



LYNX SYSTEM UPDATE

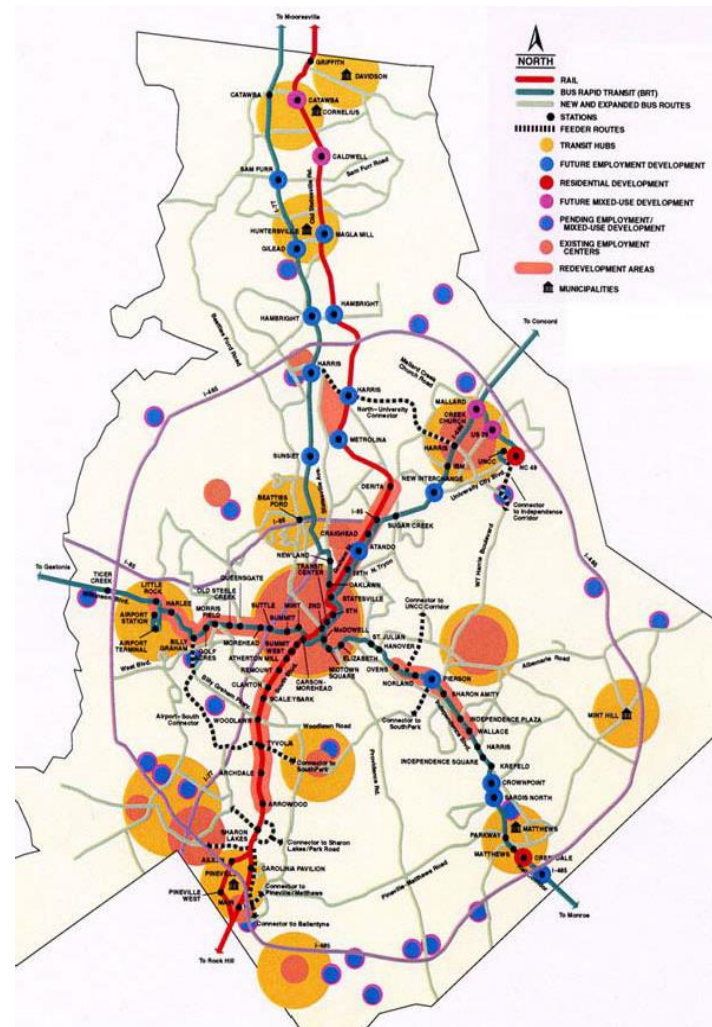
Staff Recommendations

Metropolitan Transit Commission

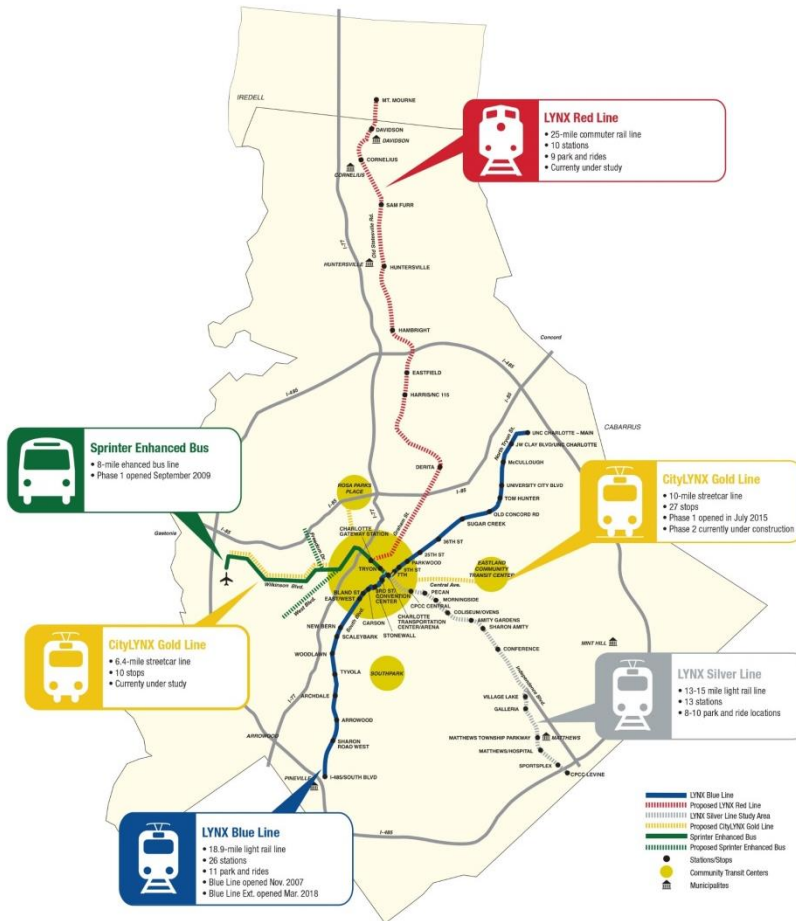
January 23, 2019



- Vision for a long-term growth management strategy
- Integrates rapid transit and mixed-used development along 5 transportation corridors
- Expands transit system to serve between the rapid transit corridors
- Provides more transportation choices to meet mobility needs
- Supports sustainable growth for region
- Updated in 2006 to the 2030 Transit System Plan



LYNX SYSTEM MAP



Operating

- LYNX Blue Line Light Rail
- Sprinter Airport Enhanced Bus
- CityLYNX Gold Line Phase 1

Under Construction

- CityLYNX Gold Line Phase 2

Under Development

- Charlotte Gateway Station

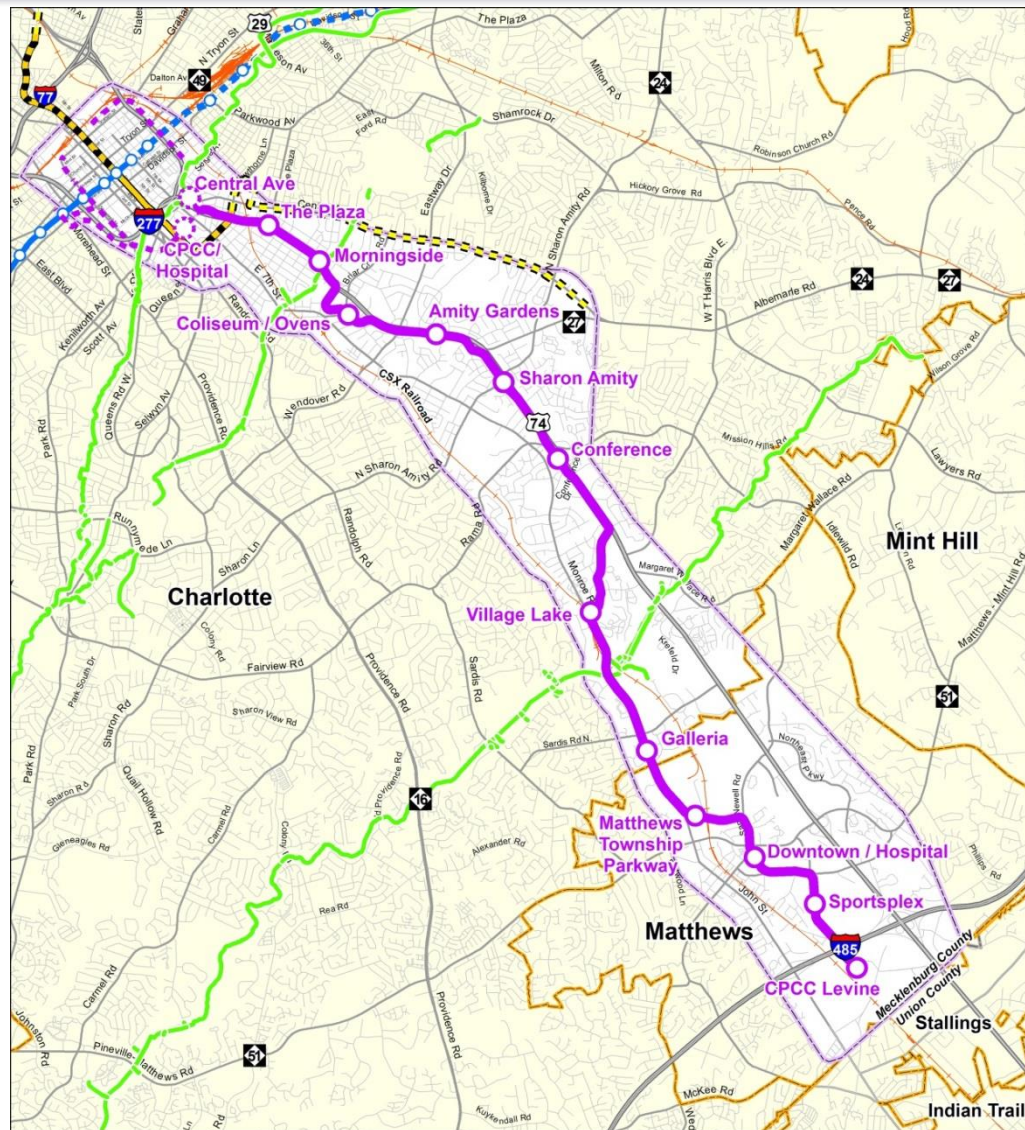
Recently Approved

- LYNX Silver Line Light Rail Adopted by MTC in November 2016

Under Study

- LYNX Red Line
- LYNX West Corridor
- LYNX Silver Line Center City
- System Integration

- MTC approved recommendation of light rail LPA in November 2016
- 13-15 miles long including planning for rail trail
- 13 stations with 8-10 park and ride locations
- Identified as possible extension to the West Corridor
- Center City alignments to be considered as part of LYNX System Update



- **Southeast Corridor (Silver Line)**

- MTC adopted light rail to Matthews as the LYNX Silver Line LPA in November 2016
- Need to determine Center City access

- **North Corridor (Red Line)**

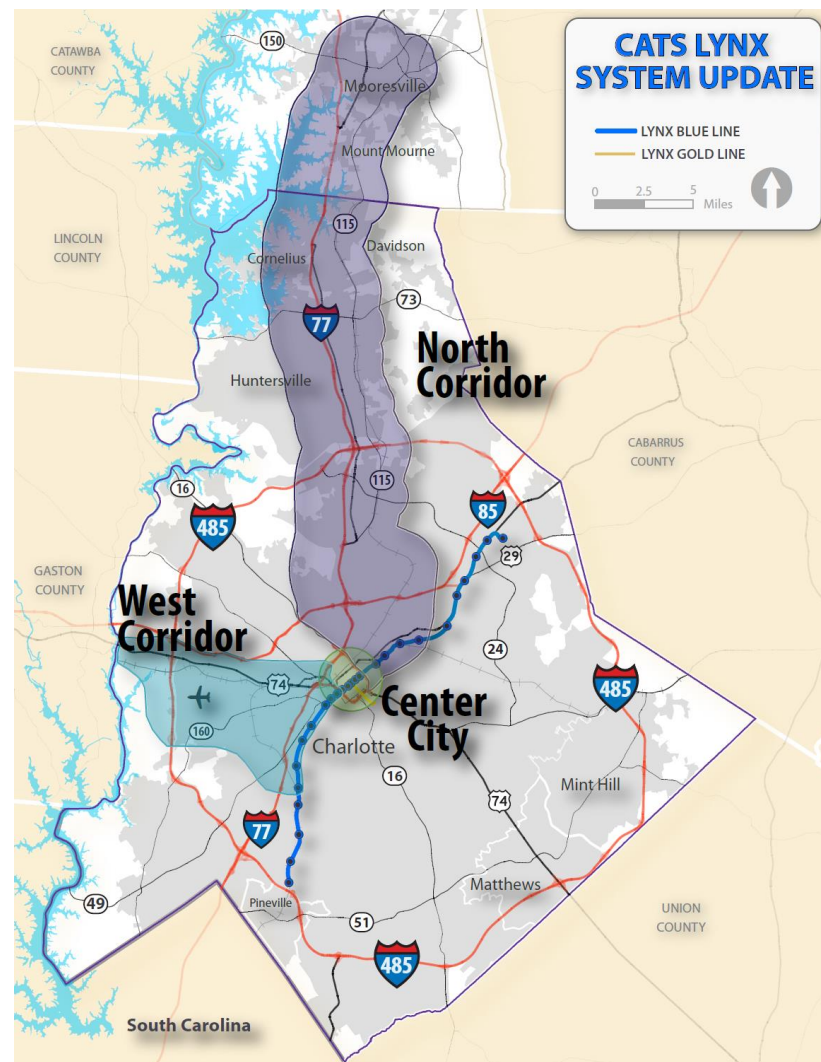
- LYNX Red Line LPA is commuter rail on Norfolk Southern (NS) O-Line
- Use of NS O-Line corridor problematic
- In addition to O-Line, the study will consider rapid transit on other alignments

- **West Corridor**

- Extends approximately 9.5 miles from Uptown Charlotte to the Gaston County border
- Current LPA is streetcar
- Plan to study light rail and potential alignments

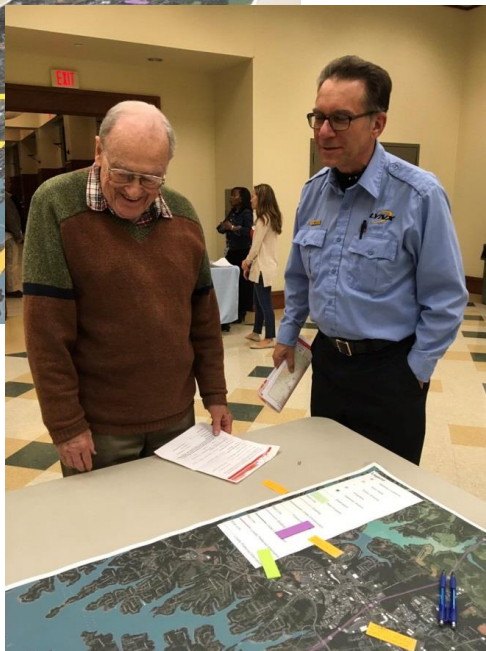
- **Center City Integration Study**

- Determine how best to integrate three corridors into Uptown with LYNX Blue Line, CityLYNX Gold Line, and Charlotte Gateway



19 Public Workshops

600+ Attendees at
Public Workshops



Cornelius Town Hall
October 17, 2017



19 Public Workshops

600+ Attendees at
Public Workshops

Gaston College, Belmont
August 21, 2018



 **Charlotte Area Transit System (CATS)** was live.
August 9 at 3:15 PM · 🌐

LYNX Red Line public meeting is underway this evening at Charles Mack Citizen Center in Mooresville. We will be here until 7:30 discussing future transit options. Can't stop by? Watch the public meeting LIVE now and comment with your questions!

