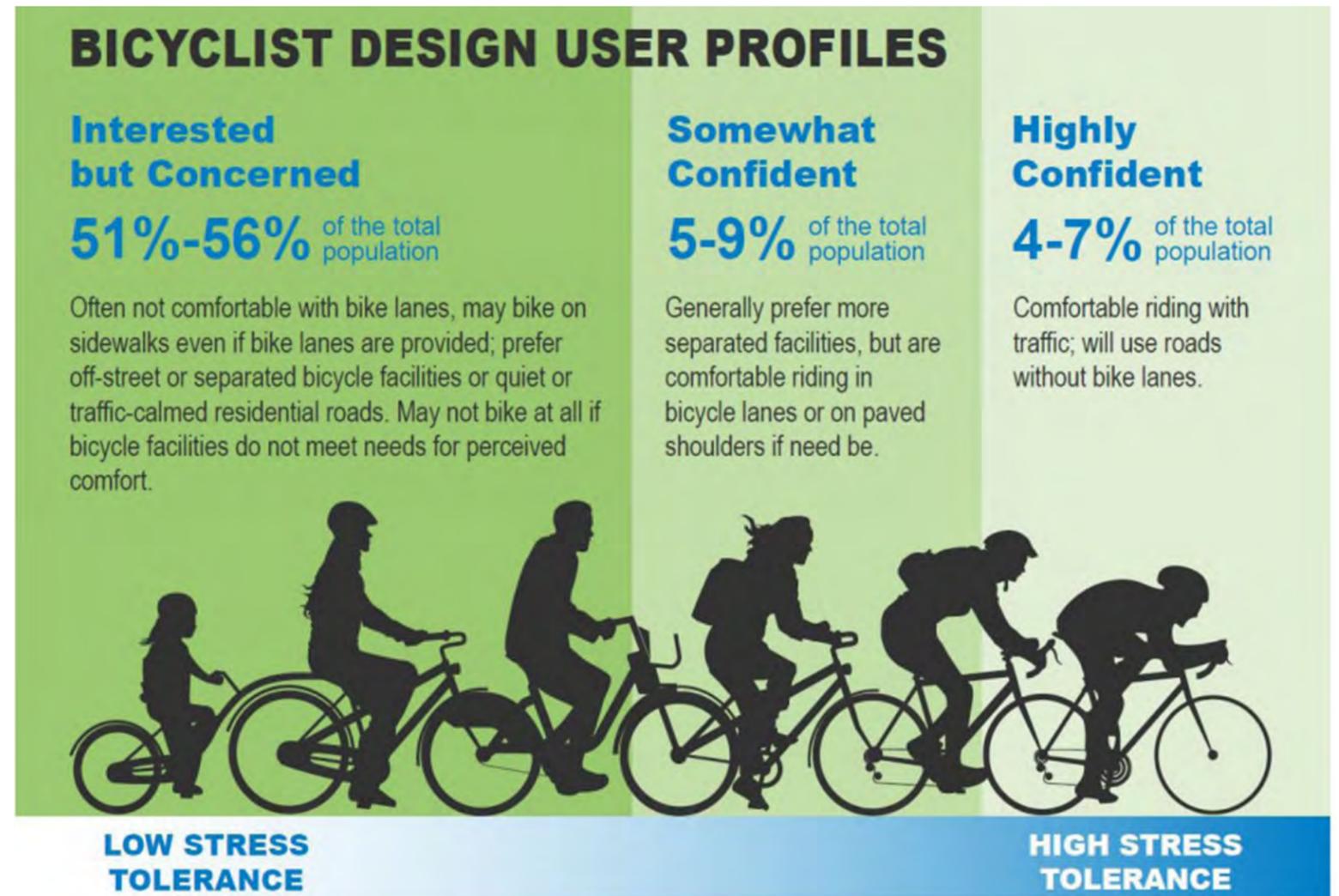


## Phase 2/3 Stakeholder Committee Meeting

The Phase 2/3 Stakeholder Committee Meeting was held on September 30, 2021. The purpose/goals of the meeting were to perform a multi-modal and streetscape review of the conditions and needs along Phases 2 and 3 of the corridor, perform an overview of land use and connectivity along all three phases of the corridor, and develop solutions in conflict areas (where insufficient existing right of way exists). Existing and potentially new crosswalks were discussed along with signals that needed improvement and where on-street parking might be needed.

The below graphic was shared with the stakeholders in order to define the target user of the intended bicycle facility.

Existing traffic volumes and speeds were also discussed in terms of AASHTO/FHWA guidance and recommendations for separating bicycles from automobile traffic, where multiuse paths were perceived as having greater comfort, shared lanes had the least perceived comfort for bicyclists, and conventional/dedicated bike lanes are viewed in the middle. While many of the users are expected to be Elon University students, stakeholders expressed that the recommended bicycle facilities are accessible to children and seniors as well.



Another goal of the second Stakeholder meeting was to further refine the suggested design from Phase 1. If all the components of the initial design were implemented on the Haggard Avenue corridor, including a multiuse path, sidewalk, planting strip, and bike lane on both sides of the road, 93-feet of Right-of-Way width (ROW) would be needed. The current ROW along Phases 2 and 3 is on average 60-feet wide. A map of the 93-foot wide ROW was projected onto aerial photos and all of Phases 2 and 3 were reviewed, with a focus on the following conflict areas:

**Rego Industries** - 75% of stakeholders agreed that a sidewalk is needed on the south side of Haggard Avenue, adjacent to Rego Industries. Given the tight corridor and parking lot in front of the business, the committee ranked from most desirable to least the following options in this conflict area: 1<sup>st</sup> – eliminate redundant bicycle facilities, 2<sup>nd</sup> - shift road centerline to north, encroaching on northern parcels, 3<sup>rd</sup> - lose or move Rego Parking, 4<sup>th</sup> - Eliminate ped facilities on south side.

**Fat Frogg** – There was unanimous agreement that a crosswalk is needed at Church Street, near Fat Frogg, though 50% of the stakeholders also felt an additional crosswalk was needed at St. John's Street. No one felt a crosswalk WASN'T needed, and no one asked for the crosswalk to be placed at Timber Station Drive.

**Park Place at Elon (Former Med Deli)** - Park Place has an outdoor patio/eating area that is directly adjacent to the road. 57% of the committee supported minimizing potential crowding in the area by not placing a MUP here (but rather a sidewalk with bicycle traffic moved to the street with a dedicated bike lane). Additionally, 67% advocated for on-street parking on the North side of the corridor, with none advocated for parking on the south side, and 33% claimed on-street parking is not needed here. It was also noted that sight line issues presented a safety hazard for bicyclists and pedestrians in the area due to vegetation in front of Skid's restaurant.

**Historic Campus - Near Young Commons in the Elon Historic Campus District.** In this area, the existing ROW is limited on the south side of Haggard Avenue because of a low historic wall that sits close to the travel lane. 67% of the committee felt it would NOT be necessary to separate bicycles from pedestrians in this area, but there was concern for bike/ped conflicts. Further, if bicyclists were to be separated, and to reduce potential impact to the Young Commons to the north, one person on the ranked their most desirable solutions to be (from 1<sup>st</sup> to last) - Dedicated bike lanes in both directions, Shared Bike Lanes in both directions, Reduction of the landscaping buffer between the sidewalk and street, and Elimination of the landscaping buffer between the sidewalk and the street.

## Phase 2/3 Public Meeting

A public meeting for Phases 2 and 3 of the Elon - Haggard Avenue Corridor Study was held virtually on November 18, 2021. The purpose of this meeting was to introduce concepts related to improving multimodal access and increasing safety of all users, followed by an opportunity to receive public comment. The Project team emphasized the goal of applying a road diet to the three-lane section of Haggard Avenue. The project goals are to be accomplished by filling in existing sidewalk gaps and planning a connected bicycle network along the corridor.

The following bicycle facilities and cross section elements were discussed with attendees:

- ◆ 10'-12' Multiuse Path (MUP)
- ◆ 5' On-Street Conventional Bike Lane
- ◆ Shared Lane
- ◆ 8' Sidewalk
- ◆ 2'-8' Variable Planting Strip
- ◆ 5'-12' Median
- ◆ 10'-12' Campus Sidewalk

The following public concern was expressed by attendees:

- ◆ Congestion experienced at the intersection of W Lebanon and N Williamson
- ◆ Possible Right of Way infringements on Rego Industries, particularly parking spaces
- ◆ Future traffic studies along Phases 2 & 3 areas should be conducted while school is in session
- ◆ Heavy pedestrian student traffic in the evening to and from Fat Frogg and Beer Republic supports additional crosswalks
- ◆ Lack of walkability for students who live off-campus

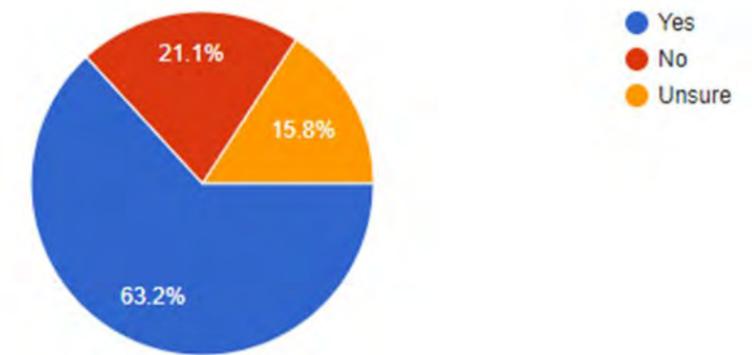
## Ph 2/3 Public Survey

Following the Ph 2/3 public meeting, comments were received between 11/19/2021 and 12/15/2021 through an online survey available on the Town's Project Website. (<https://www.townofelon.com/town-government/departments/planning-and-zoning/haggard-avenue-corridor-study/>) The survey had 19 respondents; the main results of the survey are shown through the following graphics and summaries. Additional details are provided in the Appendices.

### What sections of Haggard Avenue do you feel have the greatest amount of bicycle traffic (on an average day when campus is in session)?



### Do you think a sidewalk is needed on the south side of W. Haggard Ave. (in front of Rego Industries)?



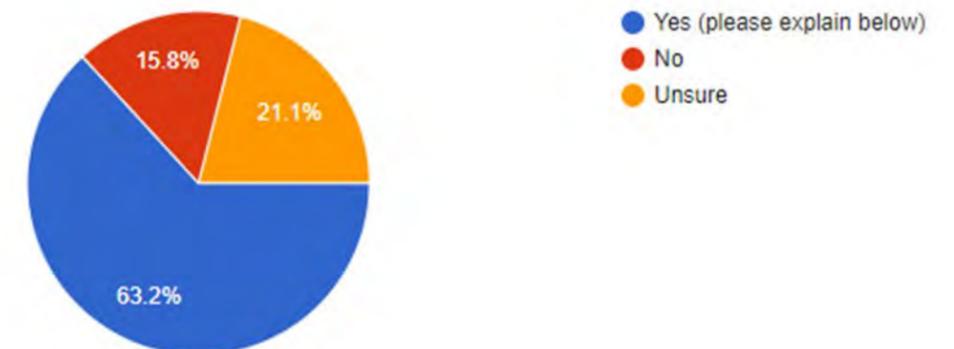
### Do you think there are specific sections of the corridor where it is best to keep bicycles separate from pedestrians?

- \* 21% of respondents selected "No"
- \* 37% of respondents selected "Unsure"
- \* 42% of respondents selected "Yes" and said the best area along Haggard Ave to separate bicycles and pedestrians is Downtown Elon and the main part of campus.

### Are there areas where you think a crosswalk is needed?

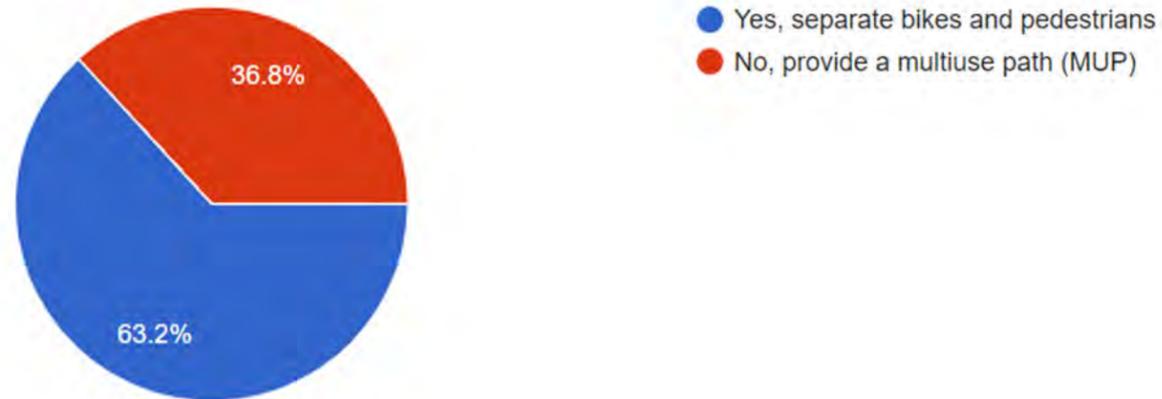
- \* 21% of respondents selected "No"
- \* 32% of respondents selected "Unsure"
- \* 47% of respondents selected "Yes". The majority said crosswalks are needed near popular restaurants (Mediterranean Deli, Fat Frogg, Simply Thai, etc.) and suggested signalized crosswalks are needed.

### Do you favor a new crosswalk at Fat Frogg?



When asked to rank their preferred Fat Frogg crosswalk location, public respondents said they mostly prefer either at Timberline Station Drive or at both St. John's Street and Church Street.

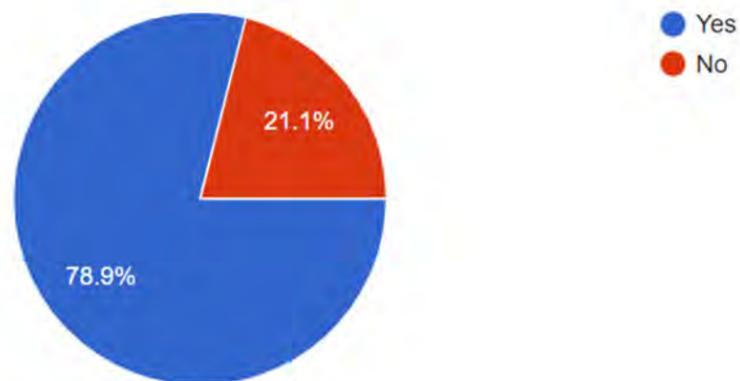
In the Young Commons / Campus Historic Area (between N. Williamson Ave. and N. Antioch Ave.), should bikes be separated from pedestrians? (i.e. MUP or sidewalk + bike lane)



Do you agree that on-street parking should be added near Park Place / former Mediterranean Deli?



Would you support the construction and use of a sidewalk on the south side of the low historic wall located on the south side of the road through the Young Commons / Campus Historic Area?



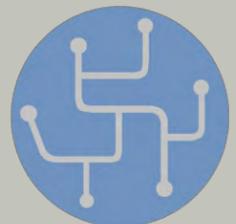
If on-street parking is needed at Park Place, on which block should they be located?



**Respondents were asked to rank the importance of each project goal. Below are the results of such ranking.**



1. Separating bicycles from cars



2. Provide complete pedestrian and bicycle networks throughout the corridor, allowing facility type and location along the road way to vary depending on existing property constraints



3. Separating bicycles from pedestrians



4. Have consistent bicycle facilities throughout the entire corridor to avoid confusion by novice riders.

A half-day design charette was held on January 28th, 2022 in - person at the Elon Community Church Life Center. The meeting was facilitated by the TranSystems Project Team and was attended by the Elon Haggard Avenue Corridor Study Team and modified Stakeholder Team. The purpose of the meeting was for TranSystems to present conceptual design concepts as well as feedback generated from both public meetings. In this meeting, the Project Team and Stakeholder Team found consensus in the following areas:

- Near Rego Industries, TranSystems recommends a multiuse path along the north side of Haggard Ave and a sidewalk along the south side. Neither on-street bike lanes nor medians will allow improvements to remain within existing Right-of-Way and ensure needed parking for Rego Industries.
- Crosswalks at both St. Johns St. and Church St. are preferred to just one crosswalk. It is also redundant to construct a third crosswalk at Timberline Station Dr.
- The Town of Elon should consider street lighting or flashing beacons at crossing locations in order to enhance pedestrian safety and visibility.
- On-street bike lanes are not recommended adjacent to on-street parking along the north side of Haggard Ave, near Park Place / former Mediterranean Deli .
- In Elon Historic Area, pedestrian spaces should be given priority over bike facilities.
- A median is not seen as beneficial in the Phase III conflict area at Beer Republic.
- Medians have the potential to affect access to individual residences and emergency vehicles. If included, medians should be mountable for fire trucks.
- If a median is to be incorporated in design as a traffic-calming measure near Fat Frogg, it is preferred to have cut out for car access to side streets and to have pedestrian refuges to enhance safety.
- A parking study is recommended to establish the availability and demand of parking spaces near Park Place (former Med Deli). The current available area in front of the former Mediterranean Deli would only allow for 5 or 6 on-street parking spaces.
- Near Beer Republic, a crosswalk is need due to pedestrian traffic from Phoenix Arms Apartments. Additionally, consistent pedestrian facilities are needed; therefore, a sidewalk is the preferred facility with a multiuse path as a secondary option.
- To retain access to Community Life Center (used by public for community meeting space).

The following milestones have been completed on the project to date:

- **May 2021 - Phase 1 Study Adopted**

- **July and September 2021 - Phase 2/3 Stakeholder Committee Meetings**

- **Nov 2021 - Phase 2/3 Public Meeting #1**

- **January 2022 – Phase 2/3 Stakeholder Design Charette**

- **May 2023 – Stakeholder Committee Review of Ph 1-3 Draft Plan**

#### **WHAT'S NEXT:**

- **July 2023 - Public Release of Final Ph 1-3 Draft**



- **August 2023 - Public Meeting**



- **August 2023 - Public Comments Due**



- **September 2023 - Joint Planning Board and Town Council Meeting & Final Ph 1-3 Plan Adoption**



# 02 Complete Streets Basics

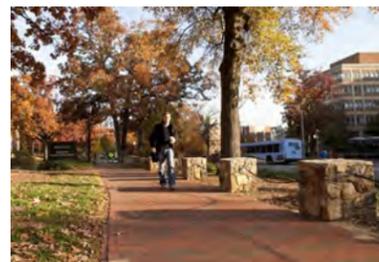
## 2.1. Components of a Streetscape

*Understanding and providing the physical space for the various components that make-up a streetscape is essential in creating a flourishing street. These components are often divided into two categories; 1) the pedestrian realm, and 2) the multi-modal vehicular realm.*

### 2.1.1. Pedestrian Realm

The pedestrian realm is the space between the vehicular roadway and adjacent building frontage. Depending on the land use, this space should be designed to accommodate a range of activity including, walking, sitting, socializing, dining and commerce. The physical components of the pedestrian realm include:

- Sidewalks;
- Multi-use paths;
- Building frontage;
- Street trees;
- Bulb-outs;
- Furnishings;
- Signage, wayfinding and public art;
- Pedestrian Lighting; and
- Landscaping.



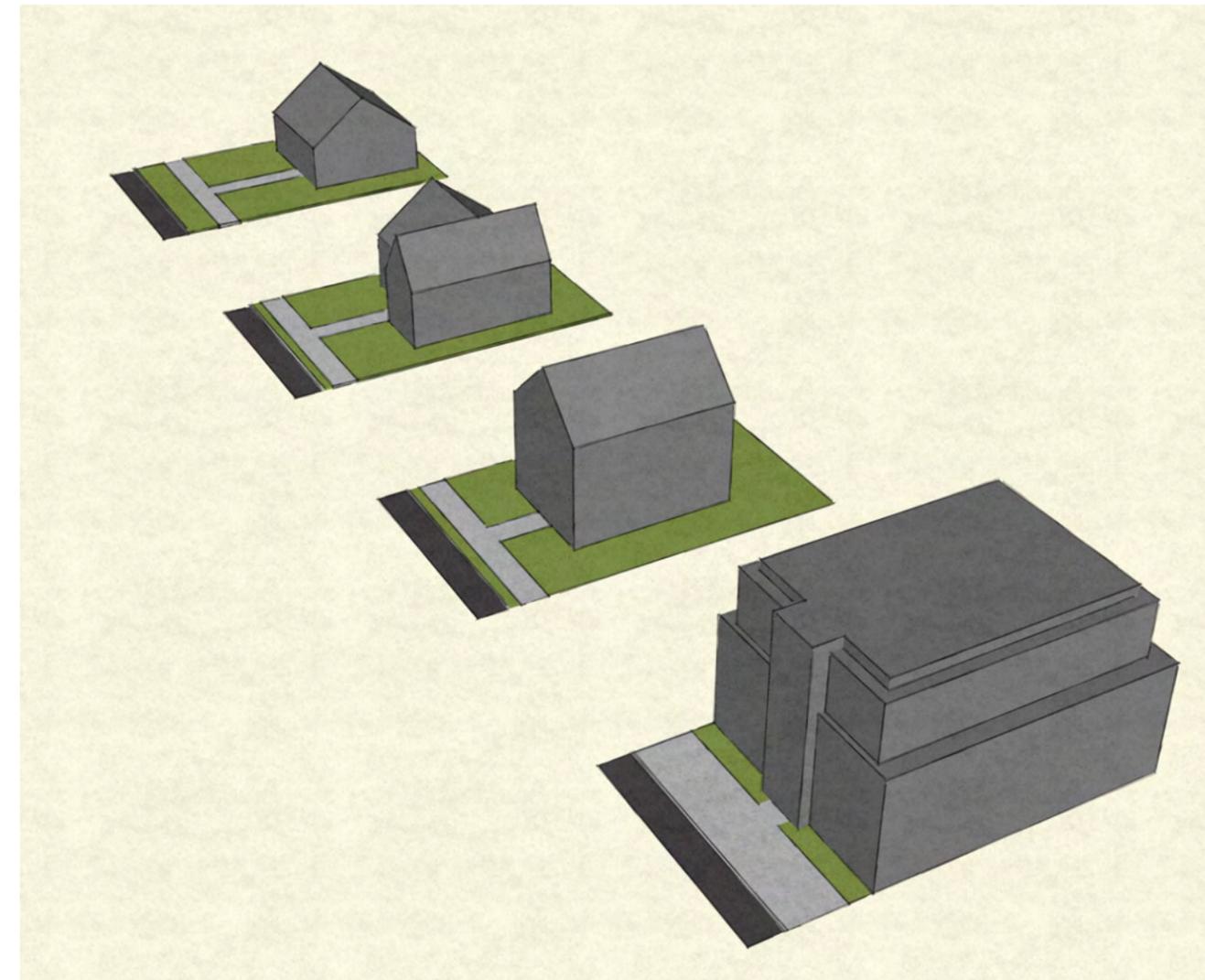
## The Pedestrian Realm can further be divided into Development, Green and Sidewalk/Multi-Use Path Zones, components of which are discussed below.

