



# **LYNX SYSTEM UPDATE**

## **Staff Recommendations**

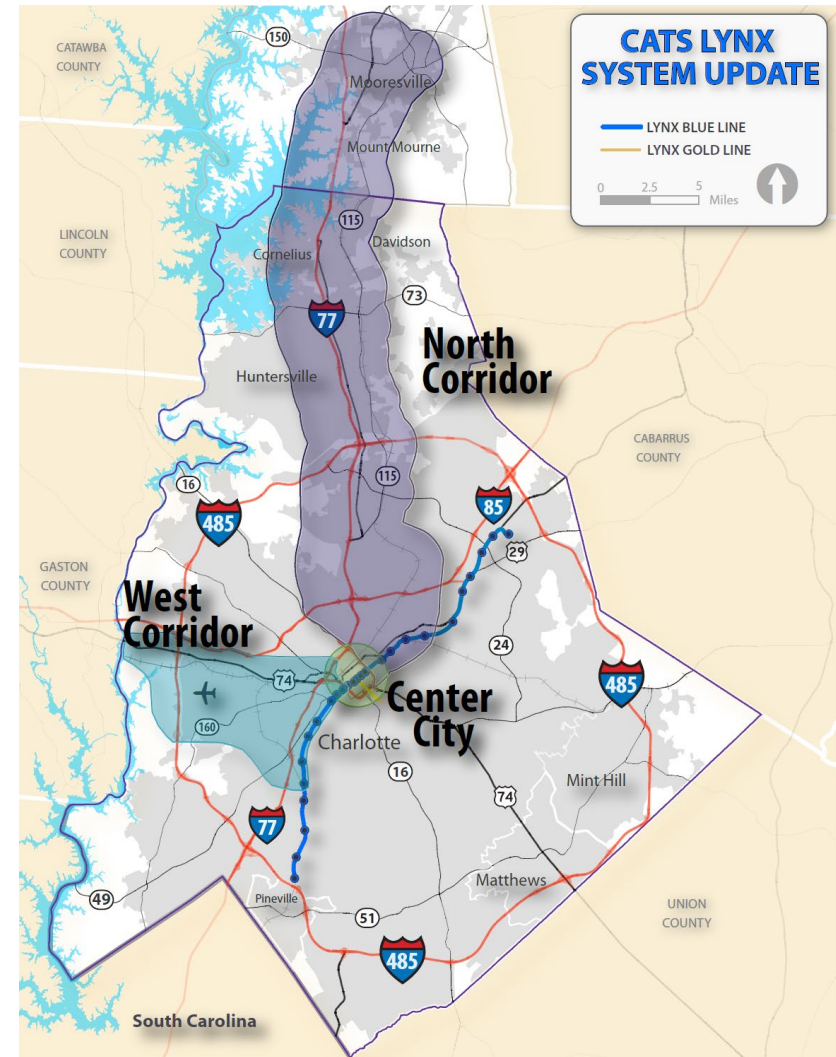
### **Davidson Board of Commissioners**

### **February 12, 2019**



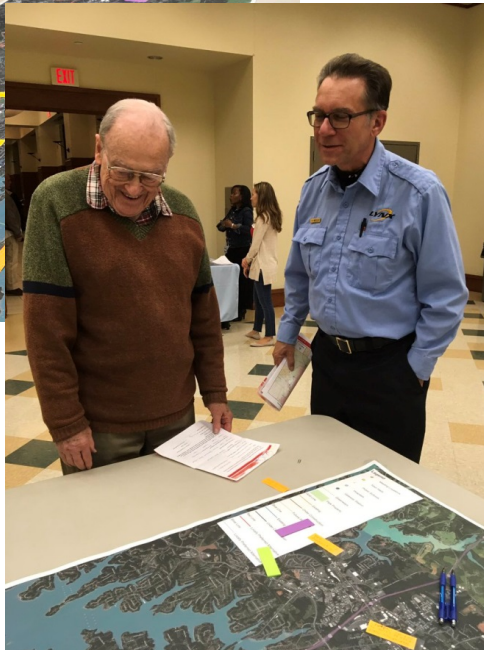


- **Southeast Corridor (Silver Line)**
  - MTC adopted light rail to Matthews as the LYNX Silver Line LPA in November 2016
  - Need to determine Center City access
- **North Corridor (Red Line)**
  - LYNX Red Line LPA is commuter rail on Norfolk Southern (NS) O-Line
  - Use of NS O-Line corridor problematic
  - In addition to O-Line, the study considered 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





**3,200+** Survey Participants

**2,800+** Facebook Live Public Workshop Video Views

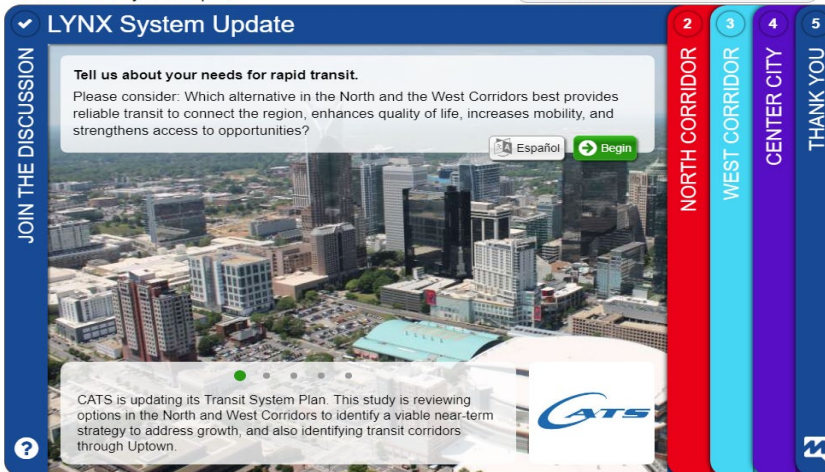
**Charlotte Area Transit System (CATS)** was live.  
August 9 at 3:15 PM · 🌐

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!



