



Eastern Lincoln MOBILITY STUDY

FINAL REPORT

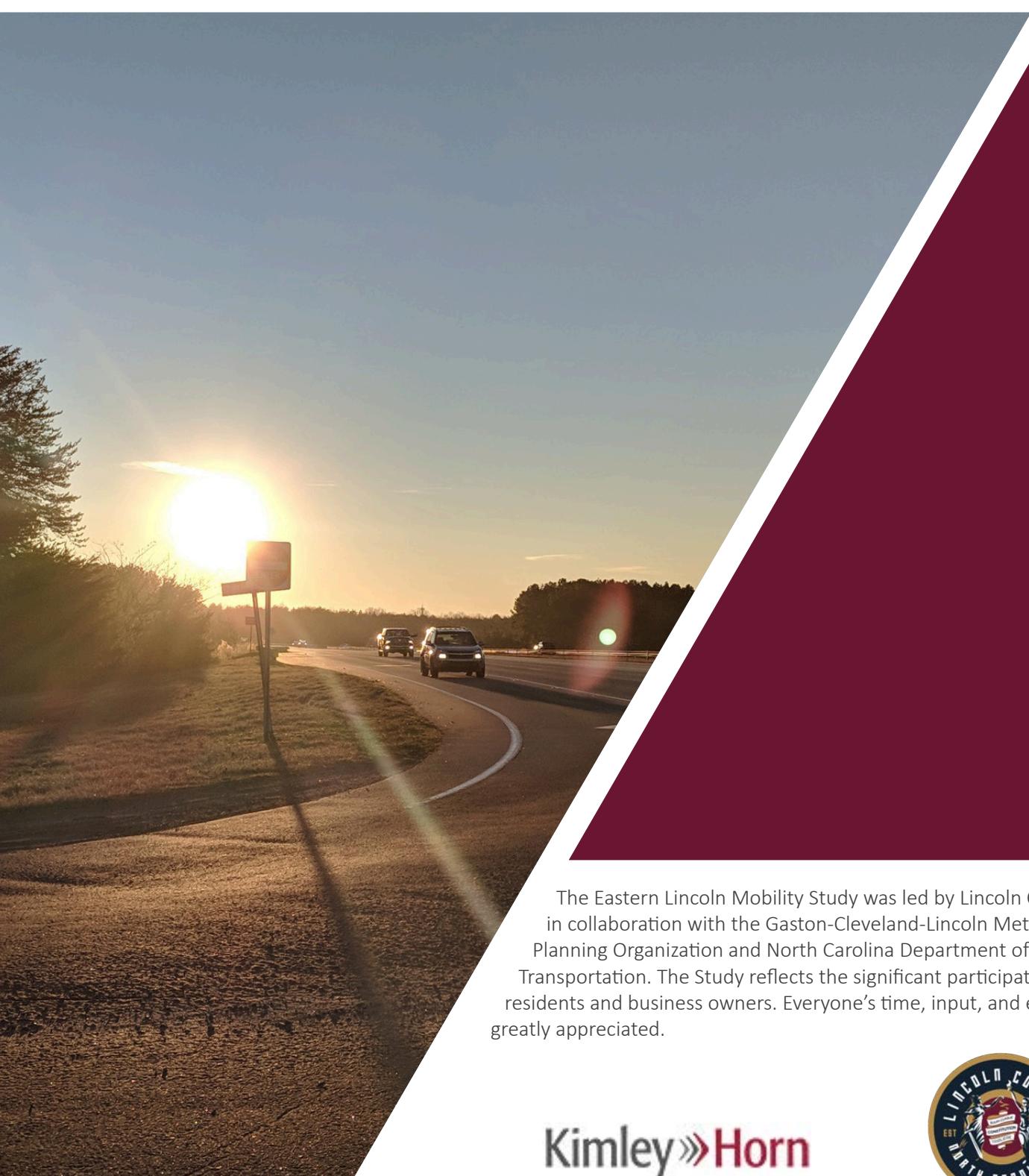
July 2020



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ACKNOWLEDGMENTS



The Eastern Lincoln Mobility Study was led by Lincoln County in collaboration with the Gaston-Cleveland-Lincoln Metropolitan Planning Organization and North Carolina Department of Transportation. The Study reflects the significant participation of residents and business owners. Everyone's time, input, and energy are greatly appreciated.

Kimley»Horn





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INTRODUCTION



Project Overview + Purpose

The Eastern Lincoln Mobility Study is an important step in making the area a better place to live, work, and relax through enhanced mobility. The Study is an important tool for Lincoln County to clearly state its transportation needs, and similar efforts have helped other communities position themselves for more funding opportunities. The Study includes short- and long-term recommendations as well as policy and programmatic changes that will improve mobility in eastern Lincoln County.

KEY CONSIDERATIONS

FUNDING FOR RECOMMENDATIONS

From planning and design to right-of-way acquisition and construction, it can take years for larger transportation projects to be funded. An important first step is showing local priorities and community support. The Eastern Lincoln Mobility Study is designed to accomplish that. It's also important that smaller projects be identified so local funds can be set aside or private dollars can be requested during the development process.

That's why it's important that the process included representatives from the County, NCDOT, and the Gaston-Cleveland-Lincoln Metropolitan Planning Organization, as well as a variety of local stakeholders.

DATA COLLECTION

Traffic data was collected for 29 intersections, mostly along NC 16 Business, NC 16 Bypass, NC 73, and North Little Egypt Road/St. James Church Road. A traffic model was created to analyze the data for existing and future year conditions.

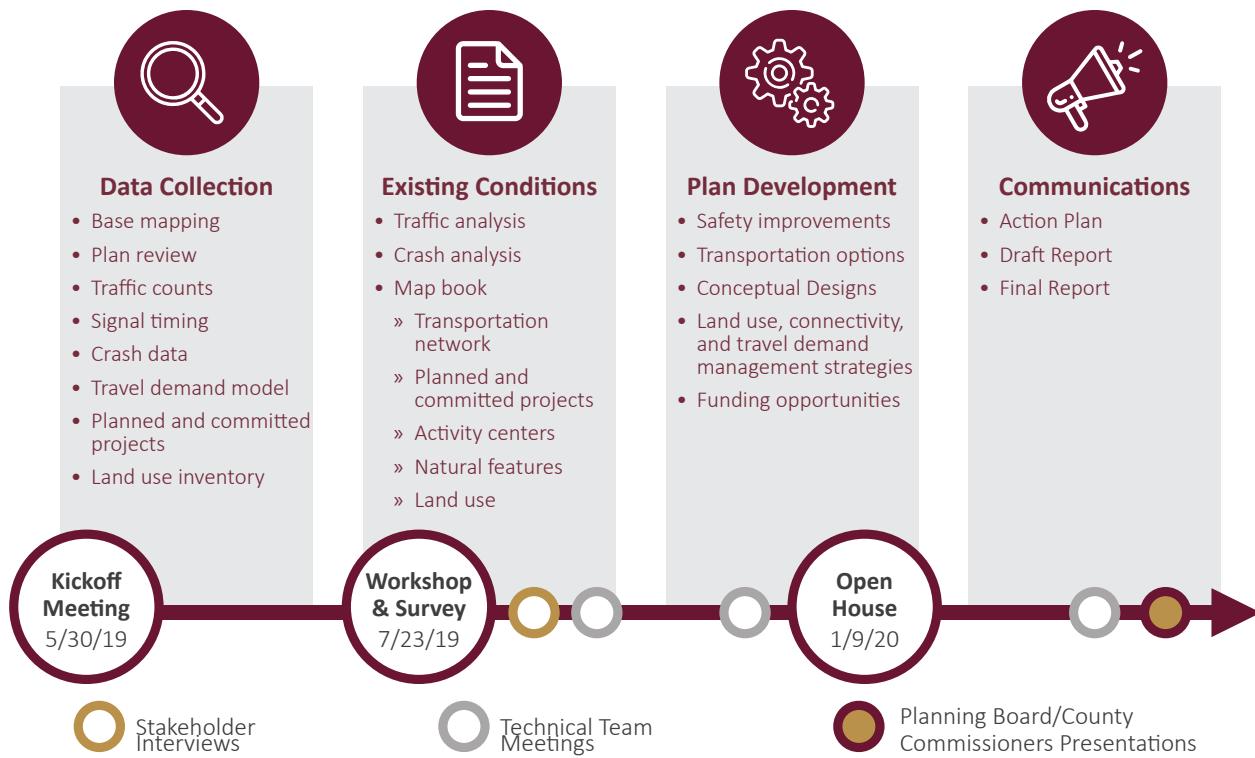
PROJECT PIPELINE

Transportation projects have been in development prior to the start of this effort, including a new interchange on the NC 16 Bypass and improvements to NC 16 Business and NC 73. The study takes into consideration projects that have been approved and are in various stages of design and implementation.

Lincoln County launched the Eastern Lincoln Mobility Study in summer 2019 to better understand transportation needs—today and in the future.

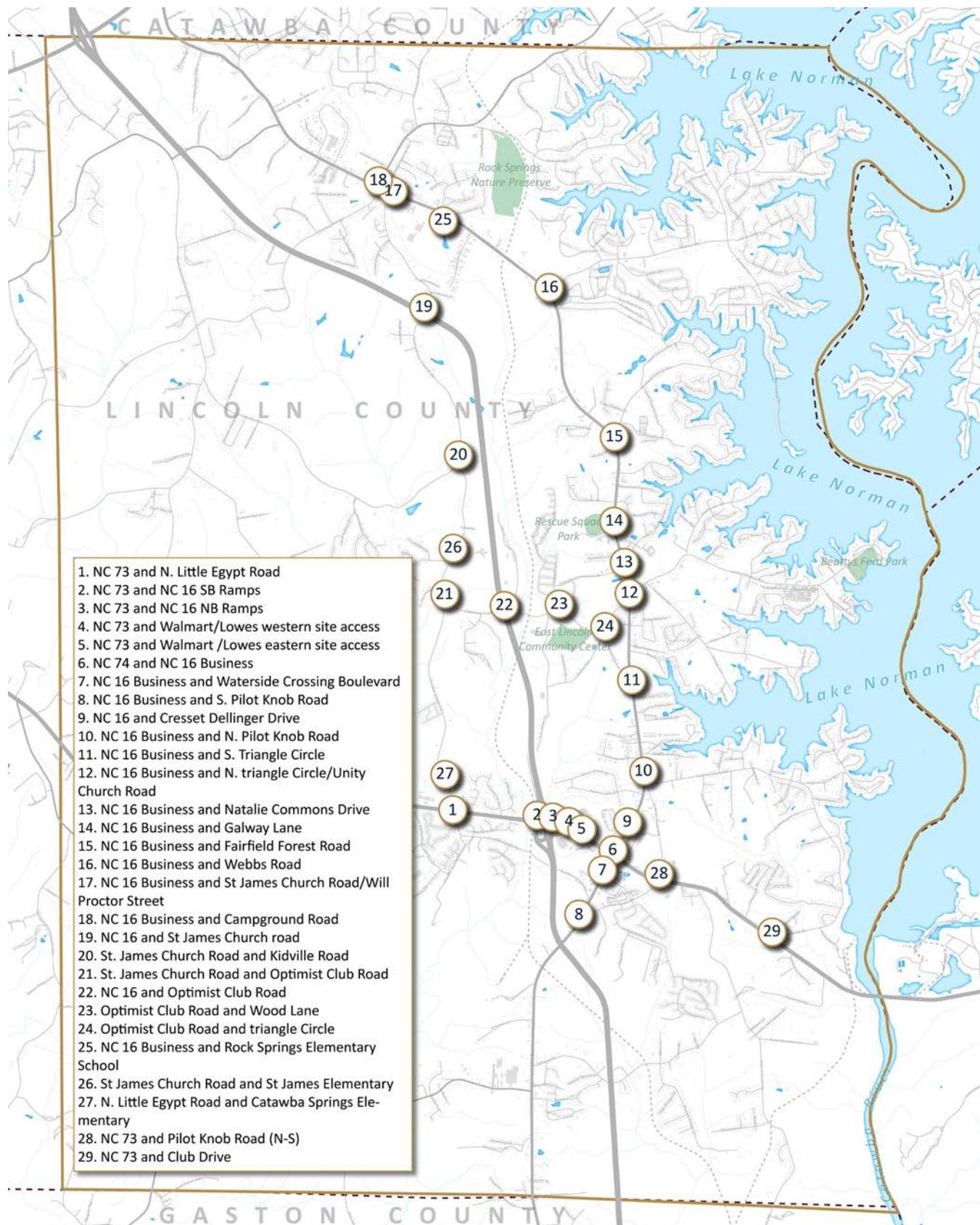
THE PROCESS

The Study process included four steps. The steps focused on the collection of key foundational data and information (Data Collection), the assemblage and analysis of that data (Existing Conditions), the development of the recommendations (Plan Development), and the reporting and prioritization of those recommendations (Communications). Public engagement touch points, Technical Team engagement, and communication with stakeholders occurred throughout the process.



Study Area

The study area includes NC 16, NC 16 Business, North Little Egypt Road/Saint James Church Road, and NC 73. The study area includes 29 intersections that have been identified for detailed analysis.



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STUDY AREA CONDITIONS



Chapter Overview

This chapter highlights the development of the critical conditions and characteristics that are vital to creating a foundation for future recommendations. The process focused on the environment, current and future development, existing future traffic analysis, and safety.

This chapter consists of six critical elements that help to define the study area conditions:

NATURAL RESOURCES

GROWTH AND DEVELOPMENT

EXISTING TRAFFIC

FUNDED IMPROVEMENTS

FUTURE TRAFFIC

CRASH ANALYSIS

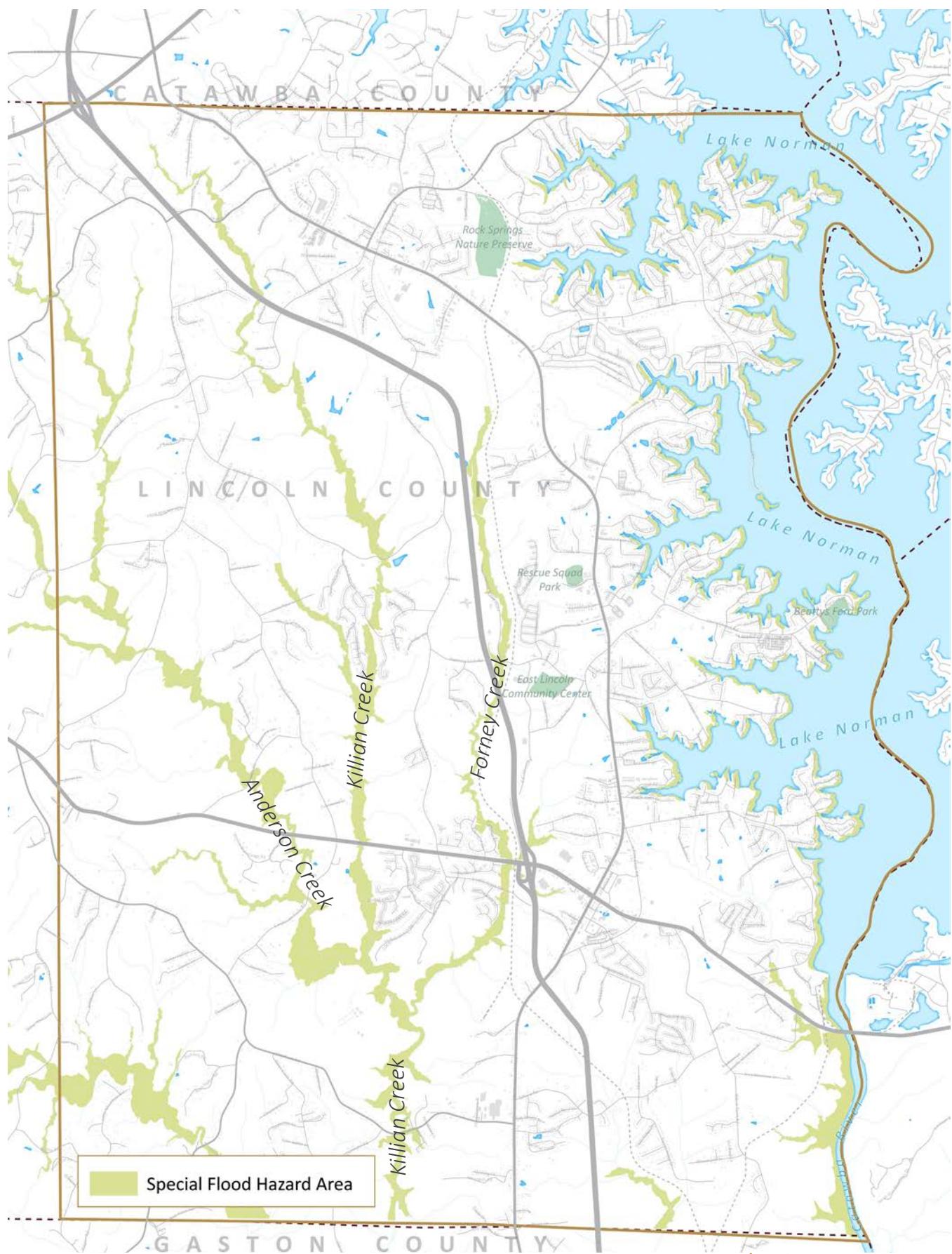


Natural Resources

The natural environment in eastern Lincoln County is dominated by two key features: Lake Norman on the east, and three major creeks. The Lake Norman waterfront is home to primarily single-family residential developments, and the peninsulas created by the shoreline do create some challenges for mobility due to bottle-necking. Three major creeks and respective floodplains run north-south (flowing south) through the study area, Forney Creek to the east, Killian Creek through the center, and Anderson Creek to the west. All three creeks branch off from the larger segment of Killian Creek to the south.



NATURAL RESOURCES MAP



Growth and Development

Eastern Lincoln County continues to be an attractive place for newcomers. The traffic model takes into account recent and upcoming development when forecasting future traffic. The map on the adjacent page shows existing residential subdivisions, approved subdivisions, and submitted plans in the study area.