### Development Zone

According to the 2012 NCDOT Complete Streets Planning and Design Guidelines\*, "the Development Zone is the area outside the street right of way (ROW) where public or private property is located or may be planned in the future. The relationship of the buildings in the development zone to the street is an important component of the character of the street, as well as how it functions for the street users. In a downtown area, it is likely that this zone includes buildings fronting or very near the back of the sidewalk. In suburban or rural areas, the development zone is more likely to include a deeper setback between the street and the developed portion of the street front (the buildings). Depending on context, this area could be a parking lot, a front lawn to a residence, or undeveloped land. In some cases, ROW for a utility strip is required behind a sidewalk which effectively shifts the development zone farther from the street."

"Since the Development Zone is outside the street ROW, the types of street elements in this area can vary widely. Elements specific to the transportation network may include:

- Bicycle or pedestrian paths;
- Transit stops or facilities;
- Public parking lots; or
- Driveway connections between private parcels."



Example of Building Sites with Different Development Zones

#### \* This study references several different NCDOT Roadway Design documents for the following reasons —

The 2019 Complete Streets Policy (<https://www.completestreetsnc.org>) states that it supersedes the 2012 Complete Streets Planning and Design Guidelines ([http://www.completestreetsnc.org/wp-content/themes/CompleteStreets\\_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf](http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf)), which are being currently revised. As such, it refers to the Current Roadway Design Manual (<https://connect.ncdot.gov/projects/Roadway/Pages/Roadway-Design-Manual.aspx>) for design guidance. However, except for a few basic elements, the Current Roadway Design Manual provides limited guidance for complete street elements. In those instances, this study refers to the 2012 Complete Streets Design Manual for guidance.

## Green Zone

It is widely accepted roadway design practice that there should be a green zone or buffer between moving traffic and pedestrians, as noted below (see bottom of page for references):

According to the 2012 NCDOT Complete Streets Manual, "the green zone is generally a landscaped area between the street pavement (or curb) and the sidewalk. In general, the street designs provide a minimum of 6 to 8 feet in this area to allow space for street trees. Street trees buffer pedestrians and other street users from vehicular traffic, as well as providing for shade and an attractive public realm. Within a high-density urban area, the green zone may be hardscaped with trees in planters. In addition to street trees, green zone elements may include features such as other landscaping, signs, benches, fire hydrants, street and pedestrian light poles, and utility poles. Transit amenities such as bus shelters can be considered, but would typically be accommodated behind the green zone."

FHWA states that, "the preferred minimum width for a nature strip is 5 to 7 feet. A nature strip this wide provides ample storage room for many utilities. The width provides an essential buffer between an out-of-control motorist and a pedestrian, improved sight distances at driveways, and adequate width for landscaping and street trees." (1)

According to PEDSAFE (Pedestrian Safety Guide and Countermeasure Selection System) which evaluates FHWA and AASHTO (American Association of State Highway and Transportation Officials) guidance among others, "the ideal width of a planting strip is 6 ft. Minimum allowable landscape buffer widths are 2-4 feet for local or collector streets and 4-6 feet for arterial/major streets." (2)

According to the Sustainable City Code, "The size of a buffer zone can and should vary according to the sidewalk location. For instance, in downtown or commercial districts street furniture, low vegetation, trees, or a bike lane may be an appropriate buffer, while in more suburban areas, a landscape strip or increased vegetation may be preferable. When drafting an ordinance to address sidewalk width and buffer zones, local governments should consider the following factors: street type, adjacent land use, adjacent building height, and roadway characteristics. Areas with higher pedestrian traffic, such as large shopping centers, schools, or tourist attractions, may require wider minimum requirements, such as fifteen feet, which may help encourage pedestrian mobility. In more rural or suburban areas, narrower sidewalk requirements may suffice, such as six feet." (3)

NOTED References:

(1) FHWA COURSE ON BICYCLE AND PEDESTRIAN TRANSPORTATION WALKWAYS, SIDEWALKS, AND PUBLIC SPACES LESSON 13

(2) [http://www.pedbikesafe.org/pedsafe/resources\\_guidelines\\_sidwalkswalkways.cfm](http://www.pedbikesafe.org/pedsafe/resources_guidelines_sidwalkswalkways.cfm)

(3) <https://sustainablecitycode.org/brief/minimum-width-and-buffer-requirements-for-sidewalks-3/>



Examples of Green Zones



## Sidewalk / Multi-Use Path Zone

Sidewalks play an important role in the life of a town. "As conduits for pedestrian movement and access, they enhance connectivity and promote walking" (NACTO Urban Street Design Guide). The term **Active Transportation** refers forms of travel that require the user to exercise, usually bicycle and pedestrian movement. In the United States where one of four adults do not engage in regular exercise, implementing safe bicycle and pedestrian facilities can improve the public health of the community. As public spaces, sidewalks serve as the "front steps" to the town, cultivating social and economic interactions.

According to the 2012 NCDOT Complete Streets Manual, "this area is reserved primarily for a paved sidewalk to carry pedestrians and provide access to transit and to adjacent land uses. In urban and suburban areas, the expectation is to provide sidewalks on both sides of the street unless there are site-specific constraints that make this impossible. When planning for, or accommodating, transit, safe and accessible pedestrian connections are needed between adjacent land uses and transit stops."

"Detached sidewalks (located behind the green zone) are preferred because they separate (or buffer) pedestrians from moving traffic and allow for a planting area between the sidewalk and travel lanes. Sidewalk widths vary based on the street type and context. Recommended sidewalk widths range from 6 to 12 feet. Narrower sidewalks (5 feet) may be sufficient for local/subdivision streets in areas with low to medium land use densities. Wider sidewalks (up to 12 feet) are preferred in urban or main street settings with higher levels of pedestrian activity."

"In urban areas or other areas with intensive development, it may be necessary to provide wider sidewalks extending to the face of existing buildings. Generally, the sidewalk zone should allow for unobstructed sidewalk width. Street and transit furniture (such as benches, trash cans, and newspaper racks), should be placed within the green zone or development zone, rather than the sidewalk zone, if there is sufficient width and offset from the curb."

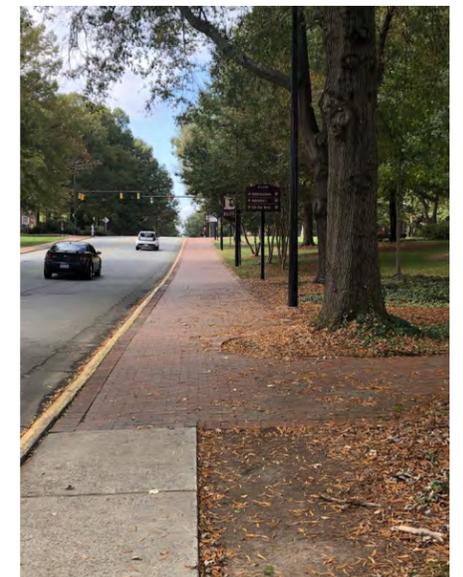
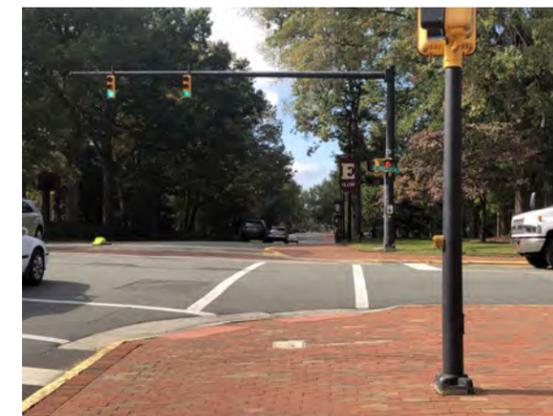
"On parkways or rural roads, instead of a sidewalk, the pedestrian space may consist of a multi-use path zone set back from the roadway. Multi-use paths are separate facilities that serve pedestrians and bicyclists. The multi-use path should be wide

4) Kirschbaum, Julie B, PW Axelson, PE Longmuir, KM Mispagel, JA Stein, & DA Yamada. "Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide." Bicycle & Pedestrian Section, Federal Highway Administration, Washington, DC: 2001.

enough to serve bicyclists and pedestrians safely. The preferred cross-section is 10 to 12 feet with two-foot gravel shoulders on each side. A green zone and natural zone help provide a buffer from the main travel way."

### Narrow Sidewalks

According to the FHWA document *Designing Sidewalks and Trails for Access: Best Practices Guide* (4) which specifies the requirements of ADA-complaint roadway design, narrow sidewalk corridors (like in portions of the project corridor) are "unsatisfactory because they limit the number of pedestrians that can use the area, require pedestrians to travel single file, and force pedestrians to travel uncomfortably close to buildings and/or automobile traffic. Access is easily compromised on narrow sidewalk corridors by objects, such as utility poles, that create even narrower spaces. Sometimes, narrow sidewalks do not provide enough clear space for people who use walking aids or wheelchairs to travel down the length of the sidewalk. In addition, narrow sidewalk corridors often have driveway crossings with steep cross slopes and curb ramps with insufficient landings and/or steep ramp grades."



## 2.1.2. Motor Vehicle / Shared Vehicle (or Multimodal Vehicle) Realm

The physical components of the motor / shared / multi-modal vehicle realm includes:

- Travel lanes and medians;
- Turn lanes and tapers;
- Channelized or striped pavement areas;
- Gutter pans;
- On-street / striped bicycle lanes;
- Crosswalks
- Shared travel lanes / Sharrows (where vehicles and bicycles share the lane)
- Transit pull offs and stops;
- On-street parking;
- Street lighting; and
- Intersections.

According to the 2012 NCDOT Complete Streets Manual, "the multi-modal vehicular realm is generally considered the paved travel way of a street. Travel lanes are important for vehicular movement and capacity along a corridor. Travel lane considerations include the number and width of lanes, the street direction (one-way or two-way), and the width and incorporation of turn lanes. It is also important to consider these elements from the standpoint of their impact on other users. Street width, for example, can affect the ability of pedestrians to cross the street or the potential provision of bike lanes."

"The majority of street cross-sections in these guidelines show a range of lane widths from 10 to 12 feet. The recommendation for 10- to 11-foot lanes reflects that, for most urban and suburban street types, lanes less than 12 feet wide are both safe and appropriate, can help to reduce the overall footprint of the street, and/or allow space for other users of the street. Additional considerations include the need for turn lanes at intersections. Sufficient width and need for turn lanes should be evaluated within the context of the larger corridor."

"A shared vehicle zone allows for both motorized and non-motorized vehicles, and typically includes additional pavement for bicycles. The preferred treatment for bicycles on higher volume and speed streets is a separate bicycle lane. If a shared vehicle zone is used instead, it might consist of additional space for a shared lane, additional space with shared lane markings, or on very low-volume, low-speed streets, a regular travel lane. The gutter pan is not considered part of the bicycle facility."

"Parking may or may not be provided along a street. The relationship between parking lane width and vehicular lane width should be evaluated (in corridors with parking, vehicular lanes may need to be wider, depending on the street type and context). If a parking zone is adjacent to the traveled way, additional offset may be provided. Transit vehicles will often utilize the motor vehicle zone for bus stops if bus pull-offs are not provided or appropriate."

Medians may or may not be provided along a street. "The median zone typically provides a landscaped buffer between traffic moving in opposing directions. Medians can also help to provide for pedestrian refuge opportunities in



some contexts. Parkways and boulevards typically have a median, avenues may have a median, and main streets may have a median, though it is atypical. Rather than continuous medians, avenues may typically include intermittent landscaped islands to allow for more access, breaks in center turn lanes, and provide pedestrian refuge opportunities. Most two-lane streets do not have a median."

"The primary considerations with medians include width and treatment. Median widths vary from 8 feet to 46 feet depending on street type and context. In most urban and suburban locations, curbs will be used to delineate the median from the traveled way. Median breaks should be identified early in the design and should be located to allow for access and to maintain network connectivity. The median zone typically includes street trees and shrubbery. Hardscaping may be provided at narrow points and at specified crossing points to facilitate pedestrian use. At crossing points, landscaping and limbs should be maintained to allow visibility for the pedestrian and motorist."

Haggard Avenue is classified by NCDOT as a minor arterial. A future traffic capacity analysis should be conducted to confirm necessary breaks in the median to provide access to driveways and side streets. To enhance mobility and maintain the suburban highway character of the western and eastern gateways to Haggard Avenue, medians are recommended only near Downtown and Elon University Campus core area. See section 3.4.4. for more details.

## 2.2. Multimodal Safety Enhancements

Safety is typically a primary concern when users consider alternative modes of travel, but it can often be hard to qualify. As designers, selecting the best type of facility for each unique situation can provide a sense of comfort and convenience to the community. Vision Zero is a strategy to eliminate traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. The approach recognizes that people will sometimes make mistakes, so we have a responsibility to design and operate a transportation system that makes inevitable mistakes less severe. The Haggard Avenue corridor study recommends implementing physical barriers between vehicles and bicycle/pedestrian facilities so that if and when accidents happen, fatalities and severe injuries can be prevented.

Safety features in this section are discussed in two separate categories, treatments along the corridor that can mitigate side-swipe type crashes and treatments at intersections that can mitigate head-on or T-shaped crashes.



Planted Median and Buffered Bike Lane, Virginia DOT.

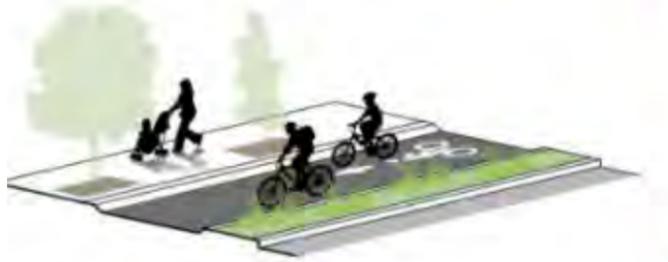


Multituse paths are family friendly and an example of designing for all ages and abilities. [www.pedbikeimages.org](http://www.pedbikeimages.org) / Toole Design Group



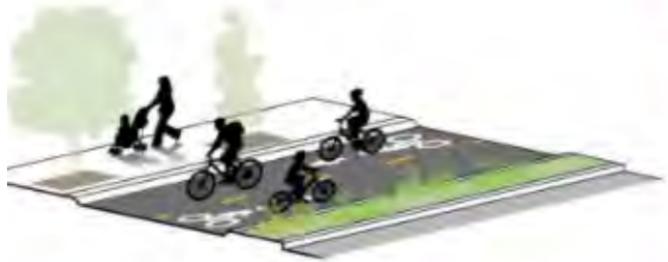
### MULTIUSE PATH / BI-DIRECTIONAL PATH

Non-motorized pathway in an independent right of way or parallel to a roadway. A multiuse path is proposed as a primary feature along Haggard Avenue to serve both pedestrians and bicyclists.



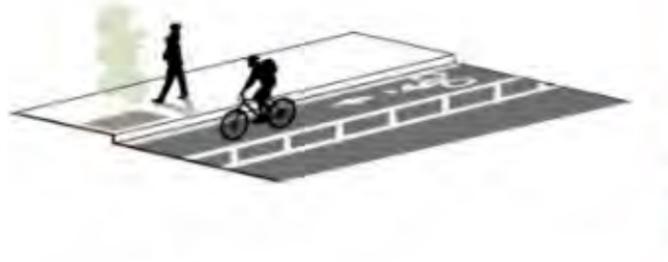
### ONE-WAY SEPARATED BIKE LANE

Physically separated bike lanes. Also known as a protected bike lane. This feature was not recommended due to right of way restrictions.



### CYCLE TRACK / TWO-WAY SEPARATE BIKE LANE

Physically separated bike lanes designed for bi-directional use. This option was discussed with stakeholders in the historic campus section but there were concerns of user confusion.



### BUFFERED BIKE LANE

On-street bike lanes paired with a designated buffer space. Recommended in the historic campus section.



### ON-STREET BIKE LANE

Designate an exclusive space for bicyclists through the use of pavement markings and signage. Perceived as unsafe by some stakeholders and public. Not appropriate under certain traffic speed conditions. Possibility of bicycle-vehicle conflict.



### SHARED ROADWAY

Shared roadways (which may be designated bike routes) are roadways without dedicated bicycle facilities. Shared Lane Markings (SLM) may be included. This option was perceived as unsafe by the public and stakeholders and not recommended.

### Corridor Best Practices

Many different facility types have been used worldwide to improve safety and visibility for bicyclists. The most widely known bicycle facility is perhaps one of the least expensive, the **on-street bicycle lane** (6). An on-street bicycle lane is designated by a painted stripe on the road, usually four or five feet wide.

A **buffered bicycle lane** is similar to an on-street bicycle lane but includes a buffer space, usually about a foot or two of diagonally striped space to offset the bicycle traffic from the vehicle traffic (7).

Bicycle routes on a **shared roadway** share the vehicle lane with vehicles but are designated by signage or **sharrows** instead of a painted stripe.

A **multiuse path** is one example of a separated bike lane and is usually bi-directional.

**Green pavement markings** increase the visibility of bicycle facilities. They can be used along the entire length of the bike lane or as spot treatment to highlight potential conflict areas.

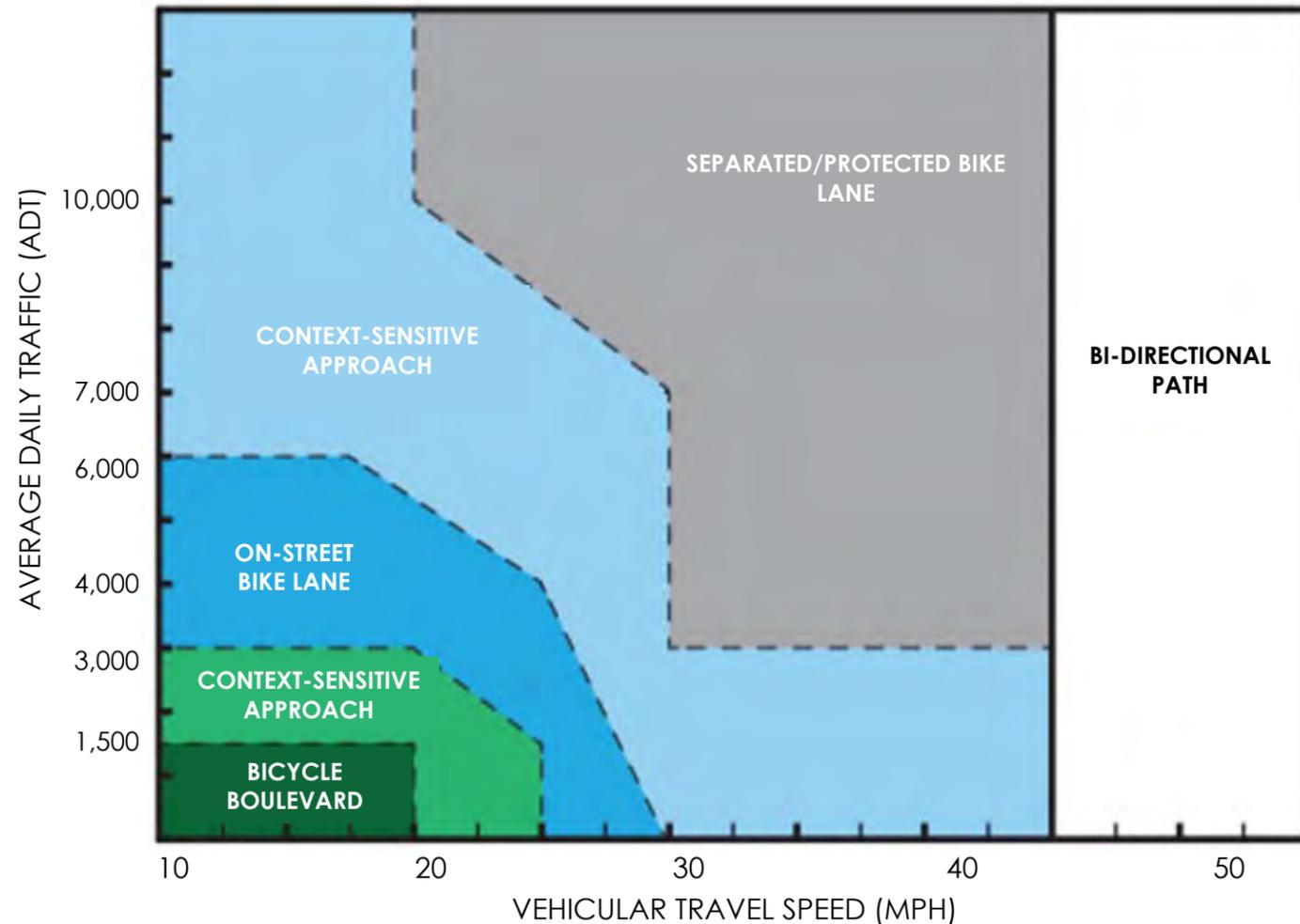
6) Gilpin, J., Falbo, N., Repsch, M., Zimmerman, A., 2015. Lessons Learned: Evolution of the Protected Intersection. Published by Alta Planning + Design. [https://altaplanning.com/wp-content/uploads/Evolution-of-the-Protected-Intersection\\_ALTA-2015.pdf](https://altaplanning.com/wp-content/uploads/Evolution-of-the-Protected-Intersection_ALTA-2015.pdf), Accessed April 8, 2019.