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

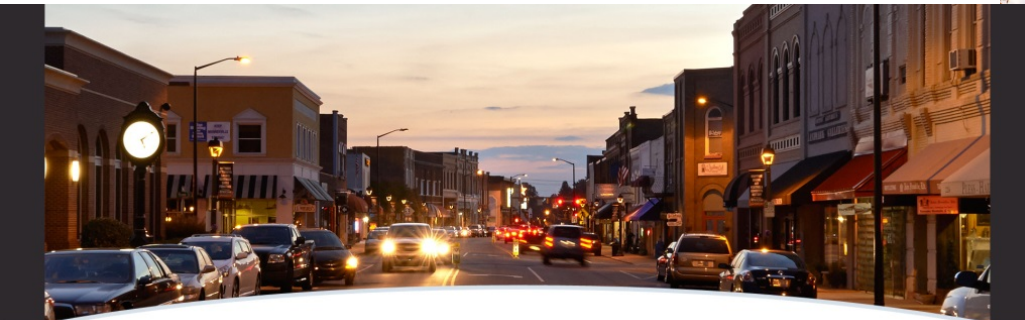


**Increase mobility** in each corridor through effective transit investments





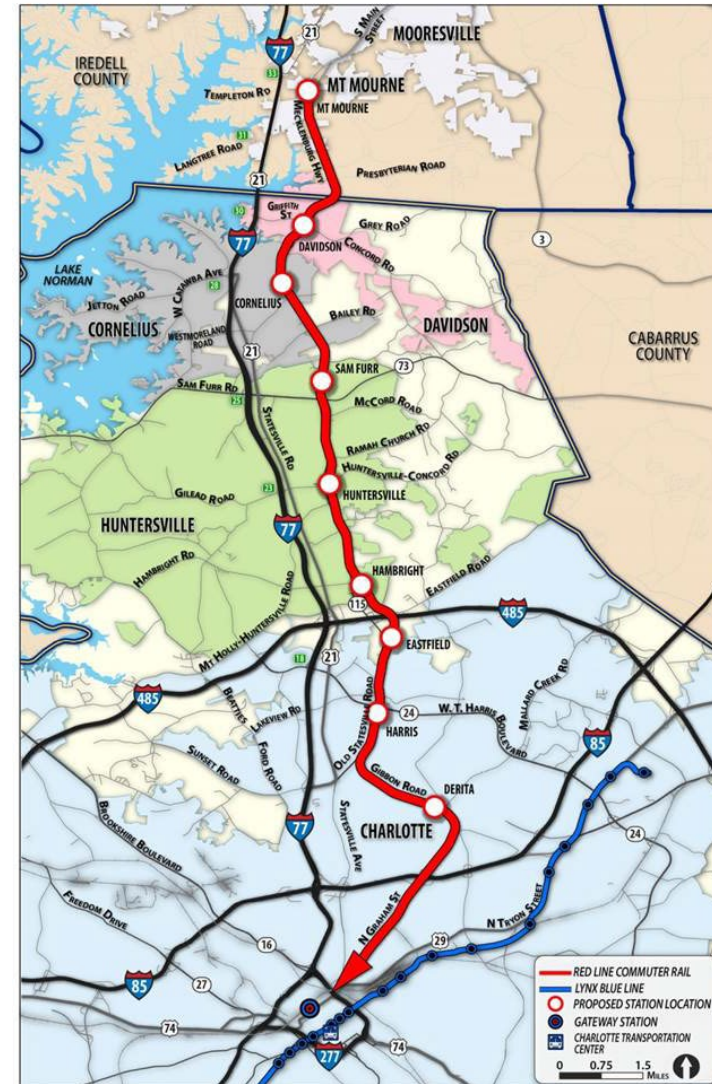
# North Corridor





## 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



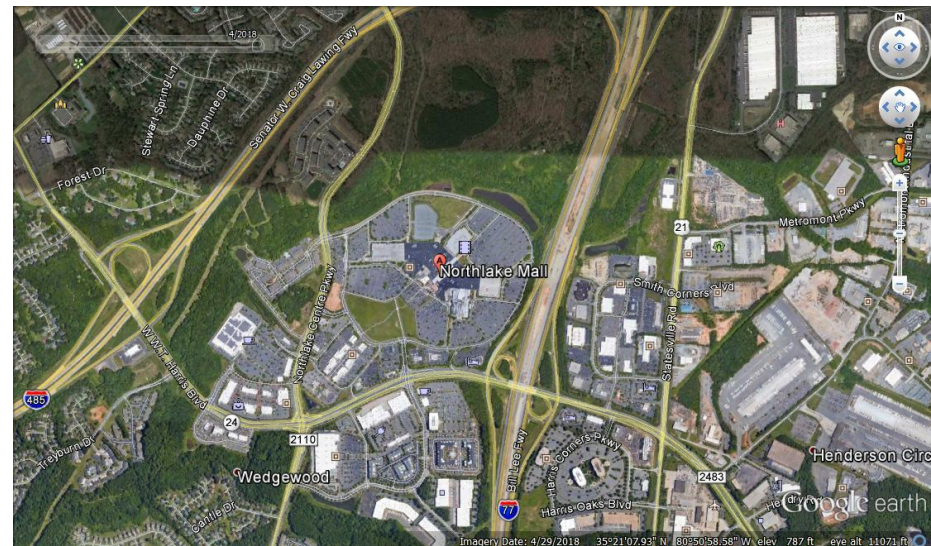
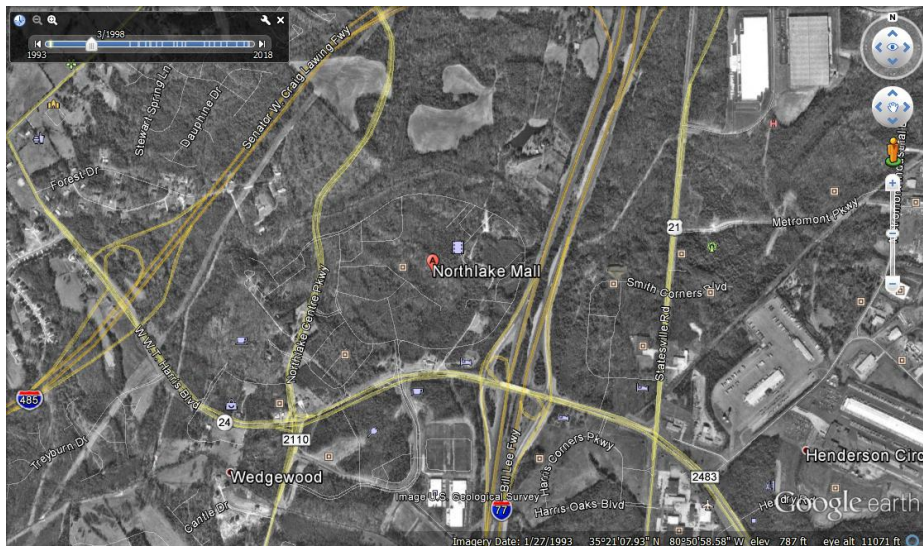
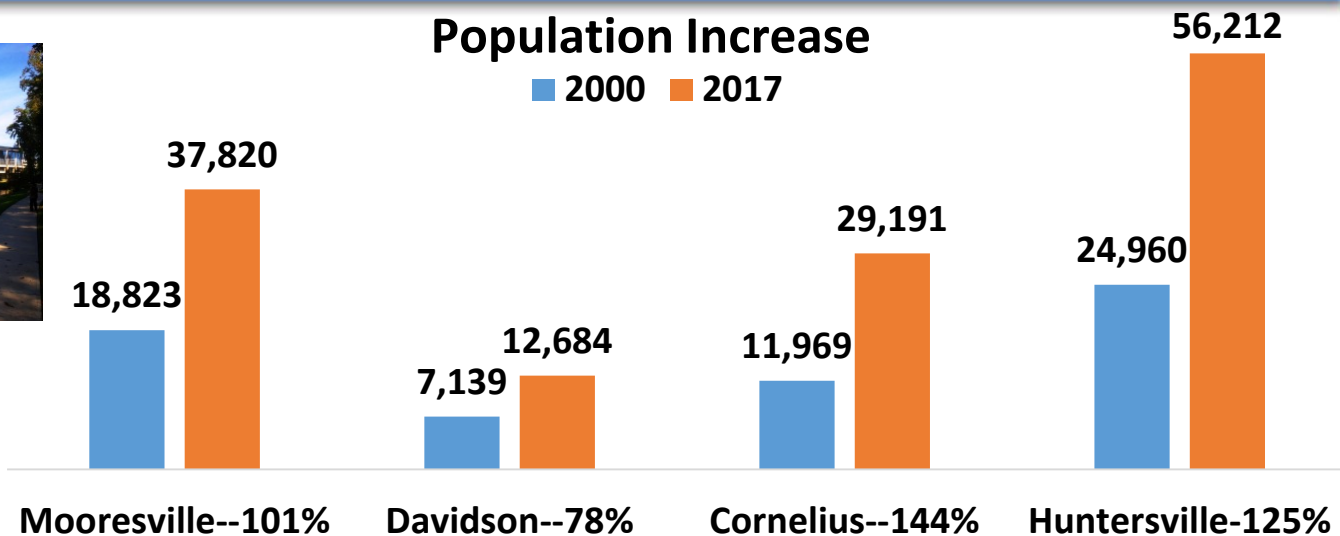
# What's Changed since 1998?