16.8%
POPULATION GROWTH
FROM 2010–2018

57% 
INCREASE IN RETAIL TRADE JOBS
BETWEEN 2011 AND 2015

40%
OF HOMES
BUILT SINCE 2000 

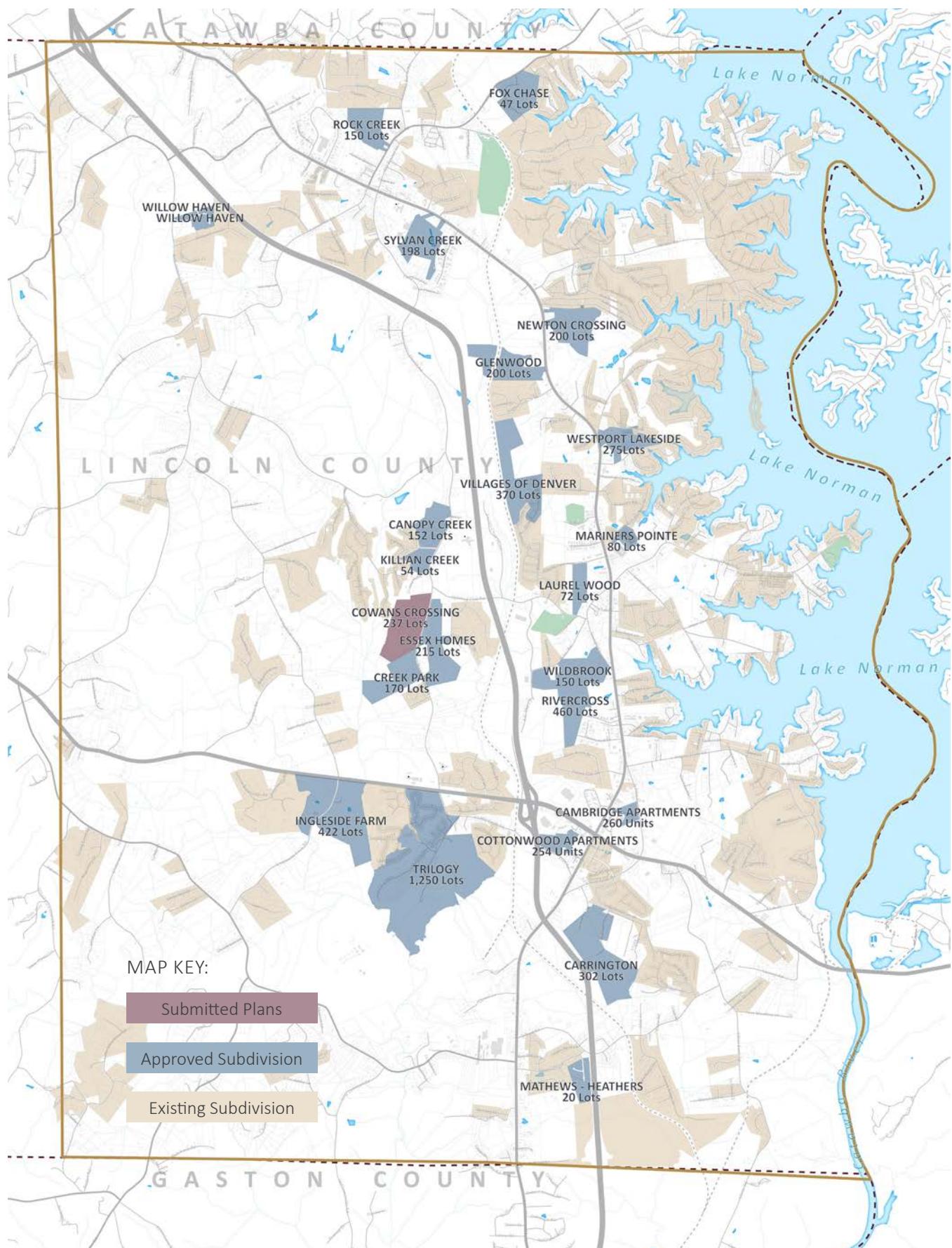


13.6%
INCREASE IN
MEDIAN HOME VALUE
THROUGH 2023

**\$500K
OR MORE** 
VALUE OF 1 OUT OF 3 HOMES



GROWTH AND DEVELOPMENT MAP



Existing Traffic

The basic data used to analyze the performance of both signalized and unsignalized intersections are turning movement counts. These counts show where traffic travels once it enters the intersection. For example: does traffic traveling north on NC 16 Business continue through the intersection or turn on Unity Church Road? The study area consists of 29 intersections and considered operations for the morning, afternoon, and Saturday peak hour periods. Data was collected on Thursday, May 16, 2019 and Saturday, May 18, 2019.

INTERSECTION LEVEL OF SERVICE

Intersection level of service (LOS) compares travel demand to an intersection's capacity. Designations range from LOS A (the best operating conditions) to LOS F (the worst operating conditions).

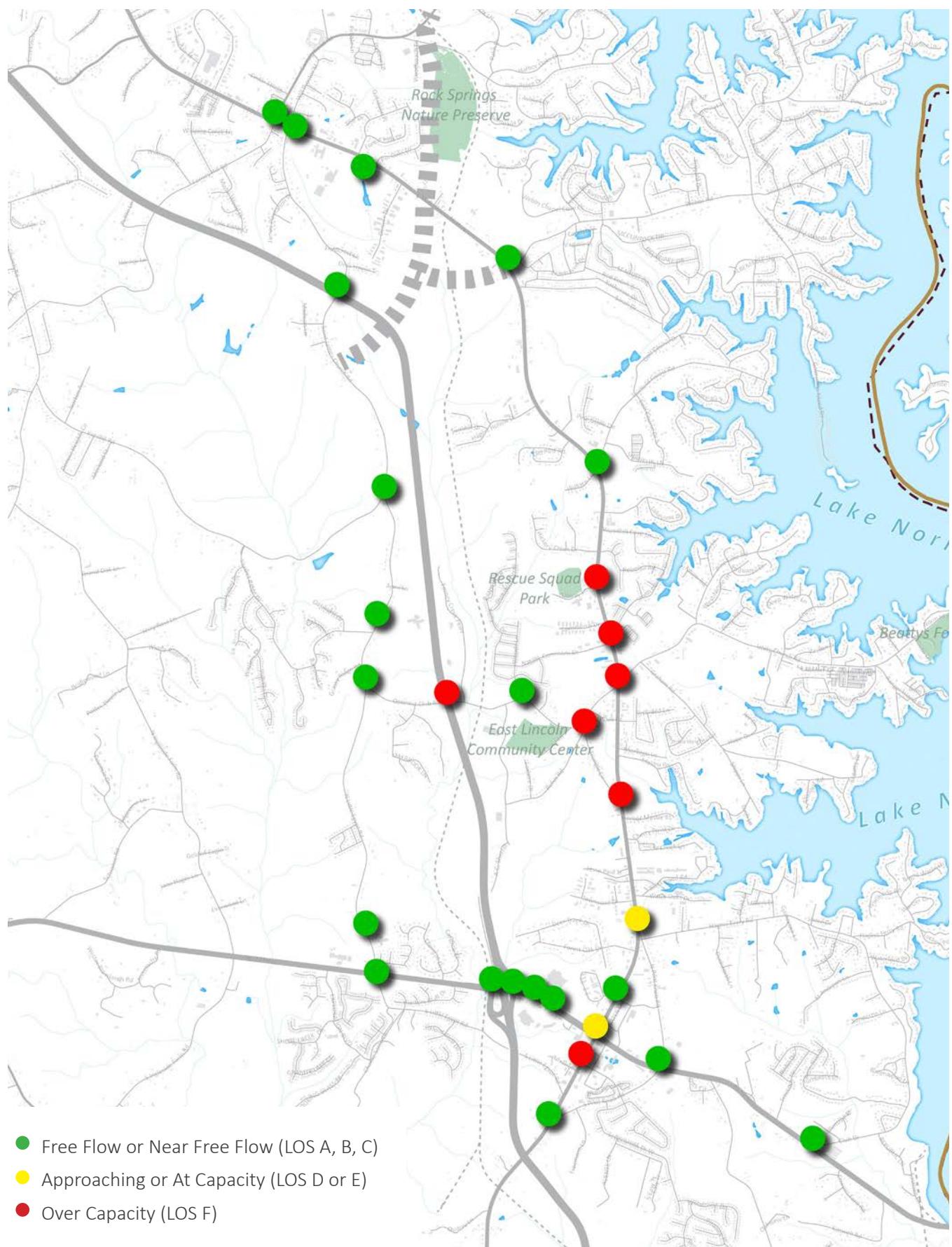
The map on the adjacent page shows how the intersections performed in 2019.

2019 FAILING INTERSECTIONS FOR LOS:

- Optimist Club Road and Triangle Circle
- NC 16 and Optimist Club Road
- NC 16 Business and Triangle Circle
- NC 16 Business and Unity Church Road
- NC 16 Business and Natalie Commons Drive
- NC 16 Business and Galway Lane
- NC 16 Business and Waterside Crossing Boulevard



2019 INTERSECTION LEVEL OF SERVICE (LOS) MAP



Funded Improvements

There are several existing and funded projects already under development in the study area that will have impactful change on mobility in east Lincoln County. These projects are funded through the Gaston-Cleveland-Lincoln Metropolitan Planning Organization's (GCLMPO) Transportation Improvement Program (TIP). The TIP identifies funded projects from larger and more high-level visioning efforts like the Comprehensive Transportation Plan (CTP) and the Metropolitan Transportation Plan (MTP) to allocate funding towards.

The current projects in the TIP are a collection of road widenings, interchange projects, intersections improvements, and roadway realignments. These projects are shown on the map on the adjacent page.

ROAD WIDENINGS

NC 73 WIDENING (R-5721A) – NC 16 TO BEATTIES FORD ROAD

ROW 2021 / *Const 2027*

NC 73 WIDENING (U-6139) – N INGLESIDE FARM RD TO NC 16

ROW 2028 / *Const unfunded*

NC 16 BUSINESS WIDENING (U-6144) – WEBBS RD TO FAIRFIELD FOREST ROAD

ROW 2029 / *Const unfunded*

NC 150 WIDENING (R-2307A) – NC 16 TO GREENWOOD ROAD

ROW 2025 / *Const 2028*

INTERCHANGE PROJECTS

NC 16 BYPASS AT OPTIMIST CLUB ROAD INTERCHANGE (U-6134)

ROW 2021 / *Const 2024*

INTERSECTION IMPROVEMENTS

NC 16 BUSINESS AT UNITY CHURCH ROAD INTERSECTION IMPROVEMENTS (R-5712)

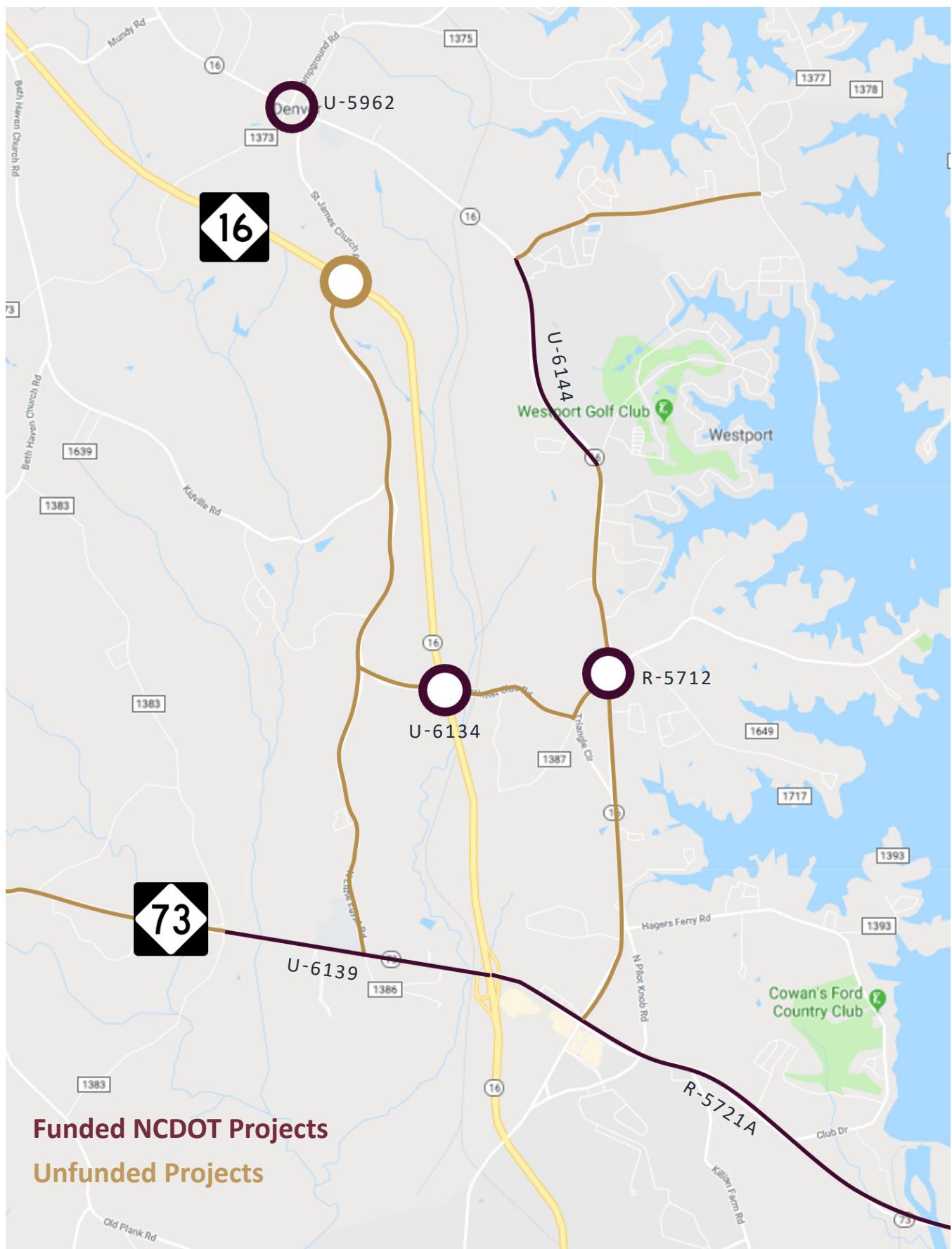
ROW 2020 / *Const 2021*

ROADWAY REALIGNMENTS

NC 16 BUSINESS AT CAMPGROUND ROAD/WILL PROCTOR ROAD REALIGNMENT (U-5962)

ROW 2021 / *Const 2026*

FUNDDED IMPROVEMENTS MAP

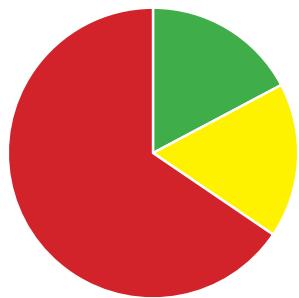


Future Traffic

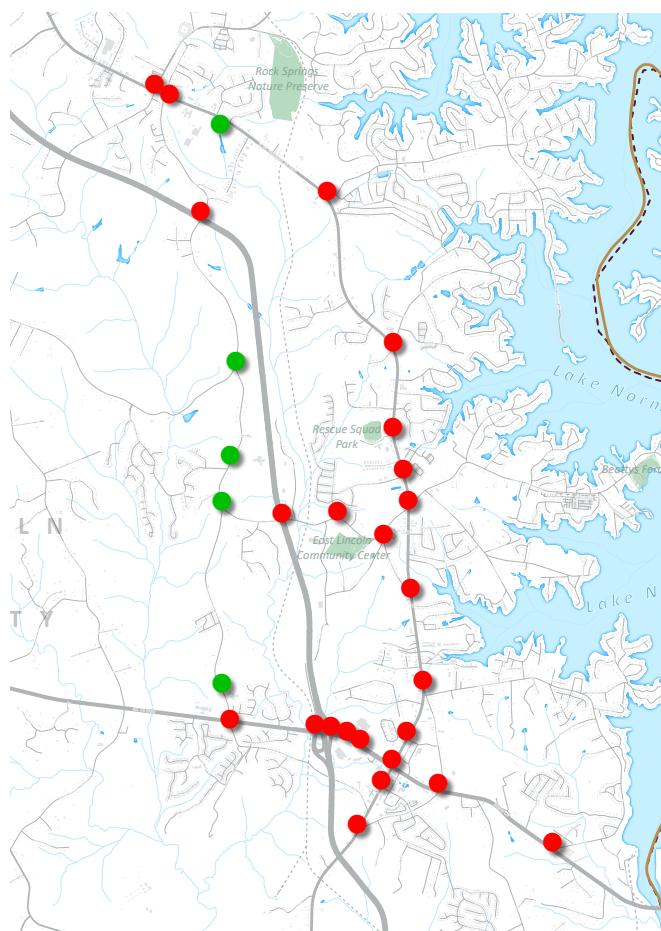
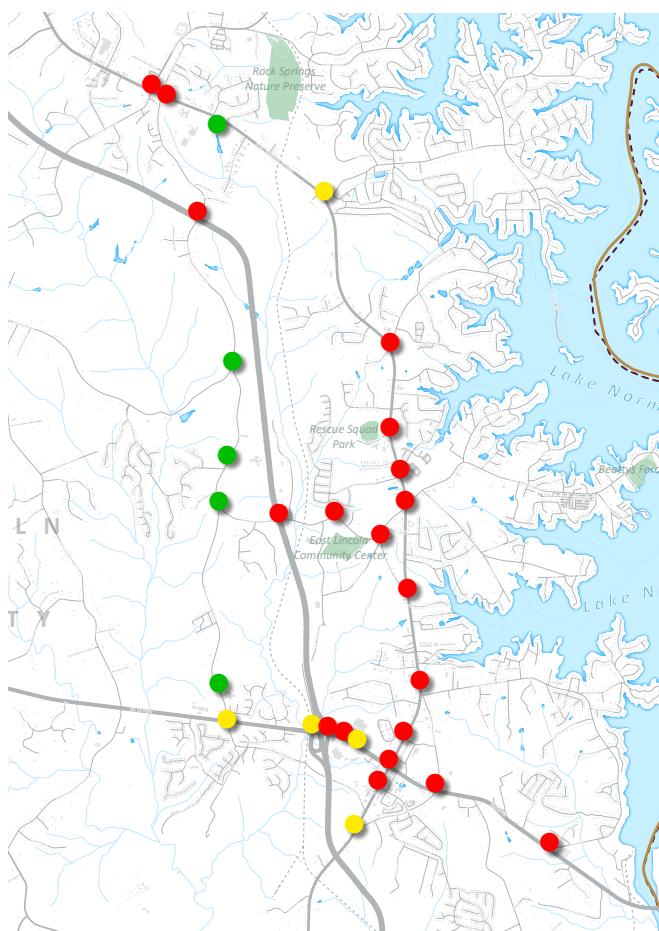
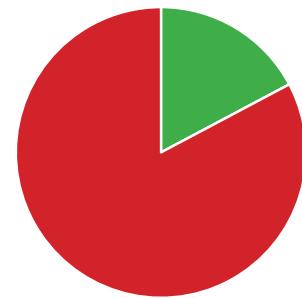
In addition to the baseline traffic data shown earlier in this chapter, future traffic was forecasted and analyzed for future years 2025 and 2045 under varying circumstances. The maps below and on the adjacent page show the results under the following two conditions:

- No transportation projects are constructed
- Only transportation projects previously identified by NCDOT STIP process are constructed

2025 LEVEL OF SERVICE
NO PROJECTS ARE CONSTRUCTED

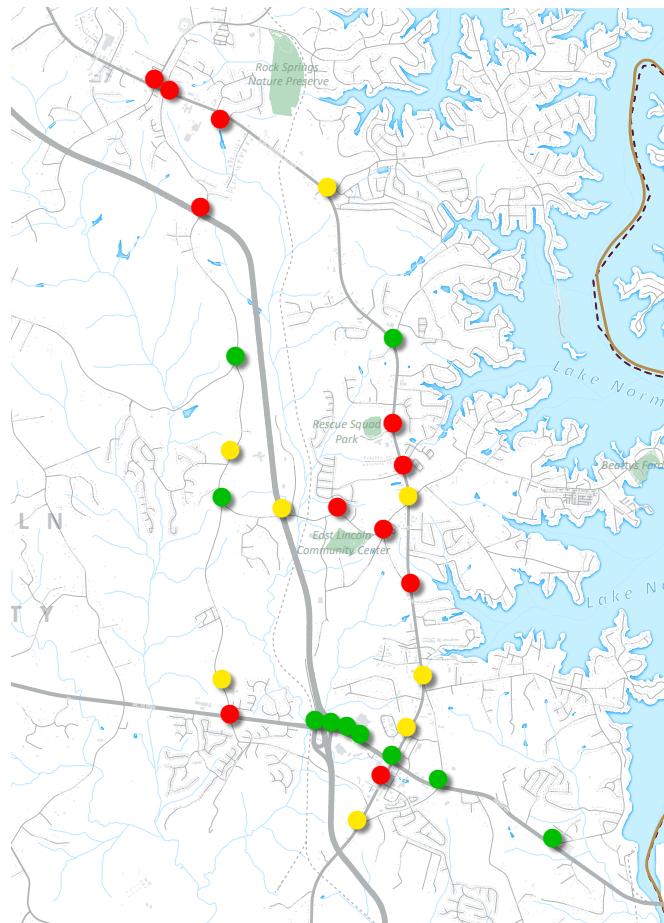
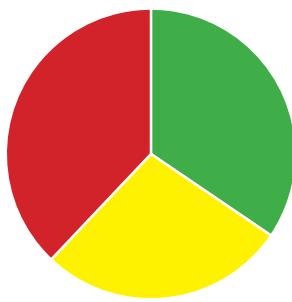


2045 LEVEL OF SERVICE
NO PROJECTS ARE CONSTRUCTED

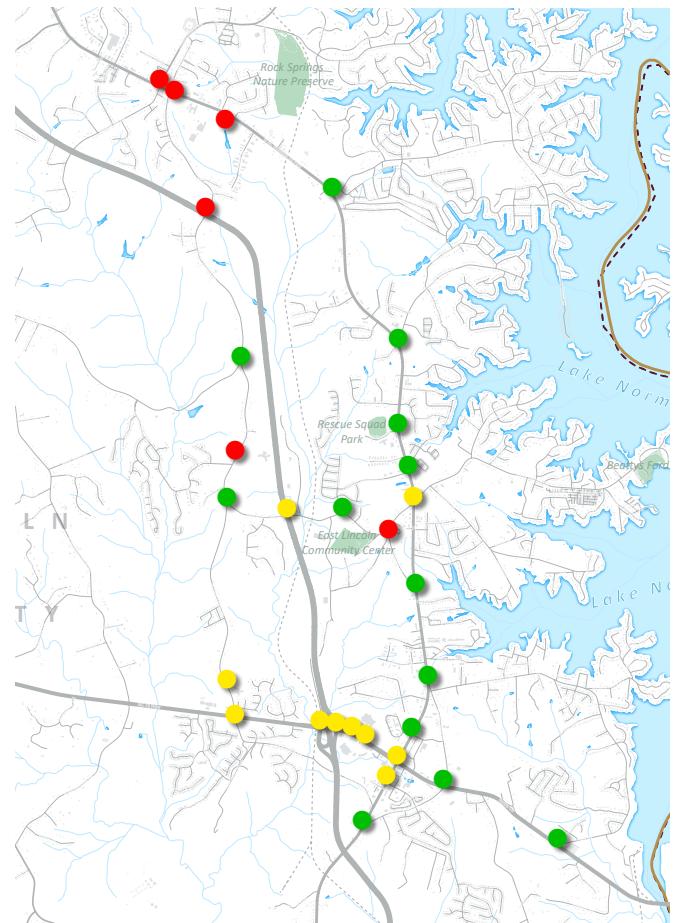
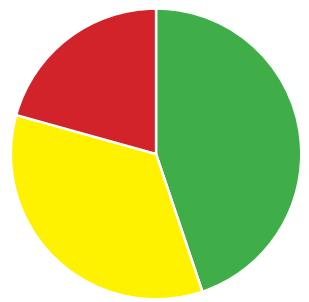


- Free Flow or Near Free Flow (LOS A, B, C)
- Approaching or At Capacity (LOS D or E)
- Over Capacity (LOS F)

2025 LEVEL OF SERVICE
WITH NCDOT IMPROVEMENTS



2045 LEVEL OF SERVICE
WITH NCDOT IMPROVEMENTS



- Free Flow or Near Free Flow (LOS A, B, C)
- Approaching or At Capacity (LOS D or E)
- Over Capacity (LOS F)

Crash Analysis

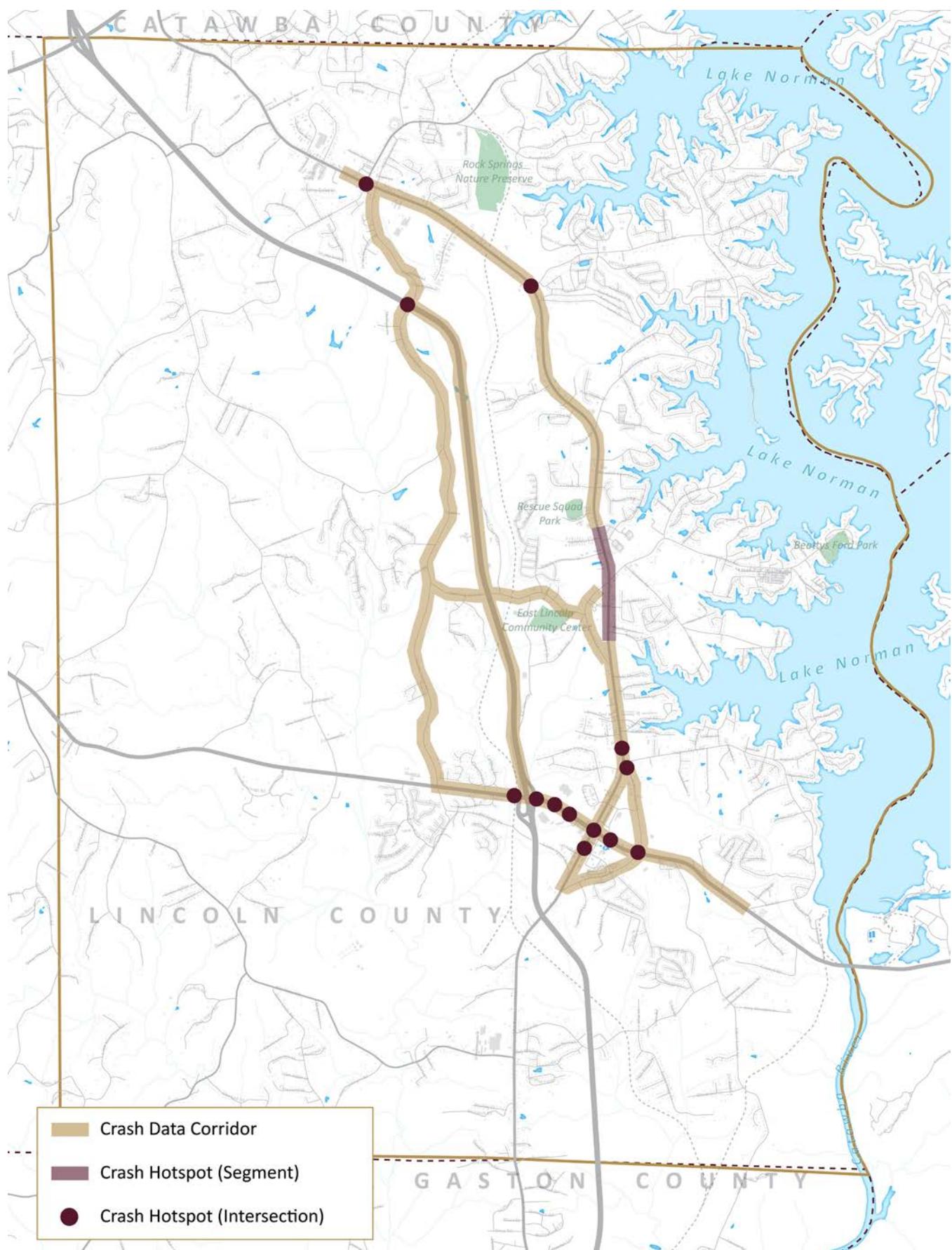
Three-year crash data (from June 1, 2016 to May 30, 2019) was collected for the Eastern Lincoln Mobility Study to capture reported crashes on key roads in the Study Area (shown on the map on the adjacent page). No fatal crashes were reported along the study corridors during the three-year reporting period.

CRASH HOTSPOT LOCATIONS

- NC 73 at NC 16 Southbound and Northbound Ramps
- NC 73 at Lowe's and Walmart Driveway Entrance (both entrances)
- NC 73 at NC 16 Business
- NC 73 at Cross Center Road/Circle K full access driveway entrance
- NC 73 at Pilot Knob Road
- NC 16 Business at Cross Drive
- NC 16 Business between Triad Lane and Commerce Drive
- NC 16 Business at Webb Road
- NC 16 Business at Will Proctor Street/St. James Church Road
- Pilot Knob Road at Hagers Ferry Road
- Pilot Knob Road approaching NC 16 Business [north of Hagers Ferry Road]
- Optimist Club Road at Woods Lane
- NC 16 at Optimist Club Road
- NC 16 at St. James Church Road



CRASH HOTSPOT MAP



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COMMUNITY CONSIDERATIONS



Engagement Overview

The Eastern Lincoln Mobility Study included extensive community engagement through meetings, workshops, and an online survey. This multi-layered engagement strategy tapped into the local knowledge of stakeholders, local officials, and the public. What we heard during these activities was critical to understanding growth and the demands that growth is placing on the study area's critical corridors and important intersections.

ENGAGEMENT OPPORTUNITIES

The process featured up to four major opportunities for the public to engage with the Eastern Lincoln Mobility Study Process. Those four events are highlighted below, and this chapter goes into extensive detail about the results from each engagement opportunity.



KEY ENGAGEMENT TAKEAWAYS

- Many residents are concerned about the amount of growth in the study area and how infrastructure can keep up.
- Traffic and safety were the two most dominant themes. Traffic along NC 16 Business and NC 73 was frequently noted. The most frequently identified safety concerns were the u-turns on the bypass and the intersection of NC 16 Business, N Pilot Knob Rd, and Hagers Ferry Rd.
- People recognize the roads and intersections cannot handle traffic during the busiest times of the day and week.
- More connectivity would be helpful.
- There's a need to ensure the transportation network has a positive influence on economic development and quality of life.
- People want to use the bypass but limited connectivity and the current u-turn configuration limits the practicality. They also agreed that traffic on NC 16 Business would be improved if more people could use the bypass.
- People indicated they would walk or bike more if it was safer and/or easier.
- Participants desired a mix of smaller and larger projects.

Considerations

The project recommendations for the plan are evaluated in part based on the eight considerations introduced at the first workshop. These considerations are shown below in priority ordered as determined by the public engagement.



TRAFFIC

Traffic often serves as a daily reminder of growth and changes that have occurred over a period of time. While we can't build enough roads to make traffic issues go away, we can make strategic decisions in which transportation projects we prioritize.



SAFETY

Crashes can occur at any time and at any location. Reducing how often crashes happen and how severe crashes are when they do occur is important during planning and design.



CONNECTIVITY

Improving connectivity of the road network helps relieve some of the pressure on the most heavily traveled routes. It does so by giving people options in the routes they choose to use.



LAND USE

The transportation system greatly influences development patterns by dictating the most convenient routes of travel. Likewise, the context of surrounding development can affect how easy it is to travel through an area.



ECONOMIC DEVELOPMENT

The presence of a safe and efficient transportation system is often cited as an important factor when individuals and companies decide to invest in an area. Transportation projects both big and small can make a difference.



BYPASS USE

When it was constructed a few years ago, the NC 16 Bypass helped improve traffic and safety conditions in the area. Could more be done to increase use of the Bypass to help routes such as NC 16 Business?



COST AND IMPLEMENTATION

How much a project will cost and how easily it can be implemented varies based on a lot of different factors. Some projects are lower cost but still help improve conditions, while other projects are expensive but have a more substantial impact on the transportation system.



WALKING AND BIKING

People walk or bike for a variety of reasons. For some, it's because they enjoy it. For others, it's because they don't have other options. Transportation projects of all sizes can improve conditions for pedestrians and bicyclists.

Kickoff Meeting

The Kickoff Meeting allowed the public to learn more about the project team, study area, and study process. Attendees completed worksheets designed to better understand expectations for the study, which topics should be emphasized, and who should join the conversation. A facilitated large-group discussion also was held. Feedback collected at the Kickoff Meeting helped shape the format of the Community Workshop.

MEETING INFORMATION

Date: **May 30, 2019**
 Location: **East Lincoln Community Center**
 Time: **7:00 p.m. to 8:30 p.m.**
 Participants: **50+**

OBJECTIVES

- Introduce the project team and committee members
- Provide background information on the study process
- Learn more about the study area (corridors and intersections)
- Discuss community engagement goals and activities
- Establish expectations for the study
- Begin to identify challenges and opportunities

MEETING SUMMARY

WHAT ARE YOUR EXPECTATIONS FOR THIS STUDY?

The discussion began by asking participants to write three expectations for the Eastern Lincoln Mobility Study. In answering this question, many participants identified specific problem areas and potential solutions that were be considered during the study. The following list summarizes key themes from the 132 comments received.

- To understand current and projected traffic in the area.
- To improve traffic flow and accommodate future growth.
- To balance transportation needs with future growth.
- To improve traffic light timing.
- To create safe roads for everyone.
- To identify short-term improvements that fit in with long-term projects.
- To create a realistic, prioritized list of projects.
- To consider all possible sources of funding and determine who is responsible.
- To increase the number of projects funded and constructed.
- To communicate the transportation needs of eastern Lincoln County, especially to NCDOT.
- To be listened to.



HOW IMPORTANT ARE THE FOLLOWING TOPICS AS WE CONSIDER TRADEOFFS AND MAKE PROJECT DECISIONS?

As a first step in the prioritization process, participants were asked to weigh in on the considerations shown in the table below. Participants rated each consideration on a scale of 1 to 5, with 5 being very important. The table shows the average rating for each of the 10 considerations as well as a write-in option that was used by four participants.