7) City of Charlotte Department of Transportation (CDOT). Charlotte Bikes: Bicycle Plan. Adopted by Charlotte City Council, North Carolina, 2017. <http://charlottenc.gov/Transportation/Programs/Documents/Charlotte%20BIKES%20Final.pdf>, Accessed April 8, 2019.

8) National Association of City Transportation Officials (NACTO). Urban Bikeway Design Guide (Second edition.). Washington, DC: Island Press/Center for Resource Economics, 2014.



The posted speed limit on the NCDOT controlled portions of the Haggard Avenue corridor is 35 mph, with AADT warranting a separated bike lane according to the above NACTO design guide. In the Campus section where the posted speed limit is lower, a bike lane facility is appropriate, and a protected bike lane is the best practice to accommodate riders of all ages and abilities.



- These speeds are generally inappropriate in an urban setting, and a path may be viable facility type.
- A separated bike lane facility is appropriate in this speed and volume range.
- A bike lane may function, but additional separation is preferred. Consider providing additional width in the form of a painted buffer or physical separation.
- A bike facility is appropriate in this speed and volume range.
- A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.
- A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.

Descriptions of bicycle facilities are location on the previous page.

NACTO, Urban Bikeway Design Guide.

## Intersection and Crossing Treatments

On-street bicycle lanes, buffered bicycle lanes, and bicycle routes provide varying degrees of protection and safety enhancements along a corridor. However, as soon as the bicyclist enters an intersection, he or she is exposed to the most severe types of crashes and yet left virtually unprotected. An example intersection-specific design improvement for bicyclists is “**bicycle boxes**.” They are a designated region at an intersection allowing bicyclists to get ahead of queuing vehicular traffic. The bicycle boxes are often brightly painted to increase bicyclist visibility (8).

Existing raised crosswalks in the Campus Scale character area are a great example of a traffic calming feature that also enhances driver experience. By combining ramped speed tables with marked pedestrian crossings, pedestrians are made more visible to drivers and drivers are forced to slow down.



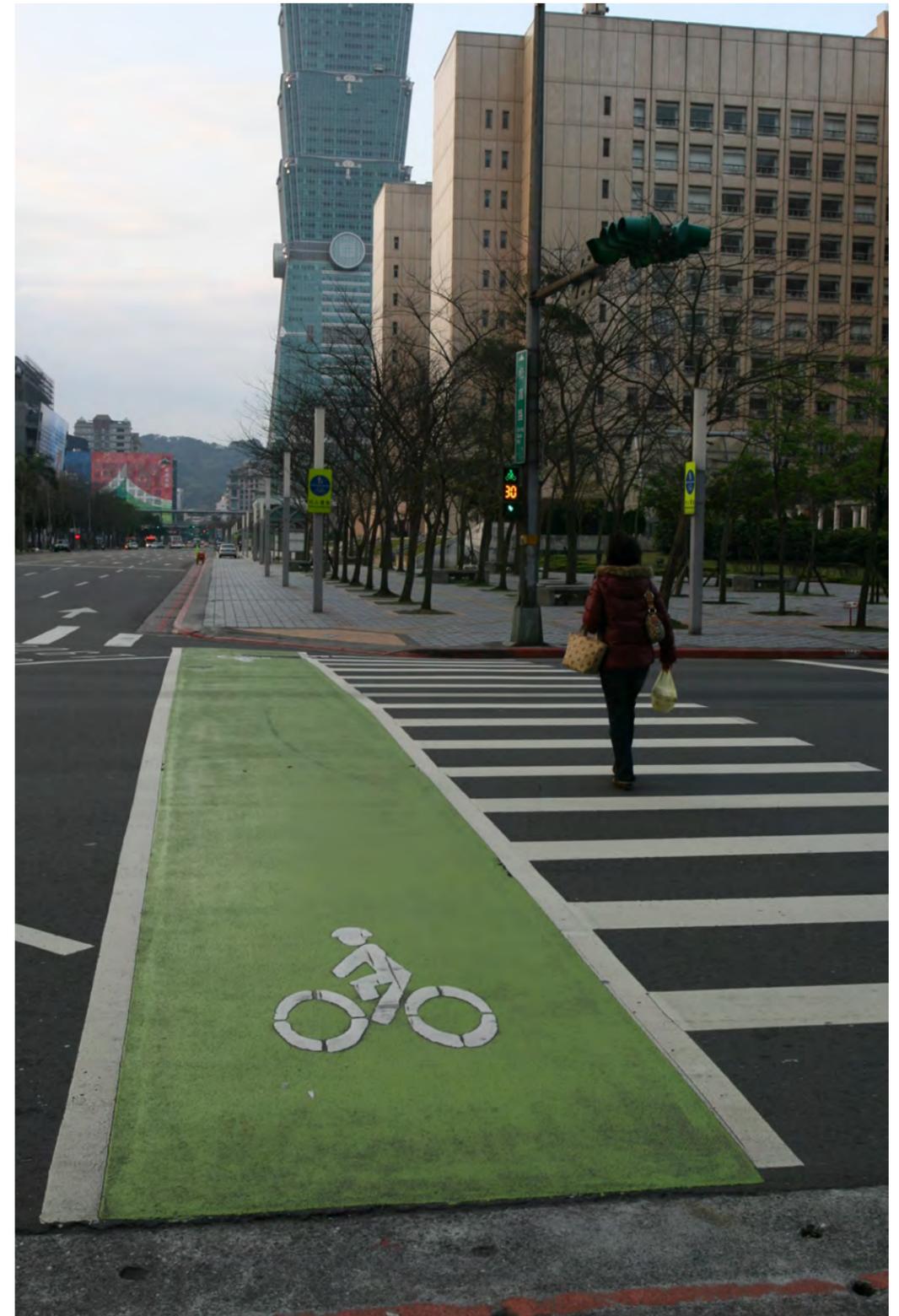
Green pavement markings, bike boxes, and two-stage left turns, Virginia DOT.

**Rectangular Rapid Flashing Beacons (RRFB)** are recommended at 4 midblock crossings along the corridor, particularly in the Suburban Highway character area of the corridor where the speed limit is 35 mph. Studies have shown that the RRFBs can improve driver yield rates up to 96% and reduce crashes by 47%. In areas with low visibility, particularly along curves, a flashing beacon can raise awareness of pedestrians. Unlike raised crosswalks, RRFBs will only slow drivers when a pedestrian initiates the signal, providing greater mobility along the NCDOT regulated segments of the corridor.



**Solar Powered RRFB.**

[www.pedbikeimages.org](http://www.pedbikeimages.org) / Michael Frederick



**Green Pavement Markings and Crosswalk**

[www.pedbikeimages.org](http://www.pedbikeimages.org) / Shawn Turner

## 2.3. What Makes a Great Street?

The character of a street is defined by both land use and street design. And streets can achieve a variety of community goals when thought of as more than a way to get from point “a” to point “b.” Urban designer Allan Jacobs describes “great streets” as those that “make community” and a “great street should be a most desirable place to be, to spend time, to live, to play, to work, at the same time that it markedly contributes to what a city should be.”<sup>1</sup>

Great streets are therefore not simply about the street itself, but the space from building face to building face, including surrounding parks and open spaces, that enclose a public realm and houses a diverse range of uses and needs.

Great streets do not happen by accident. They require a thoughtful and negotiated balance of sometimes competing uses and functional desires.

According to the American Planning Association (APA)<sup>2</sup>, elements that make a great street include “maintenance, sustainability, and safety.

A key element of a great street is connectivity: whether it is linked to a larger street network.

Great streets are those that take advantage of natural features and bow to fine architecture. They encourage social activities and take all types of users into account, not just drivers. Most important, great streets have some memorable feature — tall trees, pleasant houses, a row of small shops, a popular cafe.”

1 - Jacobs, Allan B., 1993. "Great Streets," University of California Transportation Center, Working Papers , University of California Transportation Center

2 - <https://www.planning.org/planning/2008/jan/greatstreets.htm>

### The APA\* further lists the following characteristics of great streets:

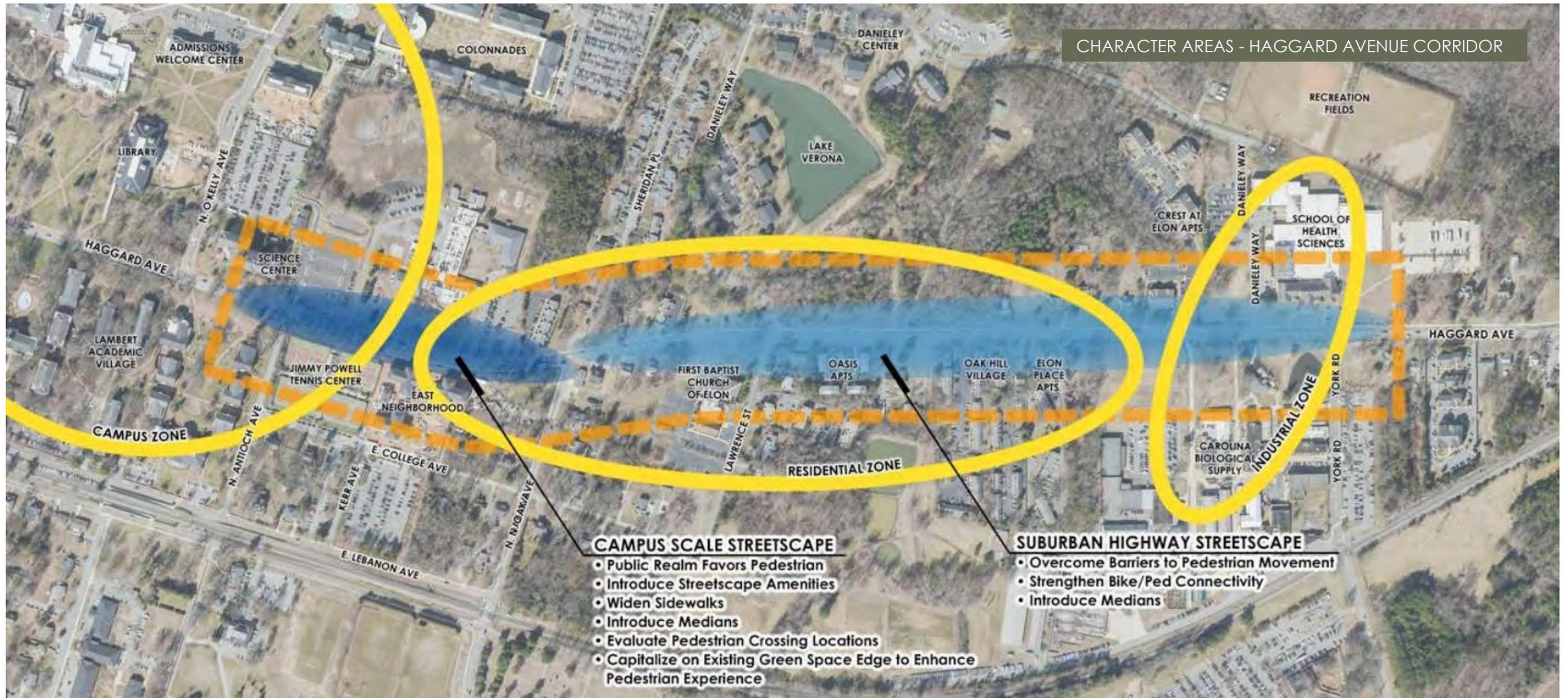
- Provides orientation to its users, and connects well to the larger pattern of ways.
- Balances the competing needs of the street — driving, transit, walking, cycling, servicing, parking, drop-offs, etc.
- Fits the topography and capitalizes on natural features.
- Is lined with a variety of interesting activities and uses that create a varied streetscape.
- Has urban design or architectural features that are exemplary in design.
- Relates well to its bordering uses — allows for continuous activity, doesn't displace pedestrians to provide access to bordering uses.
- Encourages human contact and social activities.
- Employs hardscape and/or landscape to great effect.
- Promotes safety of pedestrians and vehicles and promotes use over the 24-hour day.
- Promotes sustainability through minimizing runoff, reusing water, ensuring groundwater quality, minimizing heat islands, and responding to climatic demands.
- Is well maintained, and capable of being maintained without excessive costs.
- Has a memorable character.

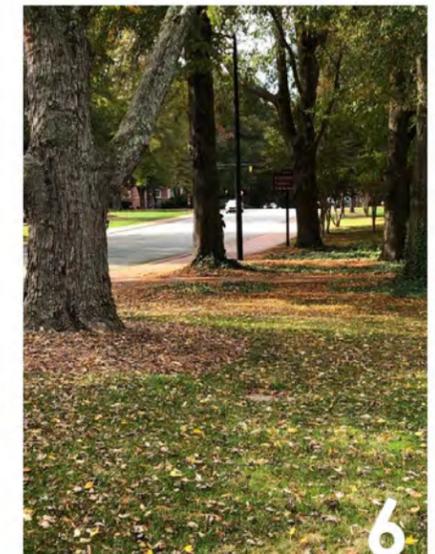
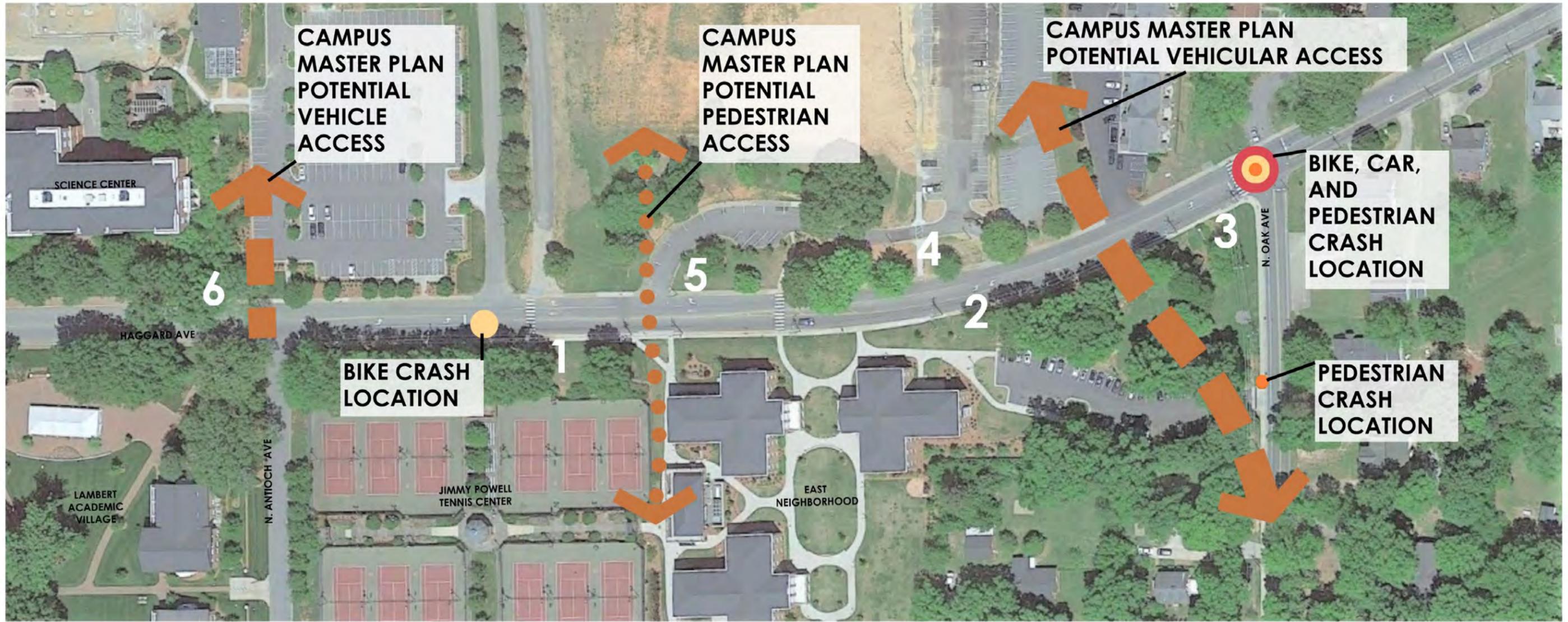
# 03 Proposed Schematic Design

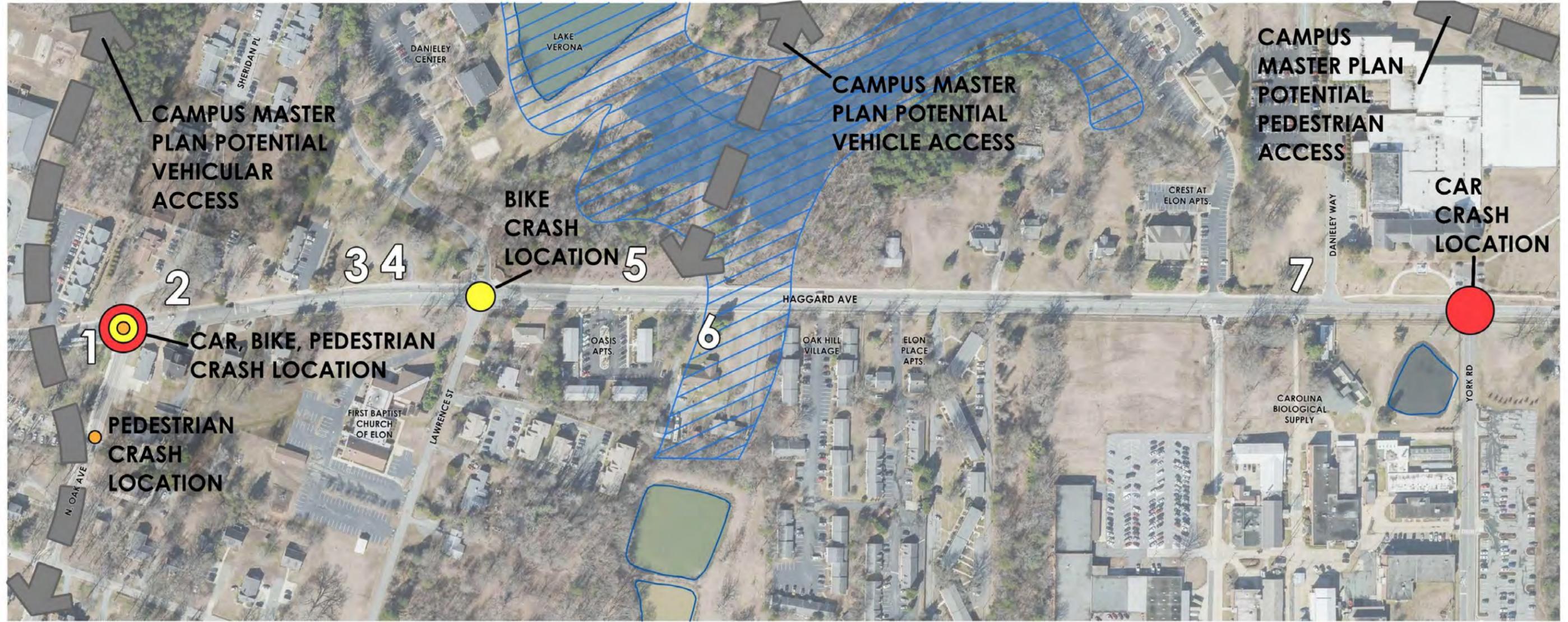
## 3.1. Character Areas

General character areas for the Phase 1 corridor were presented to the Stakeholders at the Phase 1 Design Charette to provide guidance for different applications of streetscape elements [See Character Areas Diagram below]. The existing, varying character along the corridor relates to the surrounding land uses and roadway design and provides a framework for the scale and location of streetscape elements (as shown

on the Existing Mobility Conditions Maps on the next pages). In Phase 1, the ±0.75-mile corridor from N. Antioch Avenue to York Road, we have identified two general character areas designated as Campus Scale and Suburban Highway. These descriptions refer to the character and scale of the streetscape and can accommodate a variety of design elements, respond to future development, and provide flexibility in the strategies to improve the multi-modal environment.







Within the character areas, there are existing zones that further define the corridor, based on patterns of movement and current and proposed land use. These include a Campus Zone, Residential Zone, and Industrial Zone [See Character Areas Diagram].

A transition between each of these zones would better define the pedestrian, bicycle, and vehicular paths of travel by considering the volume of each mode of travel within and between each zone.

Generally, the Campus Zone is heavily pedestrian-focused, the Residential Zone balances all modes of travel, and the Industrial Zone remains more vehicle-focused. In the Campus Scale streetscape, which generally extends along the corridor from N. Antioch Avenue to N. Oak Avenue, the public realm favors the pedestrian. The primary land uses along this segment are University-owned, and are a combination of student housing, recreational facilities (tennis courts), and academic buildings. The University's Campus Master Plan shows additional development of housing, and support services in this area. The existing condition generates a high volume of pedestrians moving along and crossing the road, and with the future planned development at the former Elon Elementary school site, that volume is anticipated to increase. The existing sidewalks are narrow and placed directly at the back of curb; the combination of which creates a generally inhospitable environment for pedestrians. Currently, there are no designated on-street bike lanes, and the volume of bicyclists is low. This could be attributed to the fact that safe access for bicyclists is not available. There are opportunities to widen sidewalks, introduce medians and plant material, and enhance the users' experience in all modes of travel within the ±60-foot-wide existing right-of-way.

An evaluation of the current pedestrian crosswalk locations compared to future development plans can be beneficial in consolidating crossings and improving safety and connectivity.

The Suburban Highway streetscape, which generally overlays the corridor from N. Oak Avenue to York Road, is vehicle-focused, with a wider roadway pavement section, higher vehicular speeds, and narrow sidewalks located at the back of curb, where present. The variety of land uses along this segment heavily influence the character and pedestrian environment, including single- and multi-family residential, religious institutions, vacant land, University-owned support services, and industrial uses. The pedestrian environment in this segment continues to be inhospitable, not ADA compliant, with a narrow sidewalk that has numerous obstructions within the path of travel, including utility poles, fire hydrants, and trash receptacles. There are opportunities to strengthen pedestrian and bicycle connectivity, to enhance the users' experience, and reduce the speed of vehicular traffic within the varying ±65-75-foot-wide existing right-of-way.

To reinforce the character of the zones and establish the framework for more detailed design, a schematic (or conceptual) design was developed by the SEPI Team. The intent of this phase of design is to create a general description of the proposed spatial arrangement and functions of corridor elements, and overall aesthetics. The Schematic Designs presented herein include general recommendations that address vehicle-pedestrian conflicts, calm vehicular traffic, and enhance the user experience in the corridor.