**Lowes moves to Mooresville in 2004**

## Population Increase

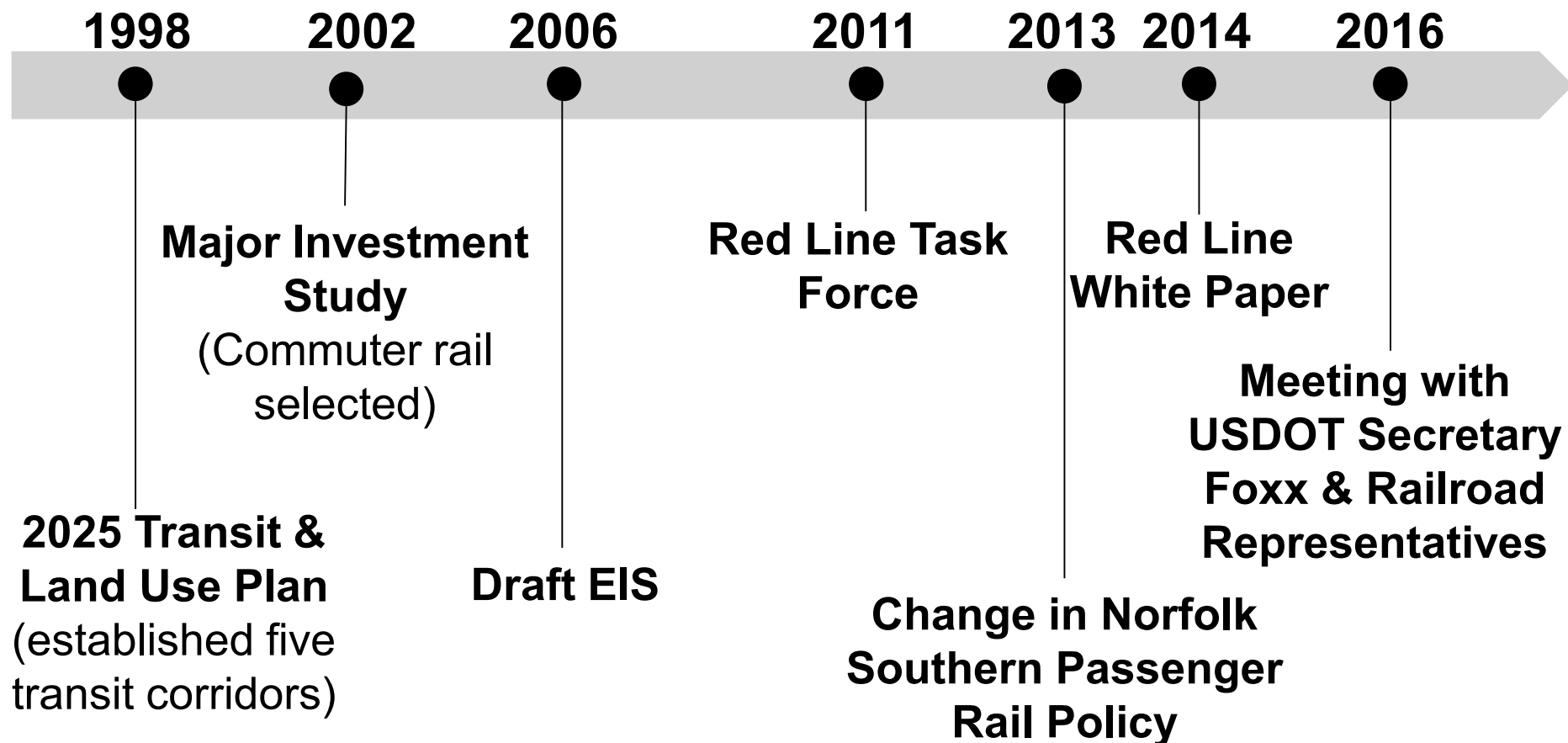
■ 2000 ■ 2017



**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



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, however, it is not a guarantee of no delay.
  - 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.