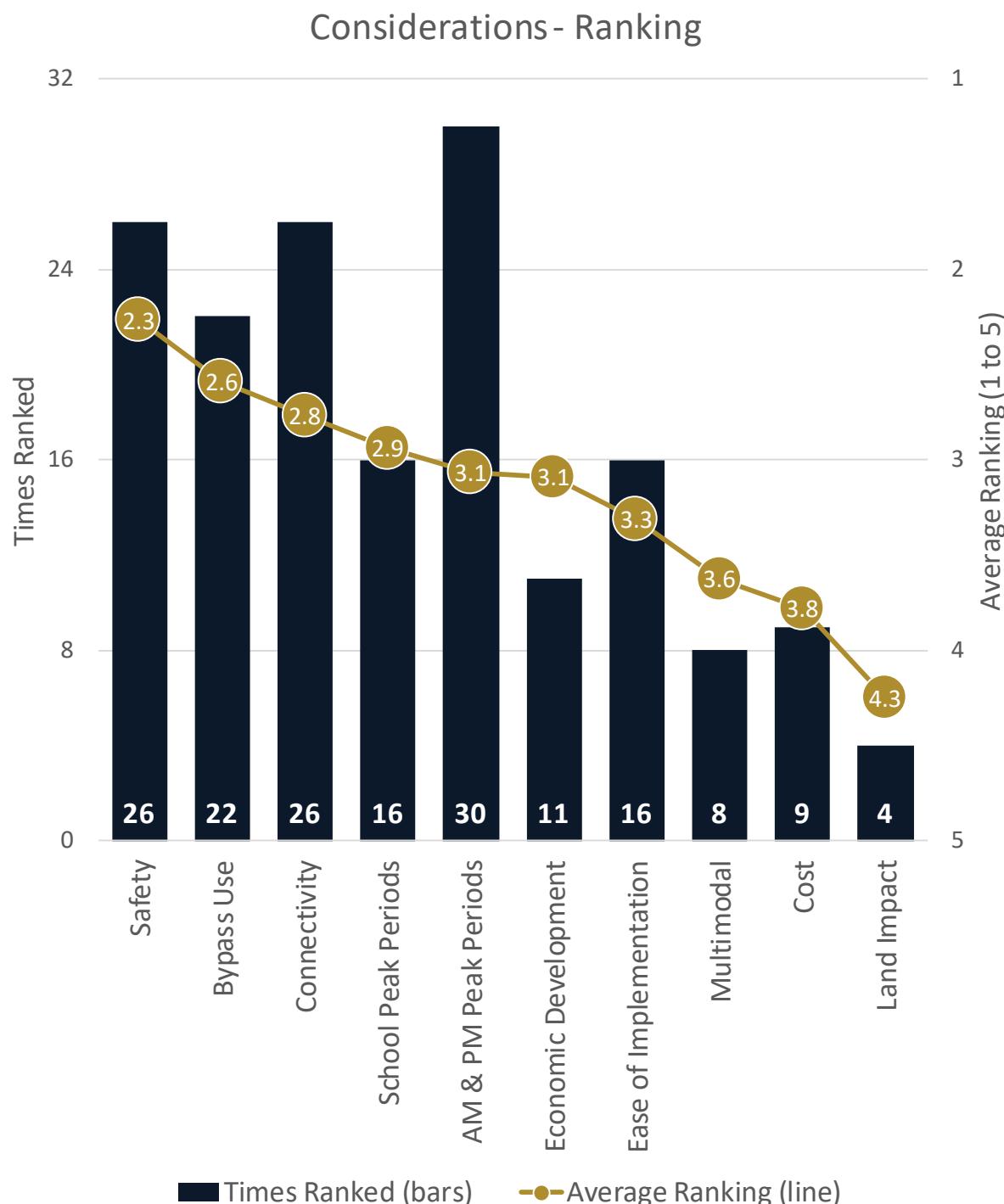
Average Ratings

Considerations	Average Rating
AM & PM PEAK PERIODS How well does the project improve travel times during traditional (AM & PM) peak periods?	4.5
CONNECTIVITY How well does the project increase overall connectivity and improve route choice?	4.4
SAFETY How well does the project improve safety?	4.3
BYPASS USE How well does the project increase use of the NC 16 Bypass?	4.1
EASE OF IMPLEMENTATION How easily and quickly can the project be implemented?	4.1
SCHOOL PEAK PERIODS How well does the project improve travel times during school drop off and pick up?	3.9
WRITE-IN When given the option to write-in a new option, a few participants added protecting greenspace, addressing bottlenecks, and making progress.	3.8
ECONOMIC DEVELOPMENT How likely will the project enhance economic development potential?	3.4
COST How inexpensive is the project?	3.1
LAND IMPACT How well does the project minimize impact to private property?	2.9
MULTIMODAL How well does the project improve walking and biking conditions?	2.8

Participants placed more weight on addressing the peak travel times in the morning and afternoon, improving connectivity, and addressing safety concerns.

RANKINGS – FREQUENCY AND INTENSITY

It's natural for people to consider each item to be very important. To better understand what was most important, participants were asked to rank their top five considerations. The graph below shows both the frequency (how often was an item ranked in the top 5) and intensity (what was each item's average ranking). A total of 49 responses were received. Safety, increasing the use of the bypass, and improving connectivity ranked the highest on average. It's interesting to note the gap between frequency and intensity for School Peak Periods. This gap shows that while not everyone thought that addressing traffic backups during school drop off and pick up times was important, those that did ranked it very high.





Workshop 1

The meeting was an interactive workshop organized in a variety of stations. The workshop included an information wall with background information and several activity stations to collect input. The workshop focused on eight transportation considerations that were revised based on an initial list presented at the May 30, 2019 project kickoff meeting. Participants were asked to rank the considerations, then respond to a series of statements about each topic. A mapping station with a large-scale plot was a centerpiece of the workshop. Participants also were informed of the online survey that launched the day of the workshop.

MEETING INFORMATION

Date: **July 23, 2019**
 Location: **East Lincoln Community Center**
 Time: **7:00 p.m. to 8:30 p.m.**
 Participants: **54 (signed in)**

OBJECTIVES

- Collect community input on existing conditions
- Educate the public on the challenges and constraints facing potential transportation improvements
- Gather feedback on transportation considerations

ACTIVITY STATIONS

- Information Wall
- One Word
- Considerations
- Statements
- Mapping
- Traffic Analysis

ACTIVITIES

ONE WORD

As they signed in, participants were given a card and asked to write one word that describes eastern Lincoln County today and one word that describes their ideal vision for eastern Lincoln County in the future. The following responses were received.

Today

overgrown
growing rampant
livable
 behind
crowded fragmented
quagmire
overcrowded messy
chaotic
struggling commuters
 pandemonium

Ideal Vision

mobility ahead
synchronization
tranquil
 flowing livable controlled
pleasant
walkable slower
orderly
fixed
sustained

CONSIDERATIONS

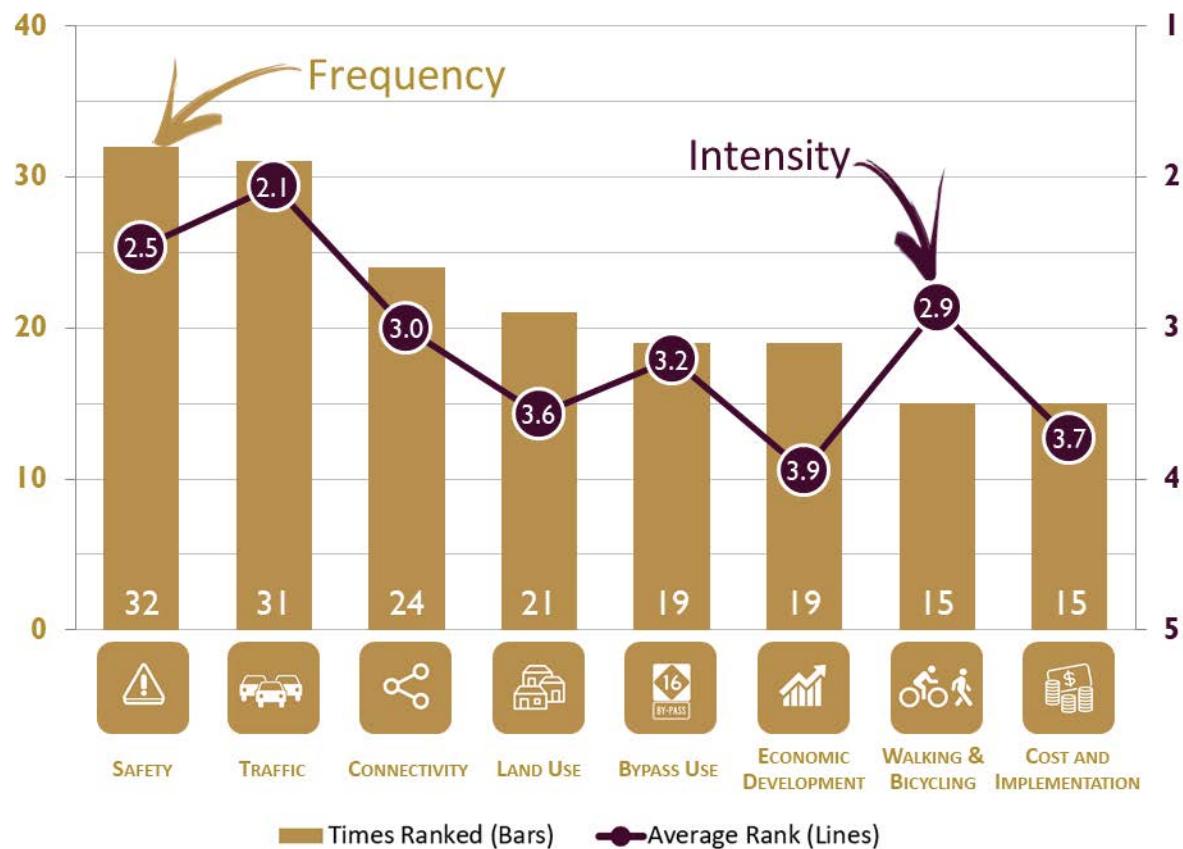
At the workshop, participants were asked to rank the eight considerations (first introduced at the Kickoff Meeting) in order of importance. The eight considerations are shown below in order of average ranking.

Notes:

- While SAFETY and TRAFFIC were ranked in the top five a similar number of times, the average ranking for TRAFFIC was higher. SAFETY and TRAFFIC were also ranked first and second on the online survey, though TRAFFIC was ranked in the top five more often.
- The four most frequently ranked categories were the same at the workshop and on the online survey.
- The higher average ranking for BYPASS USE shows that those that ranked it typically ranked it higher on average. A similar trend was observed through the online survey.
- The gap between the frequency (times ranked) and intensity (average ranking) for WALKING & BIKING shows that while not everyone sees it as an important consideration, those that do think it's very important.

1		SAFETY Ranking this category as a priority would put more emphasis on projects that improve safety, especially at those locations that have a history of frequent and/or severe crashes.
2		TRAFFIC Ranking this category as a priority would put more emphasis on projects that do the most to improve travel times during the busiest times of the week, including the morning and afternoon peak periods.
3		CONNECTIVITY Ranking this category as a priority would put more emphasis on projects that increase overall connectivity and improve route choice.
4		LAND USE CONSIDERATIONS Ranking this category as a priority would put more emphasis on projects that balance the context surrounding land uses with transportation needs.
5		BYPASS USE Ranking this category as a priority would put more emphasis on projects that seek to increase use of the Bypass.
6		ECONOMIC DEVELOPMENT Ranking this category as a priority would put more emphasis on how likely the project would help sustain economic activity or enhance economic development potential.
7		WALKING & BIKING Ranking this category as a priority would put more emphasis on projects make it safer and easier to walk or ride a bicycle, even for short distances.
8		COST AND IMPLEMENTATION Ranking this category as a priority would put more emphasis on the cost of a project and how easily it can be constructed.

CONSIDERATIONS - RANKING



STATEMENTS

To better understand issues and opportunities related to the Considerations, participants were presented with three statements for each consideration and used dots to indicate how much they agreed with each statement. The following tables show the results of this activity. The categories are ordered based on Considerations activity results.



Strongly Disagree



Disagree



Neutral



Agree



Strongly Agree

Safety

Crashes can occur at any time and at any location. Reducing how often crashes happen and how severe crashes are when they do occur is important during planning and design.

Most of the safety concerns in the area are related to the amount of traffic on the road.



Most of the safety concerns in the area are related to the current configuration of roads and intersections.



Most of the safety concerns in the area are related to the number of driveways and access points.



Traffic

Traffic often serves as a daily reminder of growth and changes that have occurred over a period of time. While we can't build enough roads to make traffic issues go away, we can make strategic decisions in which transportation projects we prioritize.

In general, traffic in the morning is worse than traffic in the afternoon.



In general, weekend traffic is worse than weekday traffic.



Truck traffic makes my daily commute worse.



Connectivity

Improving connectivity of the road network helps relieve some of the pressure on the most heavily traveled routes. It does so by giving people options in the routes they choose to use.

I wish I had more routes to get to places in the area.



Connectivity isn't the issue, it's the existing intersections that are the problem.



I would avoid NC 16 Business if I had better options.



Land Use Considerations

The transportation system greatly influences development patterns by dictating the most convenient routes of travel. Likewise, the context of surrounding development can affect how easy it is to travel through an area.

The land uses near a potential transportation solution should be considered when deciding what to do.



Fewer driveways would be okay if it meant better traffic.



The impact to private property should be limited as much as possible when selecting transportation improvements.



Bypass Use

When it was constructed a few years ago, the NC 16 Bypass helped improve traffic and safety conditions in the area. Could more be done to increase use of the Bypass to help routes such as NC 16 Business?

When I choose not to use the NC 16 Bypass, it's usually because I don't like the U-turns.



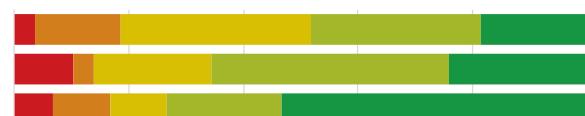
When I choose to use NC 16 Business, it's usually because it's not convenient to get to the Bypass.

Traffic on NC 16 Business would be better if it was easier to use the Bypass.

Economic Development

The presence of a safe and efficient transportation system is often cited as an important factor when individuals and companies decide to invest in an area. Transportation projects both big and small can make a difference.

We should focus on projects that help local businesses.



Projects should have a positive and direct influence on economic development.

Investment in the area is going to occur regardless.

Walking and Biking

People walk or bike for a variety of reasons. For some, it's because they enjoy it. For others, it's because they don't have other options. Transportation projects of all sizes can improve conditions for pedestrians and bicyclists.

I would walk more if it was safer and more enjoyable.



I often encounter bicyclists on local roads.



I wish it was safer for kids to walk and bike to schools and parks.



Cost and Implementation

How much a project will cost and how easily it can be implemented varies based on a lot of different factors. Some projects are lower cost but still help improve conditions, while other projects are expensive but have a more substantial impact on the transportation system.

Affordable projects that could be implemented today are preferred over more expensive projects.



Smaller projects—but more of them—should be our focus.

An expensive project that makes a big difference should be the focus... even if it takes a while to be constructed.

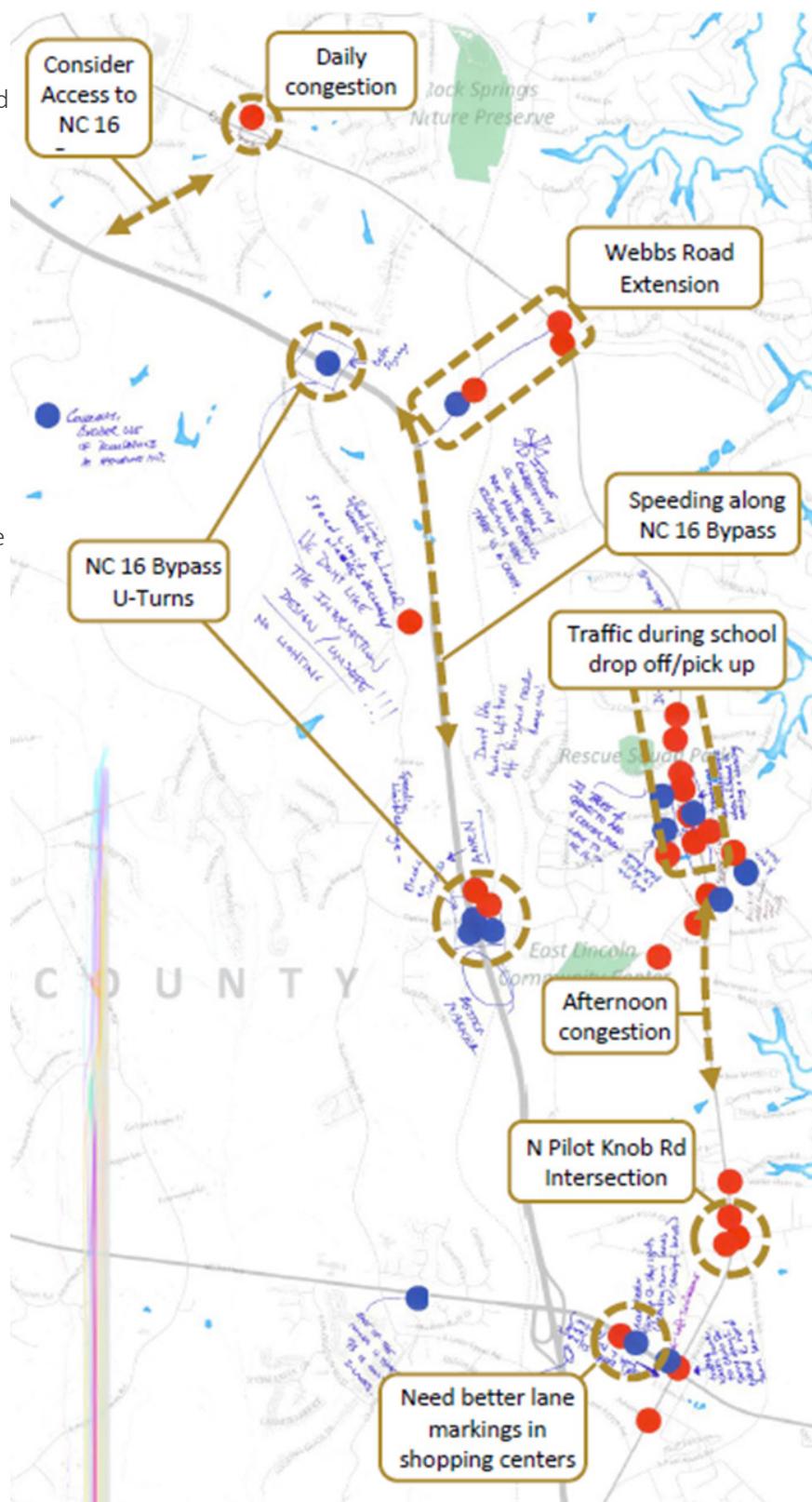


MAPPING AND TRAFFIC ANALYSIS

At the mapping station, people gathered around a large 60- by 80-inch map and used dots to identify issues and opportunities. At the Traffic Analysis station, people viewed results from the traffic model and discussed issues with the project team. At both stations, safety and congestion concerns were identified throughout the study area, as shown in the map to the right. The public also provided several general comments at the mapping station.

These comments included:

- Improve connectivity so that there are more options for traveling, especially when there is a crash.
 - Consider roundabouts.
 - Difficult to turn left onto NC 16 Business.
 - Explore whether a center turn lane can be constructed on NC 16 Business.
 - Need better wayfinding signage and lane markings.
 - Increase access to NC 16 Bypass.
 - Need sidewalks along corridors.
 - Sequence traffic lights.





Online Survey

OVERVIEW

An online survey launched at the July 23, 2019 community workshop to provide an additional opportunity for the public and stakeholders to offer input on transportation issues and preferences in eastern Lincoln County. The survey was developed using the MetroQuest platform, which allowed participants to provide input on desktop and mobile devices by responding to prompts on five interactive screens. The survey closed September 2, 2019.