### 3.2. Visual Preference Survey

During the Phase 1 Charette, a series of images containing various streetscape elements were used to engage with the stakeholders and begin to understand the various design elements that could be incorporated into Phase 1 of the corridor plan. The images presented can be grouped into the following general categories: Crosswalks, Wide Sidewalks / Multiuse Path, Separation of Pedestrian, Bike Lanes, Green Stormwater Infrastructure, and Median Plantings. The imagery was presented on display boards and participants identified images as 'favored' or 'not favored' by using green or red stickers, respectively.

The presence of crosswalks in the imagery was favored, and overwhelmingly so when the image included elements of pedestrian refuge, speed tables, and differentiation in pavement color to distinguish the pedestrian crossing area. Additionally, the use of bollards to identify the threshold between the vehicular travel lane and the pedestrian crosswalk was a generally favored element.

Responses overwhelmingly favored a widened linear path to accommodate more people. There was a clear preference for a widened sidewalk for pedestrians or a multi-use path for pedestrians and bicycles in the Campus Scale Area. However, a multiuse path was also favored for the Suburban Highway Area between N. Oak Avenue and York Road.

Feedback about the images showing the pedestrian separated from other modes of travel was generally positive, particularly in instances where a planting area created the separation.

Separate bike facilities are favored, however preference varied between on-street bike lanes and a multiuse path depending on the character area of the corridor. Generally, an on-street, designated bike lane was preferred in the Suburban Highway segment between York Road and N. Oak Avenue, whereas in the Campus Scale segment between N. Antioch Avenue and N. Oak Avenue, participants favored

the use of an on-street bike lane or a multiuse path separated from the vehicular lane equally. In either instance, participants strongly favored situations where there was a clear distinction for modes of travel.

Imagery showing Green Stormwater Infrastructure (GSI) was generally favored, particularly when located in medians. Some varying opinion cited concerns with maintenance which can significantly impact functionality and aesthetics.

Median plantings were generally favored, particularly when used to create pedestrian refuge at crossings, as a device for traffic calming, and, combined with various landscape plantings, to reinforce the transitions between character areas along the corridor. Material and specifications for medians still needs to be determined. Medians can be concrete, mountable, or vegetation. Median breaks will be determined by a further traffic study.



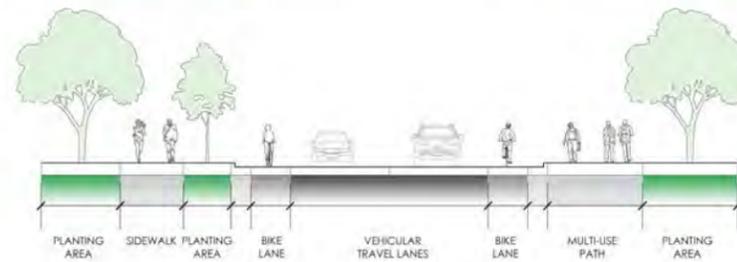
### 3.3. “Kit of Parts” | Schematic Applications

As a final component of the Charette, the Design Team further engaged the stakeholders with an exercise that translated the existing conditions analysis and input from the Visual Preference activity into schematic applications for this phase of the corridor. Building upon the idea that the character along the corridor varies, the design solutions for improving safety and multi-modal access would similarly vary along the corridor. Key design elements, or “parts” were considered in a variety of combinations to achieve the desired pedestrian environment. The design elements, or “parts”, shown in the various combinations included: sidewalk, multiuse path, median, planting area with trees, planting area with low shrubs, planting area with lawn, on-street bike lane, and vehicular travel lanes.

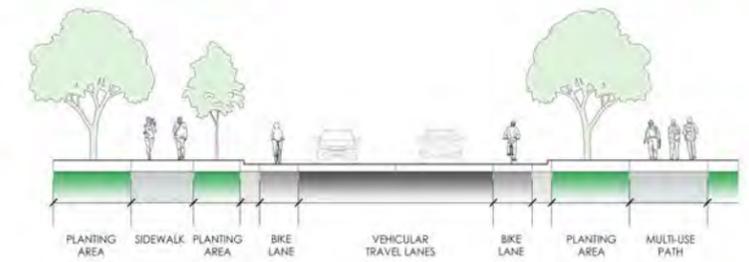
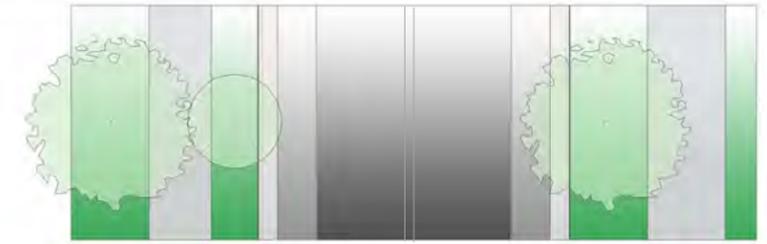
Conceptual roadway sections with different combinations of these design elements were used to illustrate the various ways the elements can be combined. [see Conceptual Sections A, B, C, D to the right]

In addition, the imagery from the Visual Preference activity informed preferred combinations of elements, including materials and placement of modes of travel. Specific imagery from the Visual Preference boards was identified by participants for application at certain locations. The participants discussed the schematic section drawings, but specific sections were not assigned to segments of the roadway. [See Visual Preference Boards on next page]

In general, the group supported the concept of reinforcing the character of the zones within the corridor by transitioning from a car-oriented to a pedestrian-oriented roadway between York Road to N. Antioch Avenue, respectively. From a design standpoint, this transition can be communicated with the use of plantings, the location of the sidewalk/multiuse path and bike lanes, and by introducing medians. Additionally, participants agreed that the intersections at York Road and N. Oak Avenue could be considered ‘gateways’ into town, and the campus area, respectively. The way to distinguish a gateway could incorporate signage, lighting, banners, landscape plantings, or a different roadway configuration. An opportunity for a potential traffic circle at the intersection of N. Oak Avenue was generally favored, with acknowledgement that needs further consideration and study by roadway and traffic engineers.

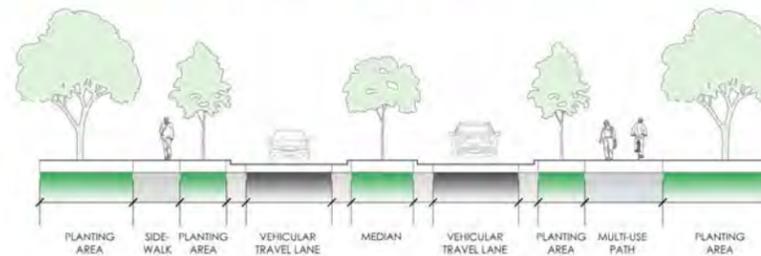
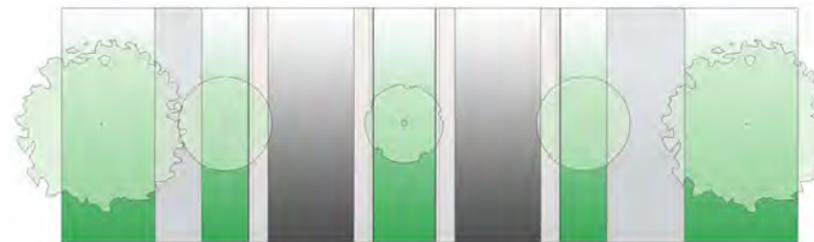


**SECTION A**  
2-Lanes | On-Street Bike Lanes | Multi-Use Path | Sidewalk

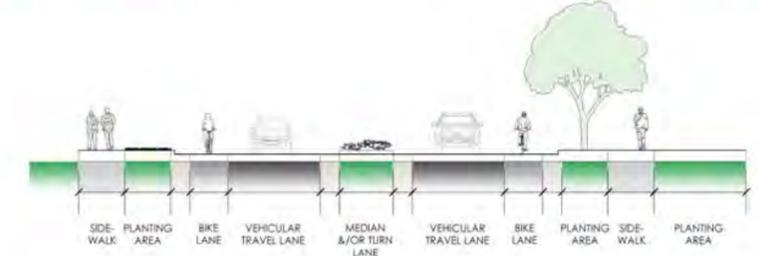
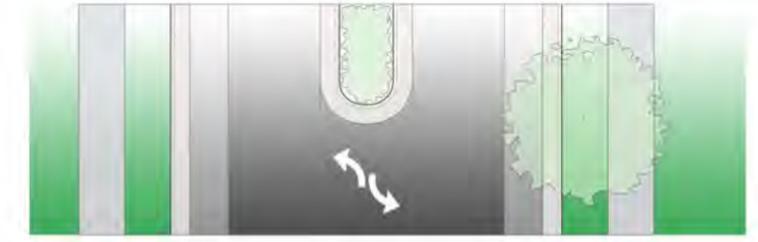


**SECTION B**  
2-Lanes | On-Street Bike Lanes | Multi-Use Path | Sidewalk

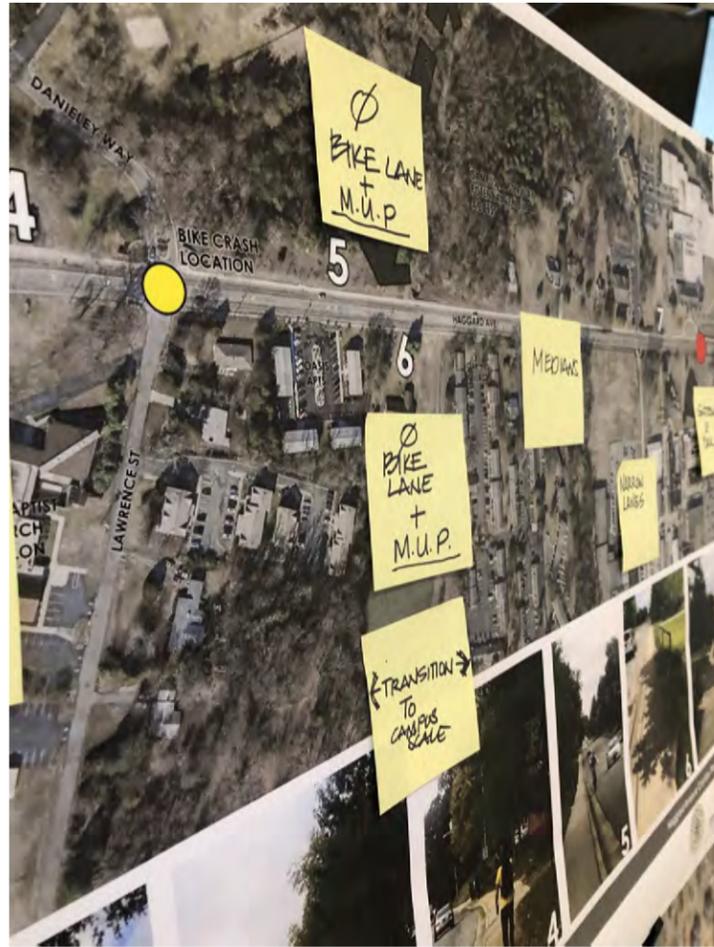
### Conceptual Roadway Sections



**SECTION C**  
2-Lanes | Planted Median | Multi-Use Path | Sidewalk



**SECTION D**  
2-Lanes | On-Street Bike Lanes | Planted Median | Turn Lanes | Multi-Use Path | Sidewalk



Further discussion revealed strong support for a clear delineation between vehicular and pedestrian movement, achieved with the use of medians with pedestrian refuge islands, bollards, and planting areas between the curb and sidewalk. Participants expressed considerable concern about the speed of vehicular traffic along the roadway and for the safety of all users. The use of traffic calming techniques was overwhelmingly favored, particularly the use of raised crosswalks and curb bump-outs in Campus Scale area, and medians to replace the center turn lane in the Suburban Highway area.

### 3.4. Schematic Design

To reinforce the character of the zones and establish the framework for more detailed design, a schematic (or conceptual) design was developed by the SEPI Team. The intent of this phase of design is to create a general description of the proposed spatial arrangement and functions of corridor elements, and overall aesthetics. The Schematic Designs presented herein include general recommendations that address vehicle-pedestrian conflicts, calm vehicular traffic, and enhance the user experience in the corridor.

#### Overall Corridor Themes

The Haggard Avenue corridor was studied as three phases with two distinct character areas, however a street should be considered as part of a cohesive network in addition to the value of its parts. Overall schematic design themes emerged from discussions with the public and stakeholders, which form the basis of the following design recommendations, including:

- Pedestrian facilities on both sides of the corridor throughout the entire study area
- Bicycle facilities that are consistent in design to minimize user confusion, with physical separation from the roadway for enhanced user safety. A multiuse path is recommended on either side of the road throughout the corridor to serve bicyclists and pedestrians of all ages and abilities.
- On-street bike lane only in a small section by campus where space is limited.
- Enhanced crosswalks and multi-modal crossings throughout the corridor.
- Opportunities to optimize parking in three key areas:
  - ⇒ Rego Industries
  - ⇒ Town Green and Downtown Elon
  - ⇒ On campus during student move-in / move-out

**SCHEMATIC DESIGN PLAN NOTES:** The potential roadway and streetscape improvements shown herein are conceptual in nature based on current information and will require more detailed roadway design, transportation engineering, environmental analysis and traffic/crash studies in the future. Additionally, to accomplish some of the recommended configurations, right-of-way acquisition from property owners along the corridor may be required. This detailed information is not available at this time, but will be developed once the project is approved and funded by NCDOT for construction. Some of the information that will be developed during those future NCDOT evaluations include updated traffic volumes, safety/crash details, detailed intersection operations and specific safety issues in need of correction (such as insufficient pedestrian guardrails over a creek crossing). Also to be addressed at that time will be optimal median break locations, locations of turn-around bulbs, optimal intersection designs (e.g., roundabout versus traditional) and traffic controls (stop, signalized, roundabout, etc.), minimization of property and public vehicle access impacts, and avoidance and mitigation of the project's human and environmental impacts.

### 3.4.1 University Drive to Manning Avenue (Phase 2, Area 1)

The recommended schematic design for the far west end of the project, from University Drive to Manning Avenue, includes embracing the Suburban Highway character while decreasing vehicle-pedestrian conflicts and providing multi-modal facilities. This portion of the roadway has a 35-mph posted speed limit and is maintained by NCDOT, and all improvements will require their approval.

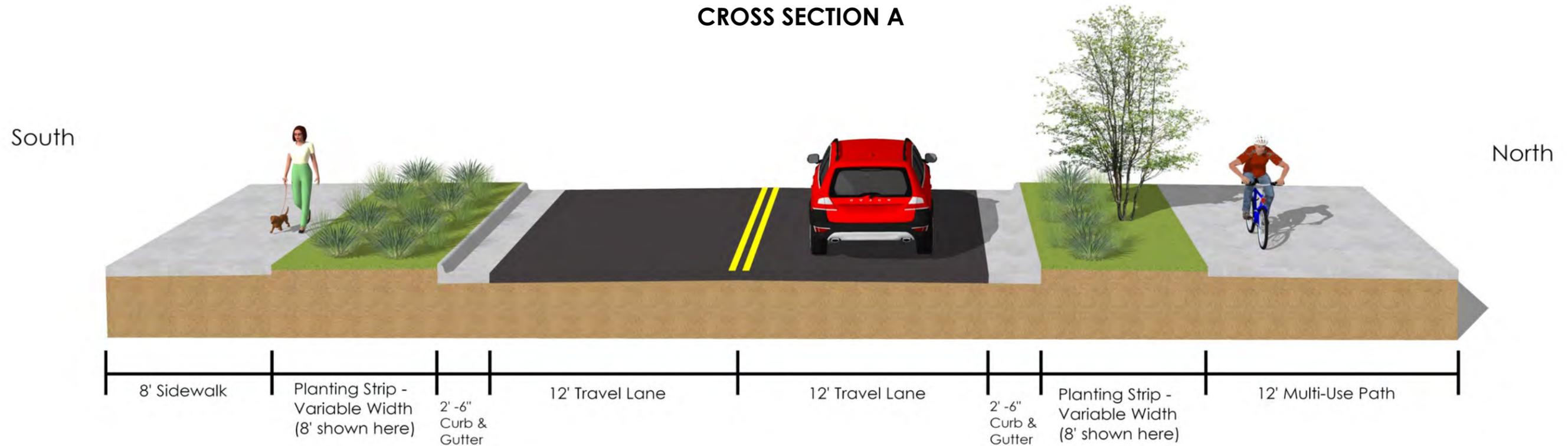
During the second (Phases 2 & 3) Design Charette, members of the stakeholder group expressed interest in connecting the proposed pedestrian facilities on Haggard Avenue with the existing sidewalk along University Drive, thereby extending the pedestrian network south to connect with communities such as the Twin Lakes Retirement Community in Burlington (2 miles). Indicated in the *Phase 2.1 Schematic Drawing* on the following page, an 8 ft sidewalk is proposed along the interior of the University Drive ramp, connecting its existing sidewalk with the proposed multiuse path on Haggard Avenue.

A 12 ft wide multiuse path (MUP) is proposed on the north side of W. Haggard Avenue on this Suburban Highway segment. Responses from the Ph 2-3 Public Meeting indicated that bicycle traffic would be relatively low here, allowing bicycles and pedestrians to share the MUP with

minimal conflicts. An 8 ft wide sidewalk is proposed on the south side of the corridor so that pedestrians are served on both sides, in compliance with the National Association of City Transportation Officials (NACTO) Urban Street Design Guide and the 2019 Complete Streets Policy discussed in Section 2.1. A sidewalk is also recommended on the south side to minimize potential impacts on existing land uses, including the parking lot of Rego Industries. 8 ft planting strips are recommended on both sides on the roadway to provide safe separation between motor vehicle traffic and active transportation facilities. As discussed in Section 2.1.1, the term active transportation refers to any mode of travel that requires exercise, usually bicycle and pedestrian movement.

New crosswalks are recommended at the following W. Haggard Avenue intersections: University Drive, St. John's Street, and Church Street. University Drive is an existing signalized intersection, so updating the signal timing to accommodate a pedestrian phase is recommended along with the crosswalk implementation. After University Drive, vehicular traffic flow on Haggard Avenue corridor is uninterrupted until the traffic signal at Williamson Avenue, maintaining the Level of Service priority of the Suburban Highway segment. Crosswalks at St. John's Street and Church Street are recommended to provide pedestrian access to Fat Frog from College Station and other student residences. These crosswalks could be considered

#### CROSS SECTION A





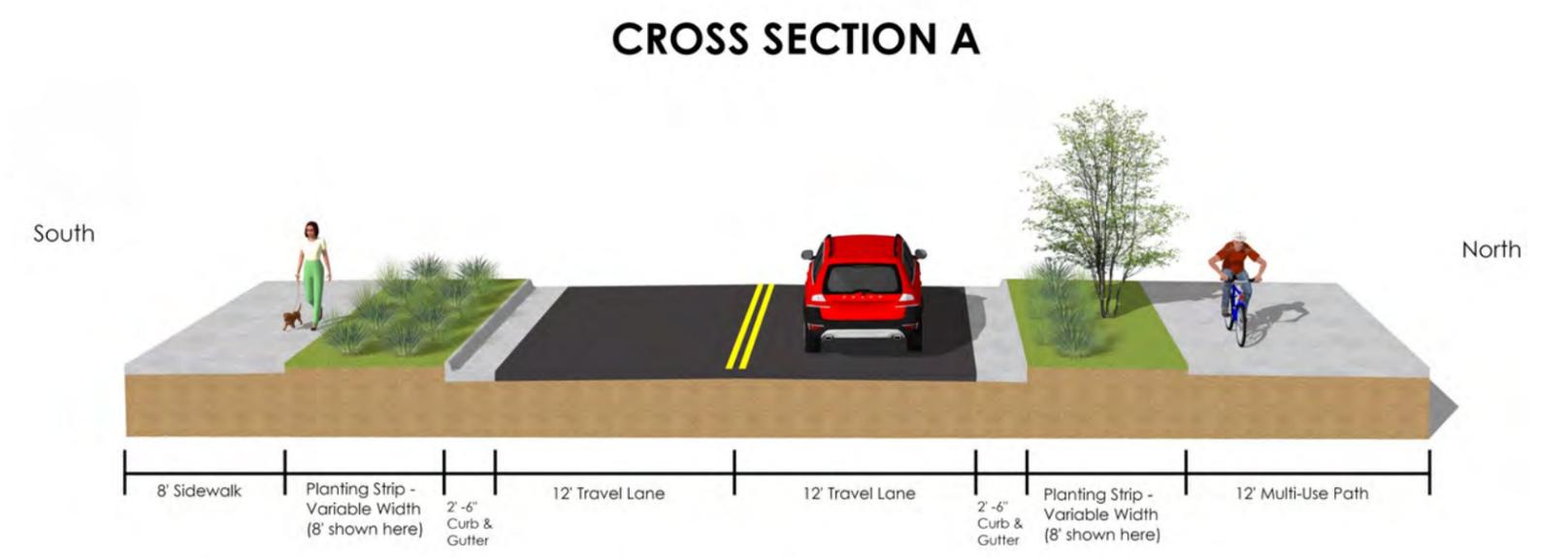
### PLAN LEGEND

- HAGGARD AVENUE
- WIDEN EXISTING SIDEWALK
- 12' NEW MULTI-USE PATH
- PROPOSED CROSSWALK
- EXISTING CROSSWALK
- EXISTING ROADWAY
- EXISTING SIDEWALK CONNECTION
- RIGHT OF WAY
- INTERSECTION IMPROVEMENTS
- PLANTING STRIP
- EXISTING LAND USE
- ELON UNIVERSITY PROPERTY
- EXISTING TRAFFIC LIGHT
- PROPOSED SIDEWALK

### PHASE 2: AREA 1

#### PLAN NOTES

- 1 MAINTAIN EXISTING PARKING AT REGO INDUSTRIES
- 2 TRAFFIC CAPACITY ANALYSIS RECOMMENDED TO DETERMINE TURN LANE NEEDS
- 3 WIDEN EXISTING SIDEWALK TO 8'





Rectangular Rapid Flashing Beacons  
 Pedbikeimages.org / Toole Design Group

“midblock crossings,” as through traffic on W. Haggard Avenue would be required to yield to pedestrians. Driver sight distance along the horizontal curve in the roadway at this section could be a safety concern, resulting in a failure to yield and potential vehicle-pedestrian conflicts. It is therefore recommended that a pair of Rectangular Rapid Flashing Beacons (RRFB) be installed at the St. John’s Street and Church Street crossings. RRFB’s will alert drivers to pedestrians when crossing, while allowing traffic flow to be uninterrupted when pedestrians are not present.