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 volumes will remain as they are; the study will not affect 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 must be evaluated in the context of the rail 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.
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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.
- Attempts to operate "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



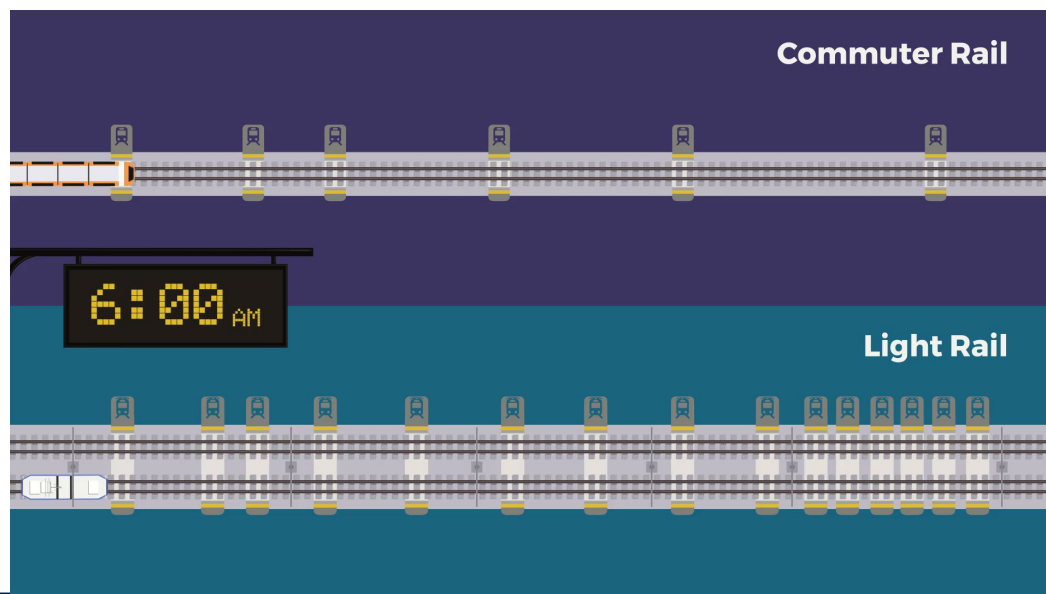
## Trade Off Exercises

SPEED VS. ACCESS

MIXED-USE VS. STAND-ALONE STATION

PEAK DEMAND VS. ALL-DAY SERVICE

DRIVING VS. OTHER





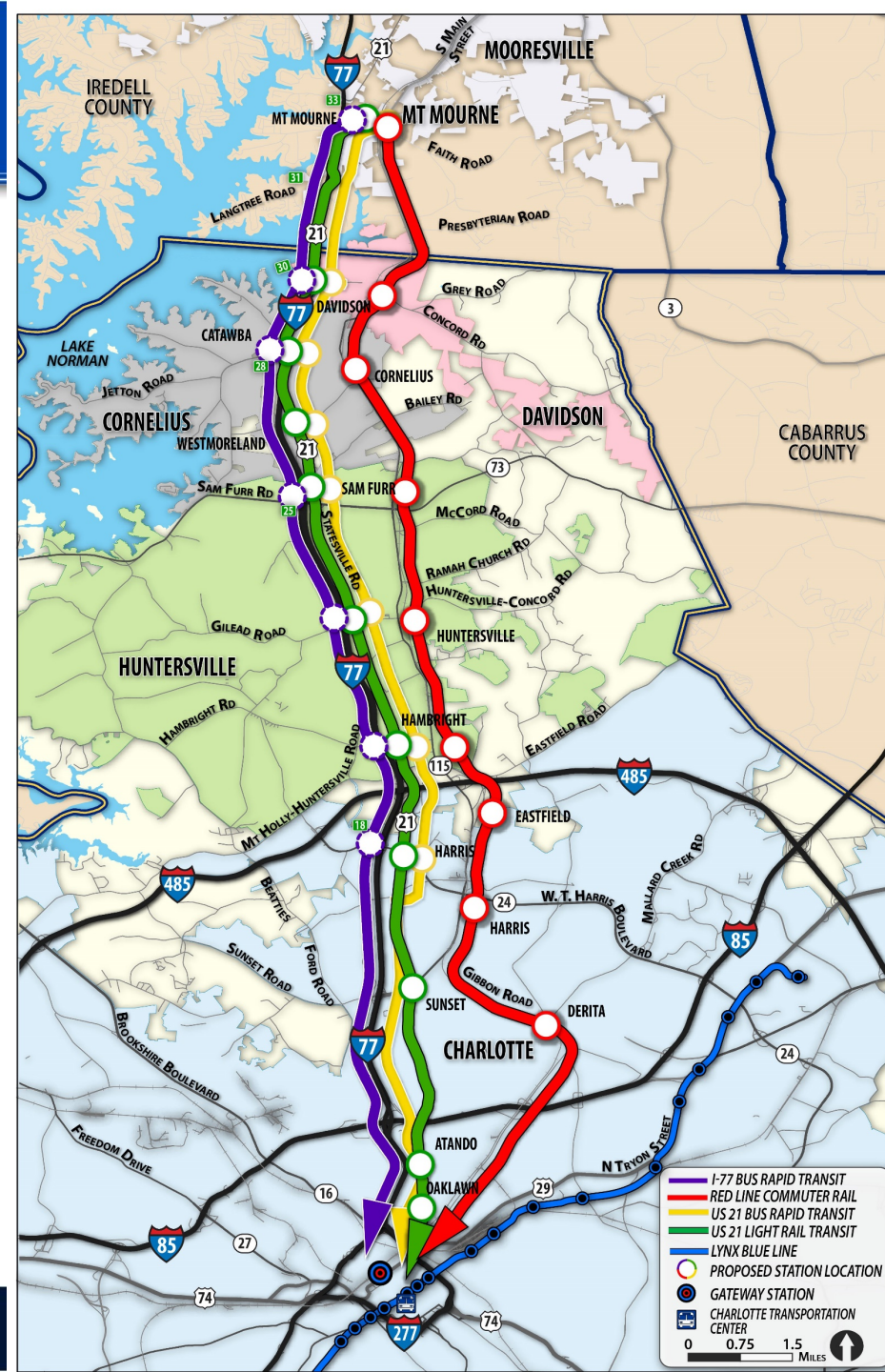
# North Corridor Summer 2018 Rapid Transit Options