3,200+ Survey Participants

2,800+ Facebook Live Public Workshop Video Views



CATS LYNX System Update

Progress 



70

Stakeholder, Civic
Organization, and
Neighborhood Meetings



2,000

Engaged



Establish **reliable transit** to connect the region, enhance quality of life, and strengthen access to opportunities



Use transit to **influence and shape growth** while respecting community character



Increase mobility in each corridor through effective transit investments

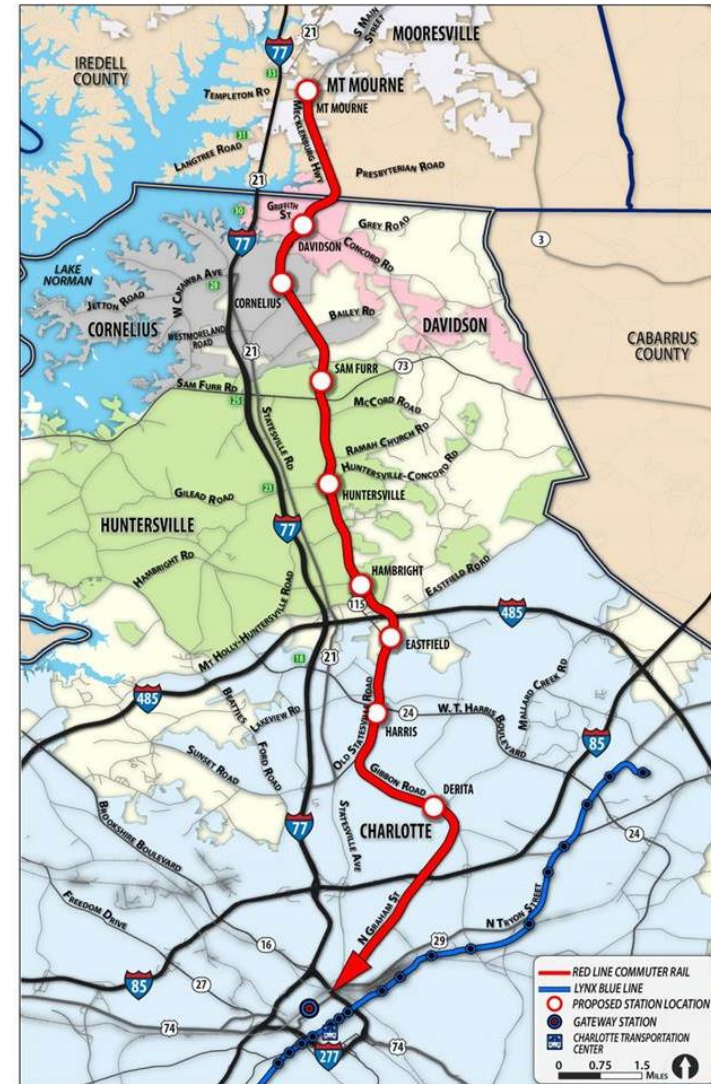


North Corridor



LYNX Red Line Commuter Rail

- Utilizes existing tracks owned by Norfolk Southern (NS) from south of Mooresville to Uptown Charlotte
- Strong downtown land use connection in Mooresville, Davidson, Cornelius, and Huntersville
- Intended to terminate at multimodal Charlotte Gateway Station
- Peak and limited midday service only
- Adopted rapid transit vision for the North Corridor since 1998
- LYNX System Update Study has evaluated potential rapid transit options for consideration by the MTC



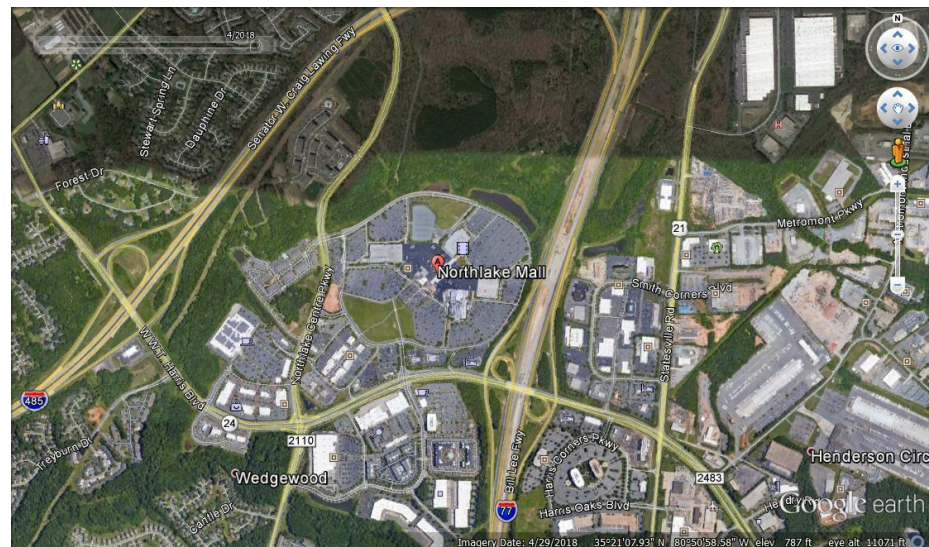
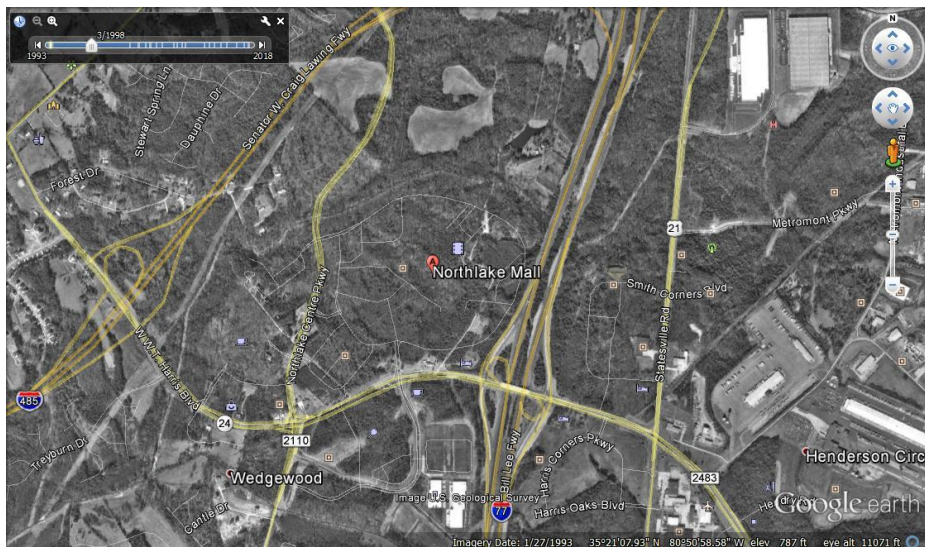
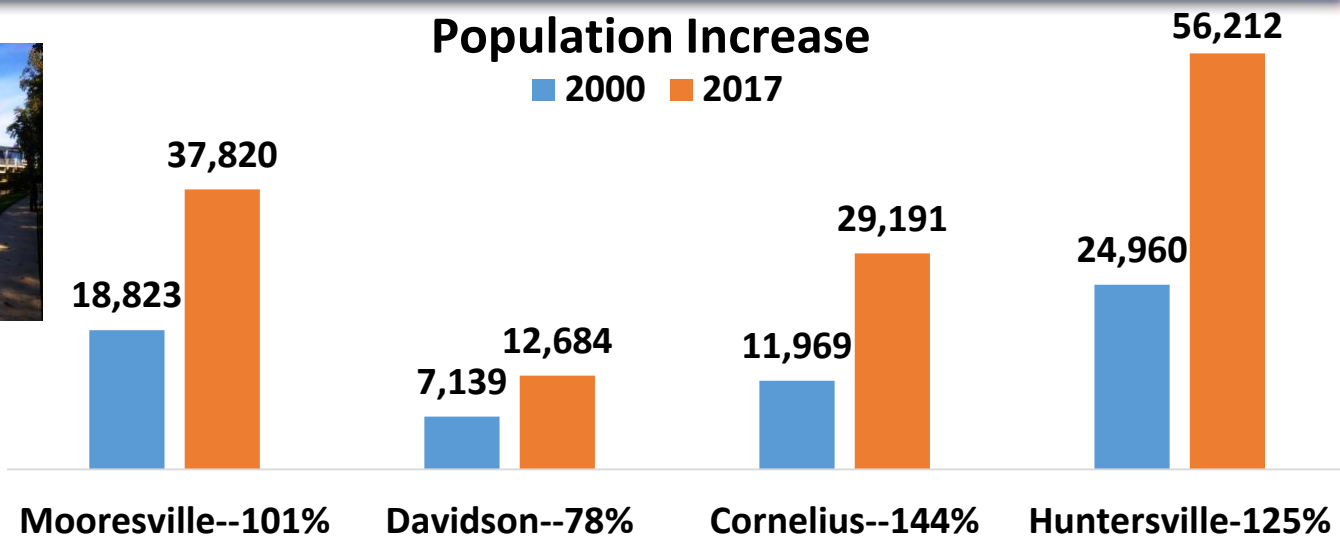
What's Changed since 1998?



Lowes moves to Mooresville in 2004

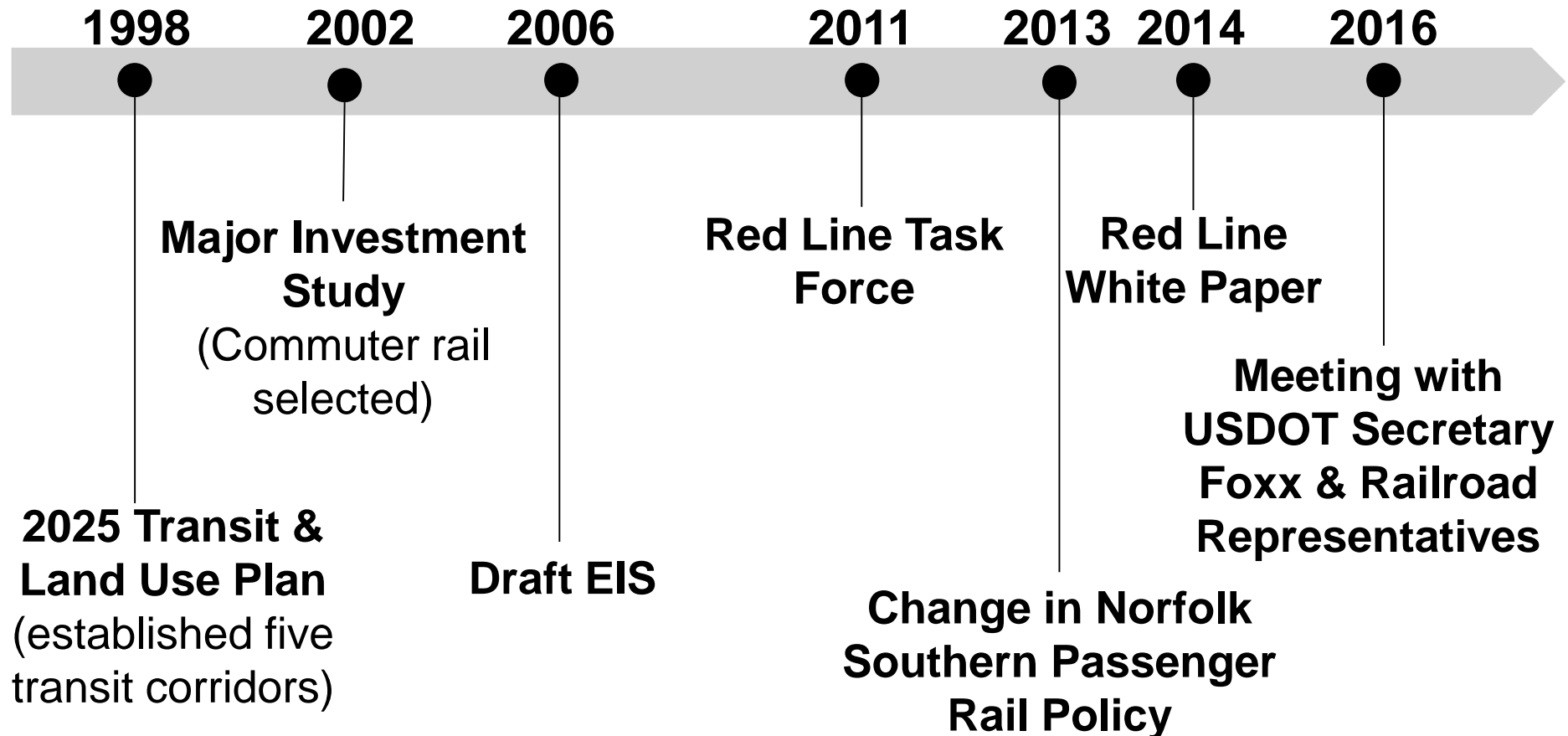
Population Increase

■ 2000 ■ 2017



1998--NorthLake Mall--2018

North Corridor Planning History



Norfolk Southern Corporation sent an updated letter to CATS on February 21, 2018



Norfolk Southern Corporation
Strategic Planning
Three Commercial Place
Norfolk, VA 23510

John V. Edwards
General Director Passenger Policy
757-629-2838
757-533-4884 – Fax
John.Edwards@nscorp.com

February 21, 2018

Via email only

John M. Lewis, Jr.
Chief Executive Officer
City of Charlotte – Charlotte Area Transit System
600 East Fourth Street – 9th Floor
Charlotte, NC 28202

Re: Proposed Passenger Projects

Dear Mr. Lewis:

First, I want to thank you for our close working relationship over the past couple of years. It has always been a pleasure.

I wanted to send our recently updated our 2013 passenger planning policy principles. You will note that nothing has changed in the principles – only the final two bullet points have been updated to address wording issues.

These passenger planning policy principles will guide our review of any new passenger initiative. They protect the safety of Norfolk Southern employees and communities, service to our freight customers, and the right-of-way and land needed to fulfill our freight transportation mission.

Please feel free to distribute this document to those who may be involved in progressing passenger initiatives in North Carolina. I am also happy to provide a separate policy that applies to the design and construction of passenger stations, should that be relevant.

As always, three primary conditions must be satisfied for NS to consider a passenger project. First, public and employee safety must be maintained or improved. Second, NS must model the configuration and effects of the proposed project, a process that can take several years. And third, any project – like our freight business – must provide a return for our stockholders. It is helpful to understand that the availability of project funding and an operational feasibility study are not the end of the discussion, but rather the beginning. Therefore, we always urge planning well in advance of when funding could become available.

Sincerely,



John Edwards

Freight operations are long distance and customer-driven, which precludes "passenger only" operating windows and temporal separation such as night –time-only freight operations.

- ***Additional, separate tracks are required for passenger service***

GENERAL PRINCIPLES GUIDING
NORFOLK SOUTHERN'S EVALUATION OF
INTERCITY AND COMMUTER PASSENGER RAIL
PROPOSALS

The following principles are a guide for planners of intercity and commuter rail proposals when working with Norfolk Southern. Of course, each proposal necessarily is unique, and NS' application of the principles to particular proposals will often be unique as well.

Safety is our paramount concern. Design, maintenance practices, and operating patterns always will emphasize safety.

An operational feasibility study is necessary to fully understand all potential impacts.

- The proposed passenger operation must create "transparency" in the affected rail system. Transparency is the capacity for passenger trains and freight trains to operate without delay, however minimal, to each other, while still allowing for route maintenance.
 - Passenger projects are meant to be successful, so the study will focus on the proposal's full-build scenario versus any interim plan. Along the same lines, freight projects must be successful as well.
 - Freight operations are long distance and customer-driven, which precludes "passenger only" operating windows and temporal separation such as night-time-only freight operations.
 - Passenger projects might cause additional effects on the NS system that are broader than the project area. Often, the studied geographic scope will have to be larger than the passenger project area in order to identify and address these effects.
 - Project costs associated with compliance with Federal Railroad Administration regulations are the responsibility of the project sponsor.
- The rail environment changes. Conditions attached to various forms of funding differ. Therefore, until funding is available, any passenger study is necessarily hypothetical.
 - A completed operational feasibility study by NS is a prerequisite to progress a project. NS will support only passenger project requests that have been fully studied and modeled.
 - As the transportation industry is dynamic, any proposal that does not secure funding cannot be shelved for future use – each proposal is unique, requiring its own up-to-date study.
 - Sometimes public funding comes with special conditions and requirements (including so-called "service outcome requirements"), which represent additional costs. Just as NS does not customarily agree to similar guarantees with our freight customers, the public sponsor will be responsible for any passenger guarantees.
 - It is possible that public funding may be taxable to Norfolk Southern, so the public sponsor must indemnify Norfolk Southern for any income taxes paid or incurred as a result of the receipt of public funding.

Passenger projects are meant to be successful, so the study will focus on the proposal's full-build scenario versus any interim plan. Along the same lines, freight volumes will grow, so any study will anticipate future freight levels.