Survey Instrument | MetroQuest

Survey Period | July 23, 2019 to September 2, 2019

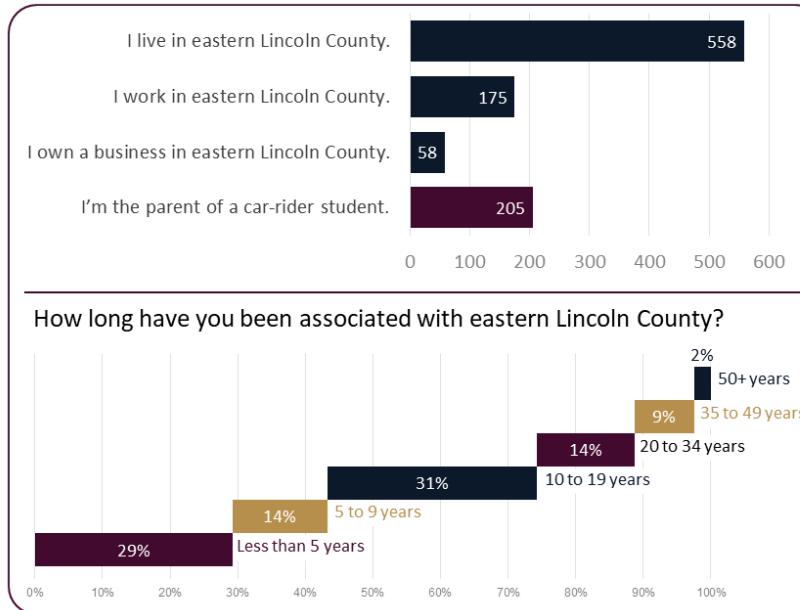
Participants | 882

Data Points | 25,000+

Written Comments | 1,600+

Screen Overview				
Welcome	Considerations	Statements	Mapping	Wrap Up
Screen 1 provided a brief introduction to the Eastern Lincoln Mobility Study.	Screen 2 asked participants to rank eight considerations that will be used to evaluate potential improvements.	Screen 3 asked participants to show how much they agreed or disagreed with three statements for each consideration they ranked on Screen 2.	Screen 4 allowed participants to drop pins on a map to identify locations of concern and opportunity.	Screen 5 asked participants a few final questions.

PARTICIPANT PROFILE



What is one thing you hope results from this study?

Action / Progress

Better Traffic Flow

Understanding Growth Effects

More Sidewalks

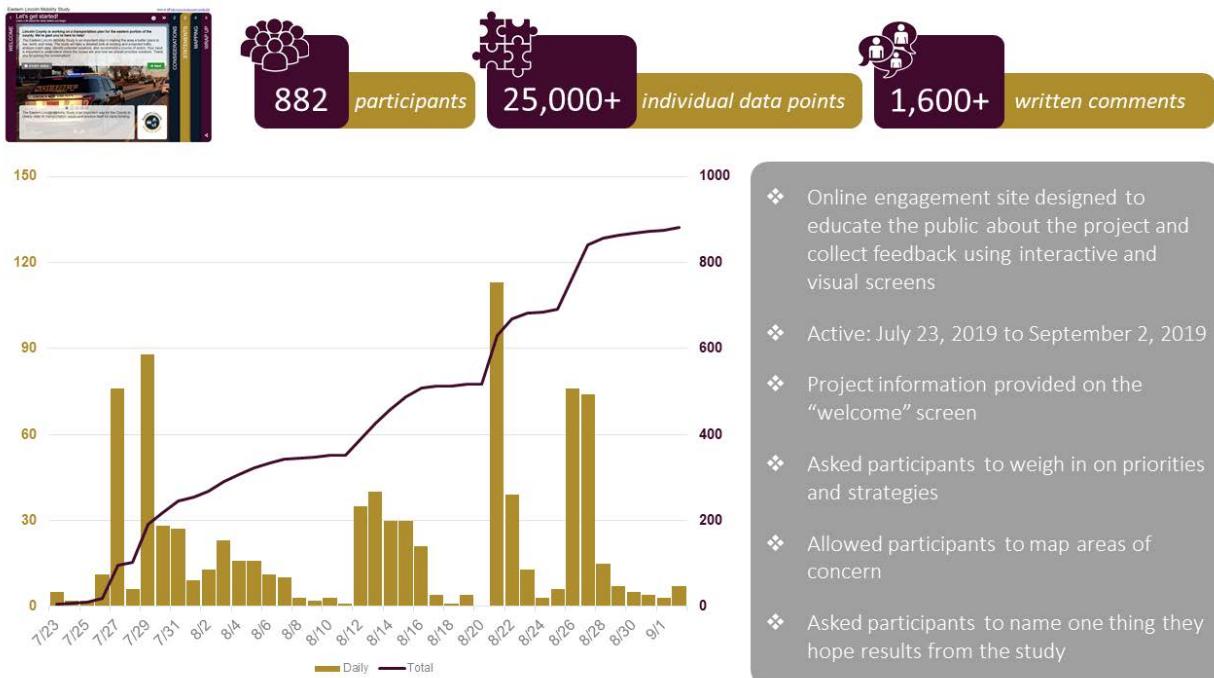
Safety

Connectivity to Bypass

Signal Timing

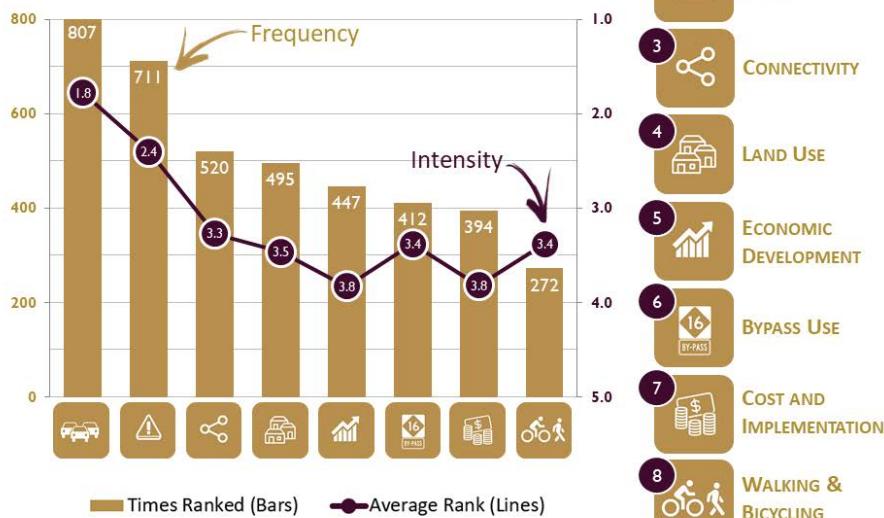
Changes to the Bypass Intersections

PARTICIPATION LEVEL



CONSIDERATIONS

The study will identify potential transportation projects throughout the study area. The projects will be evaluated based on topics the community identifies as important.



- **TRAFFIC and SAFETY:** most frequently ranked and highest average ranking
- **CONNECTIVITY and LAND USE:** ranked a similar number of times but CONNECTIVITY usually ranked slightly higher
- **BYPASS USE:** higher average ranking shows that those that ranked it ranked it higher on average
- **WALKING & BICYCLING:** gap between the intensity and frequency shows that while not everyone sees it as an important consideration, those that do think it's very important

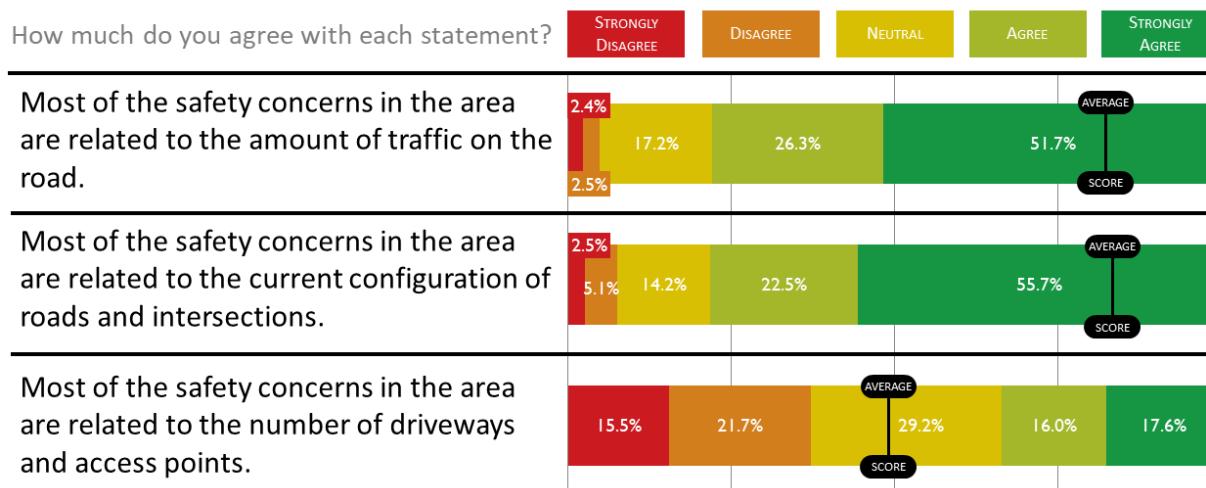
STATEMENTS

Participants responded to a series of statements about the eight considerations.



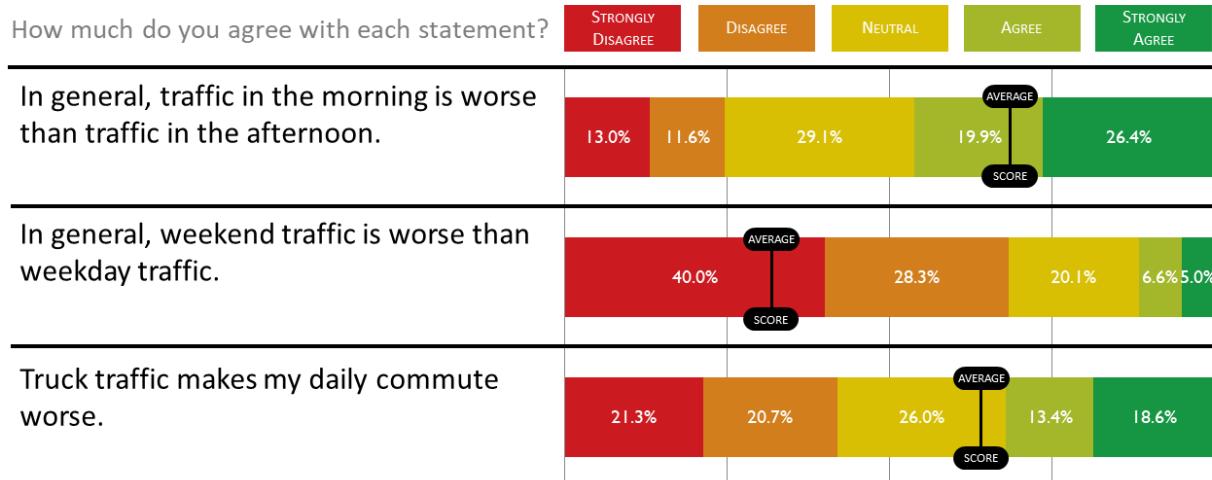
SAFETY

Crashes can occur at any time and at any location. Reducing how often crashes happen and how severe crashes are when they do occur is important during planning and design.



TRAFFIC

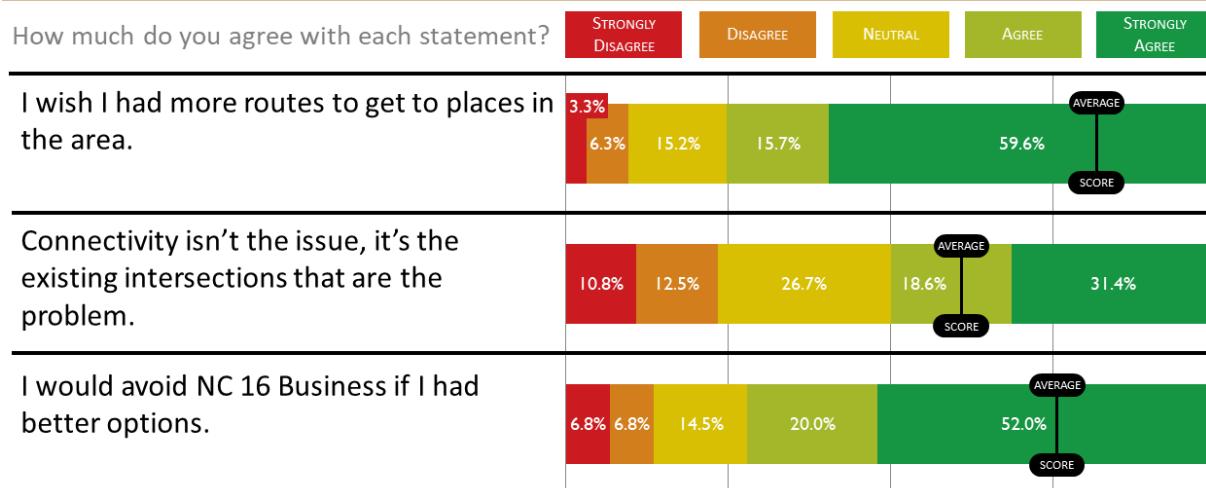
Traffic often serves as a daily reminder of growth and changes that have occurred over a period of time. While we can't build enough roads to make traffic issues go away, we can make strategic decisions in which transportation projects we prioritize.





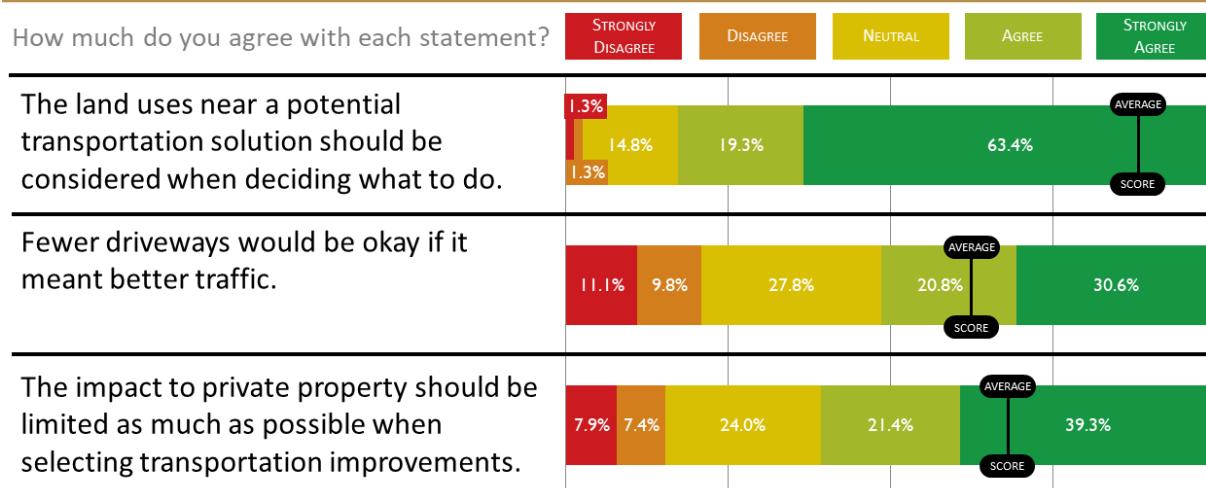
CONNECTIVITY

Improving connectivity of the road network helps relieve some of the pressure on the most heavily traveled routes. It does so by giving people options in the routes they choose to use.



LAND USE

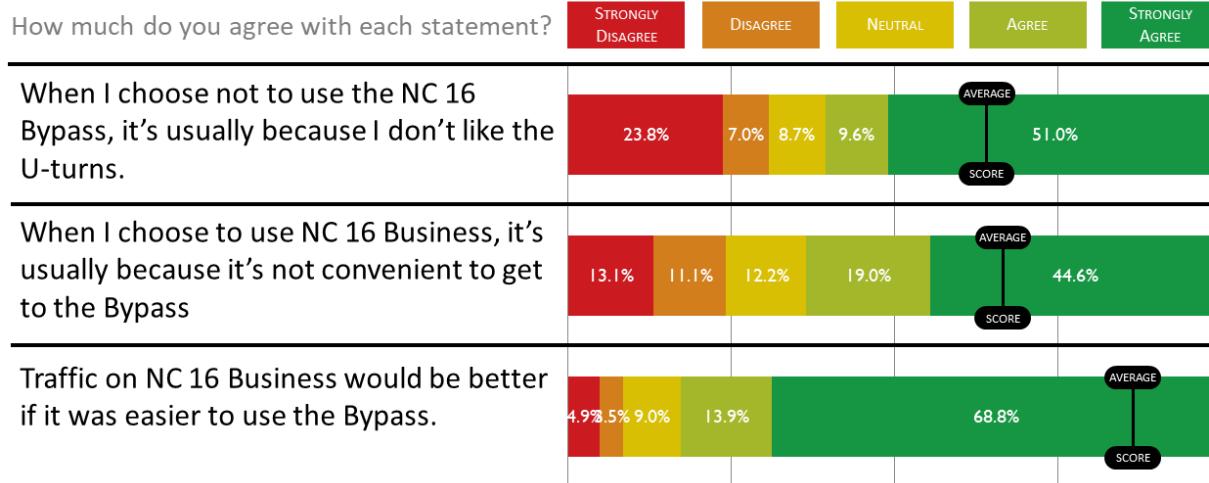
The transportation system greatly influences development patterns by dictating the most convenient routes of travel. Likewise, the context of surrounding development can affect how easy it is to travel through an area.