The *Phase 2.1 Schematic Drawing* highlights a proposed multi-modal crossing at the intersection of W. Haggard Avenue and Manning Avenue. The intersection currently has only one painted crosswalk, making it insufficient in its current state. At this intersection, bicycle traffic will be redirected from the north side of the corridor to the south side using in favor of a multiuse path in the Downtown Elon zone. This will avoid impacts to the Park Place Apartment Building, as well as the existing seating and streetscape.

Recommended multimodal intersection crossing features include enhanced modal and wayfinding signage, green pavement marking and/or raised pavement to highlight bicycle crossing, or another pavement striping/marking delineation as noted in the NACTO Design Guide. Intersection crossing markings raise awareness for bicyclists, motorists, and pedestrians of potential conflict areas and reduce confusion.

### 3.4.2. Manning Avenue to Williamson Avenue (Phase 2, Area 2)

The corridor segment from Manning Avenue to Williamson Avenue is considered as part of Downtown Elon and located east of Phase 2, Area 1. As a gateway to Elon University, this section falls within the Campus Scale character area, though the roadway currently has three traffic lanes. Zoning in this area consists of mostly Commercial (including the Mediterranean Deli, Skid’s, Elon Community Church), and Residential land uses, emphasizing the importance of pedestrian facilities for local trips. This portion of the roadway has a posted speed limit of 35 mph and is maintained by NCDOT, and all improvements will require their approval. It is recommended that the NCDOT consider reducing the posted speed limit to 25 mph throughout the Downtown Elon commercial district.

A road diet is recommended in this section to increase safety, calm traffic and decrease pedestrian crossing distance by reducing motor vehicle travel from 3 lanes to 2 lanes. The face of the Park Place at Elon (the former Mediterranean Deli) building is set approximately 15’ from the edge of the roadway, so it is recommended that future improvements maintain the northern curb line and focus improvements to the south. One aspect of the road diet includes the addition of a 6’ median, with breaks to allow for access to adjacent properties. The second aspect of the road diet requires shifting the curb line on the south towards the centerline of the roadway by approximately 6 ft. This shift allows more of the existing right-of-way to be rededicated to the pedestrian realm, allowing a 12 ft multiuse path and 8 ft planting strip to be implemented on the south side of the corridor with minimal impacts to surrounding properties.

The Manning Avenue to Williamson Avenue segment of the corridor, as demonstrated by the *Existing Conditions Map* (on page 14), currently features sidewalks on both sides of the roadway. The sidewalk on the north edge is 8 ft and the sidewalk on the south edge is 5 ft. Though currently serving pedestrians to some degree, these sidewalks are located at the back of the existing curb with no buffer area between the vehicle lane and pedestrian facility, increasing the likelihood of vehicle-pedestrian conflict. It is recommended that the sidewalk in front of the Park Place building remain unaltered to allow for the existing outdoor seating.

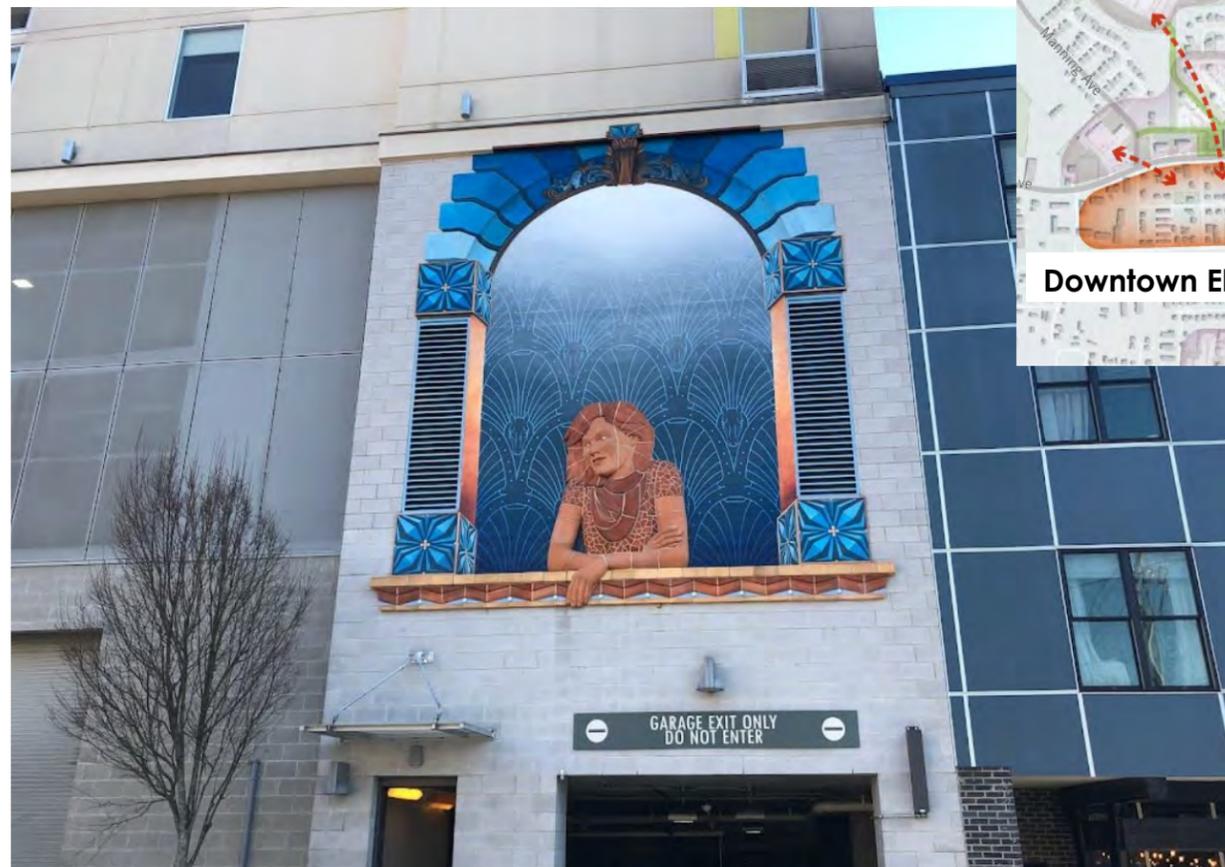
Midblock crosswalks are recommended at the W. Haggard Avenue intersections with Lee Street and N. Holt Avenue. The crossing at Lee Street will tie into the proposed sidewalk along that street that is funded as NCDOT project EB-5988. The N. Holt Avenue crosswalk is proposed to tie into the existing sidewalk on the west side of N. Holt Ave. and accommodate Downtown Elon pedestrian traffic to Park Place (former Med Deli), the Schar Convocation Center, and the Oaks.



It is recommended that bicycles be directed to the south side of the roadway on this segment, as noted in the multimodal crossing intersection paragraph of the previous section. Bicycles and pedestrians will share a right-of-way on the proposed 12 ft multiuse path, offset from the roadway by an 8 ft planting strip where feasible. The multiuse path will accommodate both eastbound and westbound bicycle and pedestrian traffic and connect to the proposed multimodal crossing at N. Williamson Avenue.

During the Phases 2 /3 Design Charette, the possibility of on-street parking in this area was discussed with stakeholders. With limited right-of-way availability and concerns of conflicts with cyclists, the group decided that parking needs would be better met elsewhere. The Town acknowledged that the lot in between Park Place and Skid's Chargrill Restaurant is remanent right-of-way for N. Holt Avenue. If this lot were redesigned to efficiently accommodate the Downtown Elon parking needs, the surrounding district could be pedestrian-oriented, promoting shopping, dining, and other commercial activity. A Downtown parking deck could serve additional traffic for events hosted on the Town Green.

Inspirational images for this project area are shown on this page, including: the Biltmore Avenue parking deck in the City of Asheville, which features artwork and supports the City's commercial core (to left); and a hydroponic wall on a parking deck in Irvine, California, which creates a stunning and environmentally -friendly placemaking feature (below).



Google 2022.

It is recommended that the existing signalized intersection of N. Williamson and Haggard Avenue (presently with crosswalks on all four quadrants) be upgraded to accommodate bicycle traffic. A traffic study (including capacity analysis) is recommended for the entire corridor to determine turn lane storage and signal timing demands for all travel modes. Possible multi-modal improvements include green painted bike boxes that accommodate bicycle turning movements and raise awareness of potential bicycle-vehicle conflict points. The recommended design requires westbound bicycle traffic to cross on the south side, so clear signage will be imperative to the efficacy of the design. This intersection also marks the transition between the W. Haggard Avenue and E. Haggard Avenue, as well as the western entrance into Elon University.

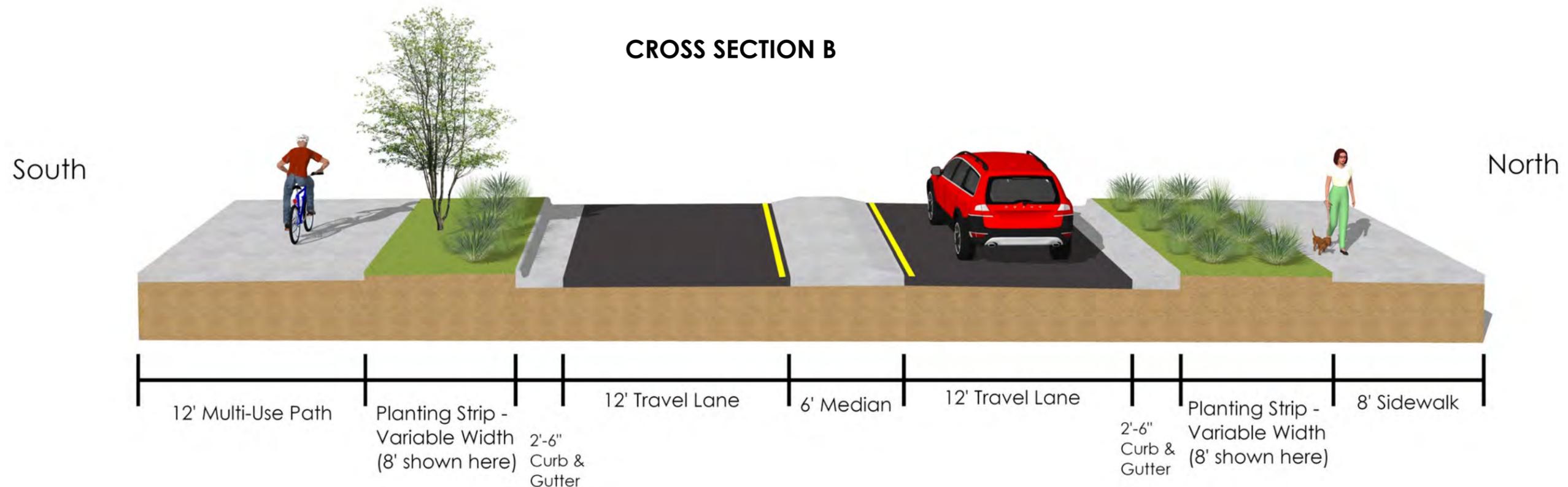
Below, Cross Section B shows the recommended streetscape along Haggard Avenue in the Downtown Elon section. To maintain the existing design language of the corridor, brick pavers can be substituted for the concrete features shown: multiuse path, median, and/or sidewalk. Median breaks will be determined by the future traffic study.

### 3.4.3. Williamson Avenue to N. Antioch Avenue (Phase 2.2)

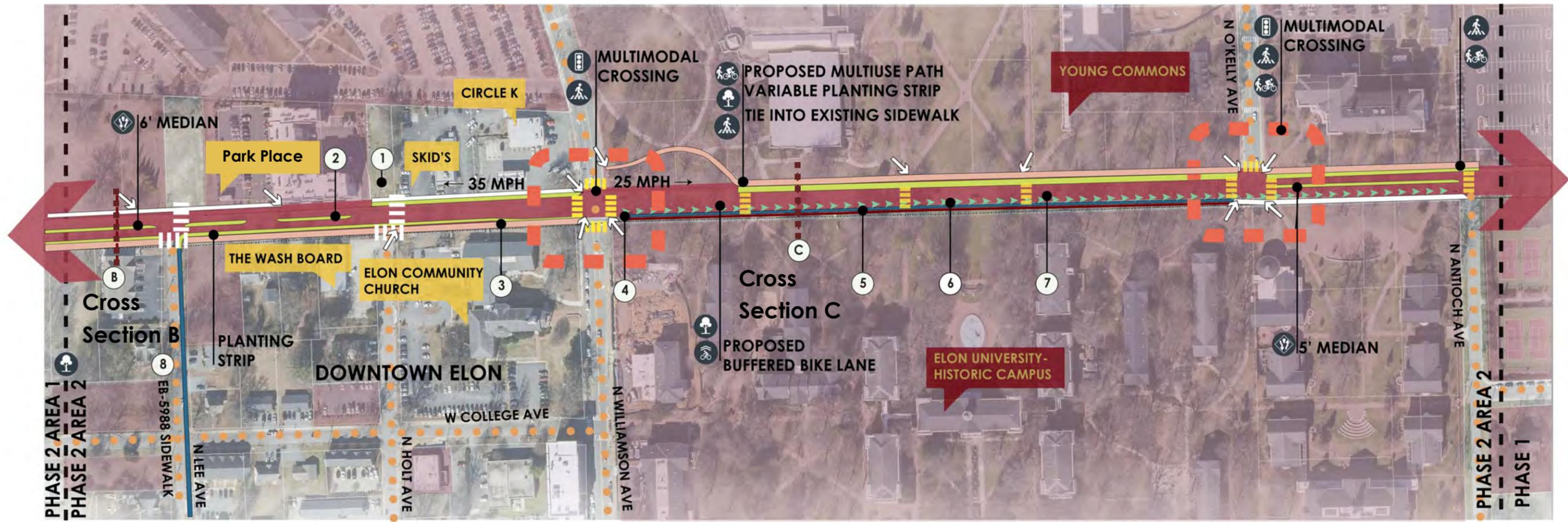
The segment of the corridor between N. Williamson Avenue and N. Antioch Avenue falls within the Campus Scale character area. The existing travel lanes are very wide, with approximately 39 ft of existing pavement, allowing some of the existing motor vehicle space to be retained in this section, with some traffic calming provided by the reduced lane width from 18 ft to 12 ft. This portion of the roadway is maintained by the Town of Elon, and all improvements will require their approval.

A historic brick wall lines the E. Haggard Avenue corridor to the south, with a few feet separating the existing curb line and the face of the wall. Stakeholder feedback at the Phases 2/3 Design Charette directed the design team to restrict project work to the north of the wall and to not disturb the historic feature. A proposed 5 ft sidewalk is recommended to be installed in front of the wall, with the existing curb line shifted to north to accommodate the sidewalk width. A 1'6" curb and gutter is recommended to separate the sidewalk from a proposed on-street bike lane.

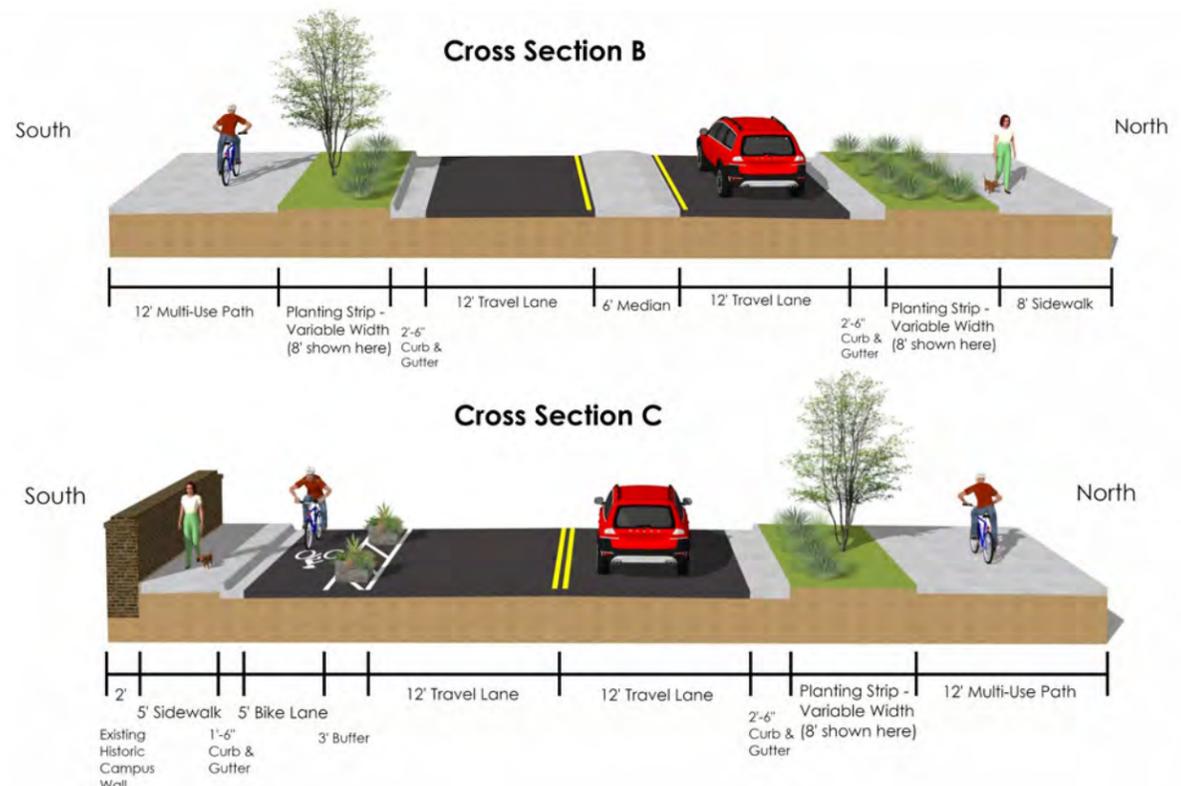
An on-street buffered bike lane (defined in Section 2.2) is recommended along the south side of



# SCHEMATIC PLAN - PHASE 2.2, DOWNTOWN ELON - MANNING AVENUE TO WILLIAMSON AVENUE



- ### PHASE 2: AREA 2
- #### PLAN NOTES
- 1 CONSIDER ADDITIONAL PARKING ON TOWN-OWNED LOT
  - 2 SHIFT ALIGNMENT ABOUT 6' NORTH TO AVOID MUP IMPACTS TO SOUTH
  - 3 BIKES DIRECTED TO MULTIUSE PATHS UNLESS INDICATED DIFFERENTLY
  - 4 TRAFFIC CAPACITY ANALYSIS RECOMMENDED TO DETERMINE TURN LANE NEEDS
  - 5 HISTORIC WALL (DO NOT DISTURB)
  - 6 BIKE LANE CAN BE TEMPORARILY CLOSED FOR PARKING/STUDENT MOVE-IN
  - 7 IMPLEMENT ROAD DIET AND DECREASE TO 2 LANES
  - 8 CONNECT TO PROPOSED SIDEWALK PROJECT EB-5988





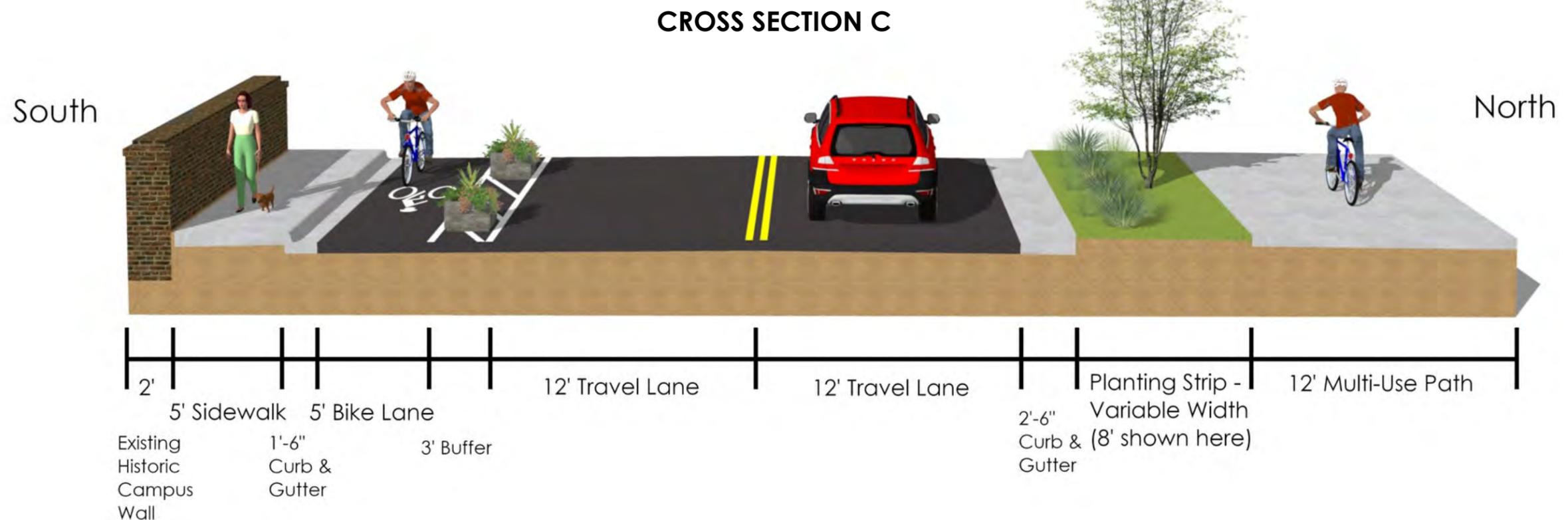
the Haggard Avenue corridor to accommodate eastbound bicycle traffic. Wayfinding signage is recommended at the beginning of the bike lane for direction and safety education, with an example from the City of Charlotte, NC provided in the graphic to the left.