- ***Norfolk Southern will want to preserve the ability to double track for freight operations***

GENERAL PRINCIPLES GUIDING
NORFOLK SOUTHERN'S EVALUATION OF
INTERCITY AND COMMUTER PASSENGER RAIL
PROPOSALS

The following principles are a guide for planners of intercity and commuter rail proposals when working with Norfolk Southern. Of course, each proposal necessarily is unique, and NS' application of the principles to particular proposals will often be unique as well.

Safety is our paramount concern. Design, maintenance practices, and operating patterns always will emphasize safety.

An operational feasibility study is necessary to fully understand all potential impacts.

- The proposed passenger operation must create "transparency" in the affected rail system. Transparency is the capacity for passenger trains and freight trains to operate without delay, how much delay, and when.
 - Passenger projects are meant to be successful, so the study will focus on the proposal's full-build scenario versus any interim plan. Along the same lines, freight volumes will grow, so any study will anticipate future freight levels.
 - Freight operations are long distance and customer-driven, which precludes "passenger only" operating windows and temporal separation such as night-time-only freight operations.
 - Passenger projects might cause "network effects" on the NS system that are broader than the project area. Often, the studied geographic scope will have to be larger than the passenger project area in order to identify and address these effects.
 - Project costs associated with compliance with Federal Railroad Administration regulations are the responsibility of the project sponsor.
- The rail environment changes. Conditions attached to various forms of funding differ. Therefore, until funding is available, any passenger study is necessarily hypothetical.
 - A completed operational feasibility study by NS is a prerequisite to progress a project. NS will support only passenger project requests that have been fully studied and modeled.
 - As the transportation industry is dynamic, any proposal that does not secure funding cannot be shelved for future use – each proposal is unique, requiring its own up-to-date study.
 - Sometimes public funding comes with special conditions and requirements (including so-called "service outcome requirements"), which represent additional costs. Just as NS does not customarily agree to similar guarantees with our freight customers, the public sponsor will be responsible for any passenger guarantees.
 - It is possible that public funding may be taxable to Norfolk Southern, so the public sponsor must indemnify Norfolk Southern for any income taxes paid or incurred as a result of the receipt of public funding.

Light rail service involves use of equipment that is not appropriate for use on NS tracks. Physical separation is required.

- ***Additional, separate tracks with buffer space would be required***

- NS will coordinate the operational feasibility study. The cost of the study (including NS' time) is the responsibility by the sponsoring public agency. For planning purposes, NS can estimate study costs in advance. Studies are detailed and specific and take a year, and often longer, to complete.

NS will receive fair compensation for use of its transportation corridors.

- NS' corridors consist of track and right-of-way that might, or might not, be fully utilized at any given time. As rail traffic flows change over time, this capacity, and the flexibility and potential it represents, is a key NS asset.
- Amtrak has certain statutory intercity passenger service access rights and therefore is not a good example to use in determining the fair and commercial price for use of NS assets.
- In determining a fair price for use of assets, NS will factor in any new equipment (including Positive Train Control) and costs, as well as additional property and other taxes, that would not be incurred absent passenger service.

New and expanded passenger operations require adequate liability protection.

- Passenger operators must compensate or indemnify NS for additional risk created by passenger projects, and any such indemnification needs to be backed up by an adequate level of insurance.
- Liability issues can create major hurdles. Often, sovereign immunity issues must be overcome. The cost to the passenger carrier for insurance and indemnification is substantial, as borne out by our experience with commuter authorities.

Special considerations are necessary for high speed rail service and corridors.

- Norfolk Southern is pleased to assist states planning for dedicated HSR and will work with planners to insulate those corridors from interference with and from NS freight corridors.
- Passenger trains operating in excess of 79 mph require their own dedicated tracks. Passenger trains operating in excess of 90 mph require their own private right-of-way.
- Where higher-speed trains share tracks with conventional freight trains, they will be able to reach 79 mph maximum. Where shared track is concerned, higher-speed trains must meet the same safety standards as conventional trains.

Special considerations are necessary for light rail service and corridors.

- Light rail service involves use of equipment that is not appropriate for use on NS tracks. Physical separation is required.
- It is not viable for operating "non-compliant" passenger equipment (equipment that does not meet Federal Railway Administration standards) in joint operations with freight trains are not viable.
- Light-rail and non-compliant project sponsors should approach NS early in the process so that NS can advise if any of the project elements are compatible with freight trains and track.

Commuter Rail



- Typically 2-5 miles between stations
- Typically operates during peak periods Monday – Friday with limited midday trips
- Typically single track with passing tracks

Light Rail



- Typically 1 mile between stations
- Typically all day service with frequent trips
- Typically double track



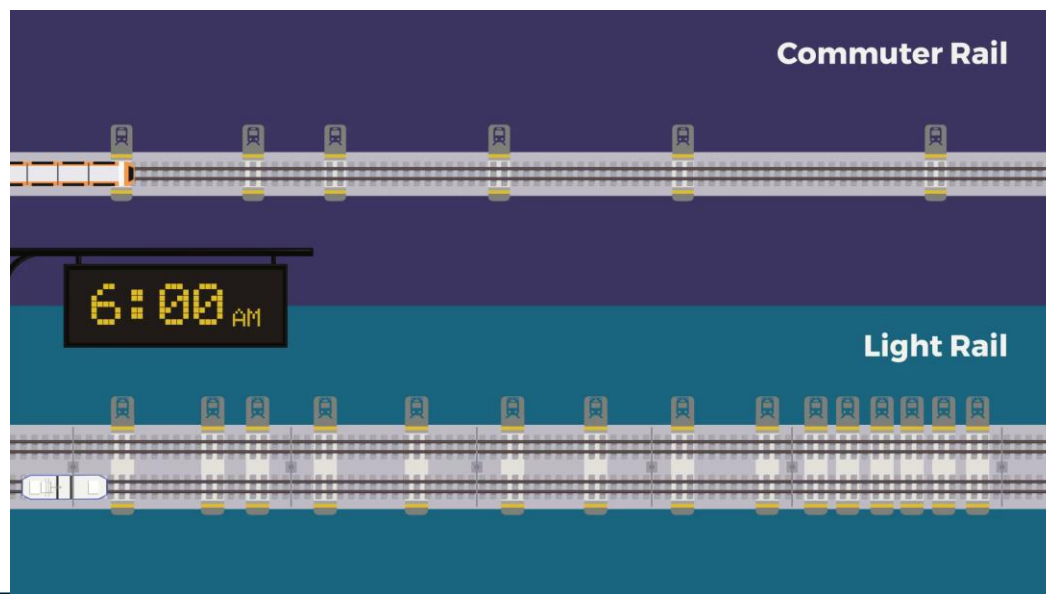
Trade Off Exercises

SPEED VS. ACCESS

MIXED-USE VS. STAND-ALONE STATION

PEAK DEMAND VS. ALL-DAY SERVICE

DRIVING VS. OTHER

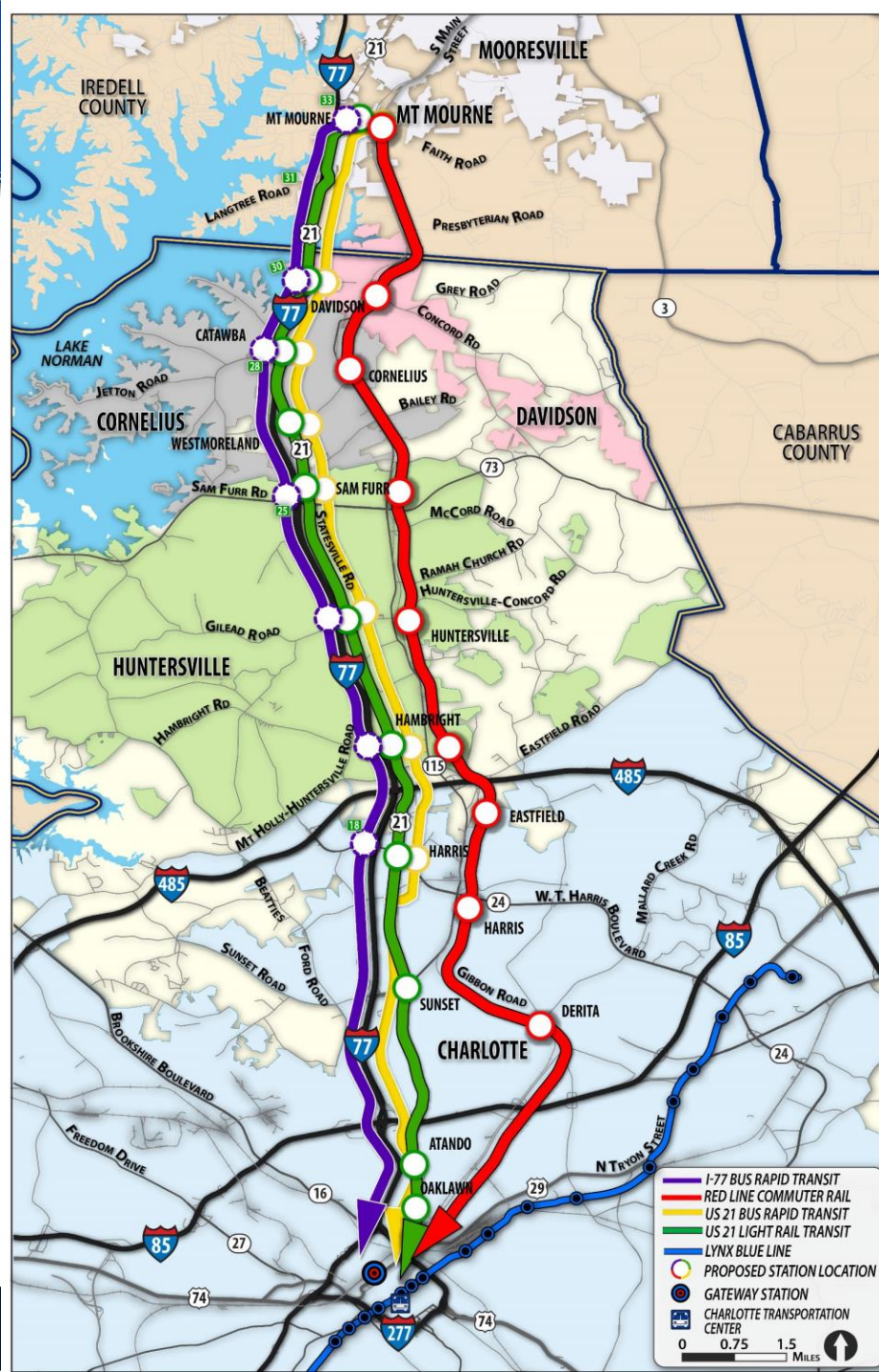


North Corridor Summer 2018 Rapid Transit Options






Red Line Commuter Rail

Interstate 77 BRT

US 21 Light Rail



Alternative Highlights

-  Requires O Line agreement with Norfolk Southern and permission to cross their main line to access Gateway Station.
-  Travel time of 56 minutes is higher than options using the I-77 express lanes.
-  Frequent service desired, increasing operating costs and need for more passing tracks.
-  Only option directly serving downtowns of Huntersville, Cornelius, and Davidson.
-  Local service within towns is possible but is limited by service frequency.



LYNX Red Line Commuter Rail


Alternative Highlights

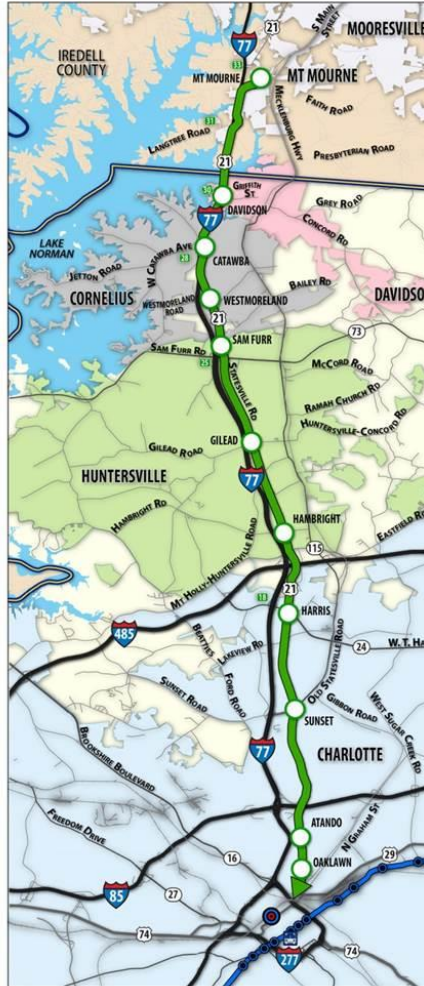
-  Low capital cost due to use of I-77 express lanes as transit guideway.
-  Travel time of 40 minutes is faster than other options due to express lanes and direct routing to park-and-ride lots.
-  New commute option that is now available due to construction of I-77 express lanes.
-  Transit-oriented development opportunities are more limited and require more creativity.
-  Local service within towns is not viable due to limited stops.



I-77 BRT

Alternative Highlights

-  Higher capital and operating costs than commuter rail.
-  Travel time of 63 minutes is much higher than other options.
-  Major new infrastructure required, including new bridge next to I-77 over Lake Norman.
-  Planned roadway widening will use most of the available right-of-way along US 21, requiring more space adjacent to US 21.
-  Frequent service provides strong connections between the towns.



US 21 LRT

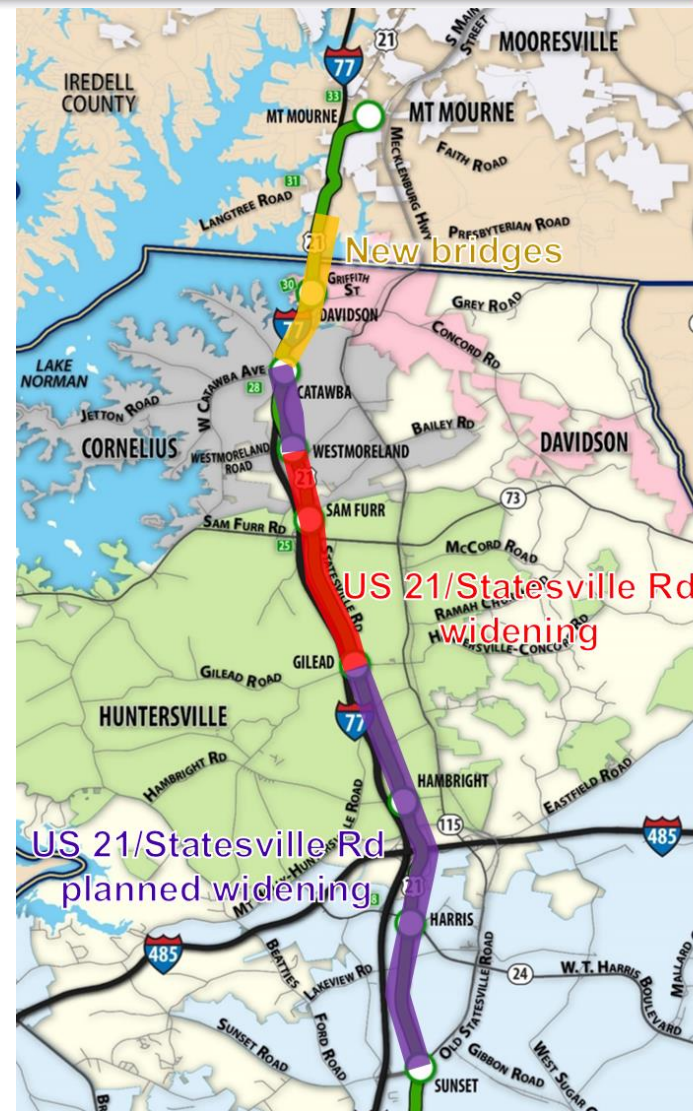
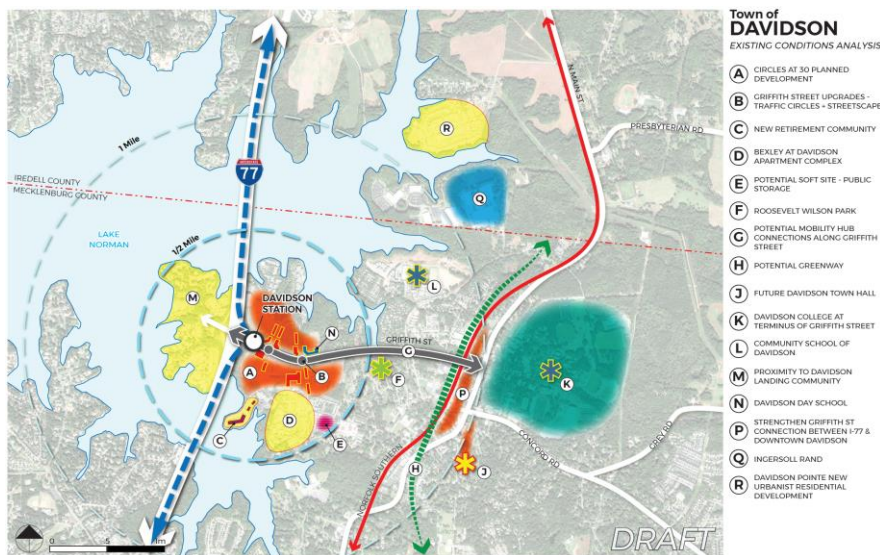
Alternative Highlights

-  Higher capital and operating costs than commuter rail, but capital costs are lower than for LRT.
-  Travel time of 54 minutes is less than LRT due to use of I-77 express lanes for some of the corridor.
-  Significant new infrastructure required, but less than LRT.
-  Planned roadway widening will use much of the available right-of-way along US 21, requiring more space adjacent to US 21.
-  Bus provides good opportunities for circulation within towns.