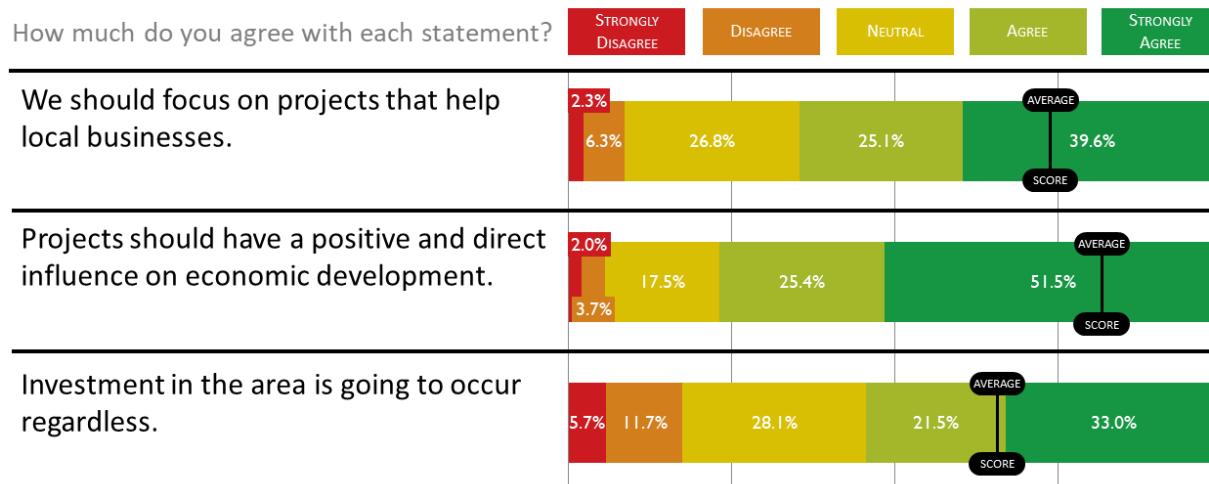
BYPASS USE

When it was constructed a few years ago, the NC 16 Bypass helped improve traffic and safety conditions in the area. Could more be done to increase use of the Bypass to help routes such as NC 16 Business?



ECONOMIC DEVELOPMENT

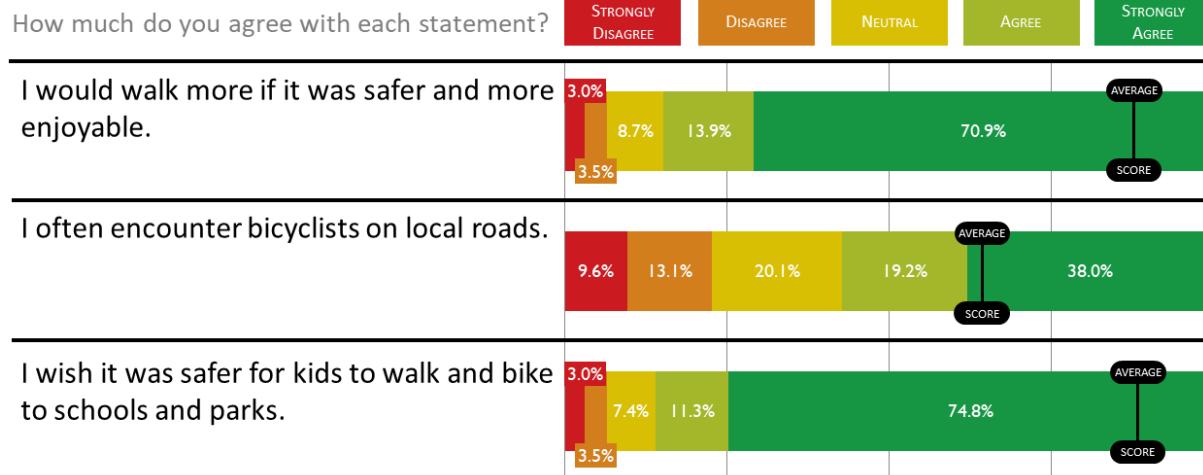
The presence of a safe and efficient transportation system is often cited as an important factor when individuals and companies decide to invest in an area. Transportation projects both big and small can make a difference.





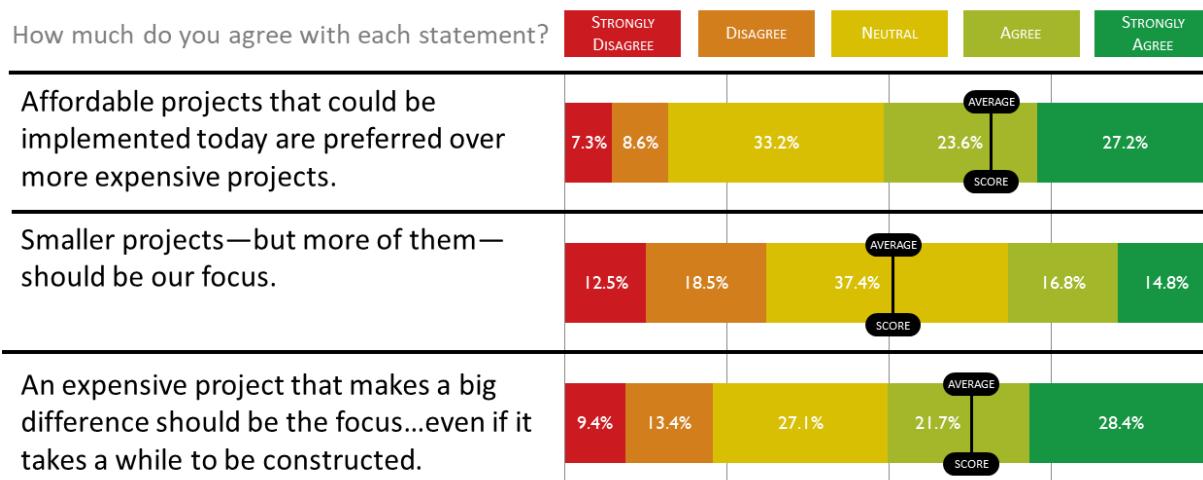
WALKING & BICYCLING

People walk or bike for a variety of reasons. For some, it's because they enjoy it. For others, it's because they don't have other options. Transportation projects of all sizes can improve conditions for pedestrians and bicyclists.



COST AND IMPLEMENTATION

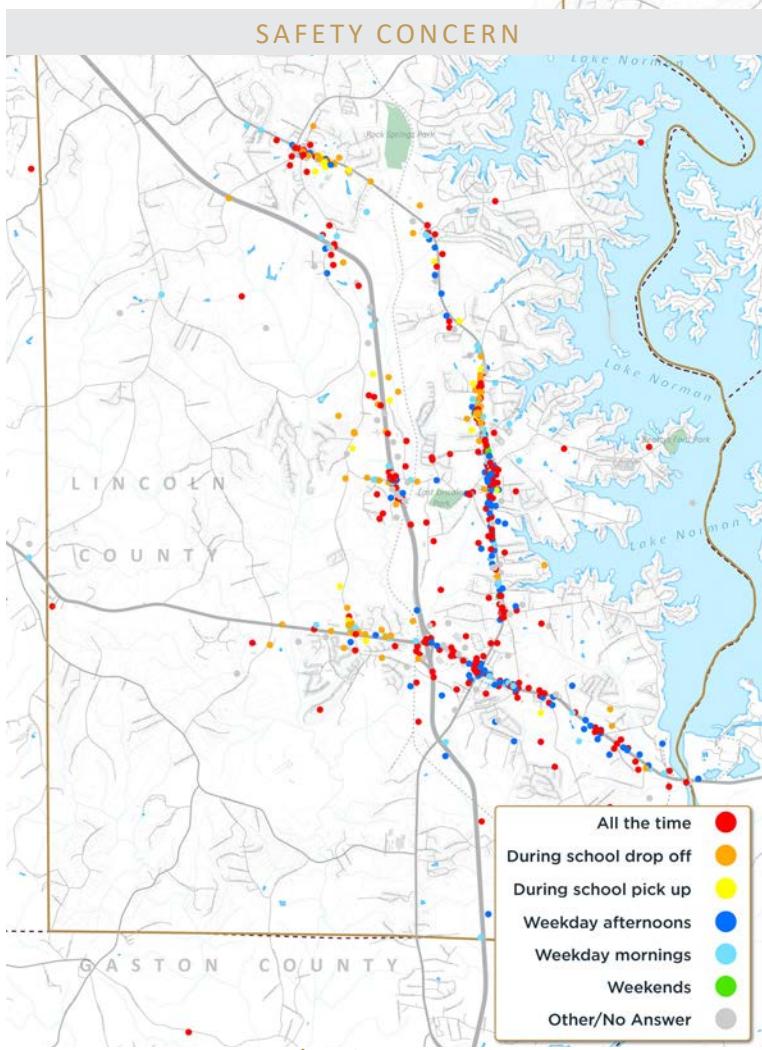
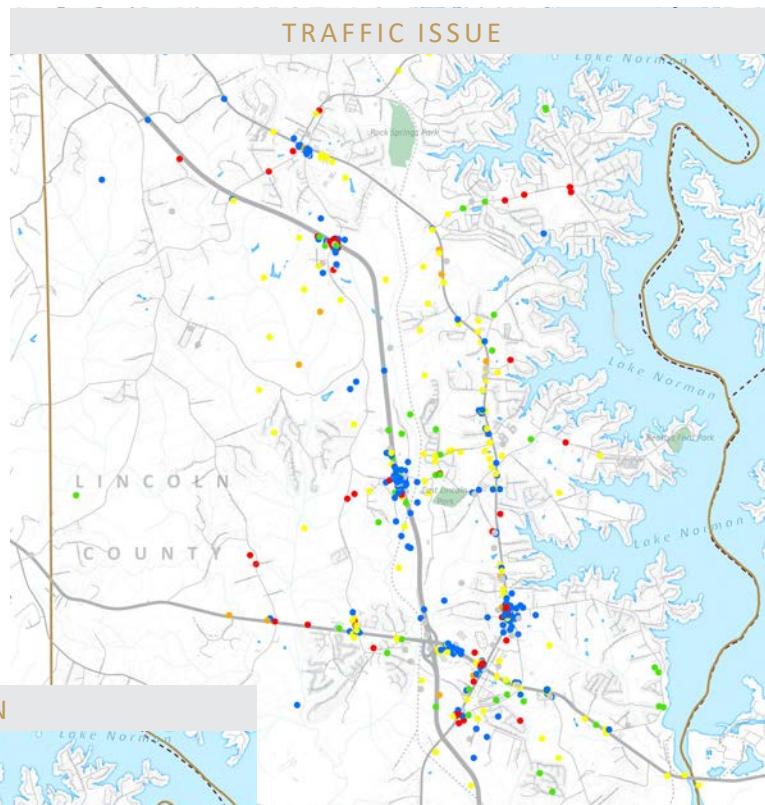
How much a project will cost and how easily it can be implemented varies based on a lot of different factors. Some projects are lower cost but still help improve conditions, while other projects are expensive but have a more substantial impact on the transportation system.



MAPPING

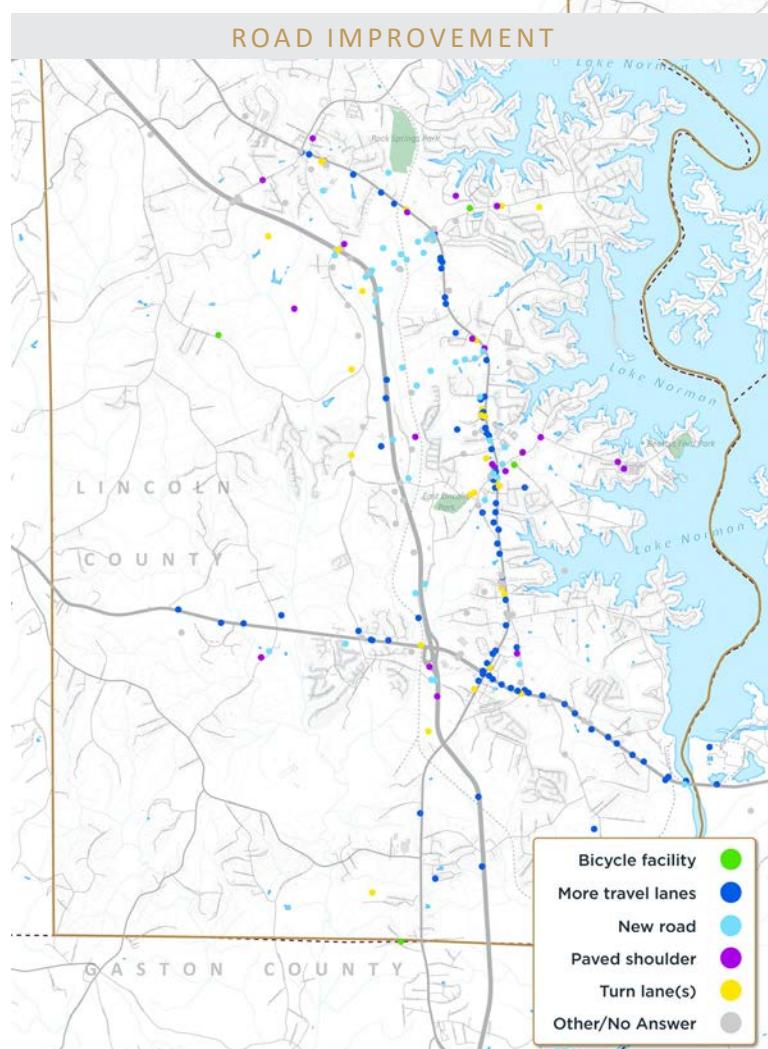
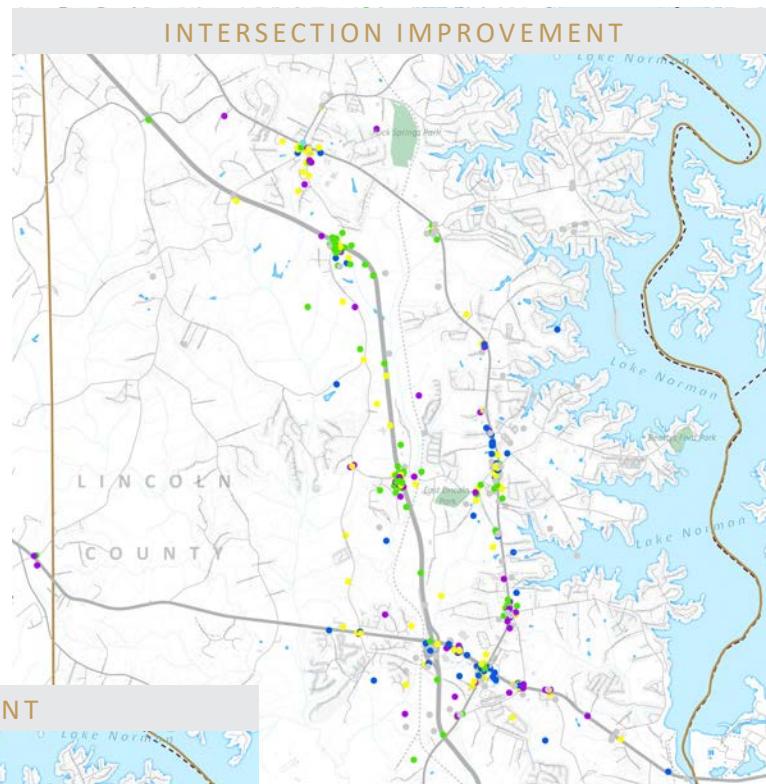
Participants used a digital map to locate challenges and opportunities for mobility in the study area.

Participants identified traffic issues along the major study corridors, with notable clusters on NC 16 Business between Fairfield Forest Road and North Pilot Knob Road. The access points along the NC 16 Bypass also were identified.



Safety concerns identified by participants included NC 16 Bypass at Optimist Club Road, NC 16 Bypass at St. James Church Road, NC 16 Business at North Pilot Knob Road, and at access points for the commercial areas near NC 16 and NC 73.

Notable locations identified by participants for intersection improvements included the existing access points along the NC 16 Bypass, NC 16 Business at North Pilot Knob Road, and numerous locations along NC 16 Business, and NC 73.



Participants clearly identified NC 73 and NC 16 Business for needing additional travel lanes. They also identified new connections to the NC 16 Bypass from Webbs Road and Fairfield Forest Road.

Workshop 2

This meeting was a drop-in workshop during which participants viewed information related to the project background, growth and development, traffic and crash analysis, and engagement activities. Preliminary recommendations were presented along with a summary of how these improvements could affect traffic in 2025 and 2045. Participants were asked to comment by responding to prompts related to engagement, traffic, and the recommendations. Participants were also given a comment form to record their thoughts.

Key themes included:

- Requests for more information on potential timeframes for implementation
- Requests for re-introducing transit service to this portion of the County
- Requests for various changes to the intersection and corridor recommendations
- Requests for more bicycle and pedestrian recommendations

Unedited comments from the prompt boards are shown on the adjacent page.

MEETING INFORMATION

Date: **January 9, 2020**
Location: **East Lincoln Community Center**
Time: **6:30 p.m. to 8:30 p.m.**
Participants: **58 (signed in)**

BOARDS AND EXHIBITS

- Project Overview
- Study Area
- Around the Study Area (photos)
- Growth and Development
- Traffic Analysis
- Crash Analysis
- Considerations
- What We Heard
- Draft Recommendations
- 2025 Modeled Improvements
- 2045 Modeled Improvements
- Active Transportation Recommendations



PROMPT BOARDS

TRAFFIC THOUGHTS

What is your reaction to the traffic results?

- With the upgrade of S. Pilot Knob and Bus 16, reroute and interest with S. Little Egypt Rd.- Improve S. Little Egypt and build a bridge over bypass 16. This would help the load at 16 and 73.
- New paint and directional signs at 73/Walmart and 73/Lowes intersection coming out from shopping center.

RECOMMENDATION REACTIONS

What is missing? What should be the Priority?

- St James at Bus 16- left arrow from school
- Prioritize Hwy 16B from Hwy 73 to Fairfield Forest Rd higher than it is.
- Widen Hwy 16 to a total of 5 lanes, including center left turn lane from Hwy 150 past Hwy 73.
- Consider service road from properties on west side of Hwy 16B at new North Pilot Knob/Hwy 16 intersection.
- What is established timeframe bike lanes/Sharrow?- no info on maps
- Priority- school intersections and sidewalks
- New paint and directional signs at 73/Walmart and 73/Lowes intersection coming out from shopping center.
- Light at intersection of 16B and Grassy Creek Rd. needed soon.
- Double lanes on Unity Church Rd.
- Why no consideration for 16 and Sifford Rd.
- What consideration has been given to the Riverbend Preserve development?
- Like the conceptual future layout. Would like to see the county layout projects with timelines that the county will fund.

ENGAGEMENT TAKEAWAYS

What is your reaction to the feedback collected?

- Good composition of feedback. Would add sidewalks to main roads to further encourage walking/biking.