During the September 2021 stakeholder meeting, 67% of committee felt it would not be necessary to separate bicycles from pedestrians in this area, but there was concern for bicycle-pedestrian conflicts. *The Phase 2/3 Public Survey* results indicated that the greatest bicycle traffic volume is anticipated through the Campus Scale section, increasing the need for directional separation to minimize conflicts. Directing eastbound bicycle traffic to the on-street bike lane will also add capacity for increased bicycle volume and minimize bicycle-pedestrian conflicts on the multiuse path, which handles a substantial amount of campus pedestrian traffic. The bike lane is proposed as 5 ft wide with a 3 ft diagonally striped buffer to increase safety and visibility. Removeable bollards or planters could be considered in the buffer to provide a physical barrier between the bicycle and motor vehicle traffic. It is recommended that the buffered bike lane is temporarily closed during the student move-in period and any physical barrier removed. With a total width of 9 ft including the gutter, the bike lane area can be used for additional on-street parking during

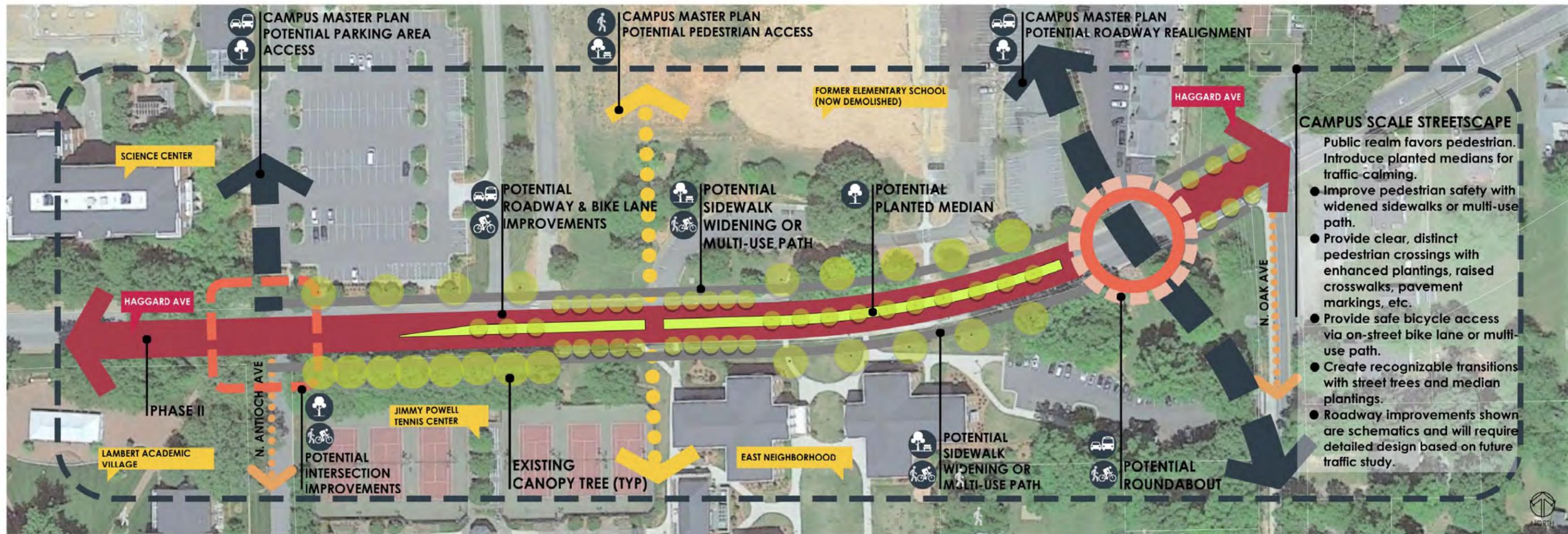
this period.

On the north side of the corridor, an 8 ft planting strip and 12 ft multiuse path are recommended. To remain consistent with Elon University's design language, this segment is recommended to be constructed with brick pavers. . Due to the proposed horizontal shift and possible right turn lane, the multiuse path east of Williamson Avenue is proposed to detour around the Elon University gateway sign and expand on the existing sidewalk alignment. Wayfinding and multi-modal educational signage are recommended on the north and south sides of the corridor. To decrease conflicts and increase capacity, signing should designate the multiuse path for pedestrians and westbound bicycle traffic only, directing eastbound bicycles to the bike lane.

Multi-modal enhancements are recommended at the signalized intersection with N. O'Kelly Avenue, including bike boxes for left turn movements (see Section 2.2). The three existing raised midblock crosswalks in this section are hard to see given worn striping and should be retained with improved pavement marking, along with enhanced street lighting to increase pedestrian visibility. A pair of Rectangular Rapid Flashing Beacons (RRFB) could be considered at the midblock crosswalk south of the Powell Building where multiple pedestrian crashes have occurred.



\* See Plan Notes on Page 56



## PLAN LEGEND

- NEW SIDEWALK
- WIDEN EXISTING SIDEWALK
- HAGGARD AVENUE
- POTENTIAL ROUNDABOUT
- PEDESTRIAN ZONE
- INTERSECTION IMPROVEMENTS
- EXISTING ROADWAY
- POTENTIAL STREET TREES
- DESIGN ELEMENTS ICON
- CAMPUS MASTER PLAN POTENTIAL ACCESS
- EXISTING LAND USE
- CAMPUS SCALE STREETScape AREA

## INSPIRATION | IMAGES



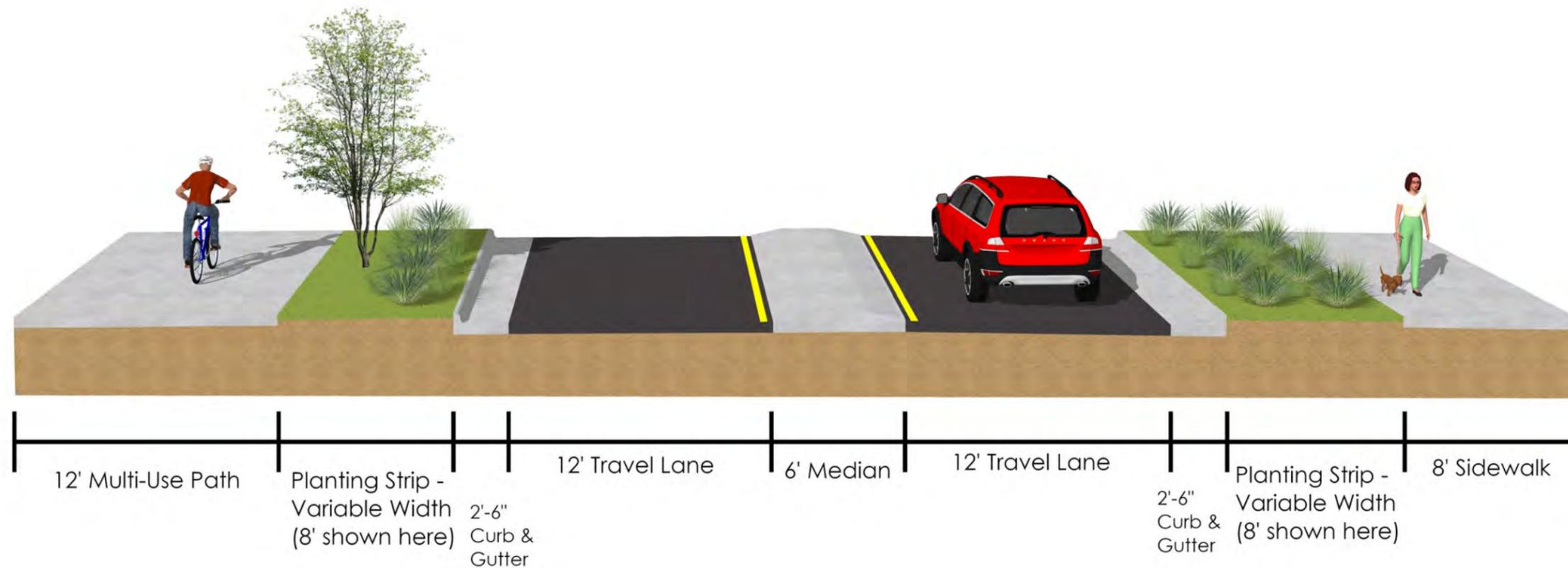
### 3.4.4. N. Antioch Avenue to N. Oak Avenue (Phase 1)

The recommended schematic design for the Campus Scale area of the corridor between N. Antioch Ave. and N. Oak Avenue included strategies to address vehicle-pedestrian conflicts, reduce crossing distances, calm vehicular traffic, and enhance the pedestrian and bicyclist experience. [see Phase 1 - Schematic Plan - N. Oak Avenue to York Road] This portion of the roadway is controlled by the Town of Elon, and all improvements will require their approval.

The Campus Scale Schematic Design illustrates a planted median to reduce traffic speed and decrease crossing distance with pedestrian refuge at potential mid-block crossings. Medians planted with small trees and low-grading shrubs lend additional spatial awareness for vehicles to reduce speed and increase awareness of other modes of travel. Where mid-block pedestrian crossings occur, plantings, pavement markings, materials changes, and signage can visually indicate the approaching crosswalk. The predictability created with these visual cues can increase pedestrian safety in a subtle but effective manner.

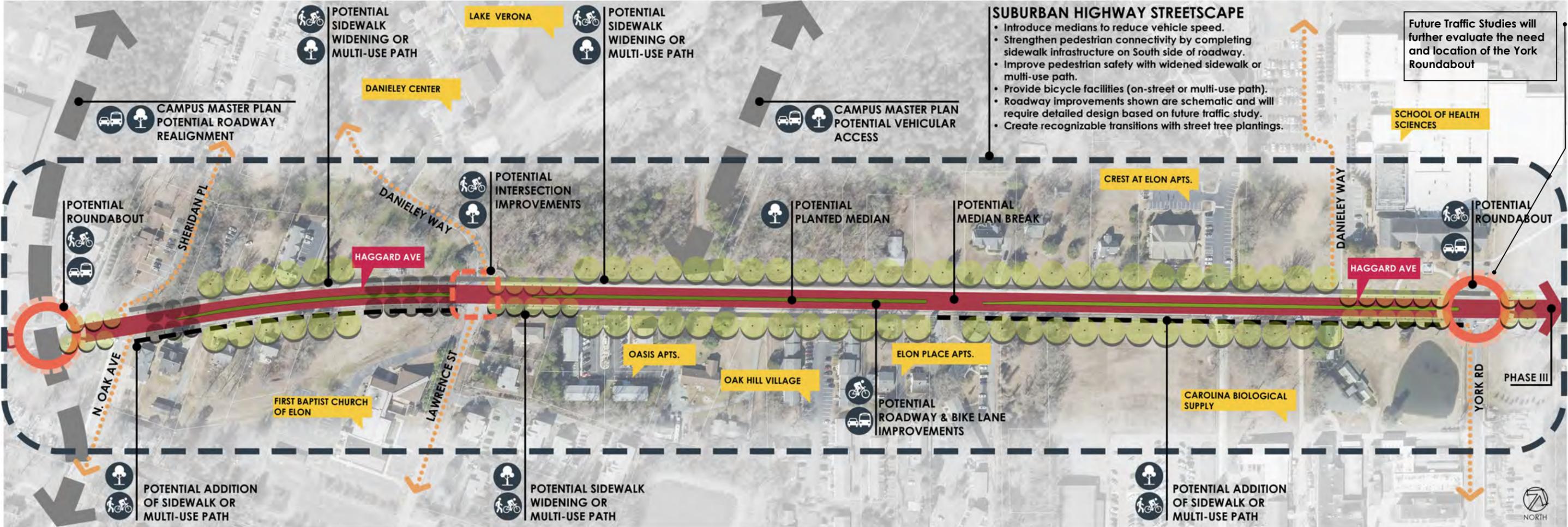
The volume of pedestrian activity in this segment supports the recommendation for widened sidewalks, or a multiuse path. To improve the pedestrian level of service, a wider sidewalk or multiuse path separated from vehicular traffic is recommended. Similar to the Suburban Highway area discussed in the following section, the design suggests improvements for bicycle access via a multiuse path or on-street bike lanes. Additionally, the design illustrates trees along the roadway that vary in size, spacing, and location based on the visual cues desired for users. Where the tree canopy reduces in size, spacing, location, and median plantings change, the intent is to inform users of an upcoming pedestrian crosswalk.

These design plans also denote intersection improvements at Antioch Avenue, which may include roadway modifications such as right and left turn lanes, as well as safe and legible places for pedestrians to be directed along Haggard Avenue towards a major pedestrian crossing planted by Elon University. These design plans also illustrate the proposed realignment of N. Oak Avenue as it crosses Haggard Avenue, extending into Elon University property. This realignment, which is based on the University's Campus Master Plan, would provide an opportunity for a roundabout at the newly created intersection. A potential roundabout would calm vehicular traffic, encourage a reduction in speed, create a transition between character areas, and serve as a gateway for the campus zone.



# SCHEMATIC PLAN - Phase 1 SUBURBAN HIGHWAY - N. OAK AVENUE TO YORK ROAD

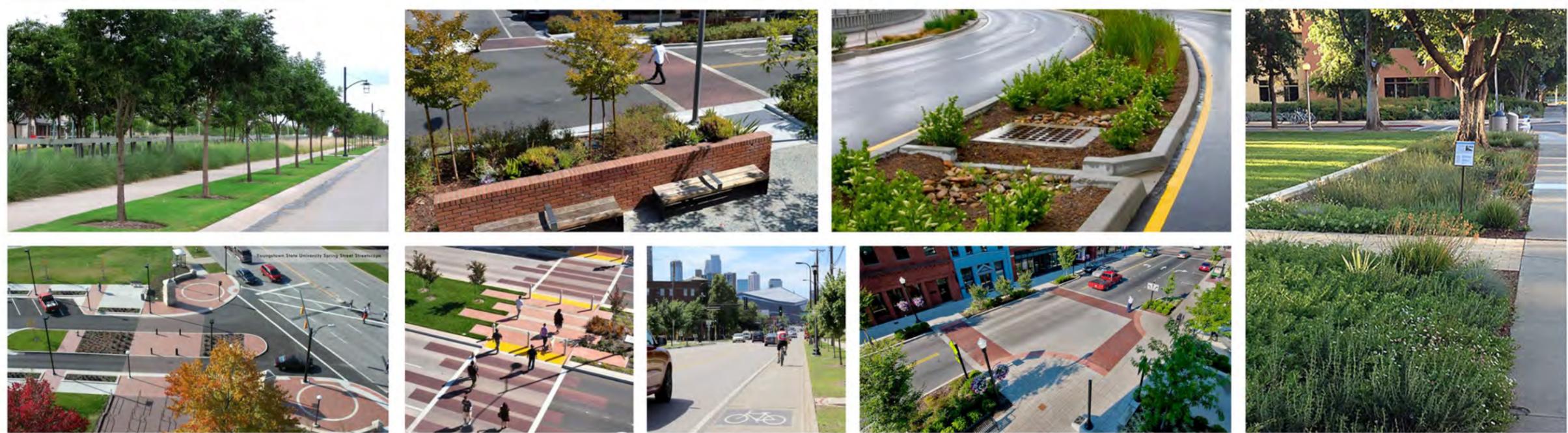
\* See Plan Notes on Page 56



## PLAN LEGEND

- NEW SIDEWALK
- WIDEN EXISTING SIDEWALK
- HAGGARD AVENUE
- POTENTIAL ROUNDABOUT
- PEDESTRIAN ZONE
- INTERSECTION IMPROVEMENTS
- EXISTING ROADWAY
- POTENTIAL STREET TREES
- DESIGN ELEMENTS ICON
- CAMPUS MASTER PLAN POTENTIAL ACCESS
- EXISTING LAND USE
- SUBURBAN HIGHWAY STREETScape AREA

## INSPIRATION | IMAGES



### 3.4.5. N. Oak Avenue to York Road (Phase 1)

The schematic design for the corridor between N. Oak Avenue to York Road (Suburban Highway area) recommends strategies to address vehicle-pedestrian conflicts, reduce traffic speed, and enhance the pedestrian and cyclist environment (see previous page). This portion of the roadway is maintained by NCDOT, and all improvements will require their approval.

The suburban highway schematic design introduces planted medians as a traffic calming device and proposes a road diet by reducing the existing 3-lane roadway section to a 2-lane section. The introduction of regularly planted street trees of varying canopy heights is intended to provide all users with visual and spatial cues about an approaching decision point. Where the tree canopy reduces both in size and spacing, the intent is to reinforce the presence of an upcoming intersection.

To strengthen pedestrian connectivity and access, the sidewalk on the south side of Haggard Avenue should be completed. Additionally, pedestrian safety and experience along the roadway can be improved by providing a wider sidewalk or multiuse path and by separating the walkway from the vehicular traffic with a planting area between the back of curb and walkway.

The plans suggest intersection improvements at Lawrence Street and York Road to create safe, legible, and predictable places for pedestrian crossings, which may include distinct crosswalks, and/or pedestrian refuge within the proposed median in conjunction with roadway modifications. To provide full multi-modal access, this plan suggests a discernable area for bicyclists, either with an on-street bike lane or via an off-street multiuse path.

These plans also specifically illustrate an opportunity for a roundabout at York Road to improve the safety and congestion issues noted at this intersection, as discussed at the July 2020 Project Stakeholder Meeting as well as the Public Meeting in October 2020. A traffic capacity analysis will need to be performed to determine the number of lanes required for a future roundabout. In addition, roundabouts offer an opportunity for placemaking sculptures or cultural art.

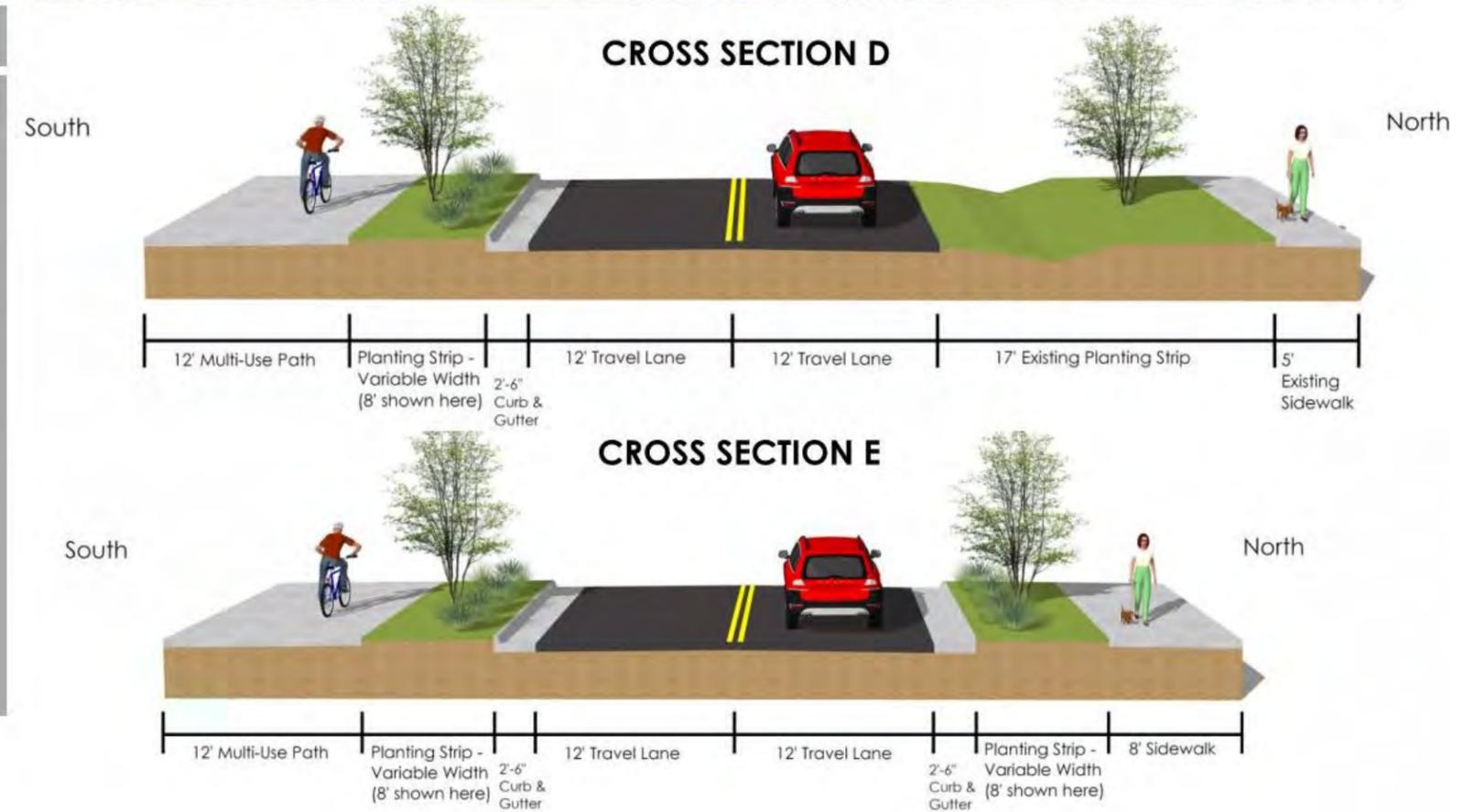
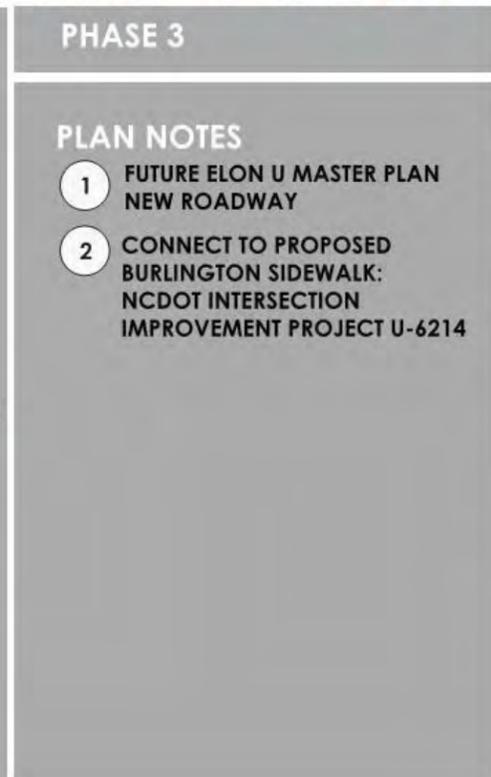


Multimodal Roundabout, Actual lane configuration to be determined in capacity analysis study.