Red Line  
Commuter  
Rail



Interstate 77  
BRT

US 21 Light  
Rail

US 21 BRT



## 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.

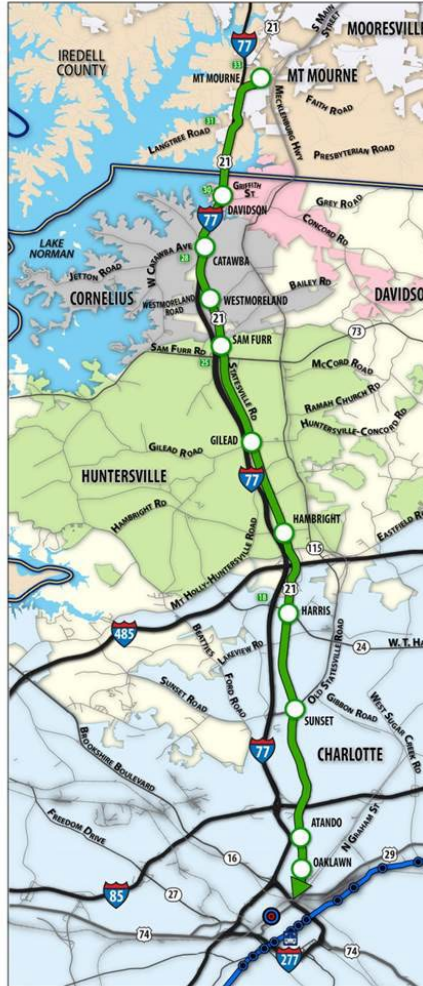


I-77 BRT



## 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

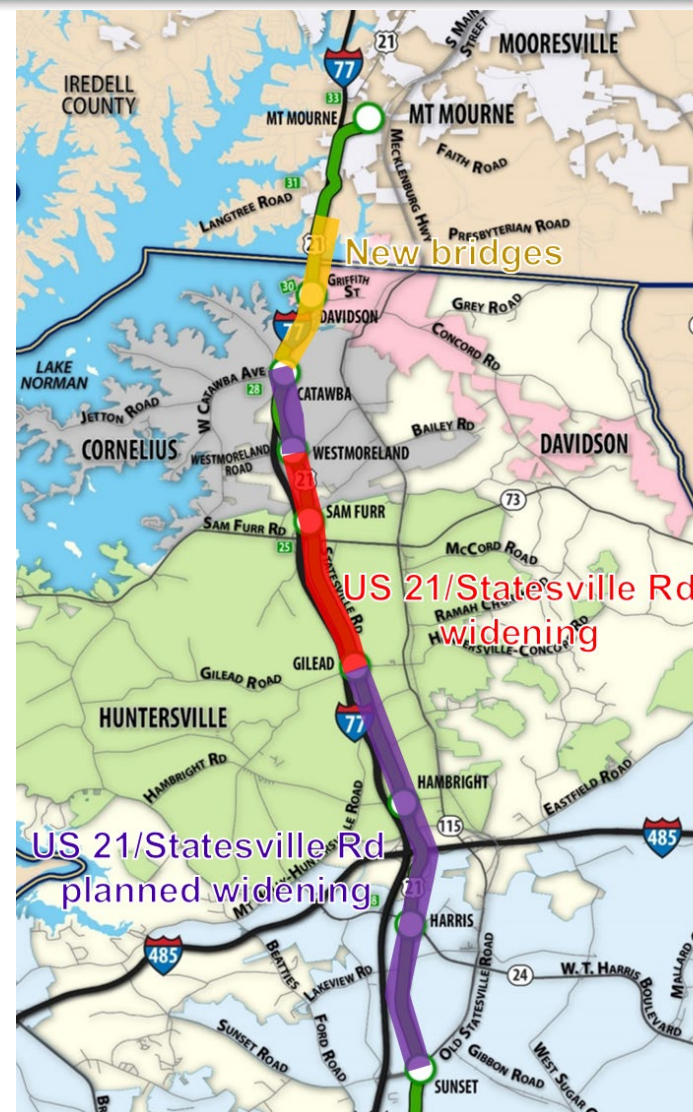
## Alternative Highlights

-  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.



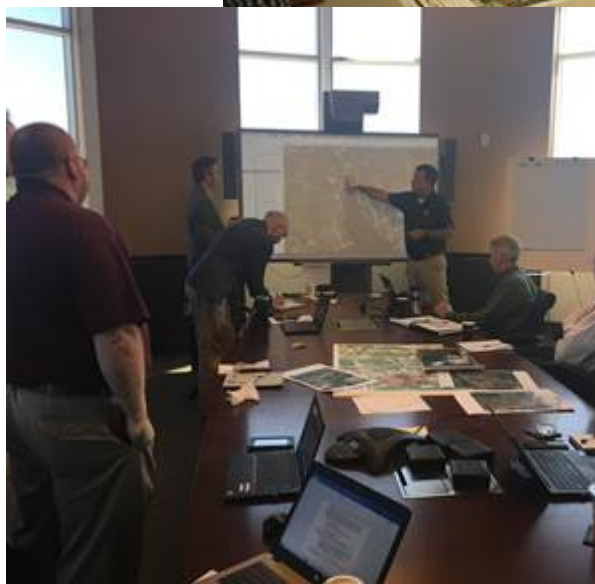
US 21/I-77 BRT

- 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
- In 2018 the project team held BRT station workshops with town staff September 18-20 and November 30





- Establish desired project design elements
- Potential direct connections to I-77 express lanes
- Potential station locations and types
- Mobility Hub concepts
- Land use opportunities



## Flatiron Flyer BRT on US 36 in Colorado Denver to Boulder



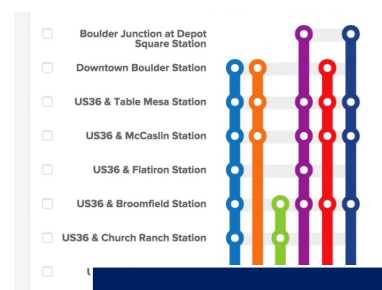
- 6 stations
- 6 routes
  - Some express
  - Some serve all stations
  - Some stop on-street in Boulder and downtown Denver
- Frequent peak service
- Off-peak service all day, nights, and weekends
- Branded coach buses