US 21/I-77 BRT

- Fall 2017 survey indicated a preference for more frequent service regardless of mode. However Summer 2018 survey indicated a preference for the LYNX Red Line commuter rail
- Advancing LRT or BRT along US-21/Statesville Rd. would require changes to NCDOT planned road projects and a shift in decades of land use planning
- The project team held BRT station workshops with town staff September 18-20 and November 30



The LYNX Red Line Commuter Rail is the current North Corridor LPA. However, until the NS passenger rail policy changes there is no path forward. In order to meet the public's desire for rapid transit services and increased mobility, CATS staff recommends:

Short term

Village Rider and Express bus stop amenity improvements

Continued express lane bus service improvements as recommended in the North Corridor Mobility Study and Envision My Ride

Medium term

Implementation of an I-77 Bus Rapid Transit service from Charlotte Gateway Station to Mooresville to include:

- All day service including nights and weekends
- Four new park and rides and two new express lane direct connects
- Integrated BRT stations into mixed use developments that also incorporate emerging mobility technologies for first/last mile.

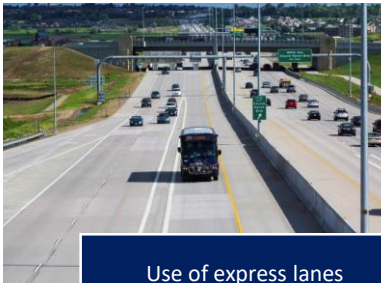
Long term

Continue dialogue with Norfolk Southern on use of the "O" Line corridor for a Rapid Transit project



Transit Service

- 6 stations
- 6 routes
 - Some express
 - Some serve all stations
 - Some stop on-street in Boulder and downtown Denver
- Frequent peak service
- Off-peak service all day, nights, and weekends
- Branded coach buses



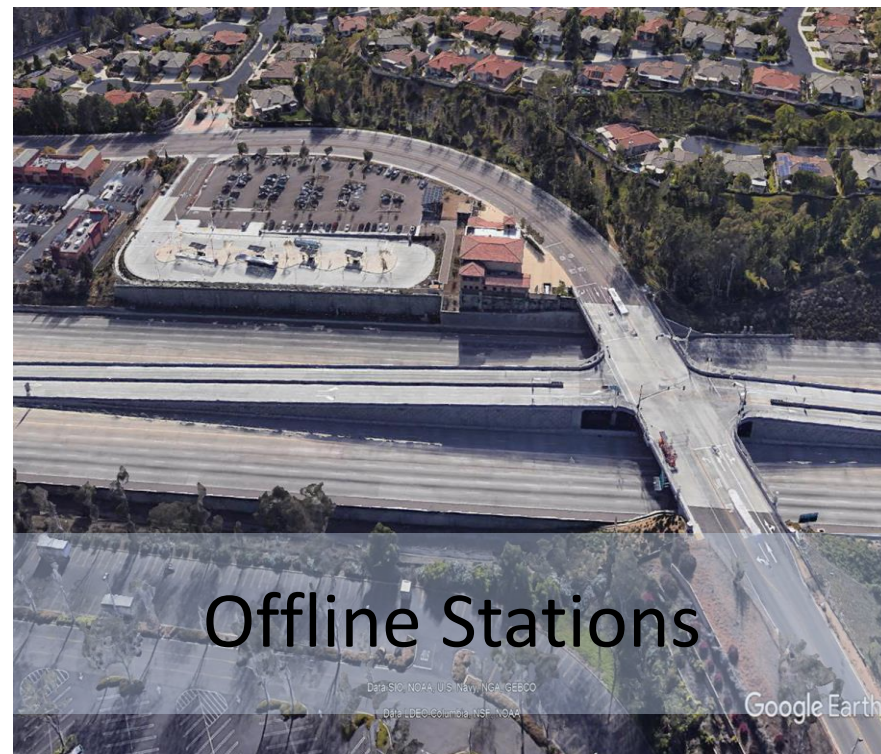
Use of express lanes



Stations functioning as local mobility and development hubs



Robust service plan



- Mooresville
- Langtree
- Griffith
- Catawba
- NorthCross
- Gilead
- Hambright
- Northlake Mall

- Catawba (bus access to station)
- NorthCross (direct connect)
- Stumptown/Gilead (direct connect)