Jorge Blanco, "BRAVO!" sculpture in roundabout with sidewalks.

City of Sarasota



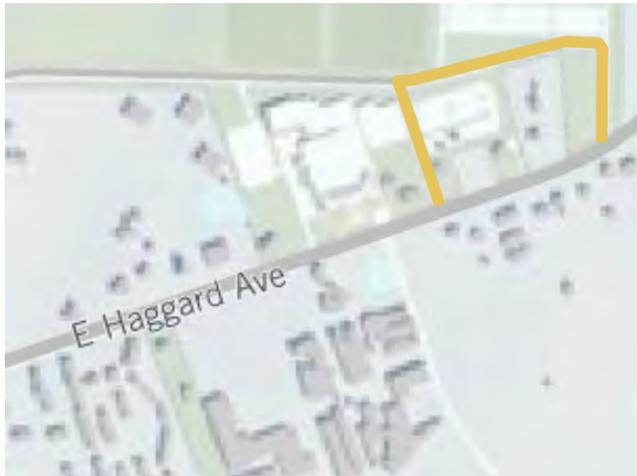
### 3.4.6. York Road to University Drive (NC 100) / NC 87 / W. Webb Street (Phase 3)

The schematic design for the corridor between York Road and University Drive (NC 100)/NC87/ W. Webb Avenue represents a continuation of the Suburban Highway of the previous Phase 1 segment, reducing potential of pedestrian-vehicle conflict by providing connections in existing sidewalk gaps and enhancing the bicycle environment. This portion of the roadway is maintained by NCDOT, and all improvements will require their approval.

The 2016 Elon University Master Plan shows a future Elon University road and far east Elon University road, pictured left, that will enhance circulation and mobility through campus. By connecting with Danieley Way, the new road could divert some traffic to E. Haggard Avenue.

Care should be taken to ensure adequate sight distance between Gilliam Road and the far east Elon University road.

This segment of the E. Haggard Avenue corridor has a posted speed of 35 mph and no existing sidewalks on the south side and only intermittent sidewalks at campus developments on the north. It is recommended that an 8' sidewalk is implemented on the north side to fill in



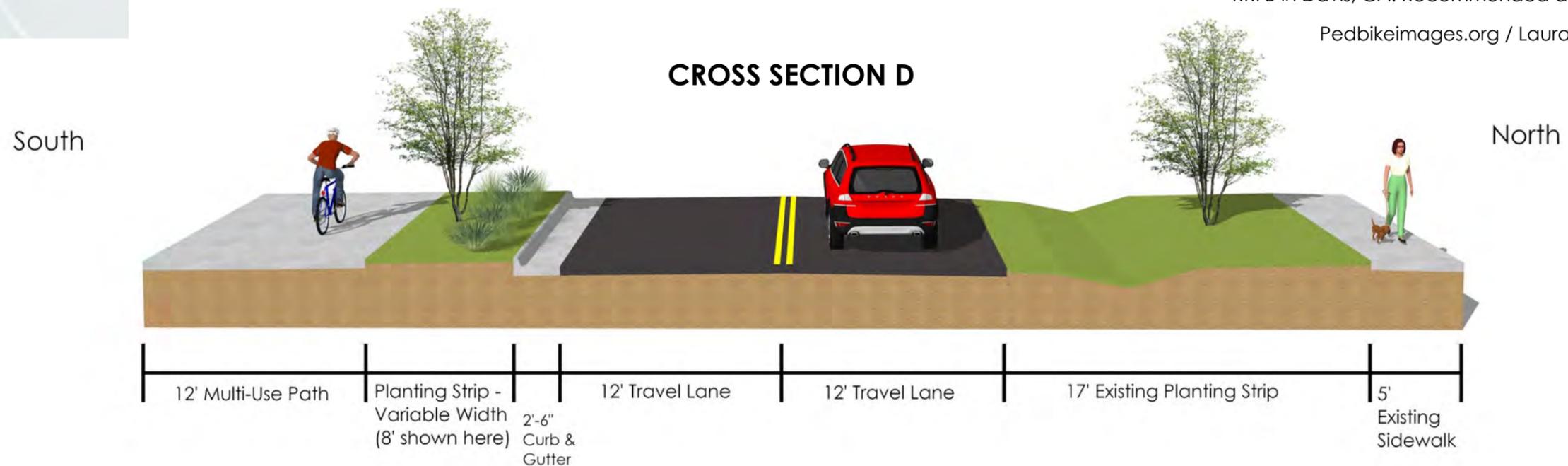
gaps and connect to existing sidewalks at Gilliam Road and Partners Place Apartments, shown below as “existing planting strip” and “existing sidewalk.” A 12 ft multiuse path is recommended on the south side of E. Haggard

Avenue in this section to provide an additional pedestrian facility and a safe and consistent bicycle and pedestrian facilities for users of all ages and abilities.



RRFB in Davis, CA. Recommended at Gilliam Road

Pedbikeimages.org / Laura Justine





# 04 Project Implementation

## 4.1. Ordinance Changes

### 4.1.1. Proposed Haggard Corridor Overlay Zoning District

As discussed in the summary notes from the 1st Stakeholder Charette (November 2020) and the Phase 2-3 Stakeholder Kickoff Meeting held in July 2021 (as found in the Appendix), the Town of Elon, with the advice of the Stakeholders, is recommending that changes be made to the Town of Elon Land Development Ordinance (LDO adopted 2/04, amended 3/13/18) to implement the vision for the Haggard Corridor as discussed and mapped in Chapter 3.

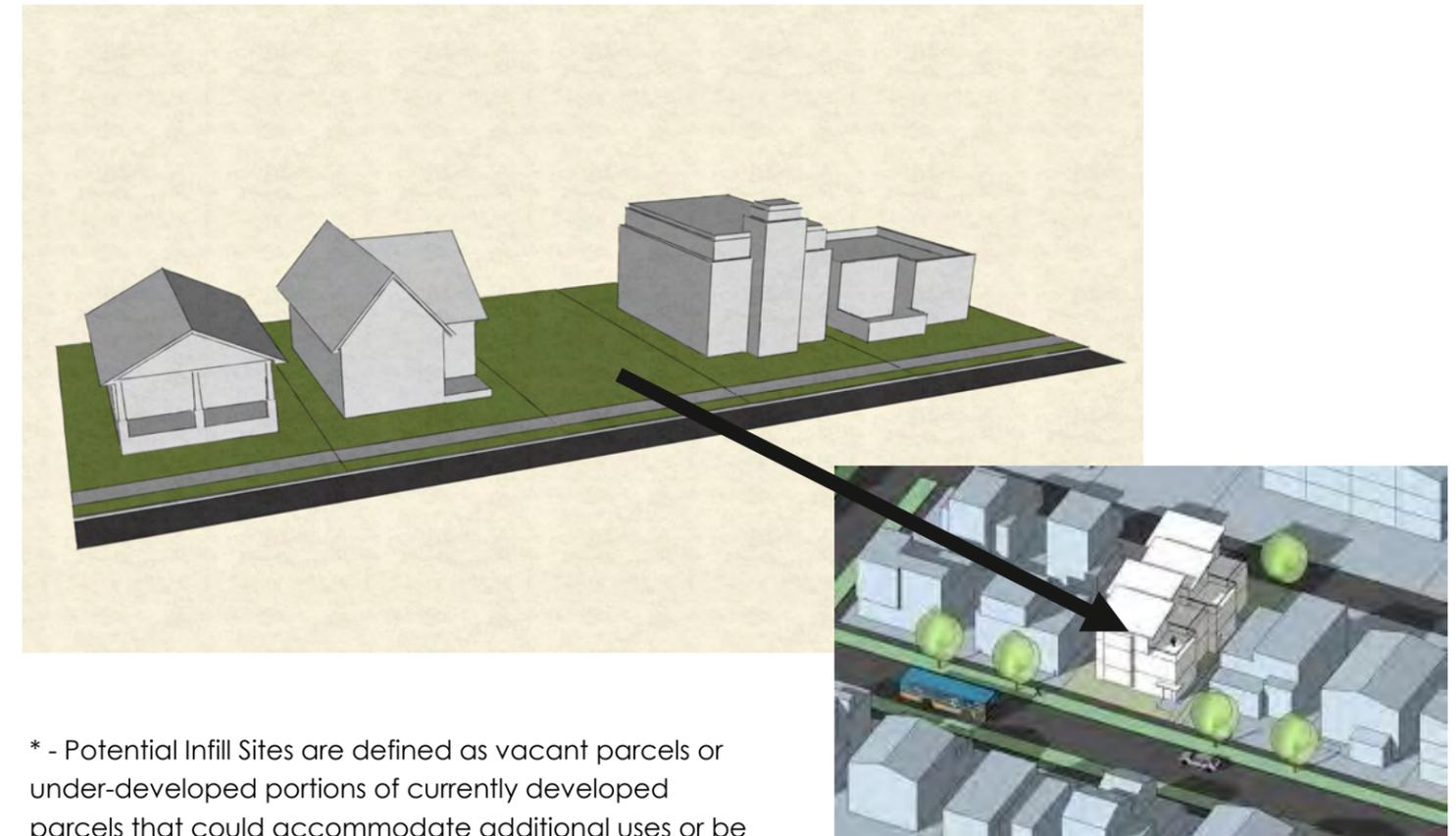
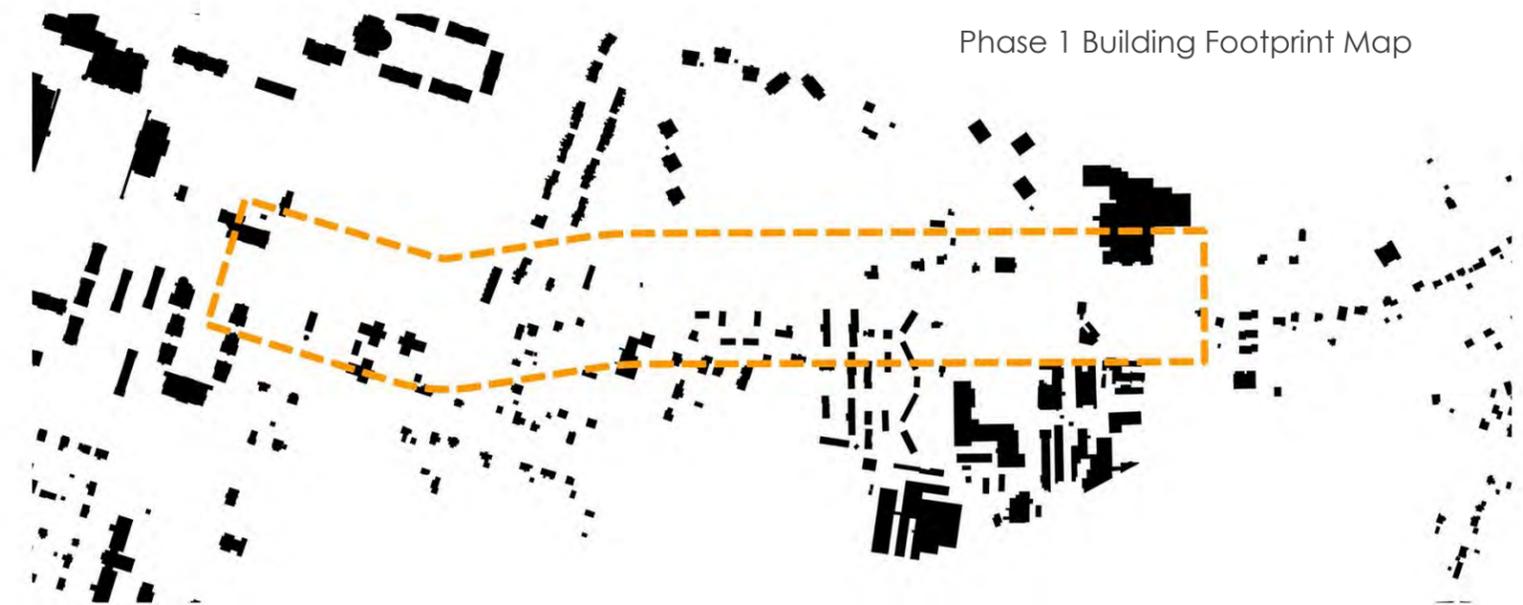
The following sections provide the rationale for a recommended new Corridor Overlay Zoning District, as well as areas of the Town's Roadway Design Standards that should be further evaluated for modification (currently within Section 5.7 of the Land Development Ordinance (LDO)). The Town intends to implement these new ordinance requirements with adoption of the Town's new Land Management Ordinance (LMO) (currently under preparation), which will replace the LDO.

#### Land Use

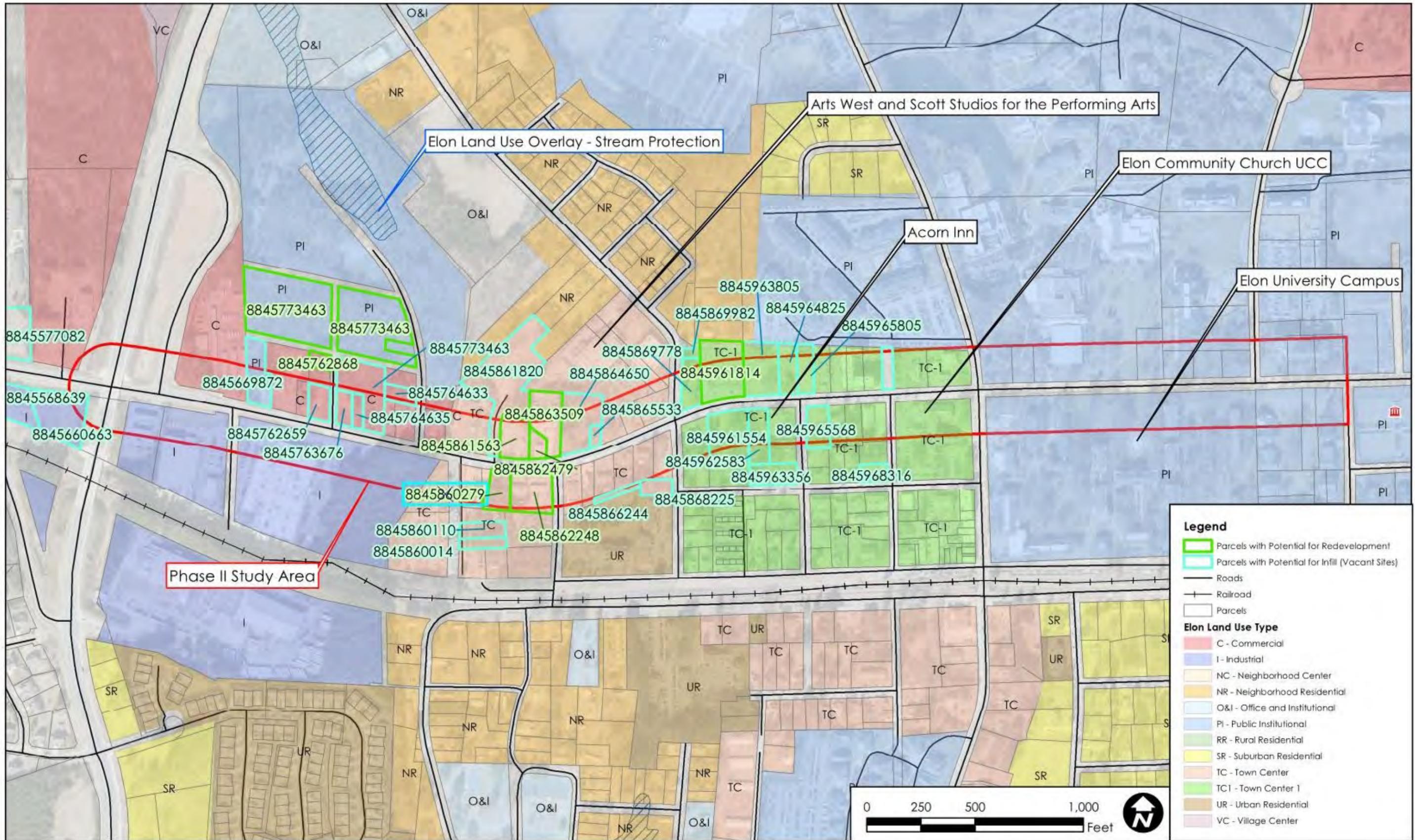
Given the dramatic impact land development has on the function and feel of adjacent roadways, the potential for new development or redevelopment in the corridor was evaluated to determine if current land use controls or additional controls are needed in the Overlay District. As shown on the Phase 1 Potential Infill Development Map\* on page 73, there are a total of 13 parcels (totaling 157.7 acres) located mostly in the Suburban Highway (eastern) portion of the corridor with the greatest potential for new development from infill or redevelopment. Of those, the one University-owned parcel totaling 86 acres east of the Danieley Center and the three privately owned parcels immediately to its east make up the main vacant/underdeveloped area in the center/north of the corridor. The next largest developable area in Phase 1 involves two parcels totaling 36 acres within the City of Burlington's Zoning Jurisdiction near York Road.

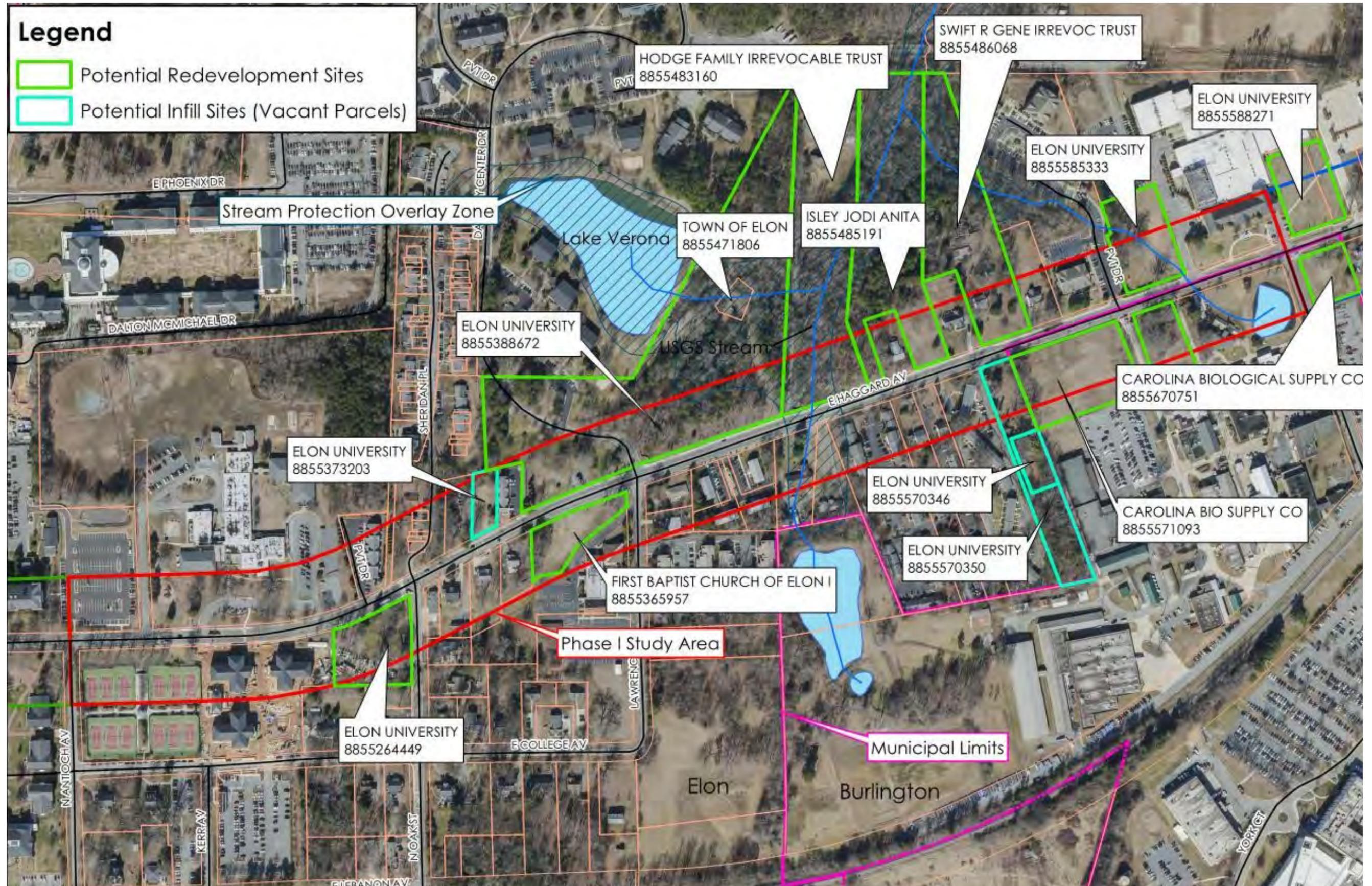
As shown on the Phase 2 Potential Infill Development Map on page 72, there are 27 relatively small vacant parcels in Town Center and Commercial Zones available for infill development. There are larger underdeveloped parcels in the Public Institution Zone on the western end of Phase 2 that are slated for expansion of the Elon Lodge.