Use of express lanes



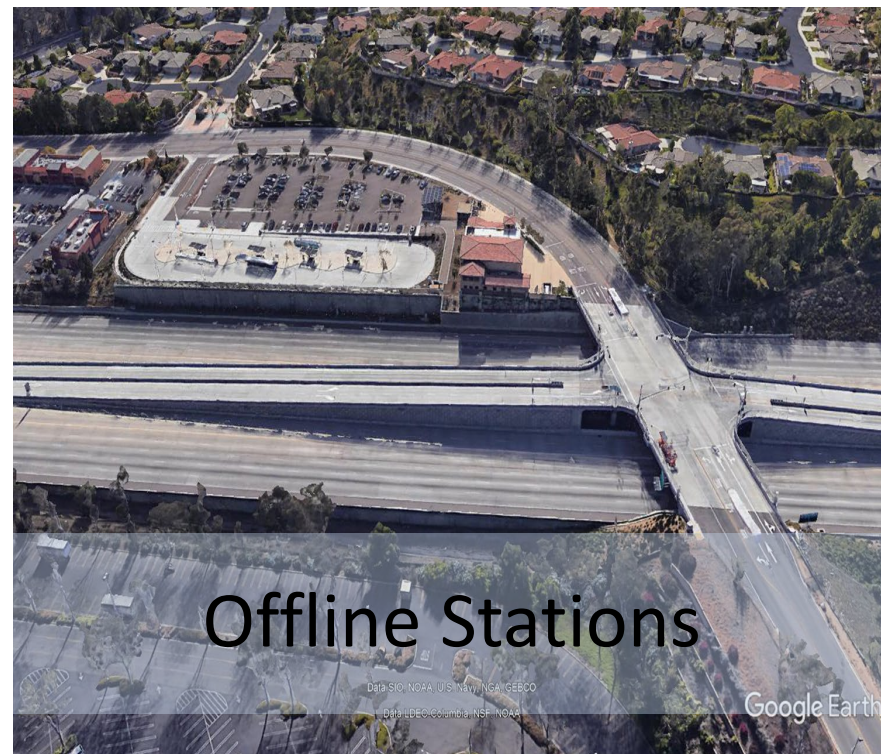
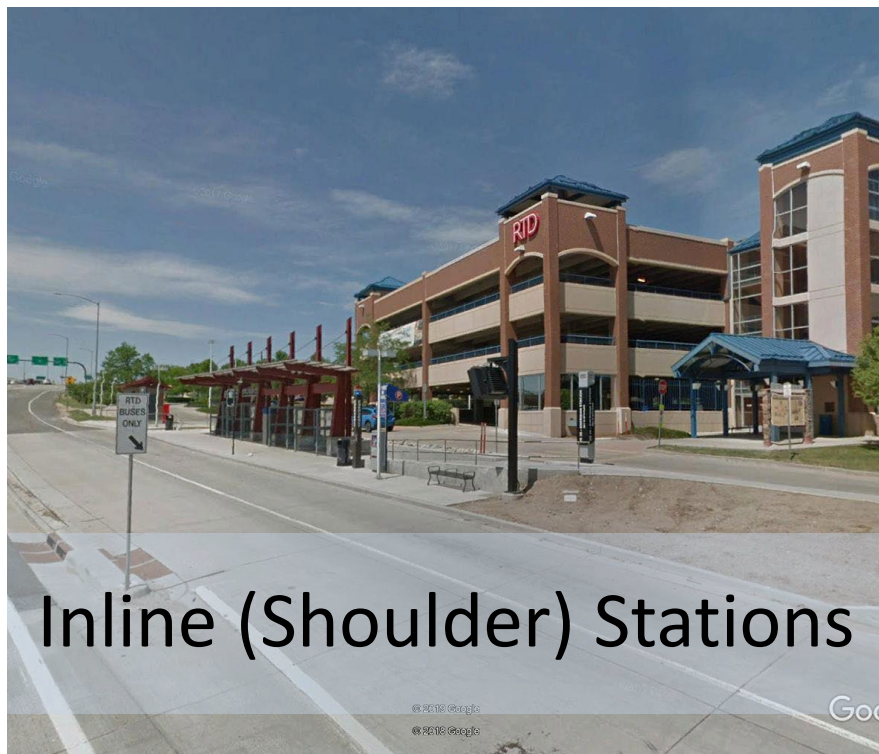
Stations functioning as local mobility and development hubs