- Hambright
- Lakeview

- Center City Charlotte

I-77 BRT Critical Coordination

Possibility to extend service past Langtree

Fairview Rd overpass

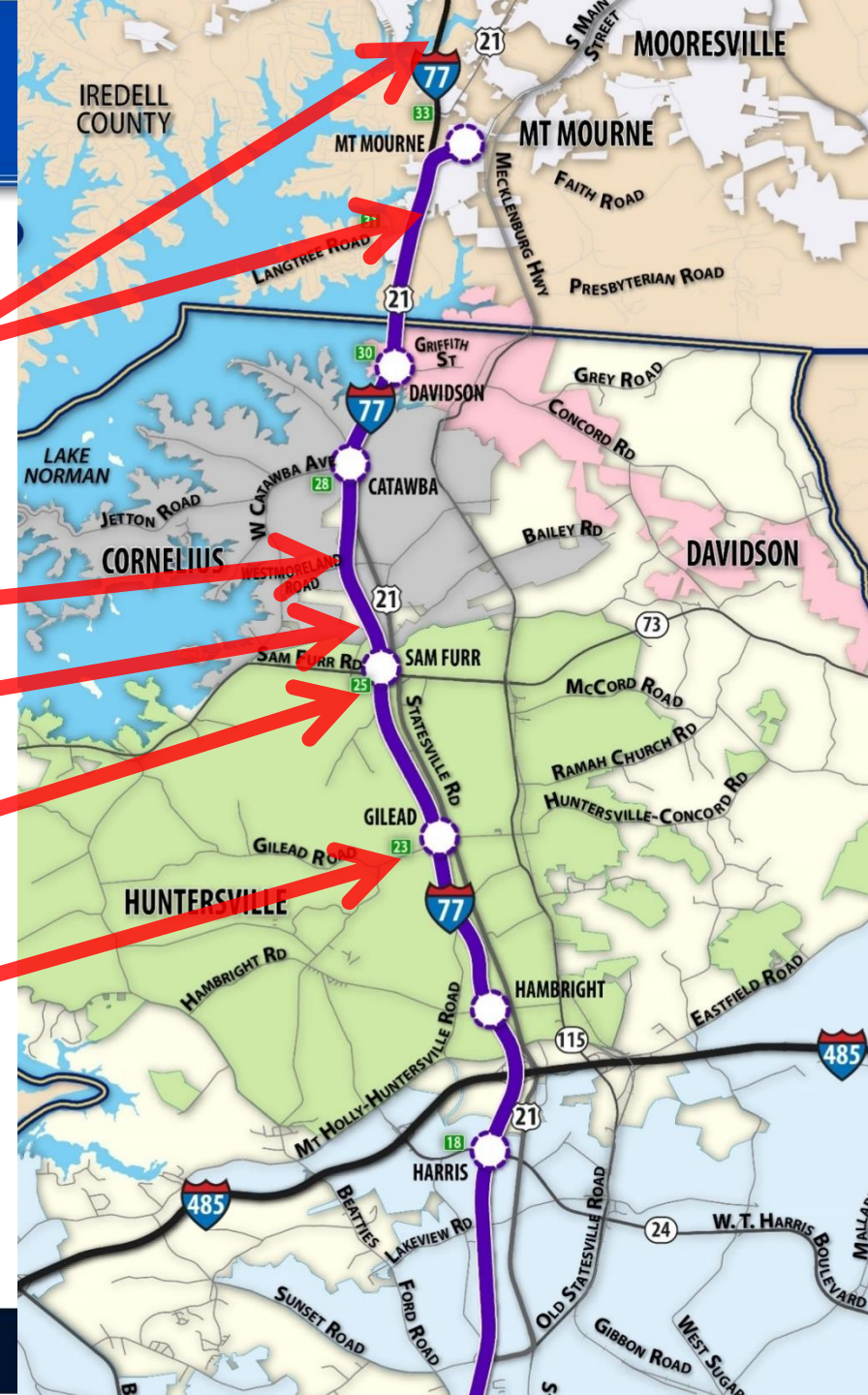
Westmoreland Rd interchange

Bailey Rd flyover

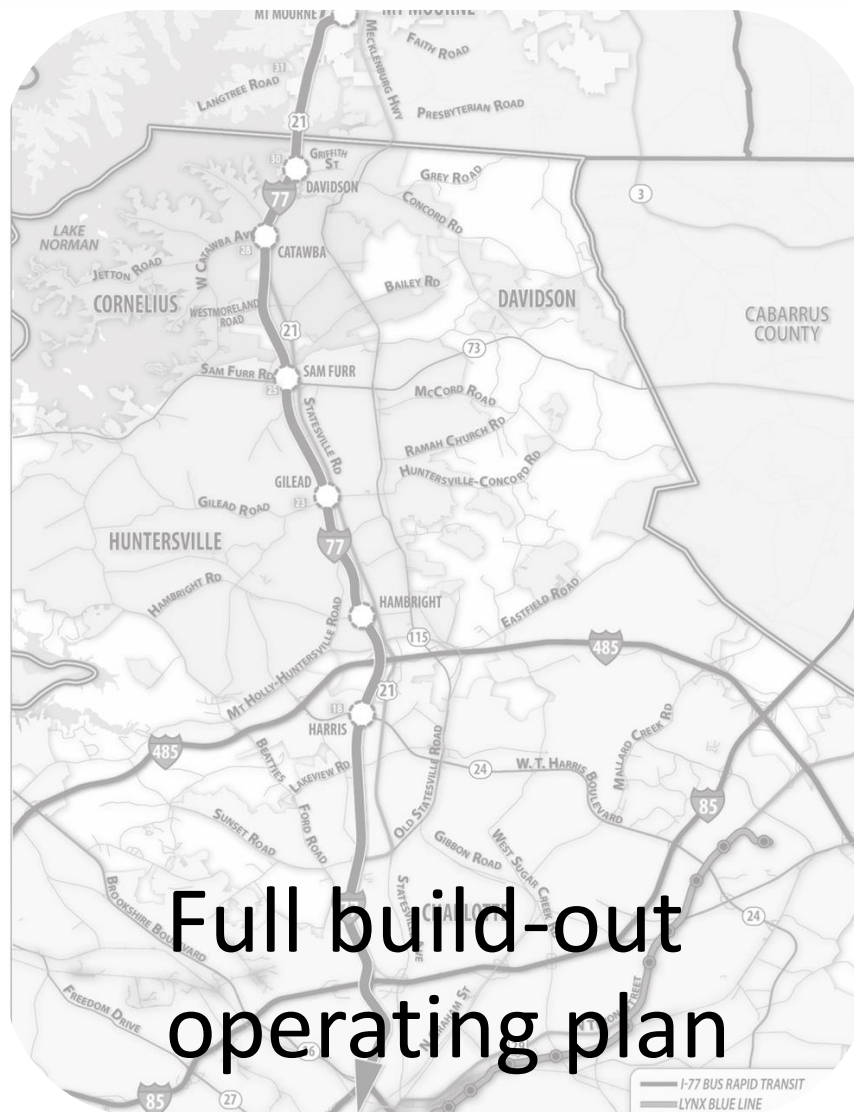
Exit 25 reconfiguration

Exit 23 reconfiguration

Coordination with comprehensive land use planning efforts throughout corridor



I-77 Enhanced BRT Program

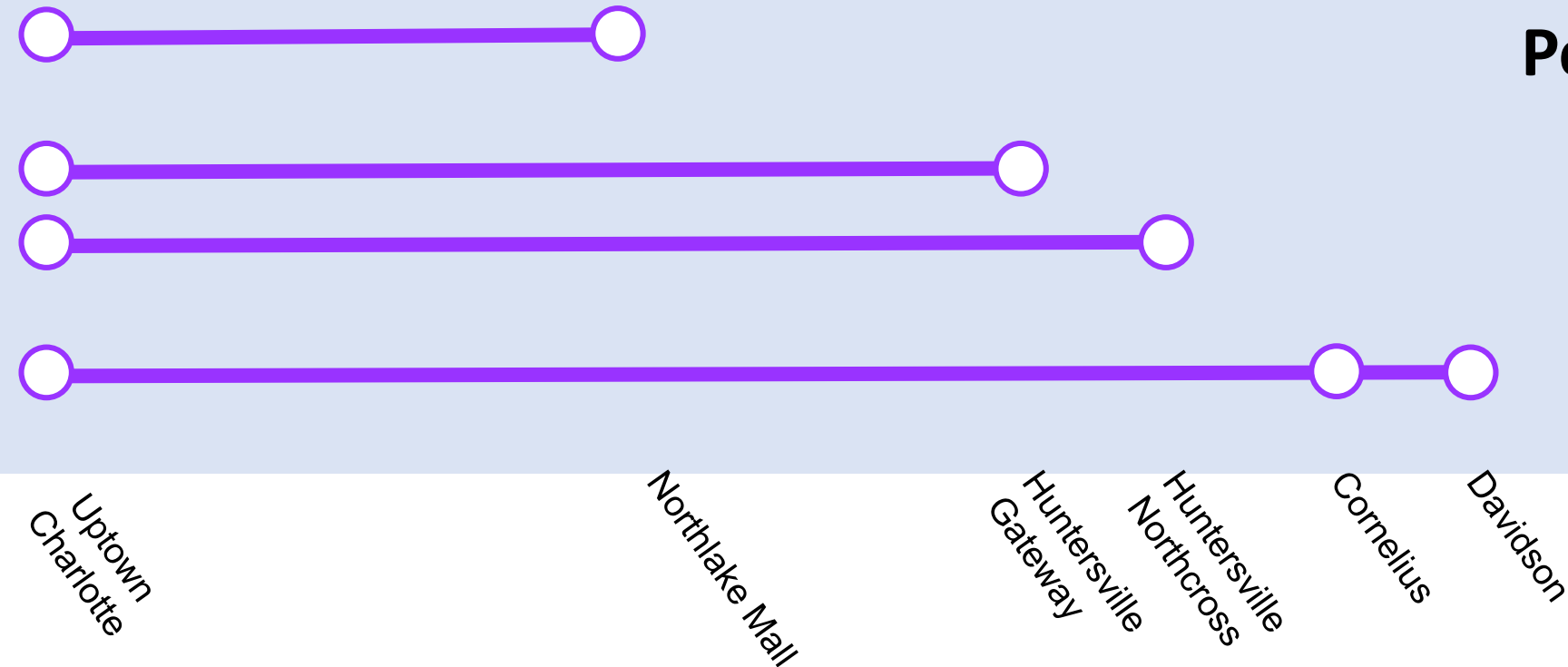


Family of services operating in the corridor



Mobility hub with flexibility to offer future autonomous service

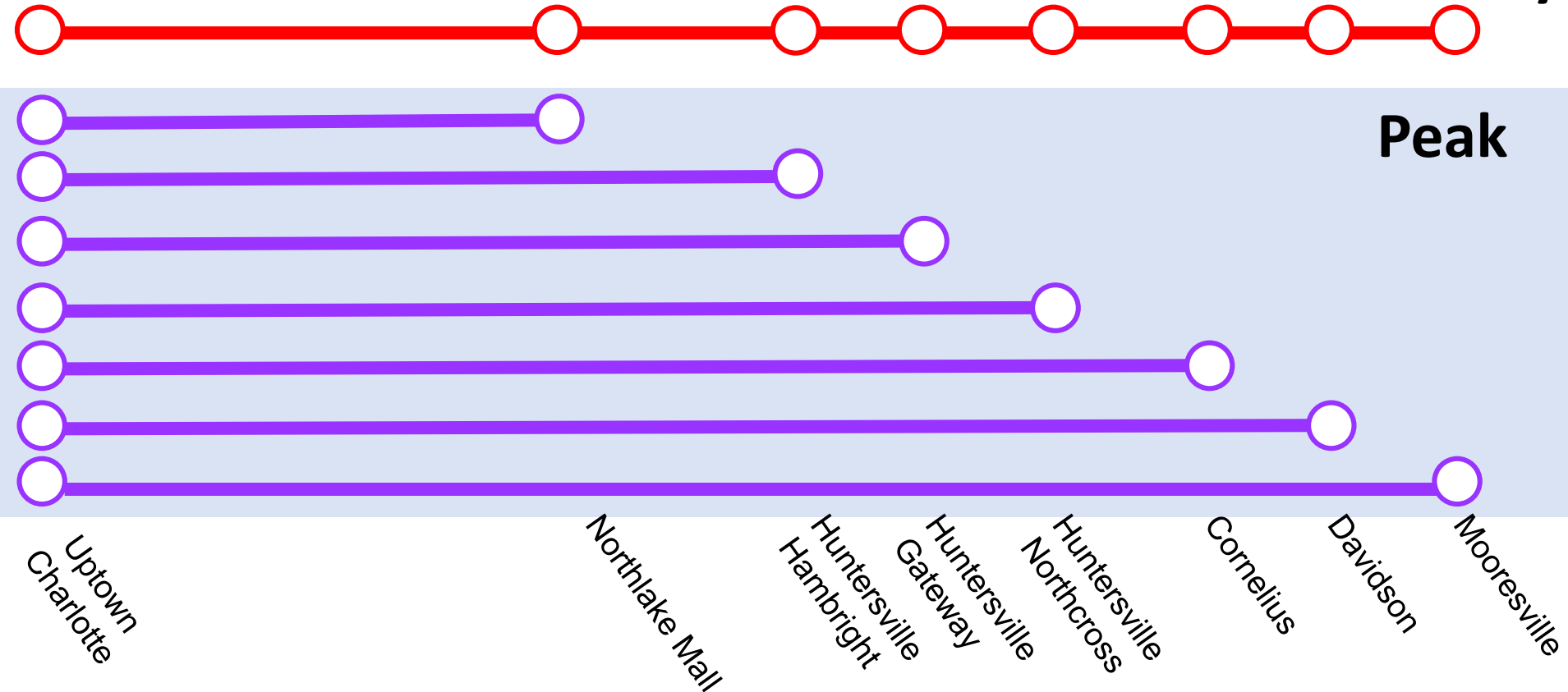
Peak



I-77 BRT Proposed Operating Plan

All Day

Peak



- **Peak direct service to existing and future park and rides**
- **Frequent service all day to each park and ride and stops**

Current Study

- Establishment of conceptual program of projects
- Development of initial illustrative station site framework concepts

Next Phase of Study

- Detailed evaluation of locations for stations and direct connects
- Coordination with NCDOT & I-77 Mobility Partners
- Community input on possible site locations
- Detailed operations planning for BRT service
- Site selection for park-and-rides

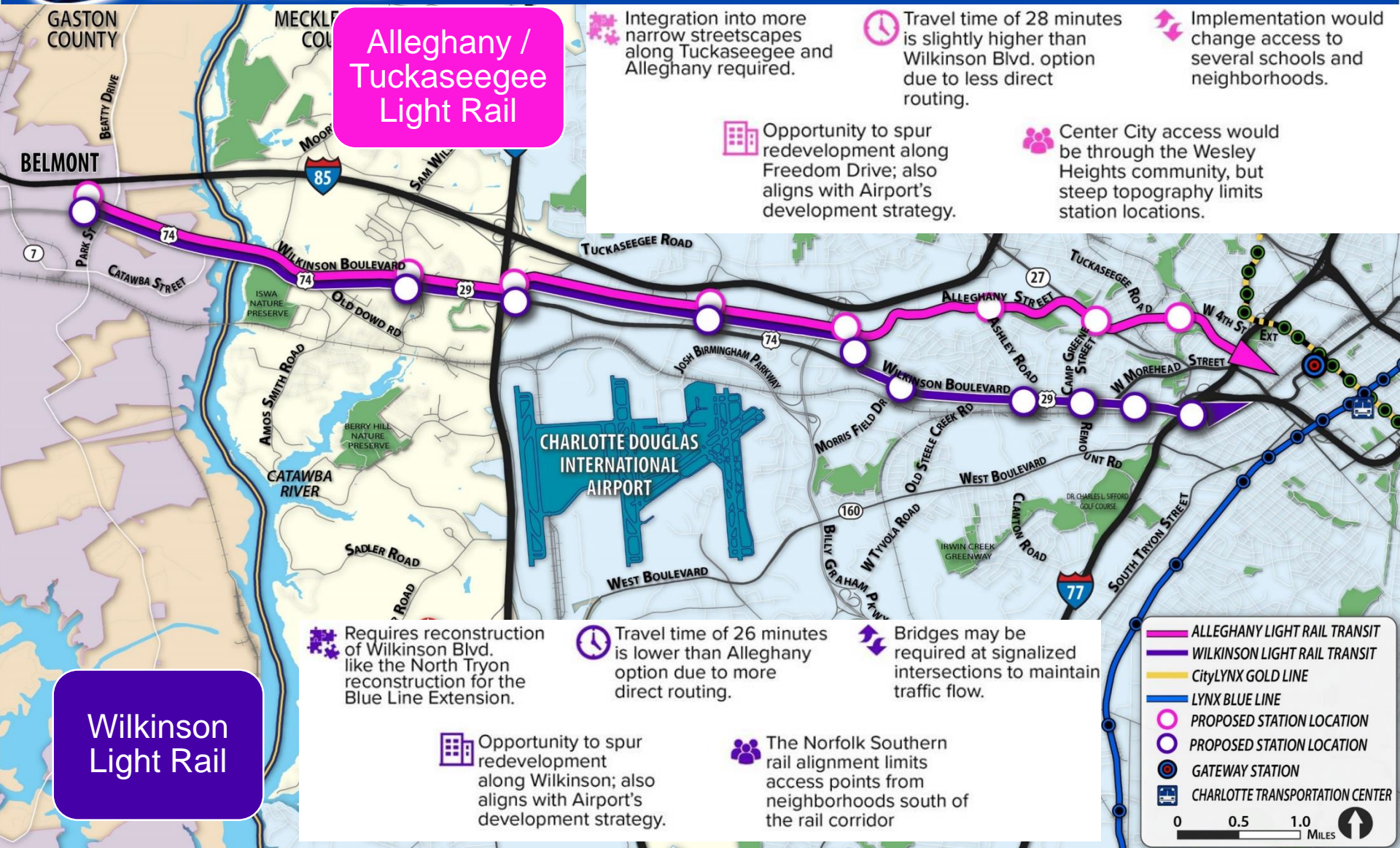
Future Implementation

- Submit program of projects for STI/FTA funding
- Final design for stations and direct connects
- Project construction

West Corridor



West Corridor Options Studied

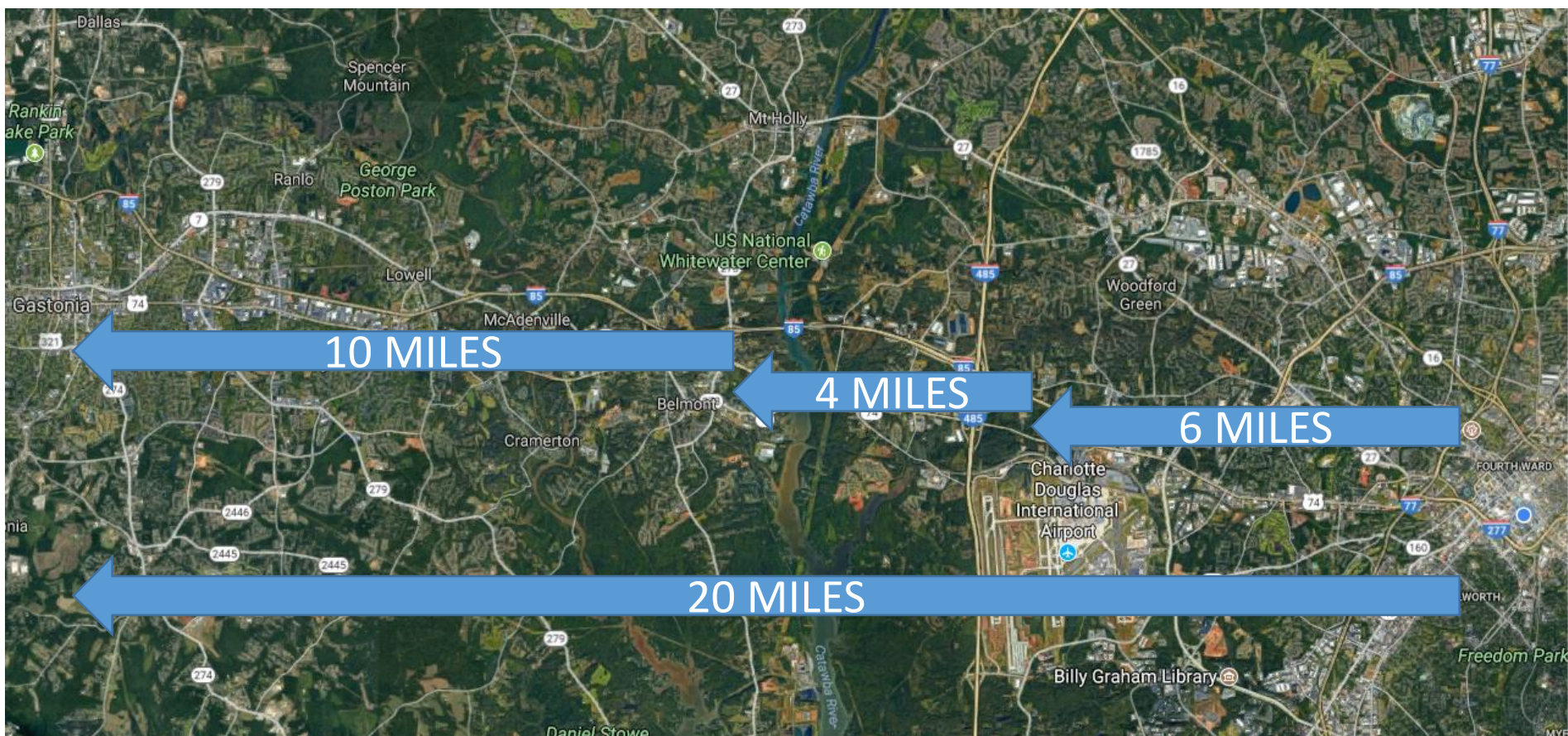


Why consider Gaston County?

- Charlotte Douglas International Airport Commercial Development Strategy
- Willingness to explore new ROW concepts
- Gaston County Charlotte Airport Economic Positioning Strategy
- Gaston County stakeholders have expressed interest
- NCDOT 74 bridge replacement



RE-ENVISIONING WILKINSON BOULEVARD BETWEEN THE CATAWBA AND SOUTH FORK RIVERS



Uptown Charlotte



Airport



Hwy 74 Bridge

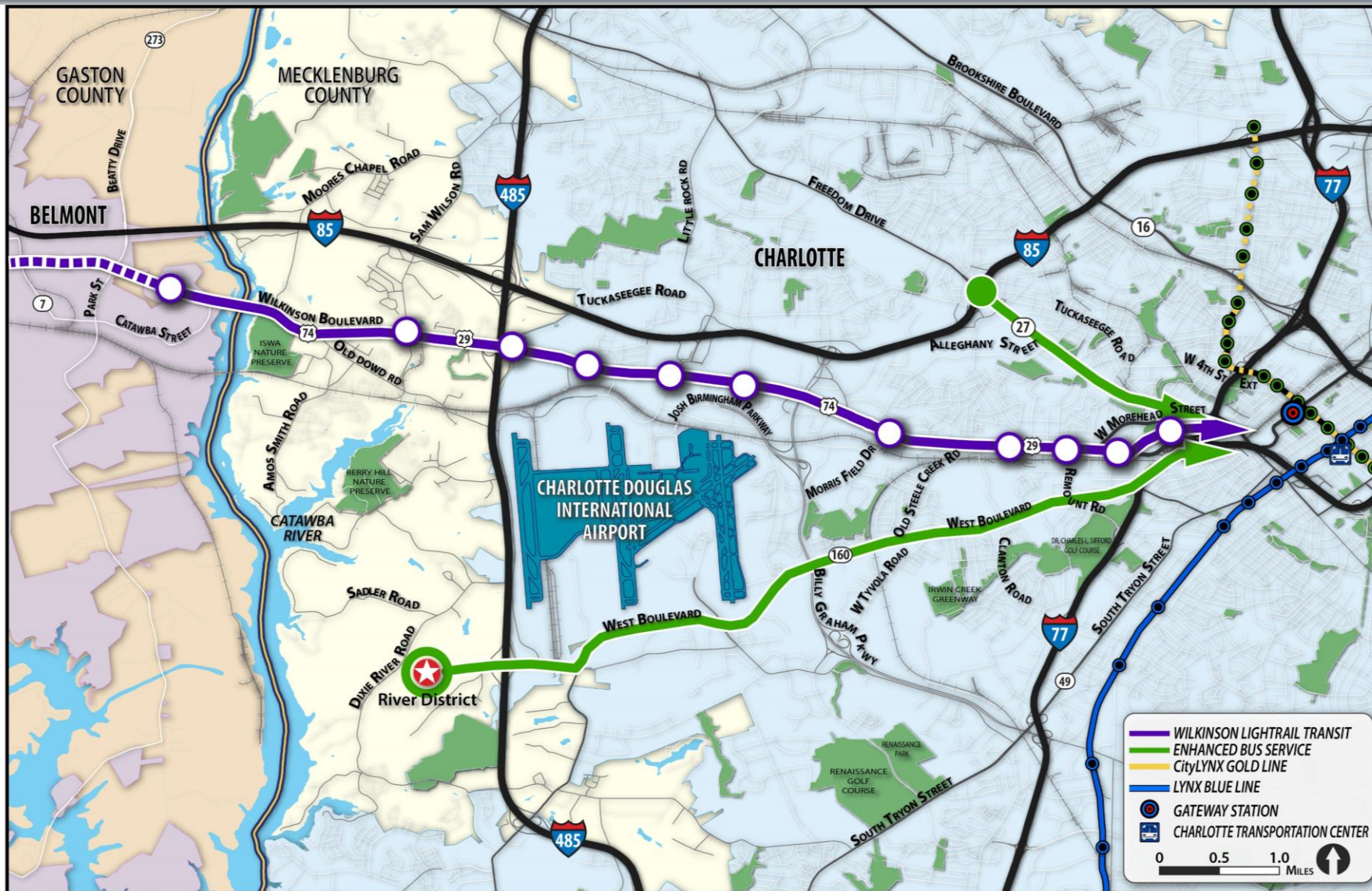




In 2006, the MTC adopted Streetcar from Charlotte Gateway Station to Charlotte Douglas International Airport.