4

MOBILITY STRATEGY



Chapter Overview

The previous two chapters summarized the current and future conditions as well as the issues, needs, and priorities expressed by the community through the engagement process. This information serves as the foundation for a comprehensive set of recommendations that create a cohesive community-based mobility strategy for eastern Lincoln County. This chapter is organized into five elements that communicate the mobility strategy.

ROADWAY RECOMMENDATIONS

This section features a map that shows the comprehensive recommendations for corridors and intersections in the study area. The map is further explained by describing considerations for each type of recommendation.

PROJECT SPOTLIGHTS

This section provides more detail for several priority recommendations identified by the public and project stakeholders. Selected projects include a new connection to the NC 16 Bypass, improvements at North Little Egypt Road at NC 73, and the extension of Optimist Club Road to NC 16 Business.

BICYCLE AND PEDESTRIAN CONSIDERATIONS

Improvements for active transportation are presented in mobility tiers, which describe the suggested type of improvement for bicyclists and pedestrians. Pedestrian hot spots are also identified as locations within a ¼-mile of community destinations.

ADDITIONAL CONSIDERATIONS

The mobility strategy concludes with a brief list of policy, programs, and studies in support of the facility recommendations.



Composite Recommendations

The full system of recommendations contains elements that are consistent with previously planned projects as well as newly identified projects through the eastern Lincoln Mobility Study process. These recommendations were formed on a foundation built of two parts: the existing conditions and the community feedback.

The composite recommendations consist of six distinct project types, which include:

INTERSECTION IMPROVEMENTS

These projects would consist of safety improvements (improvement of pedestrian crossing facilities, better lighting, improved signage), operational changes (signal timing), and/or design changes (additional turn lanes, curb radii changes, repaving).

NEW INTERCHANGES

Two new interchanges are recommended along NC 16 at Optimist Club Road and a recommended new roadway (Campground Connector). These projects are much higher in cost compared to the majority of recommendations in this study, but will provide better access to and from NC 16 to parts of eastern Lincoln County.

SCHOOL ACCESS IMPROVEMENTS

Access improvements for schools primarily consist of additional turn lanes to allow for safety improvements and better queuing for pick up and drop off.

ROADWAY WIDENINGS

Widening along key roadway segments will increase roadway capacity to help alleviate congestion issues.

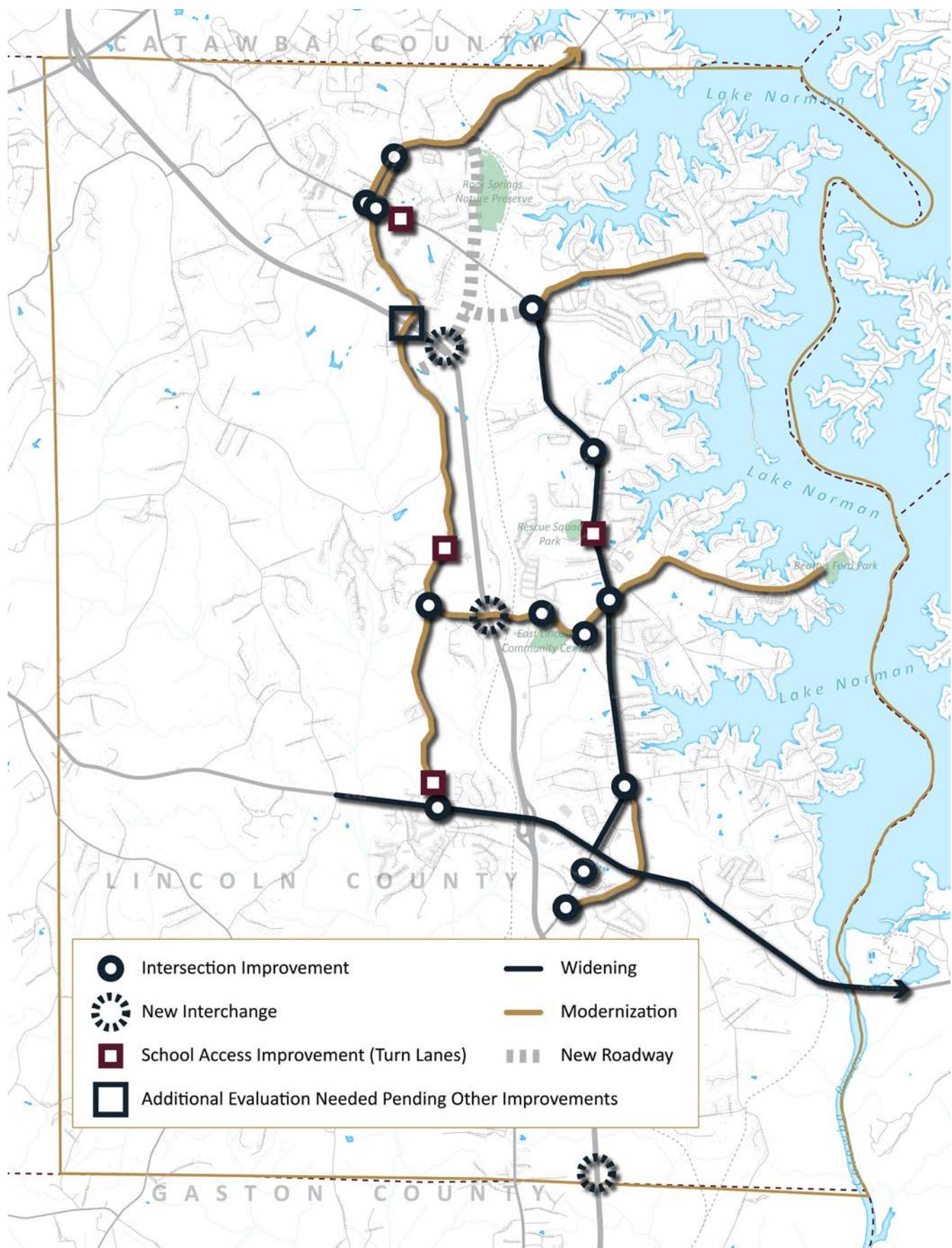
ROADWAY MODERNIZATIONS

Modernization of existing roadways would focus on improvements like straightening curves and adding shoulders along the edges of the road. These improvements will enhance safety and can improve traffic flow but will not add new turn lanes.

NEW ROADWAYS

Two new roadways are proposed that are designed to alleviate access to, across, and through NC 16 and NC 16 Business.

COMPOSITE RECOMMENDATIONS MAP



Facility Considerations

NC 16 CONNECTIONS

ST. JAMES CHURCH ROAD

Short-term improvements at the intersection include traffic lights to help manage the flow of traffic and improve safety. Long-term measures could include full access, but should be studied further.

OPTIMIST CLUB ROAD (STIP U-6134)

Short-term improvements at the intersection include traffic lights to help manage the flow of traffic and improve safety. Long-term measures should include a full access interchange. The project is estimated to cost \$13 million and construction is scheduled to begin in 2023.

NEW INTERCHANGE

A large new development is proposed for the area around NC 16 and the Lincoln County / Gaston County border to the south. Numbers regarding amount of development and specifically number of residential units are still being determined, but all evidence indicates that the development would be significant enough to warrant direct access and a new interchange with NC 16 in this area.

ROAD WIDENINGS

NC 73 (EAST) (STIP R-5721A)

This widening would run from NC 16 on the west to Vance Road Extension / Beatties Ford Road on the east. This project is critical to providing east-west regional access to and from Lincoln County south of Lake Norman. The project has an estimated cost of \$94 million and is scheduled to start construction in 2023.

NC 73 (WEST) (STIP U-6139)

The widening west of NC 16 to Ingleside Farm Road will be critical for accommodating future growth to the west. The project would widen NC 73 to multiple lanes in this section where there is currently just two lanes (one in each direction). The project has an estimated cost of \$50.1 million and is scheduled to begin right-of-way acquisition in 2028.

NC 16 BUSINESS (STIP U-6144)

Bringing NC 16 Business up to multiple lanes in each direction from Fairfield Forest Road to Webbs Road will be critical to handling current and future capacity issues in this area. This project should be phased appropriately to ensure prioritization in the STIP process. Currently, the project has an estimated cost of \$19.6 million and is scheduled to begin right-of-way acquisition in 2029.



ROADWAY MODERNIZATIONS

NORTH LITTLE EGYPT / ST. JAMES CHURCH ROAD

Growth along this corridor will be likely due to increased attractiveness with the increased connectivity and access of the Campground Connector / Webbs Road Extension. The roadway should be modernized to prepare for and attract that future growth.

WEBBS ROAD

Given the viability of the Webbs Road Extension to the Campground Connector, the existing portion of Webbs Road should be modernized with the appropriate roadway design elements and multimodal upfits as recommended in this plan.

UNITY CHURCH ROAD

The improvements at Triangle Circle and the extension of Optimist Club Road will have major impacts at the intersection of Unity Church Road and NC 16 Business. This intersection will likely see increased traffic and development due to improved connectivity associated with the other project. Therefore, it is recommended that the existing portions of Unity Church Road to the east of NC 16 Business be upgraded to be consistent with those improvements.

PILOT KNOB ROAD

Pilot Knob Road acts as a local connector around the major intersection of NC 16 Business and NC 73. With all of the commercial and residential development occurring in the area and around that major intersection, Pilot Knob Road must be modernized to meet the demands for future growth.

INTERSECTION IMPROVEMENTS

WILL PROCTOR ROAD AND CAMPGROUND ROAD (STIP U-5962)

The current alignment of Will Proctor Road and Campground Road at NC 16 Business is not ideal for safe vehicular travel or management of congestion issues. This project would look to realign the intersection to deal with those concerns. Estimated project cost would be \$5.6 million and construction is scheduled to start in 2023.

SCHOOL ACCESS

There's a distinct need to supplement the amount of turn laneage for school access, which currently has queuing issues that create traffic challenges during peak times. Turn lanes are recommended at:

Rock Springs Elementary School (southbound)

St. James Elementary School (northbound)

Catawba Springs Elementary School (northbound and southbound)

Lincoln Charter School (southbound)

Lincoln County should also work with the schools to determine strategies that can maximize internal queuing.



Project Spotlights

The project spotlight provides a greater depth of detail and analysis of roadway recommendations for three critical segments of roadways in the study area. These projects were identified due to their importance for achieving the goals of the plan and for advancing the public's vision for their community.

WEBBS EXTENSION AND CAMPGROUND CONNECTOR

Improved connectivity to the NC 16 Bypass is a critical need to address traffic issues and safety concerns for the area north of Fairfield Forest Road. The lack of connectivity puts significant stress on the "downtown Denver" area where NC 16 Business intersects St. James Church Road/Will Proctor Road and Campground Road/Forney Hill Road. Limited connectivity also increases travel time for the Webbs Road peninsula by forcing motorists to head north or south to access the bypass.

Pressure on the road network is compounded by the increasing number of through trips from the rapidly growing Sherrills Ford area. Traffic during drop-off and pick-up times at Rock Springs Elementary School lengthens peak hour traffic issues.

The Webbs Extension and Campground Connector represents two new corridors that would funnel traffic to a new interchange of the NC 16 Bypass just south of the existing St. James Church Road intersection. The connector would extend beyond the bypass to intersect with St. James Church Road. Many variables will determine the preferred alignment, ideal cross section, and interchange design. Each of these variables will affect the cost, property considerations, and specific benefits that need to be understood prior to receiving state and federal funds for construction.

AT A GLANCE

Intent

- Provide critical roadway and multimodal connectivity to northeastern Lincoln County
- Relieve pressure at Downtown Denver intersections
- Increase the use of the NC 16 Bypass

Issues and Considerations

- Significant traffic issues in Downtown Denver, which are compounded by a lack of safe and convenient access to the NC 16 Bypass
- Limited right-of-way in Downtown Denver to address existing and projected traffic
- Growing through trips from Sherrills Ford and points northeast
- Constraints, including a railroad, utility easement, developing property, Forney Creek, and varied terrain

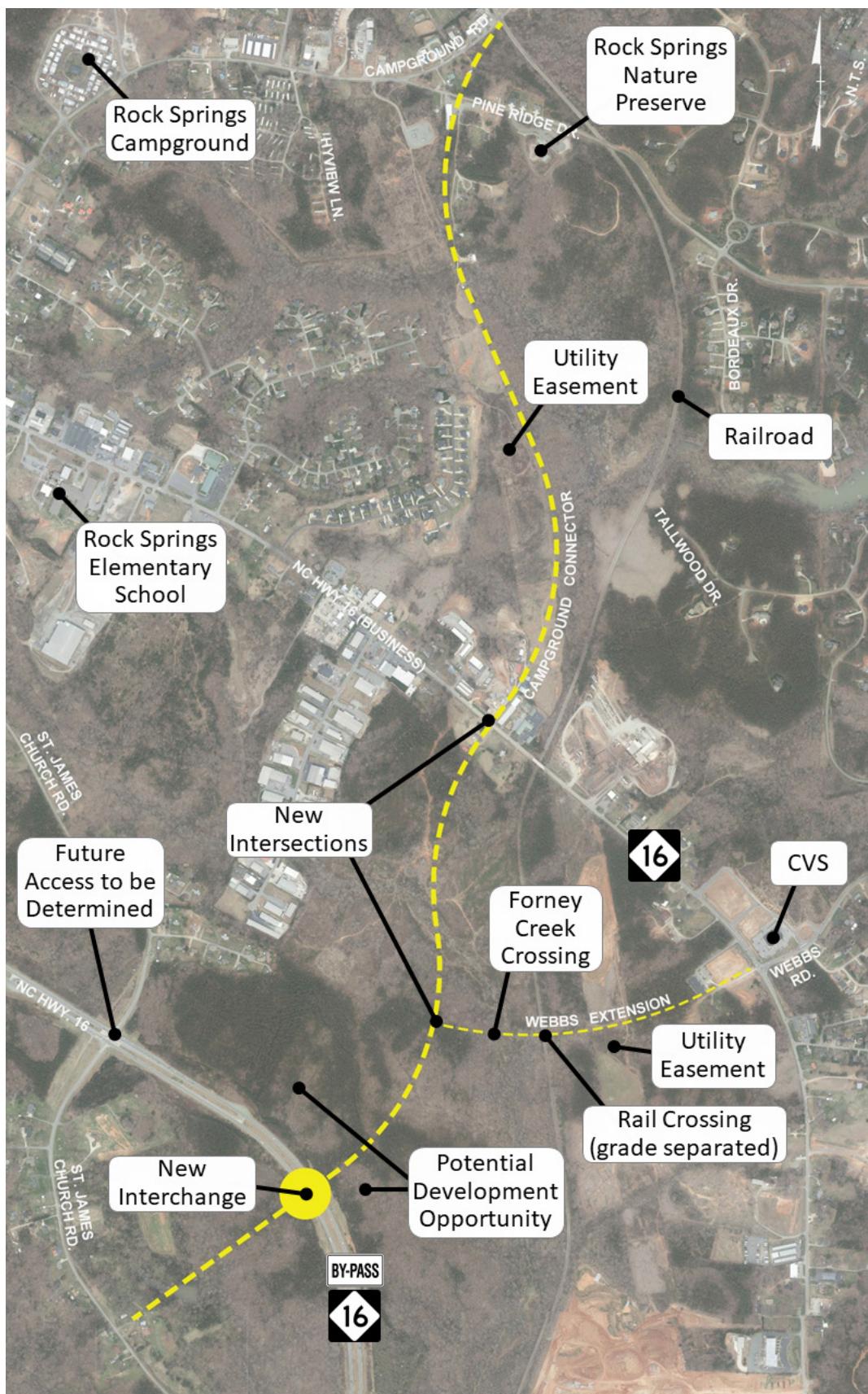
Cost

- \$50+ million (cost to be determined)

Next Steps

- Conduct a detailed study to determine the preferred cross-section, ideal alignment, conceptual design, right-of-way consideration, cost and phasing, and implementation strategies with consideration of the NCDOT prioritization process.

POTENTIAL ALIGNMENT



NORTH LITTLE EGYPT ROAD

Today, North Little Egypt Road and St. James Church Road form an important north-south route west of the NC 16 Bypass. As a growth corridor, numerous residential developments are in various stages of completion between NC 73 and the corridor's northern connection with the NC 16 Bypass. At NC 73, North Little Egypt Road provides access to Catawba Springs Elementary School and East Lincoln High School. As residential growth continues, the intersection of North Little Egypt Road at NC 73, coupled with the access points at Catawba Springs Elementary School, will continue to operate under less than optimal levels.

The concept for this area provides enhanced capacity at the intersection and improved off-site queueing for the elementary school. While the timing of these improvements is to be determined, the ideal scenario would be to improve the intersection in coordination with the planned widening of NC 73. As an interim step, the County can explore options to construct turn lanes at the elementary school. Lincoln County, the Gaston-Cleveland-Lincoln MPO, and NCDOT should explore ways to expedite the widening of NC 73.