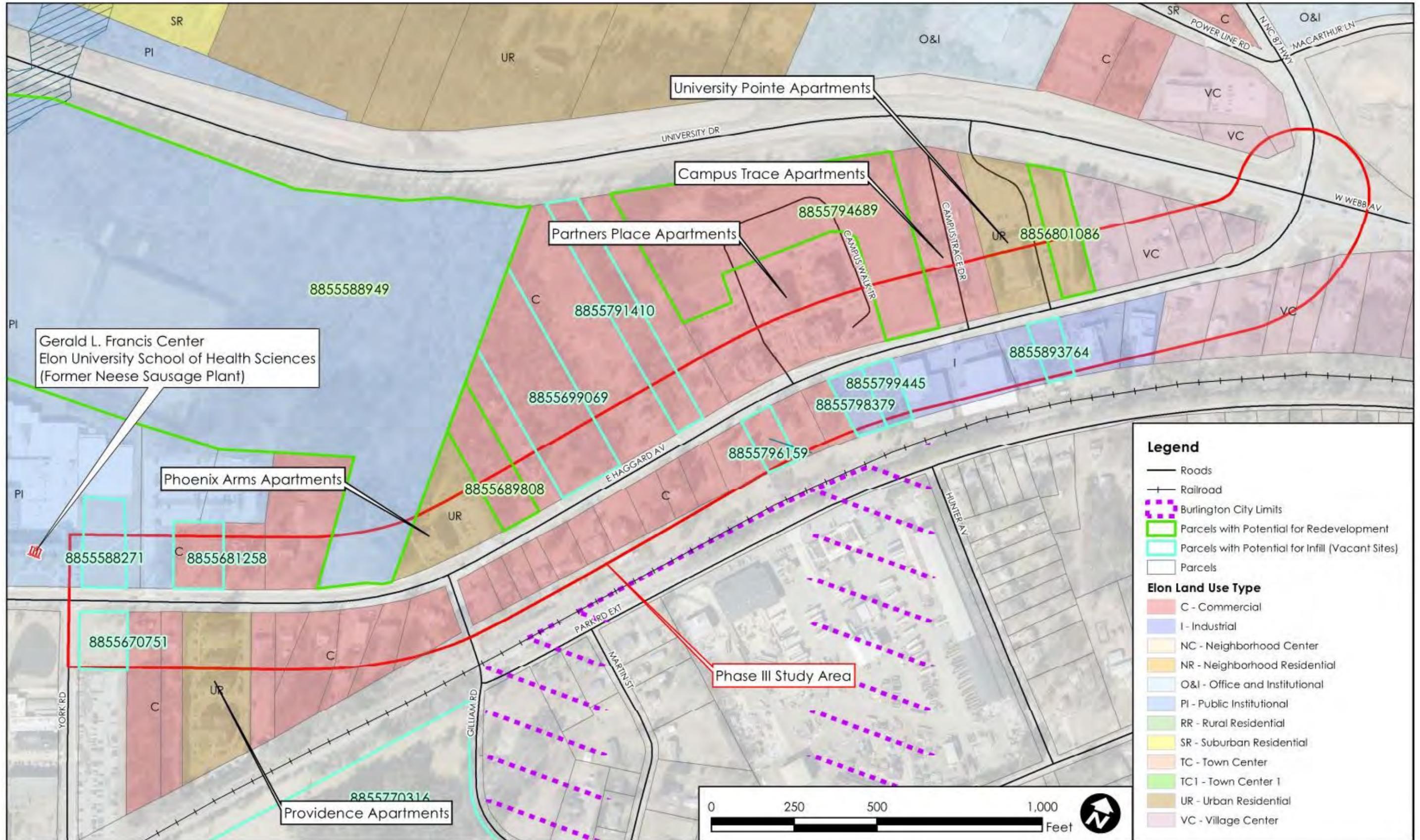
The Phase 3 Potential Infill Development Map on page 74 shows 13 parcels with the potential for redevelopment or infill development in Commercial and Public Institutional Zones, the



\* - Potential Infill Sites are defined as vacant parcels or under-developed portions of currently developed parcels that could accommodate additional uses or be combined with adjacent vacant or underdeveloped land and redeveloped.







largest being on the north side of the corridor, within the Elon Campus and planned for future educational uses. The other larger parcels (also on the north side) are zoned Commercial or Urban Residential and likely to be developed into apartment or other forms of off-campus student housing, according to the Town Planner. The smaller parcels within the Commercial and Industrial Zones in Phase 3 are likely to be developed into non-residential uses.

As most of the future developable sites within Phase 1 are owned by Elon University with their intention of developing them for University purposes, it is the commitment of the Town to continue to collaborate with the University on future long-range planning and site development review to address the Town's potential land use concerns. There are no specific land use elements recommended to be added to the Overlay District.

### Access Management

Good transportation planning acknowledges that the placement, size and orientation of new driveways, entrances/exits and cross streets along urban roadways must be carefully planned and controlled, as they can either positively or negatively impact traffic flow, safety, development potential, environmental resources, and more broadly, community character.

FHWA's Access Management Guidance\* specifically calls attention to the importance of managing access along arterials such as Haggard Avenue because of the need to protect both its mobility and access functions.

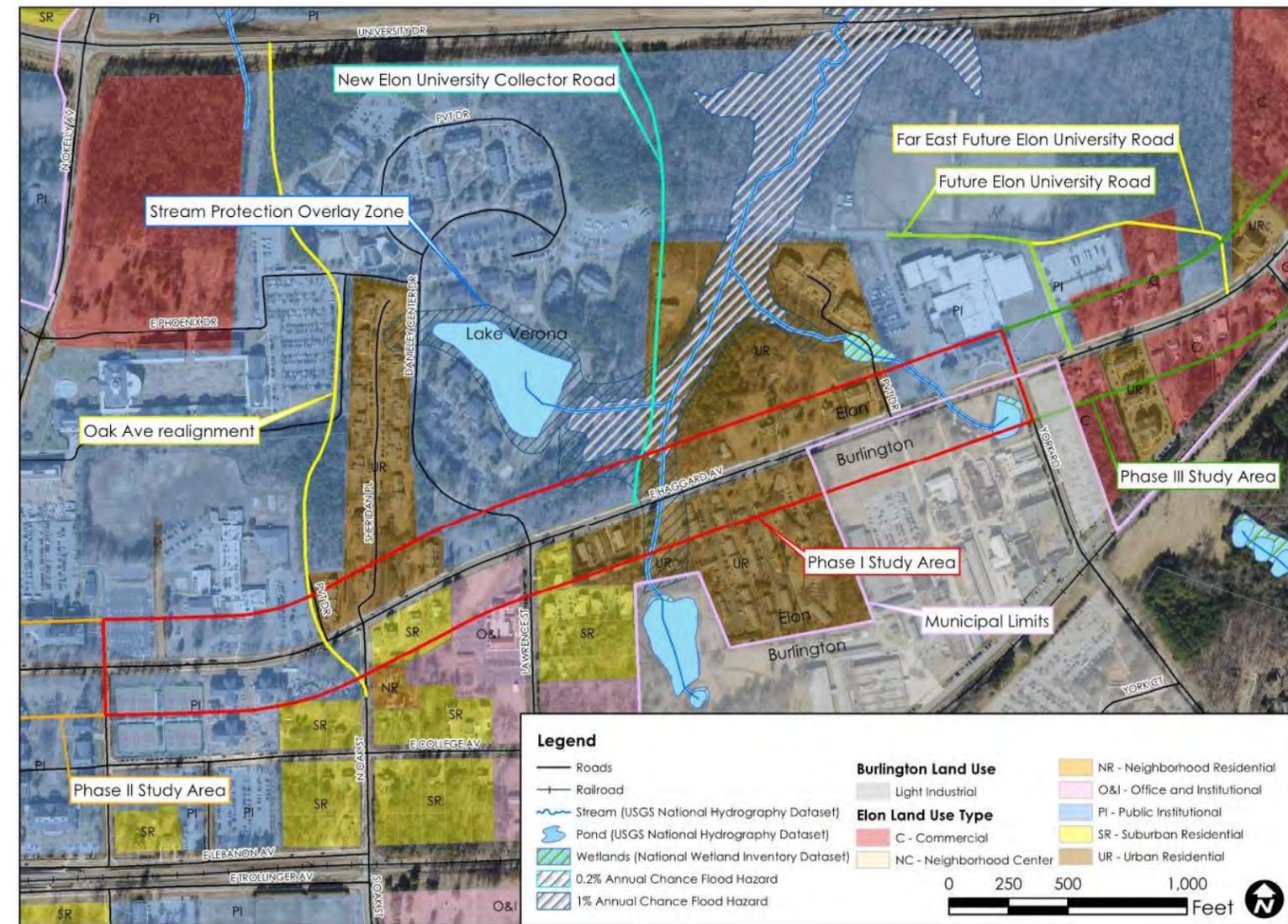
Given that every legal parcel of land is allowed at least one driveway, and new development could add even more, several new driveways may be

constructed on the corridor. Elon University is also proposing a new cross street ("Elon University (EU) Collector") that would intersect the project corridor on the north side of East Haggard Avenue, across from Elon Village Homes and extending north to University Drive (see Future Land Use and University Roadways Map) This future roadway, along with other "ring roads" planned by the University further to the east in the Phase III project area (also shown on that map), are intended to provide non-arterial access to new University development in the area and help bypass (and therefore reduce vehicular traffic) on Haggard Avenue in the congested Campus Scale area.

The "EU Collector" is shown to lie on the University Master Plan directly within an Unnamed Tributary to Dry Creek where it extends under East Haggard Avenue at a culvert (see Existing Conditions Map).

According to FHWA, it is best to manage driveways so that access is provided to and from the roadway with the lower functional classification, as these roadways typically have lower traffic volumes and speeds. This helps to reduce the frequency of conflicts, which minimizes both the opportunity for crashes and the severity of those crashes, should they occur.

Thus, in planning, designing and managing access (i.e., driveways, entrances or exits), critical consideration must be given to arterial and collector streets as these streets serve both mobility and access functions. ([https://safety.fhwa.dot.gov/intersection/other\\_topics/fhwasa10002/#s11](https://safety.fhwa.dot.gov/intersection/other_topics/fhwasa10002/#s11))



Future Land Use and University Roadways



**Given the conditions , it is recommended that the Overlay District contain the following requirements to adequately manage access (and therefore protect the long term functionality and safety) of East Haggard Avenue after new infill / redevelopment:**

- Multiple driveway cuts on to East Haggard Avenue should be restricted to the maximum extent possible.
- All future new public roads, including the "EU Collector" road proposed by Elon University, should be located outside of environmentally sensitive areas to the maximum extent practicable.
- The Traffic Impact Analysis (TIA) prepared by Elon University for the development of its 86 acre parcel to the east of the Danieleley Center (soon to be a requirement for all large developments as part of the new Elon LMO) should include:
  - ⇒ Analysis of the "EU Collector" roadway and its intersection with Haggard Avenue as part of the development of the site. The Town prefers that the this collector be public to help divert traffic through the Campus Scale area, but if the University proposes it to be private, which would allow closure on occasion, the TIA must also evaluate the impacts of this restriction on the transportation network, especially within the Campus Scale area. The TIA should evaluate all alternatives on how well they reduce traffic and improve safety on Haggard Avenue.
  - ⇒ Evaluation of the "EU Collector" as the primary means of access to the 86-acre development so that campus traffic is funneled to Haggard at one controlled location, with other access points for the development onto East Haggard Avenue restricted.
  - ⇒ Alternative locations of the "EU Collector" be evaluated to determine if placement near the eastern property line will allow/provide primary access for future development of that private parcel and also be used as the "front" / primary access point for infill / redevelopment of other surrounding private-owned parcels.

## Front Yard Building Setbacks

Front yard building setback is the minimum distance between the front edge of a parcel (measured at the public right-of-way line) and where a structure can be built. As noted in Section 7.2 of the current Elon LDO (see below), this setback is very important, as it provides the public spaces and green areas between buildings and streets, literally forming the “streetscape” zone as discussed in Chapter 2.

The following table shows current front yard building setbacks for the Elon and Burlington Zoning Districts.

Current Front Yard Setback Zoning (Elon LDO - Adopted 12/04; Amended 9/21; Burlington UDO – Last Updated 12/06/22)		
Urban Residential (UR) (Elon)	Public Institutional (PI) (Elon)	Light Industrial (LI) (Burlington)
10 ft min / 25 ft max	30 ft	40 ft*

\* - On corner lots of record, the street setback may be reduced by 50 percent on the long side lot.

It was noted by the Stakeholder Committee that, with most of the corridor planned for Public Institutional (PI) and owned by the University, collaboration between the Town and the University on future development plans should address most of the potential front yard setback concerns in the PI zoned areas.

Although the setbacks for the PI and LI zoned areas are sufficiently wide to provide the needed space for the amenities recommended for the corridor (30 and 40-ft, respectively), the minimum setback standard for the Urban Residential (UR) Zoning District (10 feet) may not be sufficient. Given the setback variation currently allowed in the UR zoning and the need for a consistent theme along the corridor, **it is recommended that the minimum front yard setbacks for UR development in the Overlay District be increased by 10-ft, such that a minimum of 20-ft front yard setback is required. It is also recommended that the maximum front yard setback in the UR zoned areas be increased to 30-ft, which would meet the minimum PI setback.**

### 7.2 Defining the Public Space of the Street (Current Elon LDO)

As the most prevalent public spaces in Elon, streets should be spatially defined by buildings. Proper alignment and delineation of the public street space occurs when the facades of adjacent buildings are aligned much like the walls forming a room. Buildings that make up the street edges are aligned in a disciplined manner. The defined space observes a certain ratio of height to width. Building articulation must take place primarily in the vertical plane of the façade. Appendages such as porches, balconies, and bay windows are encouraged to promote the transition between the public street and the private dwelling.



## Utilities

The current presence of above ground utilities (e.g., telephone poles carrying electrical and communications lines) in the sidewalk along portions of the existing corridor was identified as unattractive, inconsistent with FHWA and NCDOT guidance, and violates ADA requirements by making the sidewalk impassable for wheelchairs. Furthermore, this issue was recognized as in need of correction with the project by the Town and some Stakeholders.

According to the 2012 NCDOT Complete Street Design Manual, “when planning, designing and constructing sidewalks, planting strips, medians and other street features provided on complete streets, the design input team must allow for service access to underground and overhead utilities.” Placement of utilities in the design of the street side should therefore (according to this Manual) consider the following guidance:

- Longitudinal underground utility lines should be placed in a uniform alignment as close to the right of way line as practical, or within a planting strip or amenity zone.
- Consolidate utility poles and signage poles where possible. Remove redundant poles in retrofit situations.
- Whenever possible, utilities should be placed underground to preserve sidewalk capacity for pedestrians and allow for street trees and aesthetic treatments.
- When underground placement is not possible, consider alternative locations for utility poles including the back of the right of way or in the planting strip.”

If not placed underground, the DOT 2019 Complete Streets Policy would require new ones built within the corridor and placed “outside the Clear Zone”, or “a minimum of 12 feet from the face of the curb. And all utility poles that are placed closer than 12 feet shall be breakaway poles.”

**Placing utilities underground is therefore recommended for the corridor, as doing so will improve aesthetics as well as preserve sidewalk capacity for pedestrians and allow for street trees and aesthetic treatments.**



### 4.1.1. Roadway Design Standards

Public roadways are not built randomly. The portion of the corridor under control of the Town of Elon (between N. Williamson Avenue and N. Oak Street) is dictated by the Town's Street Design Standards, as contained in the Elon LDO (Adopted 12/04; Last Amended 9/21). The portion of the corridor under NCDOT control (west of N. Williamson Ave. and east of N. Oak St.) is controlled by NCDOT Roadway Design Standards, as explained on page 23.

**The recommended Roadway Design Standards for the Haggard Corridor Overlay Zoning District are identified in the final column of the adjacent table.** These recommendations are based on: feedback received from the Town, Stakeholders, the Public; the proposed design schematics shown in Chapter 3; and various FHWA and NCDOT roadway design guidance, as discussed in Chapter 2.

This list of recommended standards has two purposes:

- 1) To inform the final design and construction of the improvements when eventually funded by NCDOT in a future STIP.
- 2) To become the basis of a Haggard Overlay Zoning District, which will ONLY become mandatory for development that occurs after the Overlay District is adopted as part of the new LMO being prepared separately by the Town. These regulations may be implemented with some flexibility to accommodate existing conditions in the corridor when applied to new development prior to the corridor being reconstructed with the future STIP Project.

\* NCDOT Complete Streets is based on current Roadway Design Manual if listed; otherwise based on 2012 Complete Street Manual.

\*\* If overhead powerlines are not able to be placed underground, smaller than 40-ft tall trees should be planted in the Campus and Downtown Areas (portions of Phases 1 & 2)

Streetscape Element	Town of Elon Standards	NCDOT Complete Streets Standards*	Recommended Overlay District Standard
<b>Travel Lane Width</b>	13-feet (included as an engineering technical standard, not listed in LDO)	12-ft (may be reduced to 11-ft in urban areas)	Min. 11-ft
<b>Sidewalks</b>	Min. 5-ft, 8-ft for commercial, 12-ft for retail/activity centers	Minimum – 4-ft (resid.), 5-ft (commercial/school routes) Desirable – 5-ft (residential), 10-ft (commercial/school routes) Areas with heavy pedestrian traffic warrant wider widths	Min. 8-ft in Suburban Zone, 10-12-ft in Campus Zone, 12-ft+ in Phase 2 Area 2 (Historic Campus Area)
	Both sides of street	Both sides of street	Both sides of street (or MUP)
<b>Multi-Use Paths</b>	8-ft	Not Mentioned	Min. 12-ft
<b>Bike Lanes</b>	4-ft striped/dedicated	5-6 ft on-street striped	5-6-ft striped/dedicated on street
	Required on-street	14-ft shared lane / sharrow	Or 14-15-ft sharrow
<b>Green Zone / Sidewalk Buffer / Planting Strip</b>	2 ft 6 in (included as an engineering technical standard, (not listed in LDO) for standard residential street)	6-8 ft (8-ft preferred for street trees)	Min. 2-8-ft, 8-ft+ for trees
<b>Streetlights</b>	160-200 ft separation	not mentioned	Equally spaced. Light footprint must overlap on roadway. Use manuf. lumen specs/ratings for each light type.
<b>Pedestrian Lights</b>	not mentioned	Equally spaced, Recommended	Equally spaced. Light footprint must overlap on sidewalk. Use manuf. lumen specs/ratings for each light type.
<b>Pedestrian Crosswalks</b>	Min. 10-ft in width	no specifics	Min 10-ft in width; high visibility markings/signage
<b>Landscaping</b>	1 large mature tree / 40 ft (should shade sidewalk)	no specifics	Min of 1 large mature tree / 40 ft (should shade sidewalk) **

## 4.2. Study Recommendations (Listed in Order of Priority)

1) Work with BGMPO and NCDOT to prioritize the entire project (Phases 1-3) and receive approval for the project to be included in a future STIP, which will provide funding for traffic engineering, final design, environmental impact analysis, permitting and construction of the following recommended corridor improvements:

- a) Implement Campus Scale Improvements between N. Williamson Ave and N. Oak Ave:
- Shift Haggard Avenue centerline approximately 6 ft north from Manning Ave to N. O'Kelly Ave.
  - Design and construct buffered bike lane along historic wall on Elon University campus.
  - Realignment of N. Oak Ave intersection, potential roundabout to serve as a corridor gateway
  - Multimodal intersection improvements at N. Williamson Ave, N. O'Kelly Ave, and N. Antioch Ave.
  - Mid-block and side street pedestrian crossings with pedestrian refuge, plantings, pavement markings, materials changes, and signage.
  - Widen and fill in sidewalk gaps.
  - Bicycle access via a multi-use path or on-street bike lanes.
  - Planted medians where access and corridor width allows.
  - Street trees that vary in size, spacing and location
- b) Implement Suburban Highway Improvements from University Drive to Williamson Ave and from N. Oak Ave to NC 87:
- Reduce travel lanes from 3 to 2 where present.
  - Fill in sidewalk gaps to complete pedestrian network
  - Multimodal intersection improvements at Manning Ave, N. Oak Ave, and Lawrence St with potential roundabout at York Road.
  - Add planting area between the back of curb and sidewalk where feasible
  - Pedestrian crossings, including distinct crosswalks and/or pedestrian refuges within median

- Provide bicycle access via a multi-use path
  - Street trees that vary in size, spacing and location
- 2) Develop and adopt a Haggard Avenue Corridor Overlay District that considers the following recommended requirements for new development:
- Streetscape Standards as shown in Section 4.1.1
  - Front-yard Setbacks - Consider setting the minimum front yard setbacks for UR development in the Overlay District to be 20-ft min. and 30-ft max. to provide adequate room for streetscape amenities and provide a consistent theme along the corridor.
  - Underground Utilities - It is the goal of the future Haggard Avenue corridor that all streetscape utilities will be placed underground to improve aesthetics as well as preserve sidewalk capacity for pedestrians and allow for street trees and aesthetic treatments. As such, when the Town submits its request to BGMPO and NCDOT for funding the improvements discussed in this Plan, it will specifically call out the need to fund the undergrounding of utilities along the streetscape. Given that it may take several years for NCDOT to construct these roadway improvements, it is important that any new development that occurs in the intervening time provide the improvements discussed in this plan. Therefore, it is recommended that the Overlay District contain language that requires applications for new development on parcels fronting on Haggard Avenue to either provide for the relocation of streetscape utilities underground, or provide hardship reasoning / justification as to why the developer does not propose to do so.
  - Environmental Protection - Require all future new public roads, including the "EU Collector" road proposed by Elon University, to be located outside of environmentally sensitive areas to the maximum extent practicable.
  - Access Management - Restrict multiple driveway cuts on to East Haggard Avenue to the maximum extent possible.

- 3) Require that the Traffic Impact Analysis prepared by Elon University for the development of its 86 acre parcel to the east of the Danieley Center (which will soon be a requirement for all large developments as part of the new Elon LMO) include the following:
- Analysis of the "EU Collector" roadway and its intersection with Haggard Avenue as part of the development of the site. The Town prefers that the this collector be public to help divert traffic through the Campus area, but if the University proposes it to be private, which would allow closure on occasion, the TIA must also evaluate the impacts of this restriction on the transportation network. The TIA should evaluate all alternatives as to how well they reduce traffic and improve safety on network roadways.
  - Evaluation of the "EU Collector" as the primary means of access to the 86-acre development so that campus traffic is funneled to Haggard at one controlled location, with other access points for the development onto East Haggard Avenue restricted.
  - Evaluate alternative locations of the "EU Collector" to determine if it can feasibly provide "frontage" / primary access for infill / redevelopment of surrounding privately-owned parcels.
  - Analysis of capacity and turning movements at Manning Ave, Williamson Ave, Antioch Ave, and Lawrence St.
  - Evaluate the operation of proposed roundabouts at N. Oak Ave and York Rd.
- 4) Continue collaboration with Elon University on future long-range planning efforts and site development to address the elements discussed throughout this plan.