CATS Staff recommends:

- Light rail replace streetcar as the West Corridor Transit Mode
- Wilkinson Blvd as the light rail alignment including planning for rail trail
- West Corridor be included in the LYNX Silver Line project
- Extend light rail across the Catawba River to the City of Belmont
- As part of the Regional Transit Study, evaluate light rail to downtown Gastonia
- Implement enhanced bus services and bus stop capital improvements along West Blvd and Freedom Drive

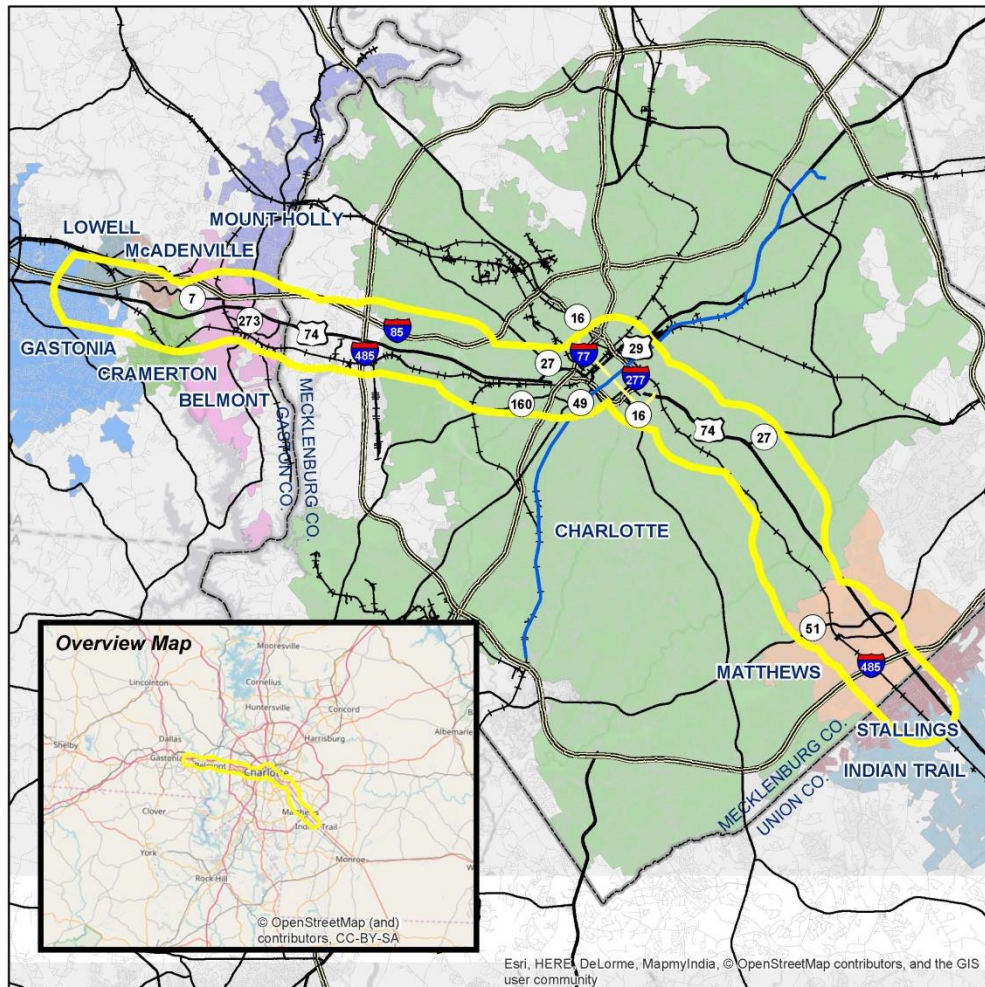


CATS -in partnership with Charlotte Planning, Design + Development Department, City of Gastonia, City of Belmont, Town of Matthews, Town of Stallings, and Town of Indian Trail- was awarded a planning grant for TOD planning from the Federal Transit Administration.

Silver Line Study Area

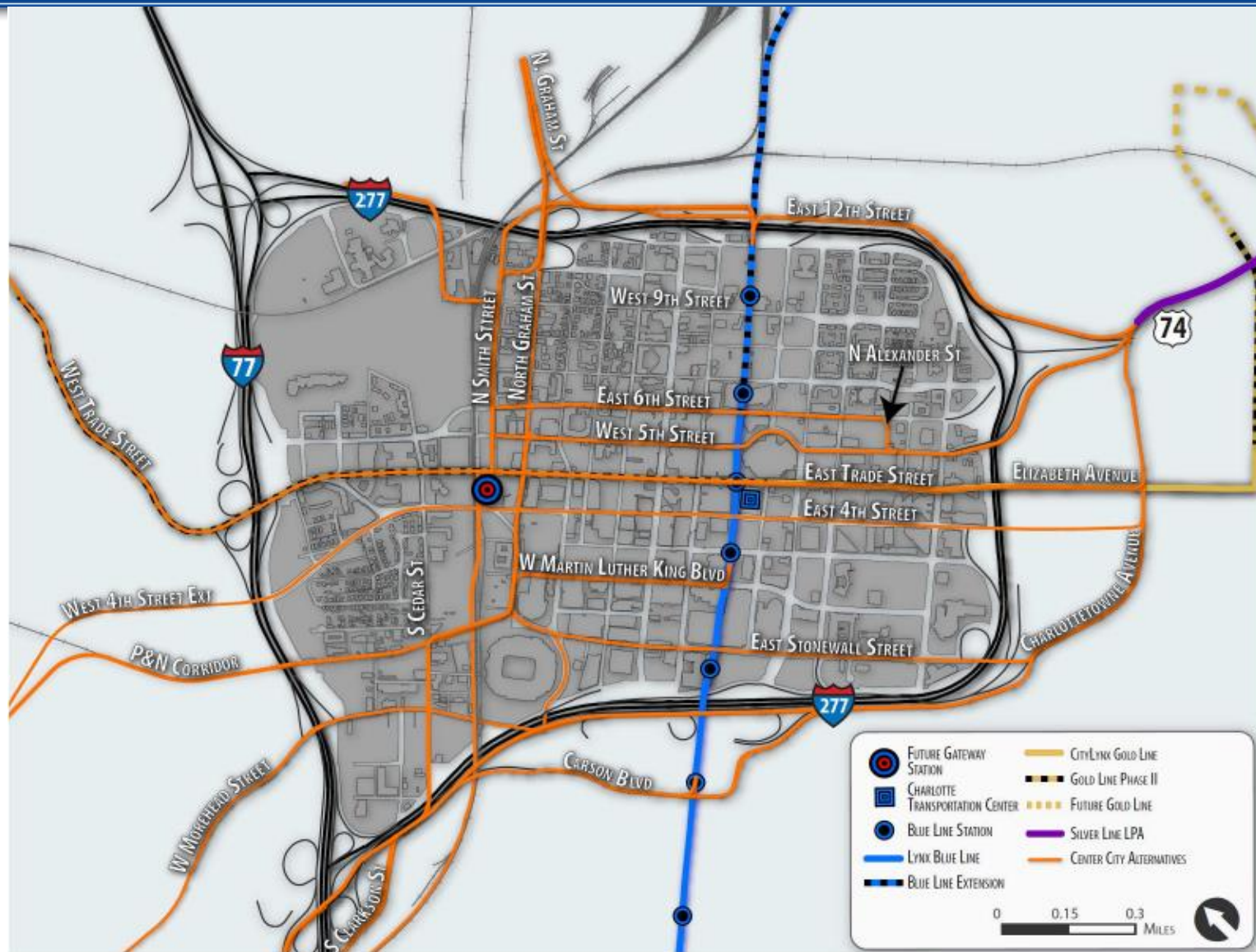
LEGEND

-  Study Area
-  Interstate
-  US Route
-  NC Route
-  Local Road
-  Railroad
-  LYNX Blue Line
-  CityLYNX Gold Line



Specific outcomes of this work will include:

- Determining future land use around stations
- Identifying supporting infrastructure
- Advance actions for corridor preservation and affordable housing
- Identifying innovative economic development and financing strategies





Time is of the essence for selecting a preferred Center City transit approach.

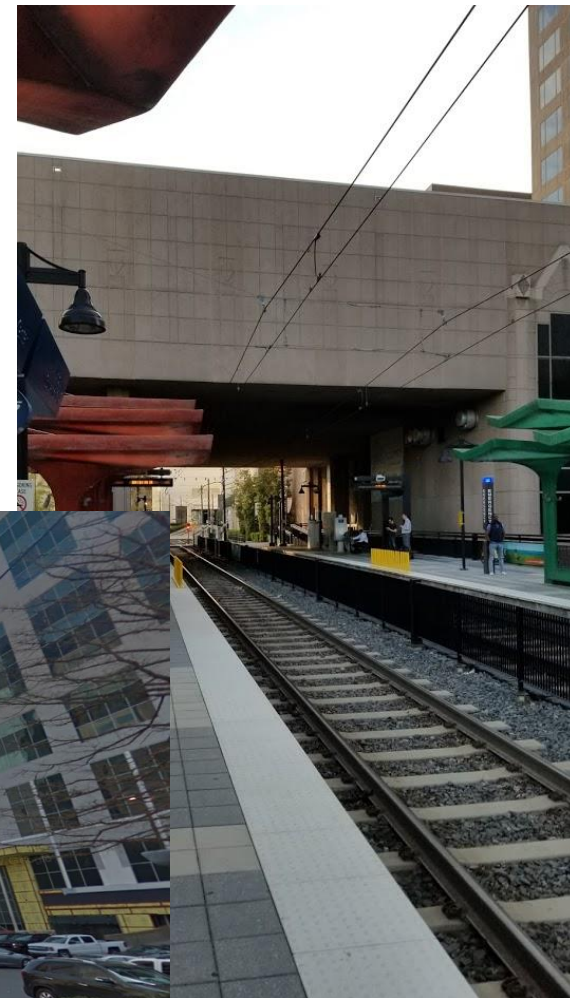
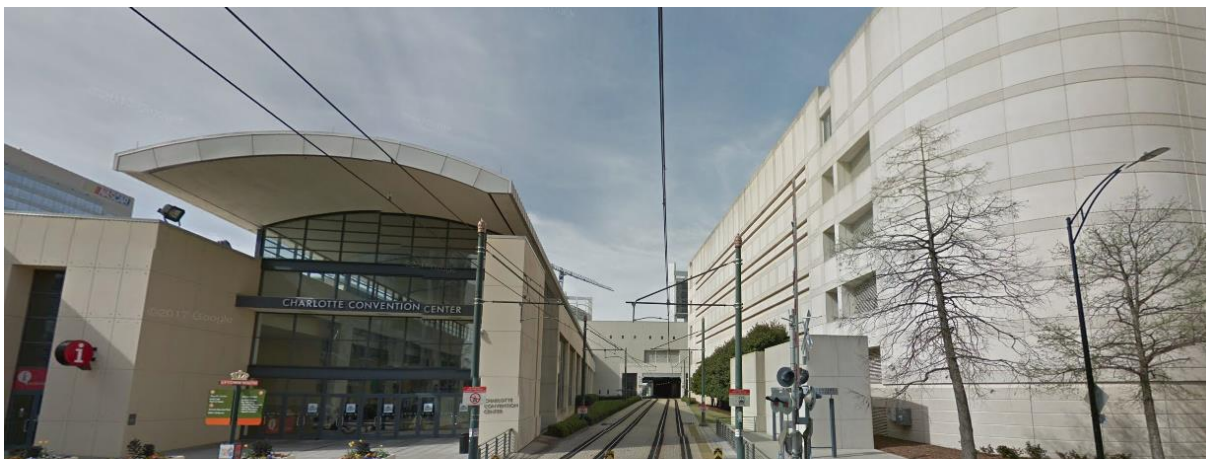
CATS cannot advance its System Plan without certainty on how all the transit pieces fit together.

Finding an approach will only get more difficult as Center City continues to develop.



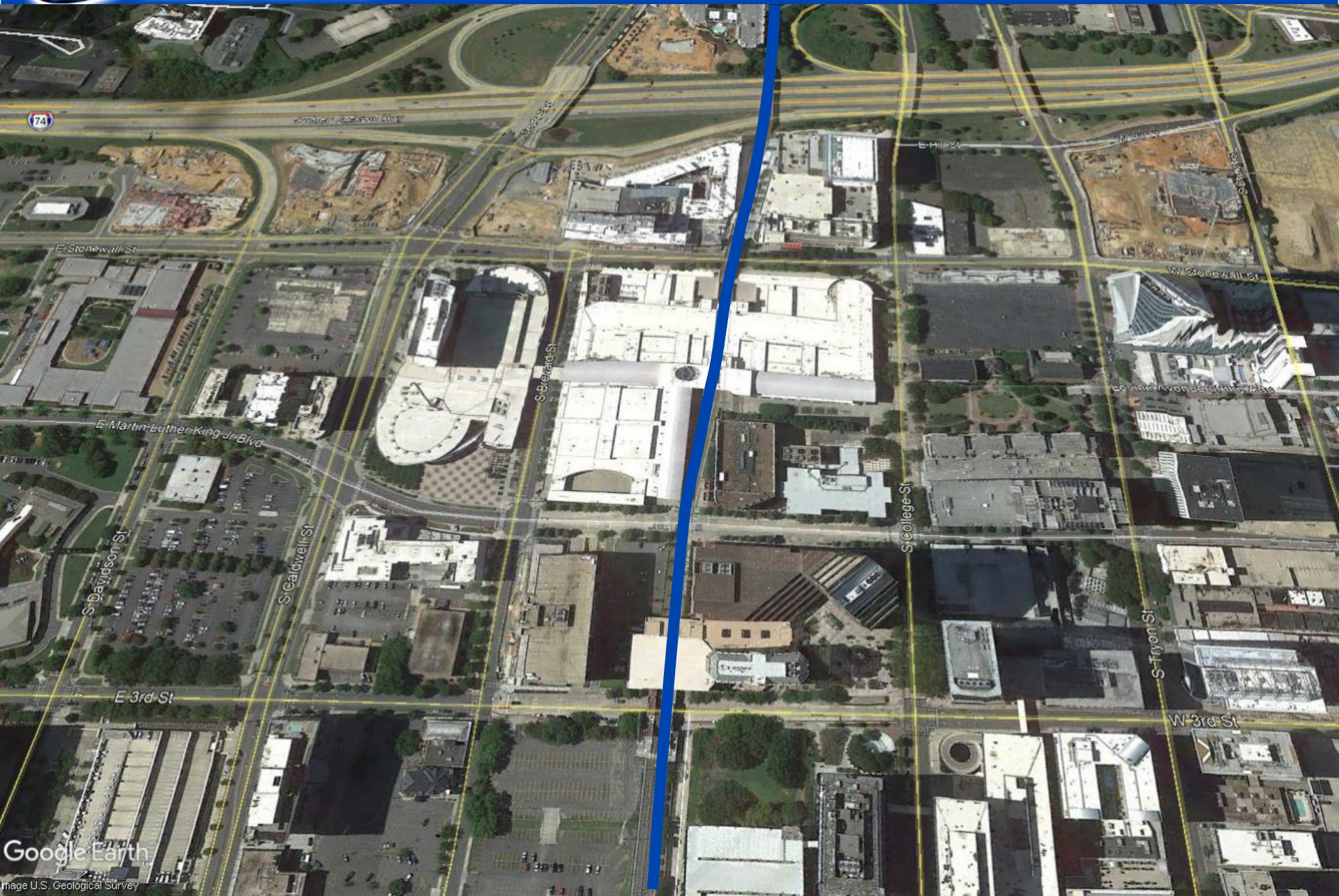
Look Familiar?