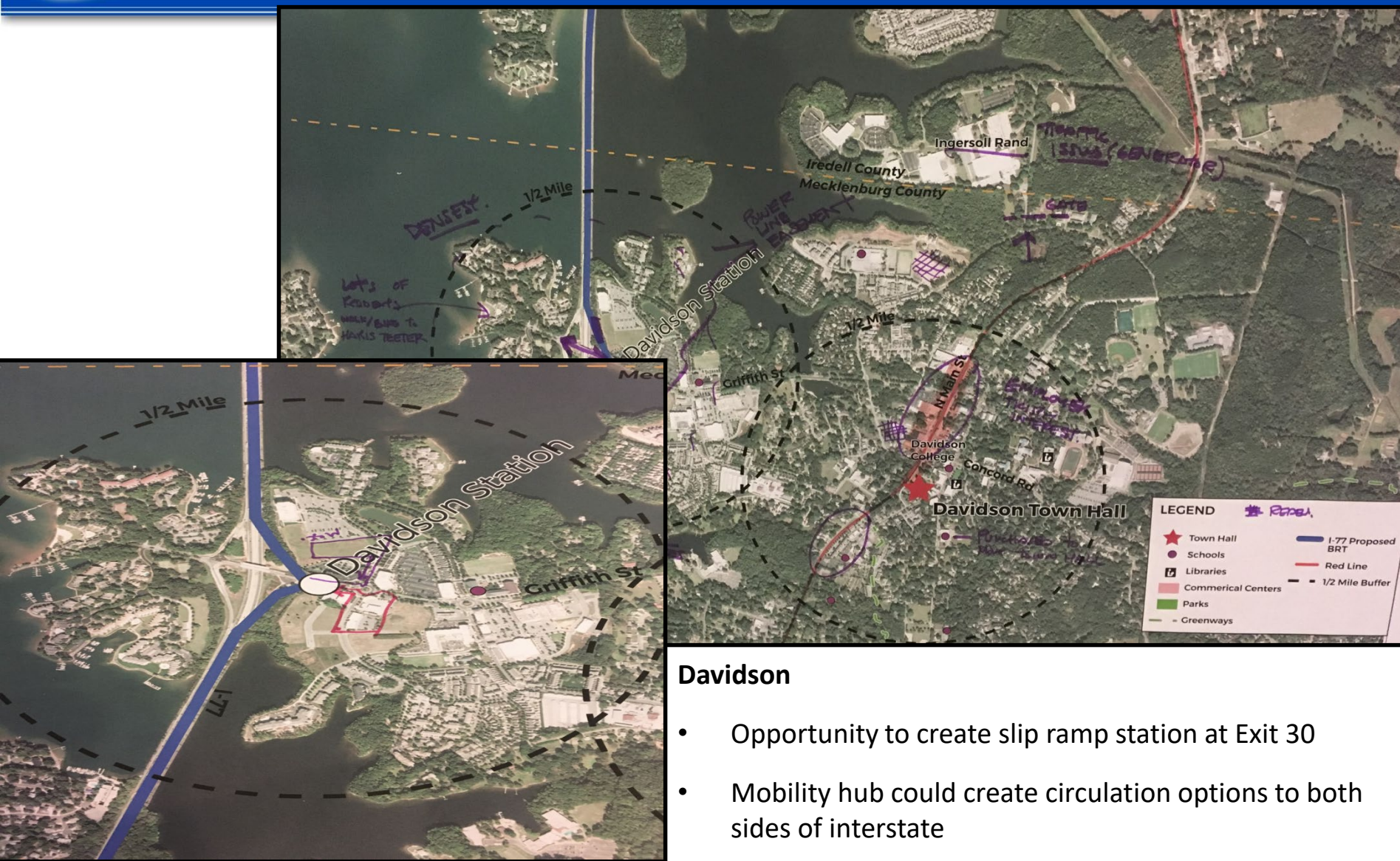
Robust service plan



## I-77 BRT – Types of Stations



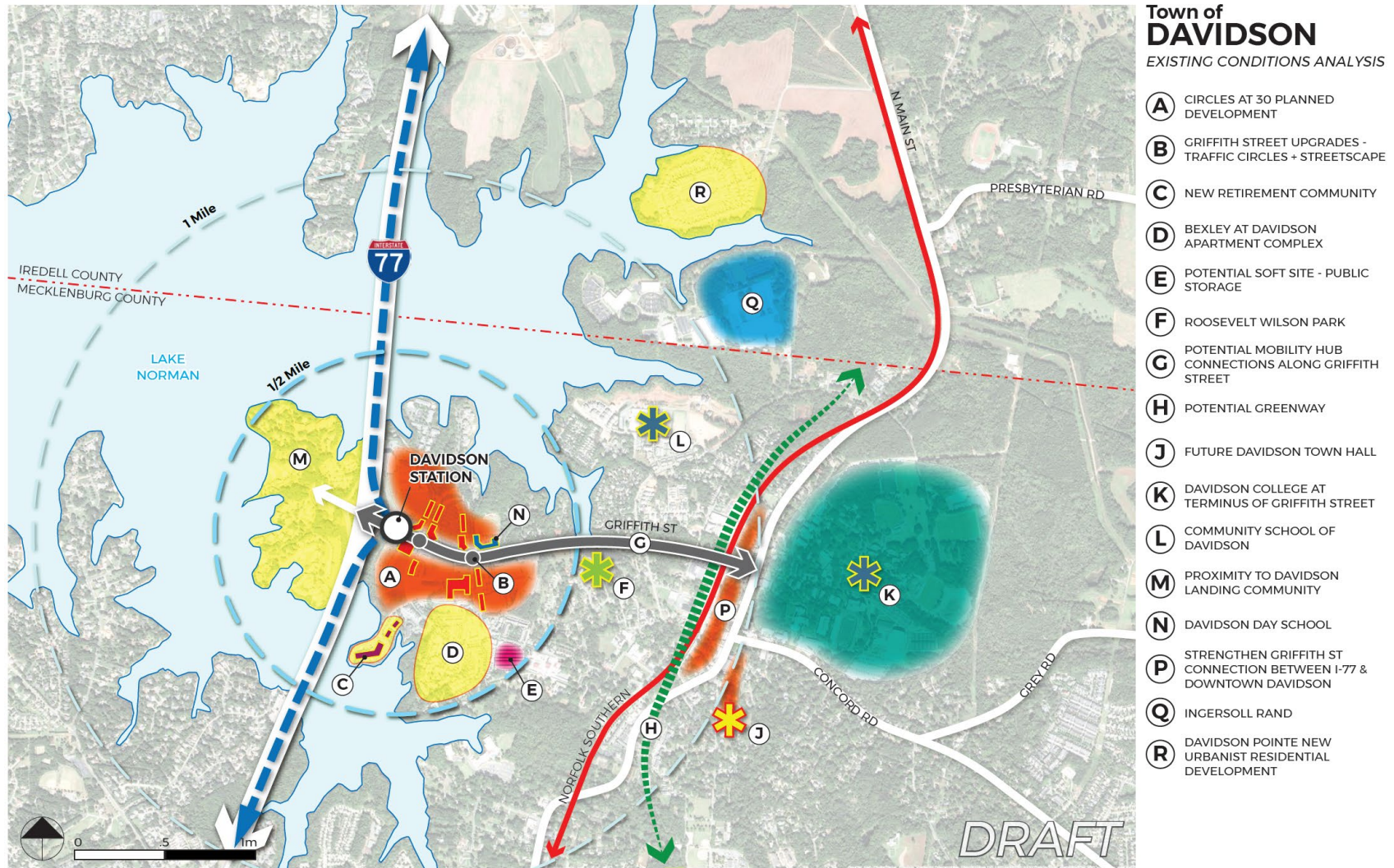




## Davidson

- Opportunity to create slip ramp station at Exit 30
- Mobility hub could create circulation options to both sides of interstate





1. Most appropriate location with the highest potential for trip capture in the immediate vicinity.
2. There is an approved Southeast Quadrant Master Plan from 1998 that is still applicable.
3. This entire area of town is located within the Lake Norman Critical Area of the watershed, investigate use of pervious pavers.
4. Develop a mobility hub for connections to downtown that includes parking and “future ready” capacity.
5. Any proposed park and ride at this location will need to coordinate with property owners
6. Maintain existing driveways and develop new road, bike, and ped network that is consistent with Mobility Plan