AT A GLANCE

Intent

- Improve traffic flow during school drop-off and pick-up times by constructing turn lanes at the Catawba Springs Elementary School access points
- Improve traffic at the intersection of North Little Egypt Road and NC 73 by adding 300' of storage for left turns
- Provide flexible options that can be constructed concurrent with or prior to the widening of NC 73

Issues and Considerations

- Continued growth along North Little Egypt Road/St. James Church Road
- Limited internal queueing for Catawba Springs Elementary School
- Expense of adding an eastbound travel lane to receive dual left turns from North Little Egypt Road

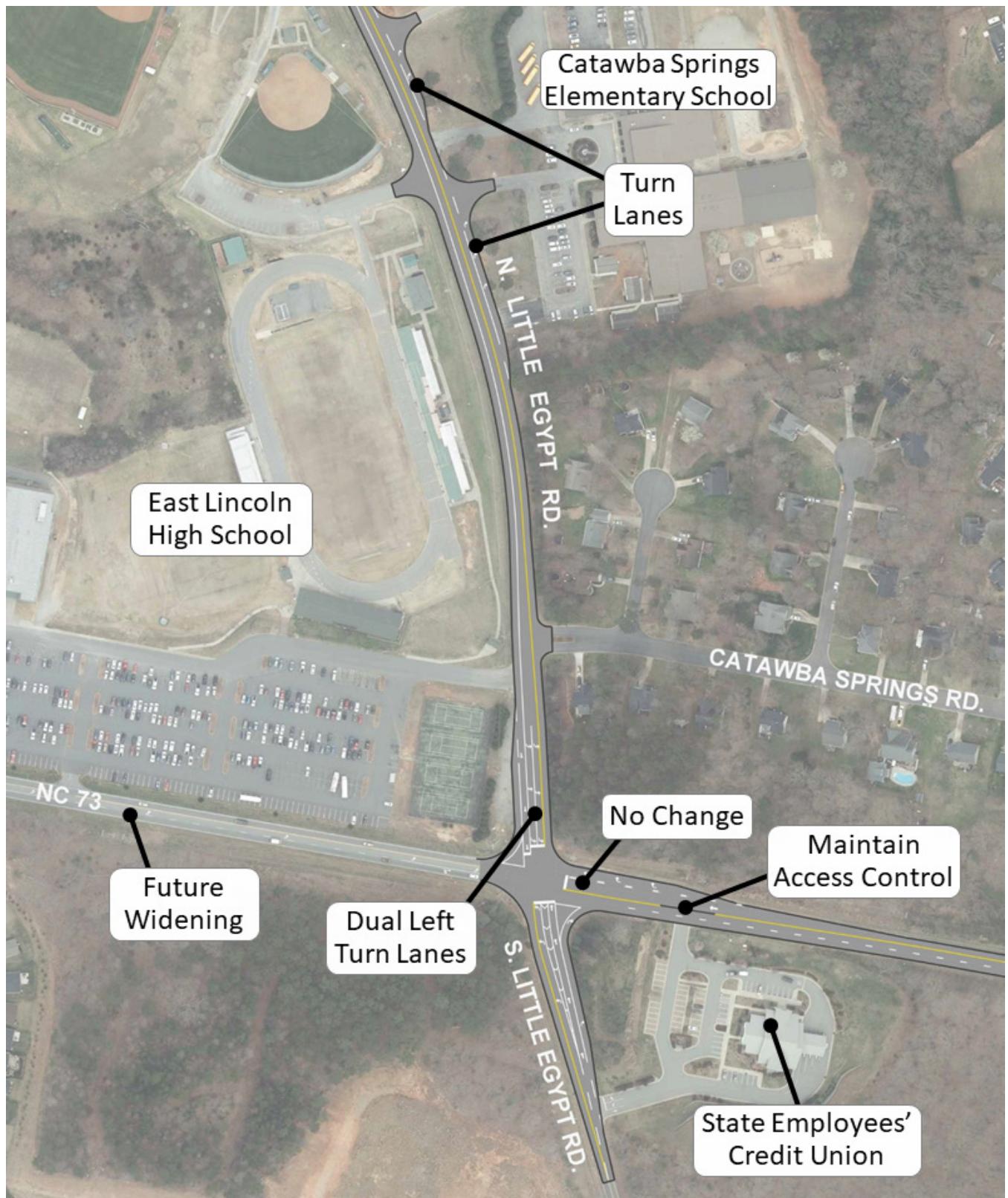
Cost

- \$5 million (intersection); \$2.5-3 million (school turn lanes)

Next Steps

- Continue to advocate for an accelerated schedule for widening NC 73 to North Ingleside Farm Road
- Evaluate the best use of local funds and/or developer contributions to make interim improvements

PROPOSED CONCEPT



OPTIMIST CLUB ROAD AT TRIANGLE CIRCLE (ALTERNATIVE ONE)

Optimist Club Road is an important east-west route in eastern Lincoln County and provides the most direct connection to the NC 16 Bypass. Both interim (traffic signals) and long-term (interchange) improvements at NC 16 will likely increase traffic on the corridor. In addition to serving trips destined for the NC 16 Bypass, the corridor provides access to Atrium Health, Sally's YMCA, Airlie Business Park, East Lincoln Community Center, East Lincoln Optimist Club, and one convenience site for trash and recycling.

Currently, eastbound motorists come to a stop-controlled intersection at Triangle Circle and must turn left or right to access NC 16 Business. The concept shown developed as part of the Eastern Lincoln Mobility Study would extend Optimist Club Road directly to NC 16 Business. A potential interim step would change the current intersection of Optimist Club Road and Triangle Circle into a three-way stop controlled intersection. The Eastern Lincoln Mobility Study also evaluated a two-phased approach by which a roundabout would be constructed at the Optimist Club Road/Triangle Circle intersection as a first step toward the eventual extension of Optimist Club Road to NC 16 Business.

AT A GLANCE

Intent

- Enhance east-west connectivity between the NC 16 Bypass and NC 16 Business
- Improve safety at Optimist Club Road and Triangle Circle
- Reduce traffic at the NC 16 Business/Unity Church Road intersection

Issues and Considerations

- Potential changes to traffic flow patterns following the completion of intersection improvements at NC 16 Business and Unity Church Road (R-5712)
- Utilities in the northwest quadrant of the Optimist Club Road/Triangle Circle intersection
- Reducing the posted speed limit on Optimist Club Road

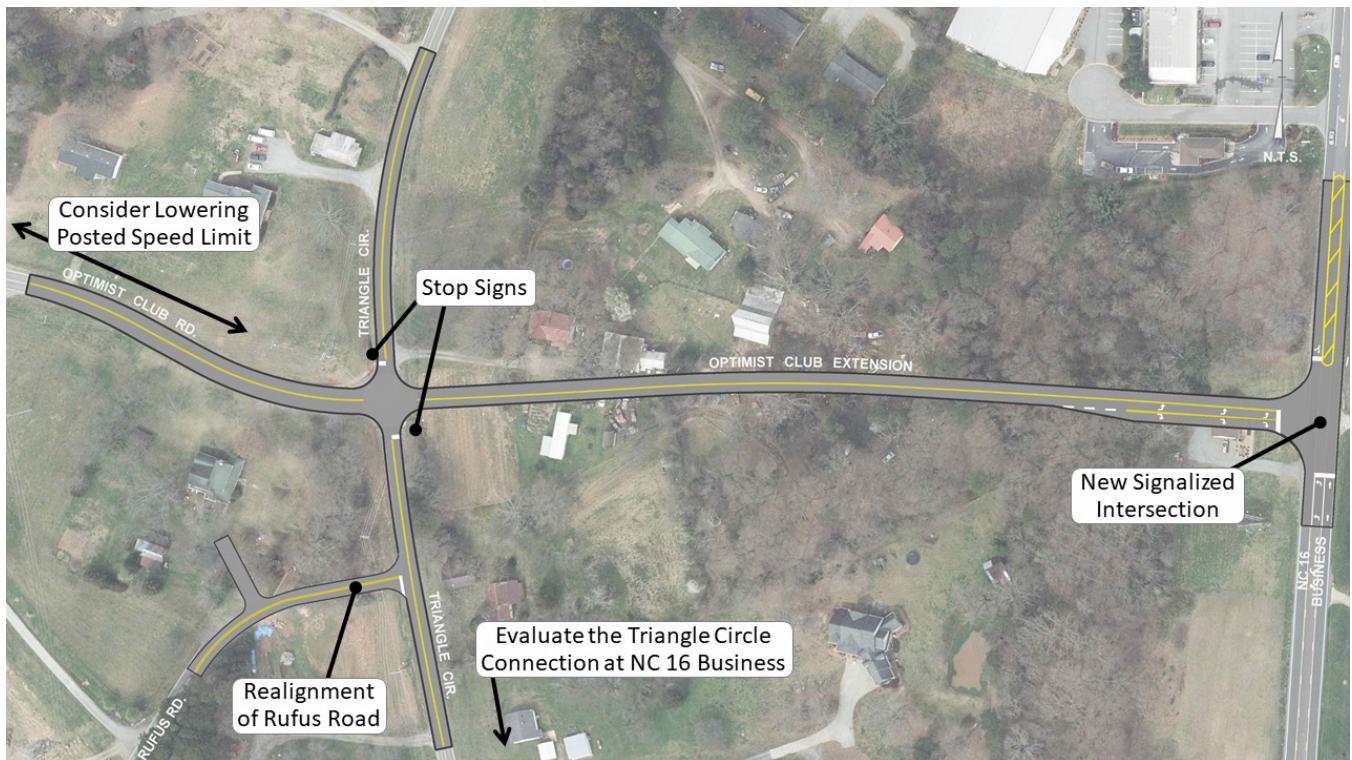
Cost

- \$2+ million

Next Steps

- Proceed with entering the Optimist Club Road Extension for scoring in the NCDOT prioritization process
- Consider options for leveraging local funds to expedite construction
- NOTE: As an interim step, stop signs could be added to Triangle Circle at its intersection with Optimist Club Road. A fully stop controlled three-leg intersection could reduce queuing and travel times for eastbound traffic.

PROPOSED CONCEPT



OPTIMIST CLUB AT TRIANGLE CIRCLE (ALTERNATIVE TWO)

This two-phased alternative concept features a roundabout at Optimist Club Road and Triangle Circle. While this alternative was considered, its cost of approximately \$8 million prompted the project team to develop the preferred alternative.

Phase 1

The initial phase would be the construction of a roundabout at Optimist Club Road and Triangle Circle to reduce typical queuing during peak hours and improve safety by reducing conflict points. (During construction, Rufus Road would be redirected to connect directly with Triangle Circle. This connection would minimize safety issues associated with the current intersection configuration while also simplifying the roundabout.)

Phase 2

The second phase would construct a new road between the new roundabout at Triangle Circle to NC 16 Business. A signalized intersection on NC 16 Business at the Optimist Club Road Extension would relieve pressure at the existing intersection of NC 16 Business and Unity Church Road.



PHASE ONE



PHASE TWO



Bicycle and Pedestrian Considerations

Vehicular travel isn't the only way to move around eastern Lincoln County. Throughout the engagement process, the project team received consistent input that it was vital to improve the multimodal system within the area. This includes developing a set of system-wide recommendations specific to bicycle and pedestrian movement.

The approach for developing multimodal recommendations focused on creating a tier system to indicate typical and desired bicycle and pedestrian facilities depending on the roadway. These tiers will help guide future decision making when it comes to bicycle and pedestrian projects in the area. Each tier contains a set of desired bicycle and/or pedestrian accommodations. These suggested accommodations are the recommended minimum for bicycle and pedestrian facilities, it is desirable to always add more if possible.

The tiers are described below and shown on the map on the adjacent page:

TIER ONE

BICYCLE ACCOMMODATIONS

Bicycle lane, wide outside lane, or multi-use path

PEDESTRIAN ACCOMMODATIONS

Sidewalk on both sides or multi-use path

TIER TWO

BICYCLE ACCOMMODATIONS

Sharrow and shared-use signage

PEDESTRIAN ACCOMMODATIONS

Sidewalk on at least one side

TIER THREE

BICYCLE ACCOMMODATIONS

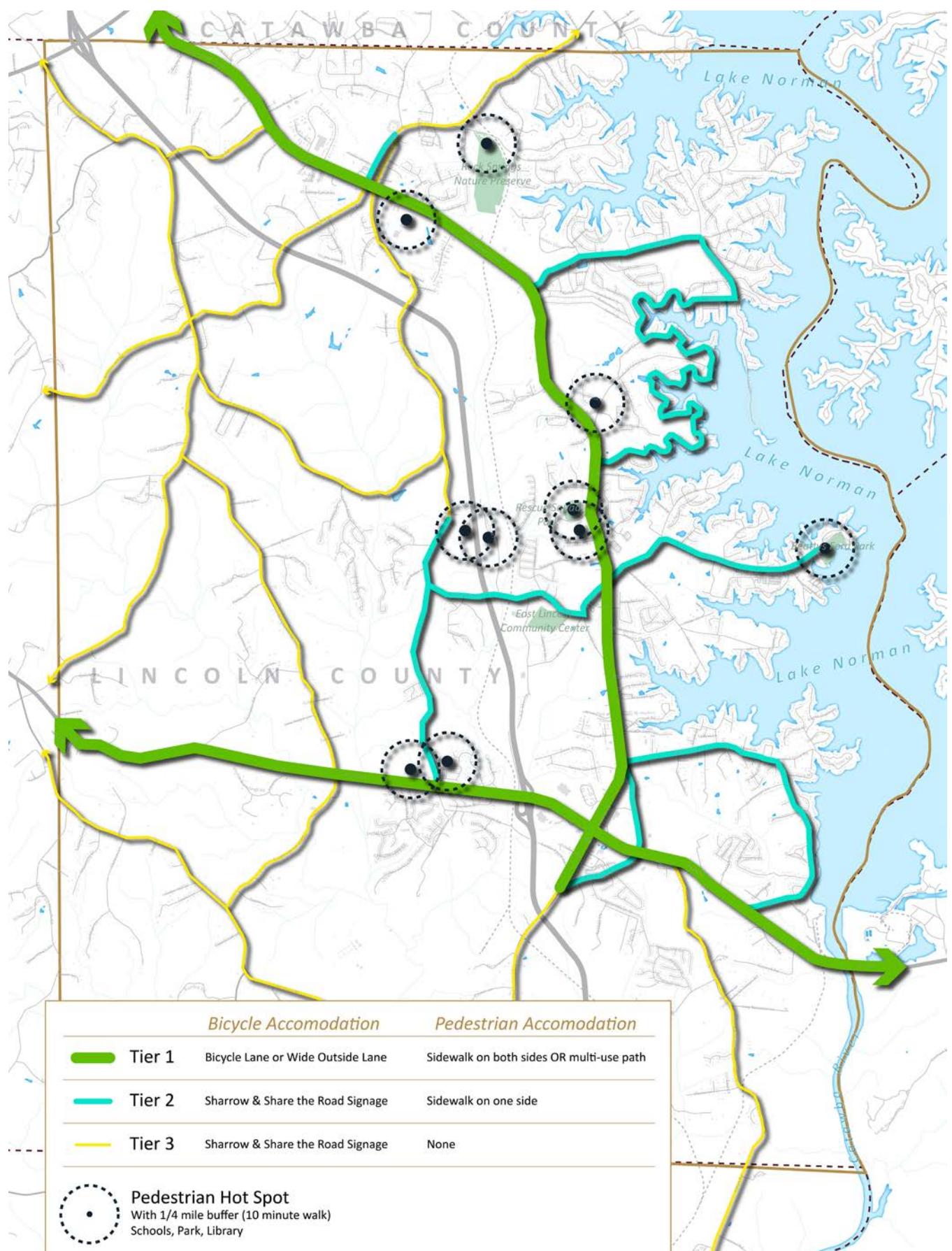
Sharrow and shared-use signage

PEDESTRIAN ACCOMMODATIONS

None



BICYCLE AND PEDESTRIAN TIER MAP



Additional Considerations

In addition to the physical recommendations of the study, it is important to also consider policy and programmatic changes that can improve mobility. Additionally, the identification of studies and plans critical to the future of mobility in the area will help guide future decision making.

RECOMMENDED POLICY AND PROGRAMS

BUILD UPON THE COUNTY'S CURRENT TIA PROGRAM

The County should look to enhance their TIA program to be consistent with the future recommendations and vision for this plan. Ensuring that TIA's around private and public development are furthering community vision is critical to improving mobility in the area.

SET RIGHT-OF-WAY EXPECTATIONS FOR KEY CORRIDORS

Using the recommended projects from the plan, the County should identify preferred cross sections for key corridors in eastern Lincoln County. These preferred cross sections will provide guidance on right-of-way expectations as well as roadway and multimodal design expectations for these critical corridors.

STRENGTHEN ACCESS MANAGEMENT REQUIREMENTS

Improved access management, particularly around schools, other public destinations like parks, and large commercial developments is critical to improving safety and reducing congestion in eastern Lincoln County. The County should ensure safe and efficient access to these key places by enhancing the current requirements for access management on new developments.

FULLY CONSIDER TRANSPORTATION NEEDS DURING SITE DESIGN REVIEW



When new developments are proposed in the County, all efforts should be made to ensure that those new developments are consistent with the transportation recommendations from this plan and other transportation planning efforts. Development should be supportive of transportation and mobility solutions. Additionally, this requires consideration of ROW expectations to ensure the site can accommodate future widening.

ESTABLISH INTERCONNECTIVITY REQUIREMENTS FOR VEHICLES AND/OR BICYCLISTS AND PEDESTRIANS

The County should encourage enhanced multimodal connectivity by establishing requirements for the accommodation of bicycle and pedestrian facilities on vehicular roadways. This ensures that the transportation systems in the community are designed for all modes of travel, and aren't focused solely on vehicular movements.

INTRODUCE TRANSIT OPTIONS TO EASTERN LINCOLN COUNTY

The County should work with the Charlotte Area Transit System (CATS) to re-establish express bus service to Uptown Charlotte as soon as possible. As a long-term solution, future plans and studies should consider rail opportunities to the eastern portion of Lincoln County.

RECOMMENDED FUTURE STUDIES AND PLANS

CAMPGROUND CONNECTOR AND WEBBS ROAD EXTENSION ALIGNMENT STUDY

This spotlight project should be looked at from a more detailed engineering perspective to better clarify the preferred alignment and to better determine feasibility, cost, and timetable for implementation.

NC 16 BUSINESS CORRIDOR STUDY

This study would set specific expectations for land use and transportation along the corridor, ensuring a smart marriage of land use and mobility decision making. The study should clarify a preferred cross-section for the corridor to better understand the barriers to widening the road and any right-of-way requirements.

LINCOLN COUNTY BICYCLE AND PEDESTRIAN MASTER PLAN

A county-wide bicycle and pedestrian master plan will establish a vision for enhanced and integrated multimodal travel on bicycle and pedestrian facilities in the area. The plan would identify key projects and prioritize them to better guide future decision making.



5

CONCLUSION

Promoting and encouraging safer and more efficient mobility continues to be a priority for Lincoln County and for communities across the region, state, and country. The Eastern Lincoln Mobility Study is an initial step in creating a vibrant community where mobility thrives, in turn benefiting the community's vision, safety, health, economy, environment, and livability. This plan, when supported by staff, elected officials, local businesses, and residents, serves as an impactful advocacy tool to make it safe and convenient for residents and visitors to move about their community.



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**Eastern Lincoln
MOBILITY STUDY**

July 2020

Kimley»Horn