LYNX Blue Line in Uptown Charlotte











STONEWALL STREET in 2015

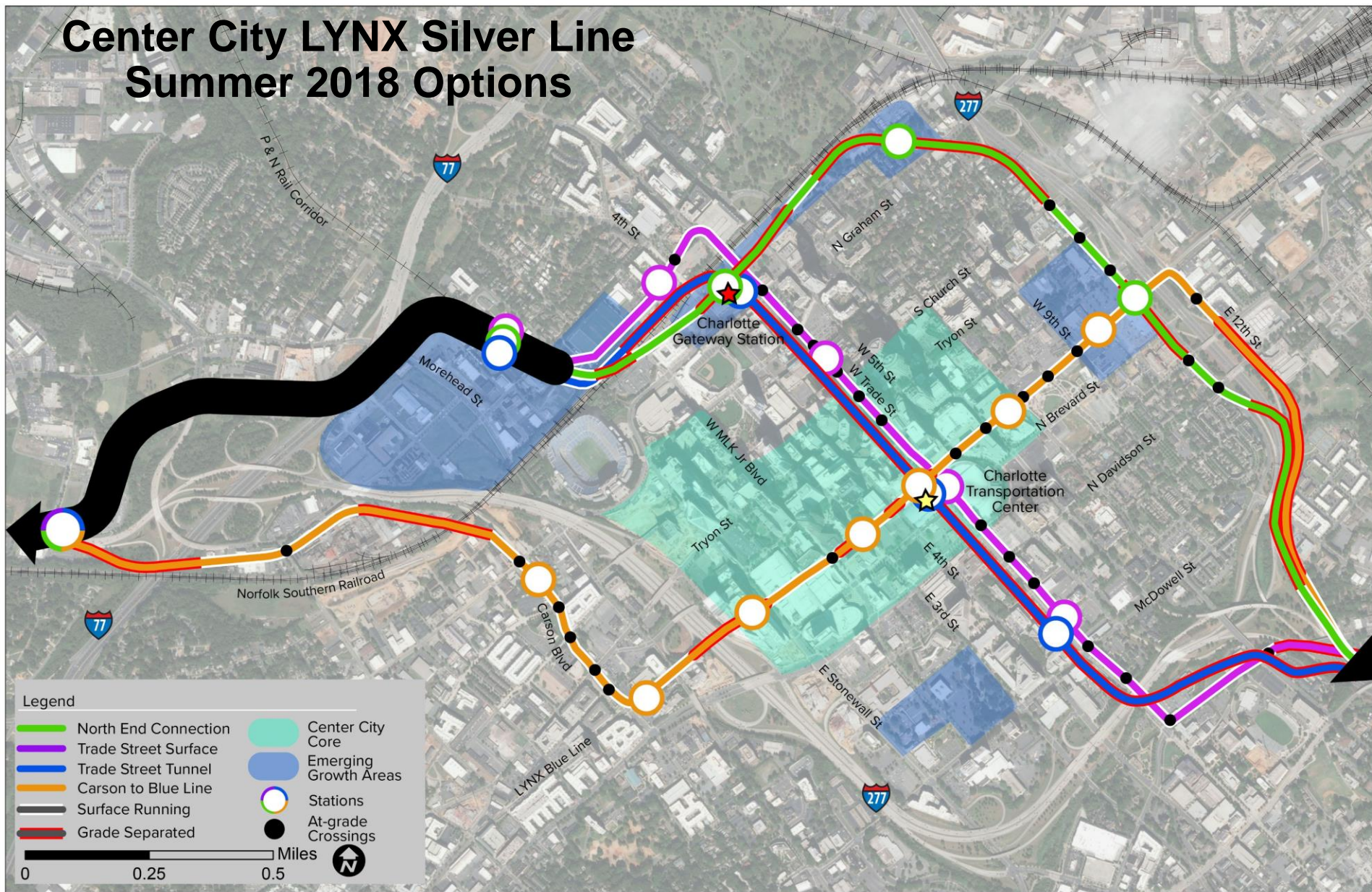


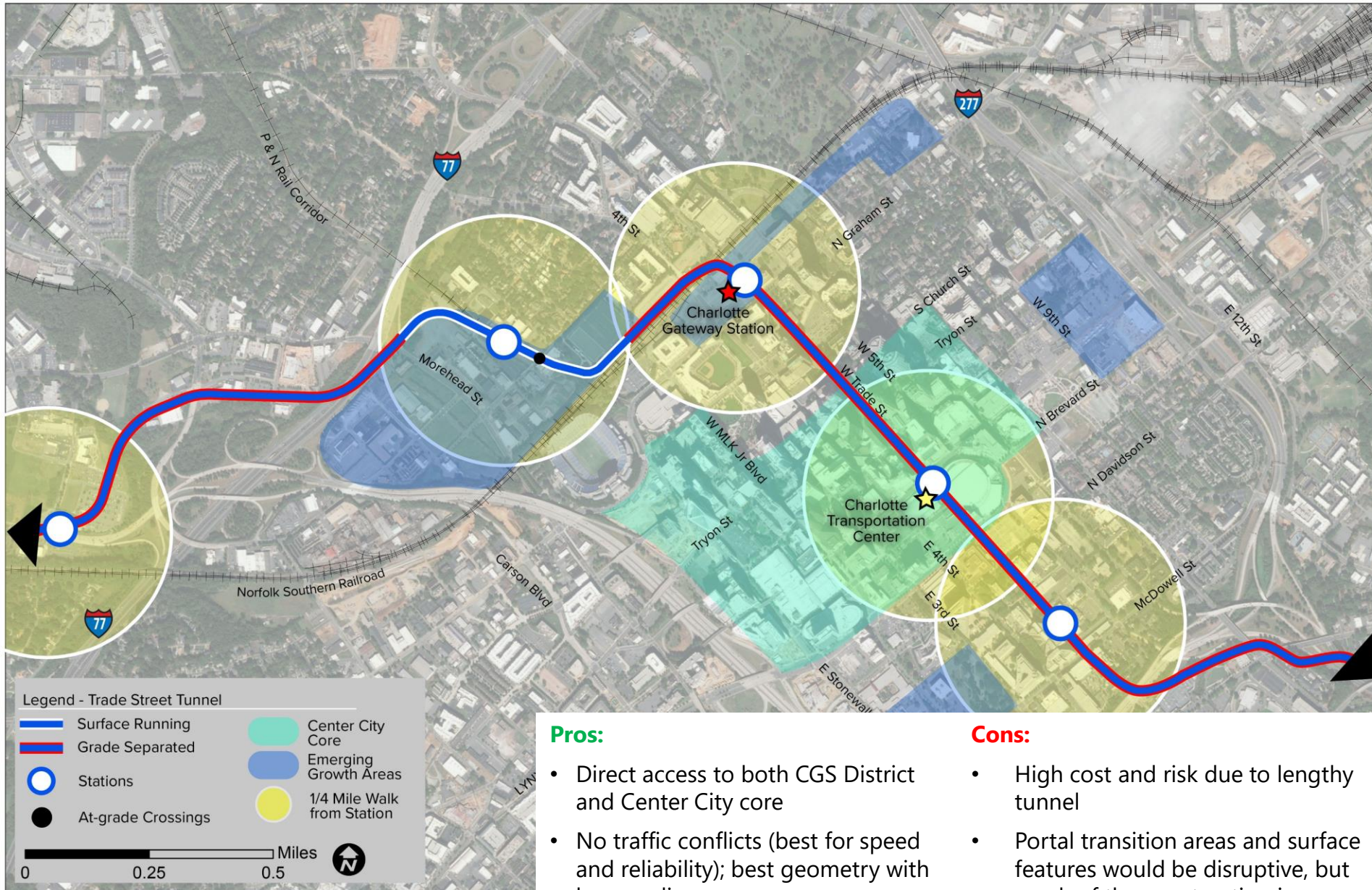
Charlotte
Convention Center

LYNX Blue Line



Center City LYNX Silver Line Summer 2018 Options



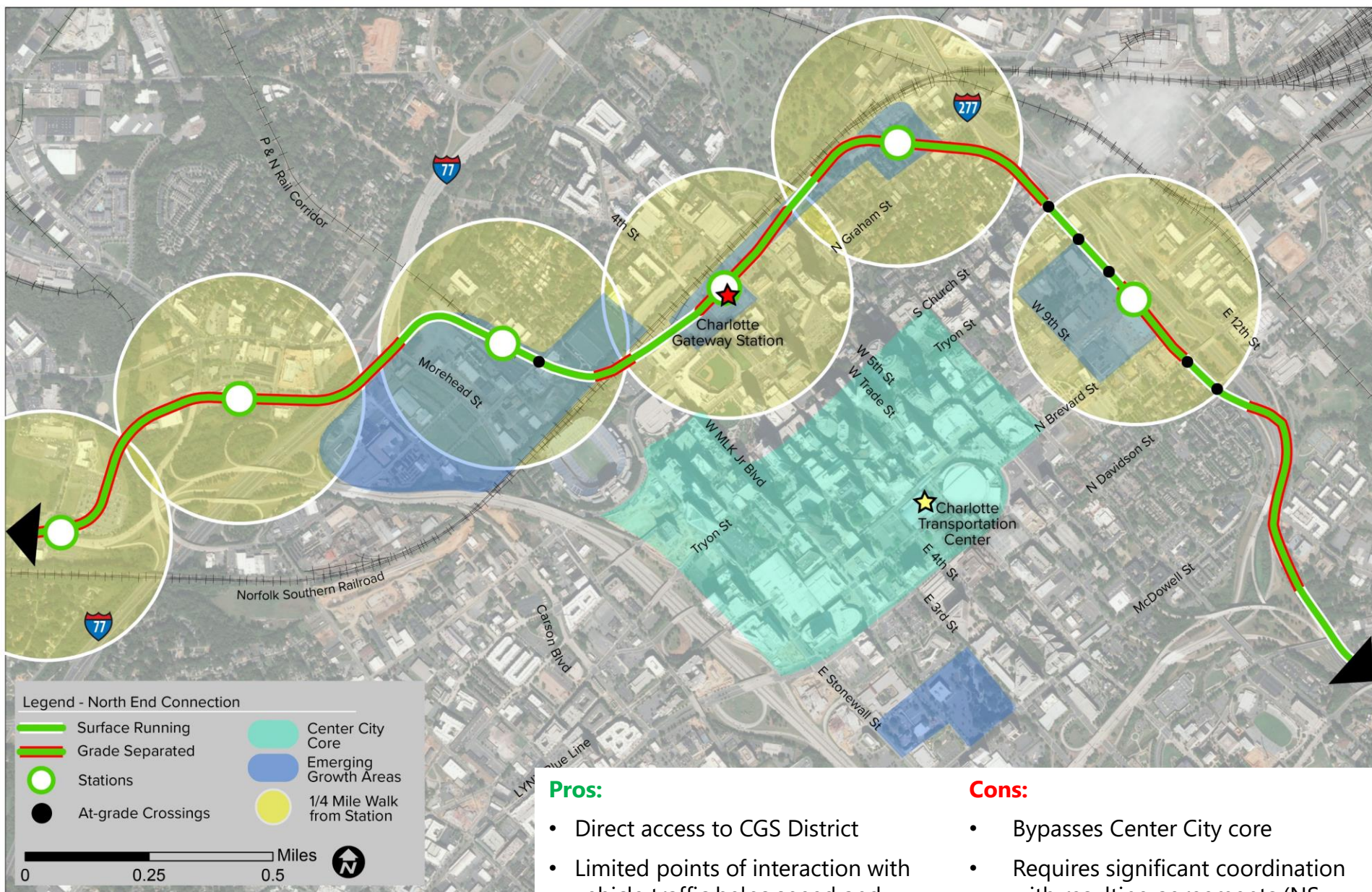


Pros:

- Direct access to both CGS District and Center City core
- No traffic conflicts (best for speed and reliability); best geometry with large radius curves
- New exclusive alignment creates potential additional capacity for future rail expansion

Cons:

- High cost and risk due to lengthy tunnel
- Portal transition areas and surface features would be disruptive, but much of the construction is underground
- Separate non-revenue connection required (more cost and complexity)



North End

Pros:

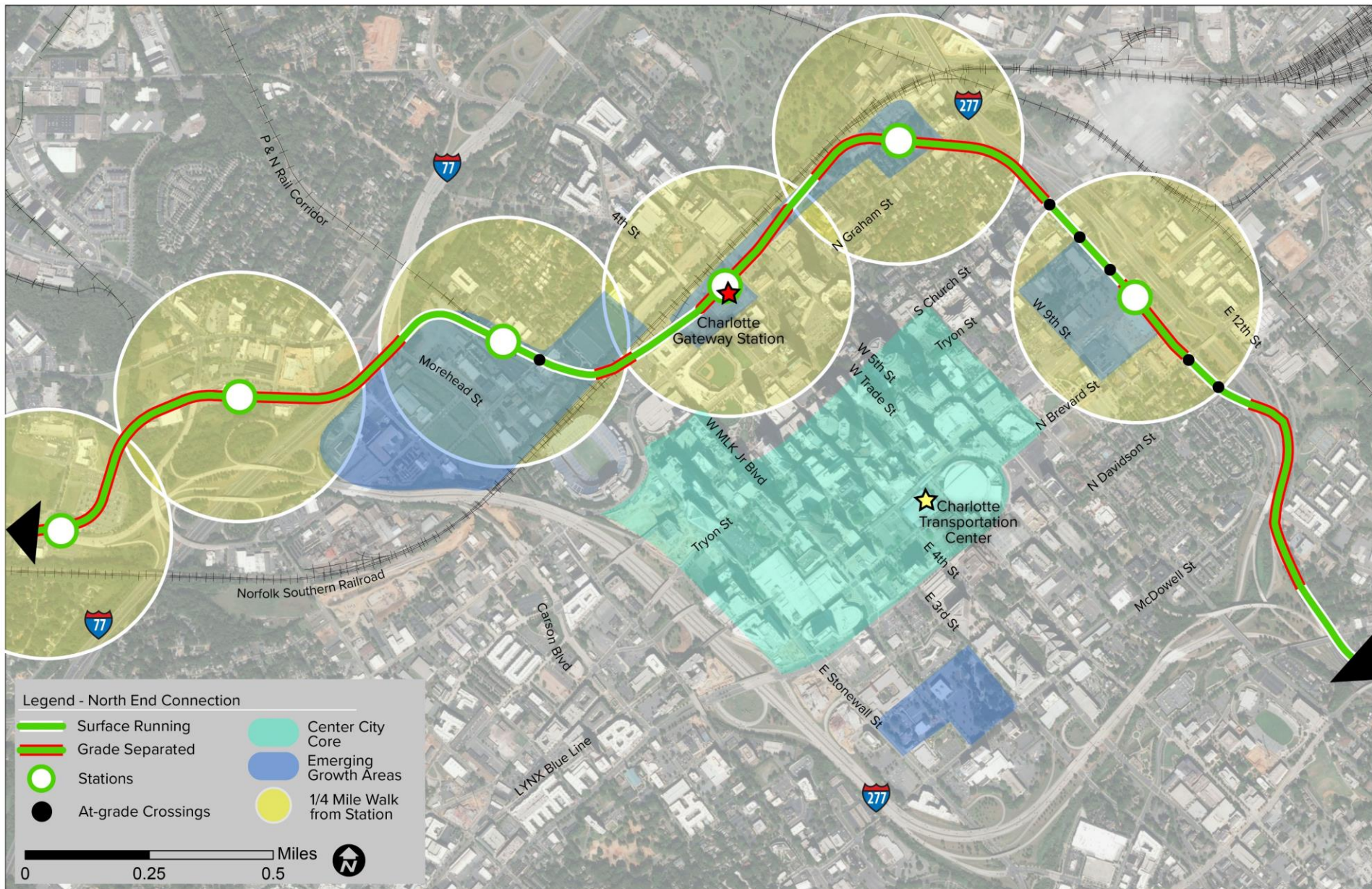
- Direct access to CGS District
- Limited points of interaction with vehicle traffic helps speed and reliability
- New exclusive alignment creates potential additional capacity for future rail expansion

Cons:

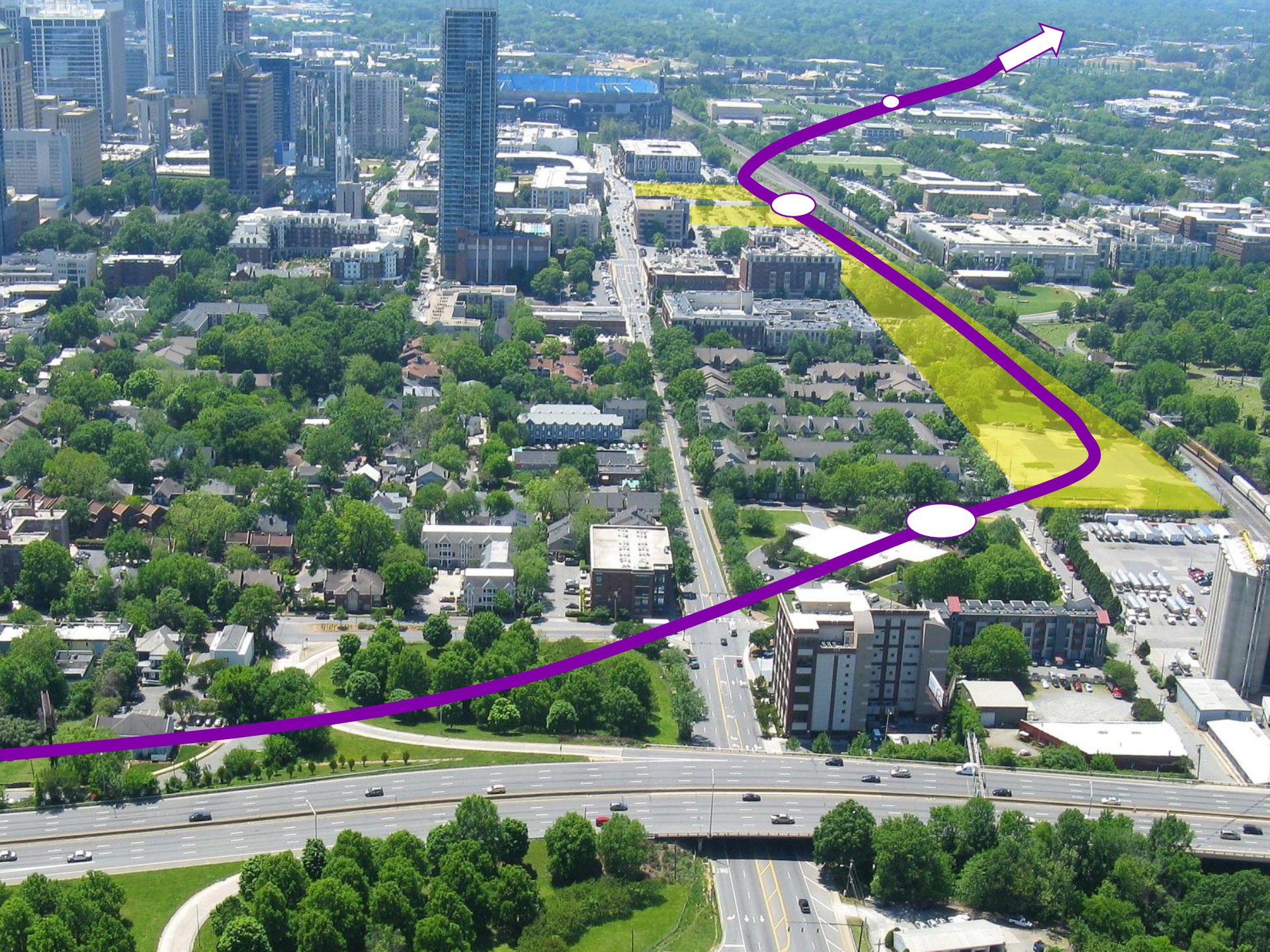
- Bypasses Center City core
- Requires significant coordination with resulting agreements (NS, CGS, NCDOT)
- High cost associated with significant structures and right-of-way acquisition

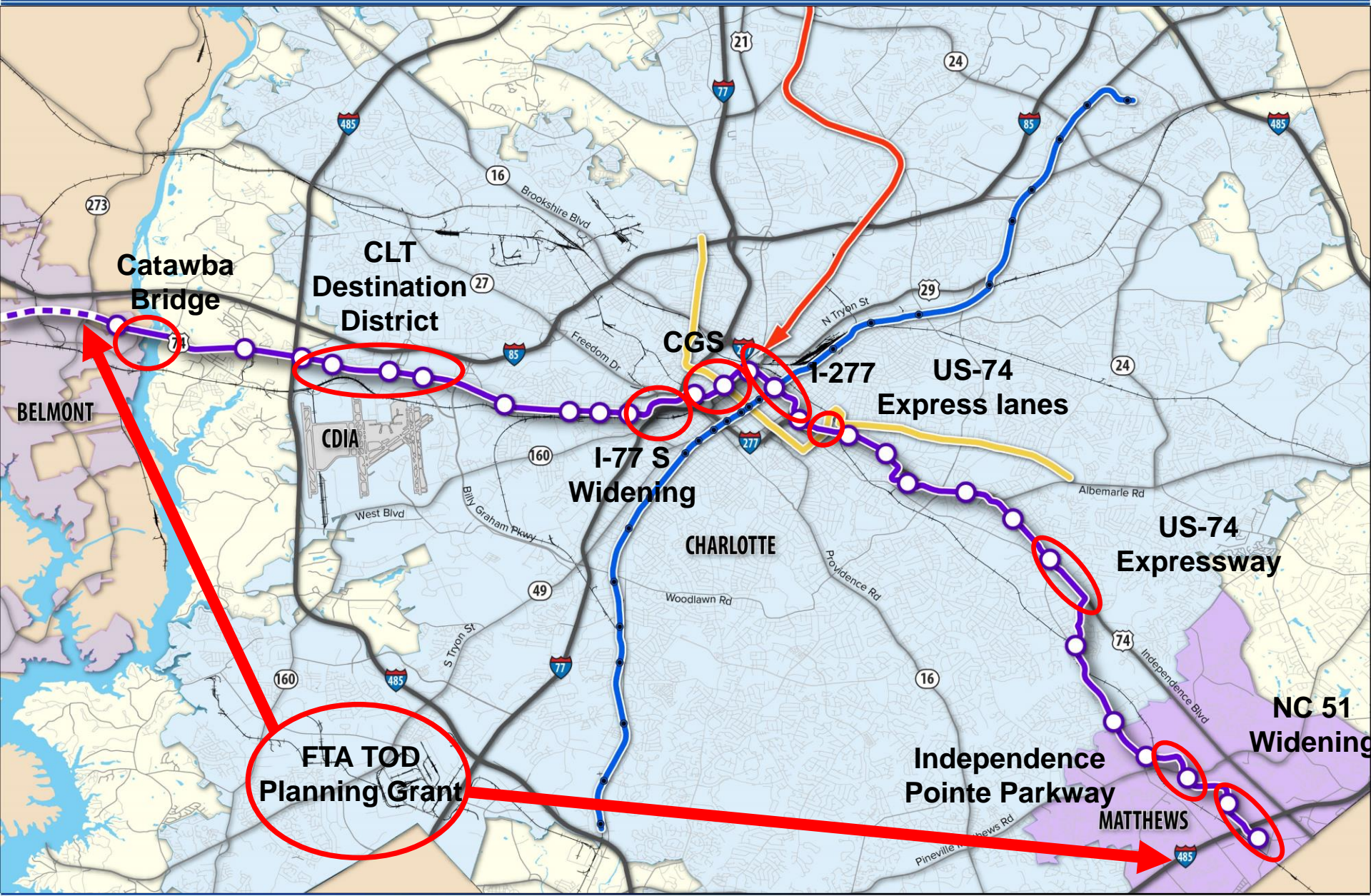
CATS Center City Silver Line

Staff Recommendation

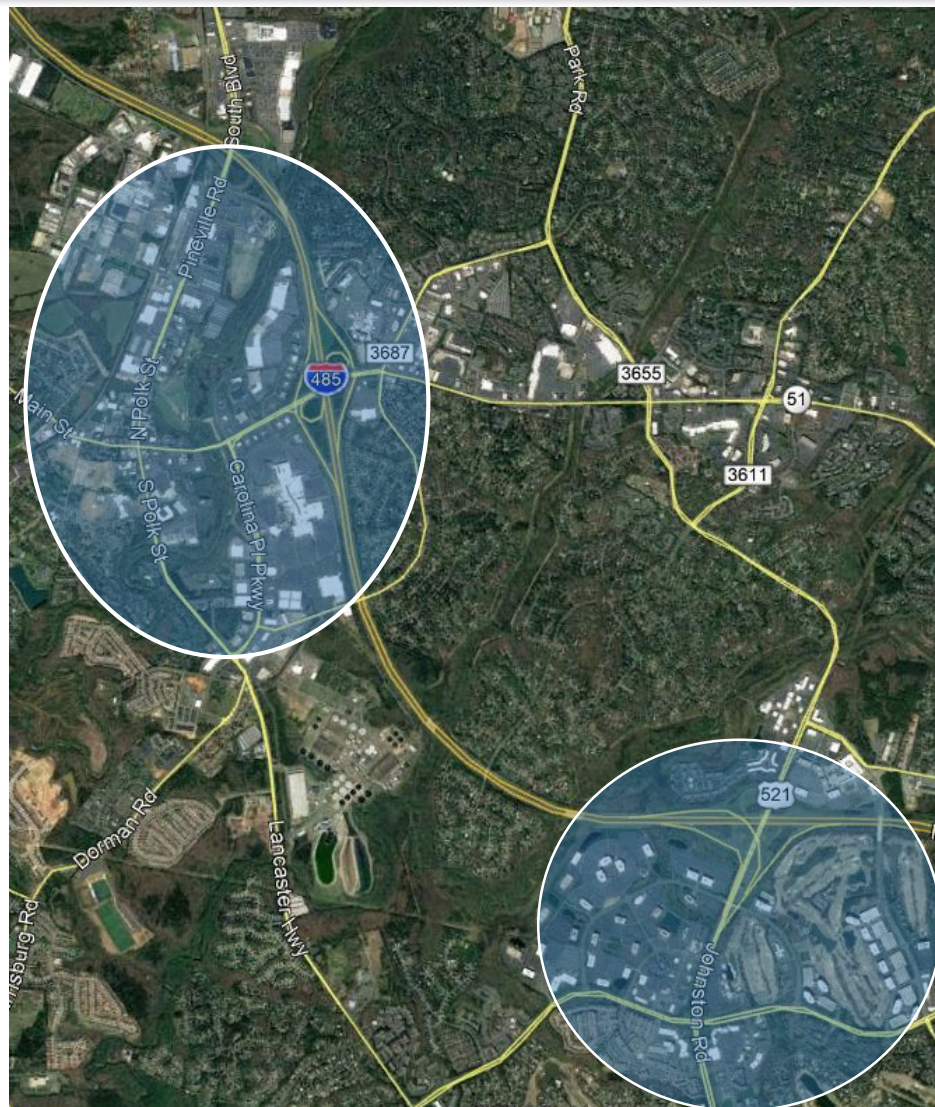








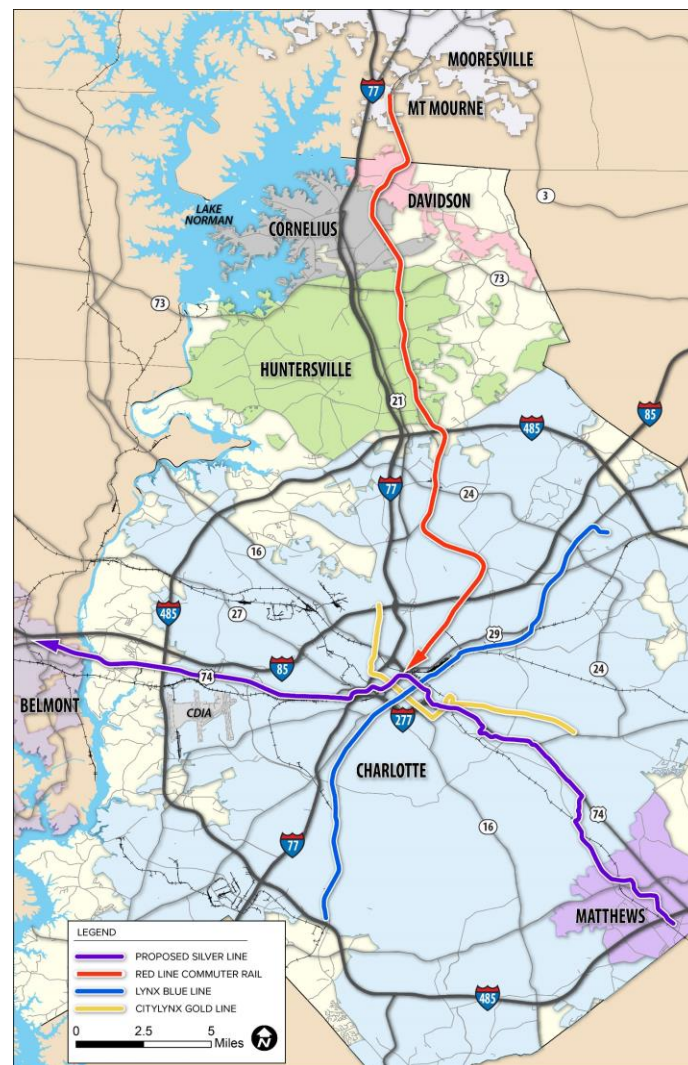
- During the LYNX System Update and the Regional Transit Engagement Series there was significant interest in rapid transit to Pineville and Ballantyne
- As part of the upcoming Regional Transit Study, CATS has planned to study rapid transit options for Pineville and Ballantyne.
- CATS recommends to continue the LYNX System Update efforts by beginning an immediate LYNX Blue Line Extension study to Pineville and Ballantyne as well as develop near-term mobility options.



Upcoming January/February Stakeholder Engagement

- Charlotte Mecklenburg Schools
- Charlotte Mecklenburg Housing Partnership
- Charlotte Housing Authority
- Charlotte Housing & Neighborhood Services
- Turnpike Authority, I-77 Mobility Partners, and NCDOT
- Cornelius Town Board
- Davidson Town Board
- Charlotte Douglas International Airport
- ENLACE-Latin American Council of Charlotte

- Provides additional transportation choice
- Provides access to economic opportunities
- Must be coordinated with affordable housing goals
- Creates a framework for growth
- Increases regional economic competitiveness





LYNX SYSTEM UPDATE

Staff Recommendations

Questions?