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



- 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

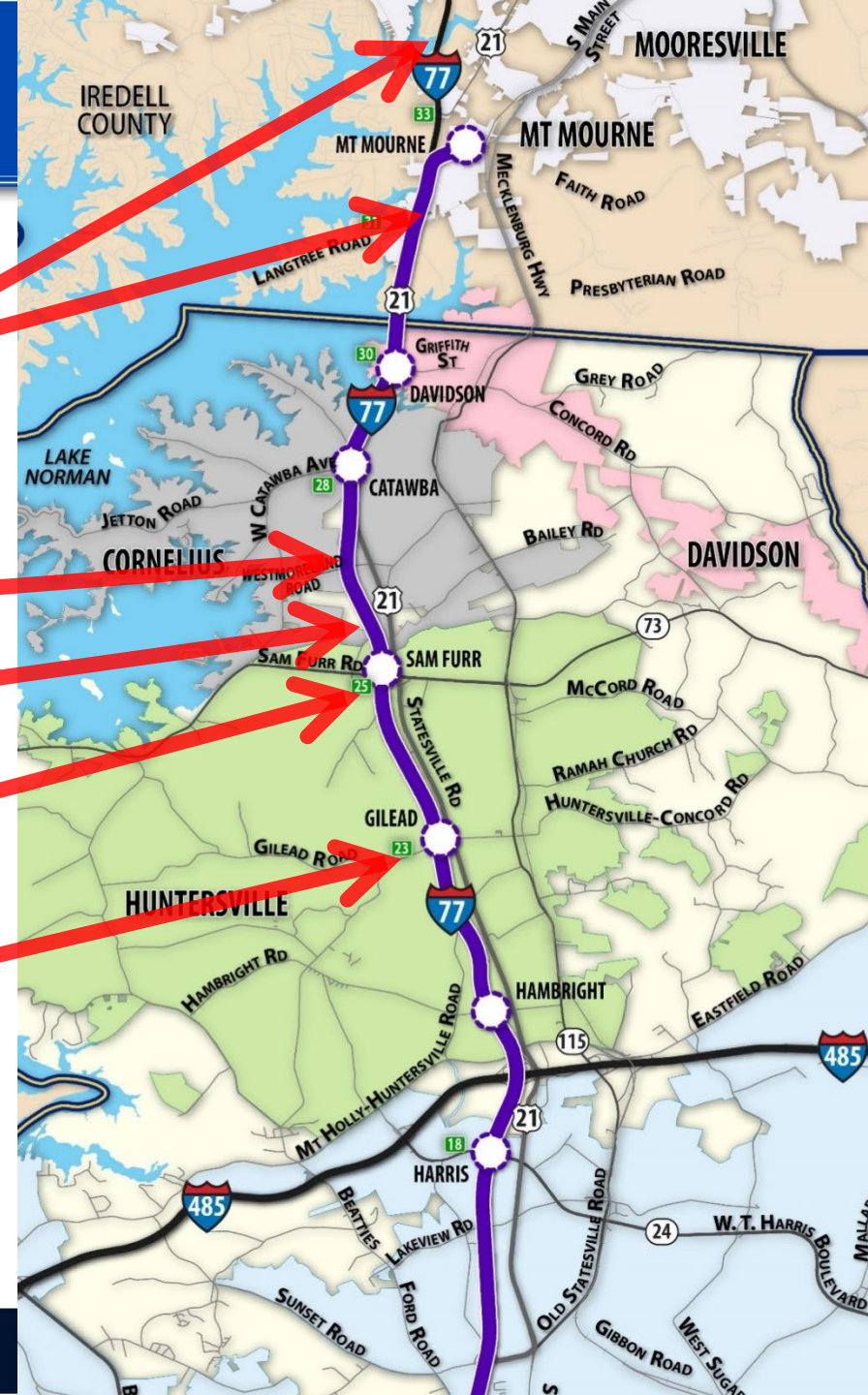
Westmoreland Rd interchange

Bailey Rd flyover

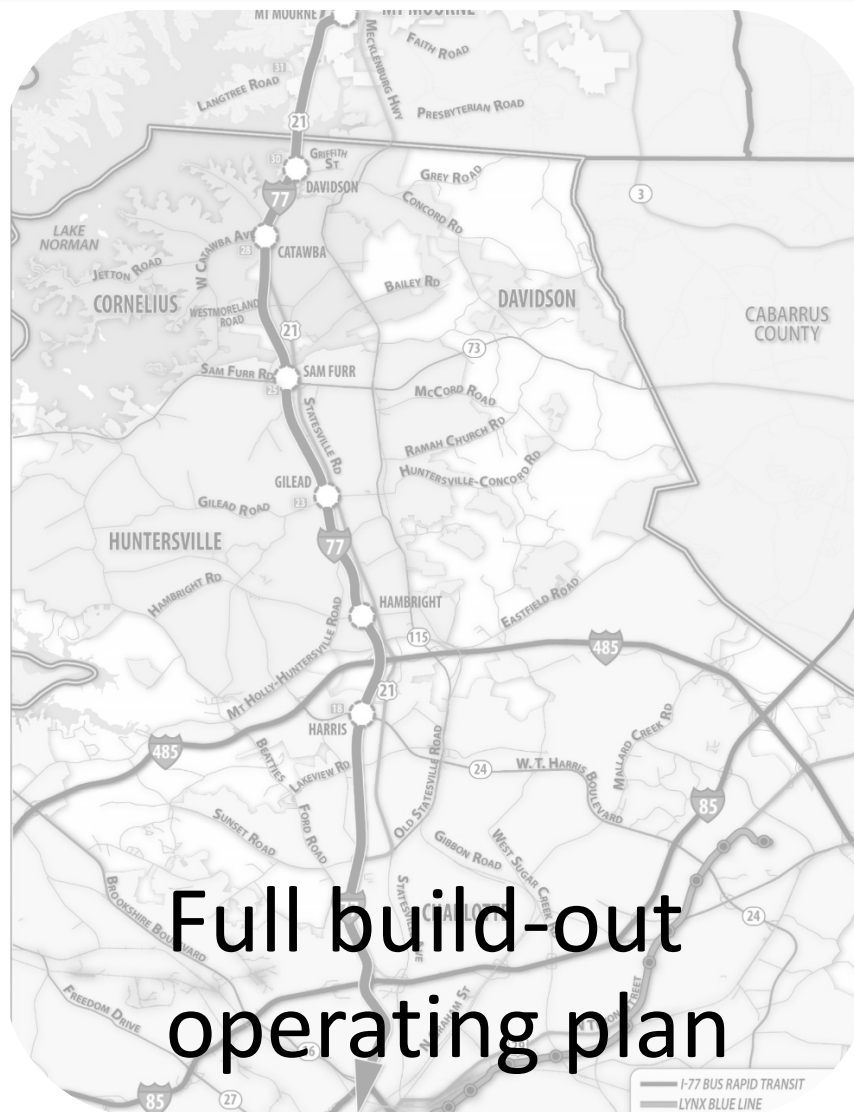
Exit 25 reconfiguration

Exit 23 reconfiguration

Coordination with comprehensive land use  
planning efforts throughout corridor





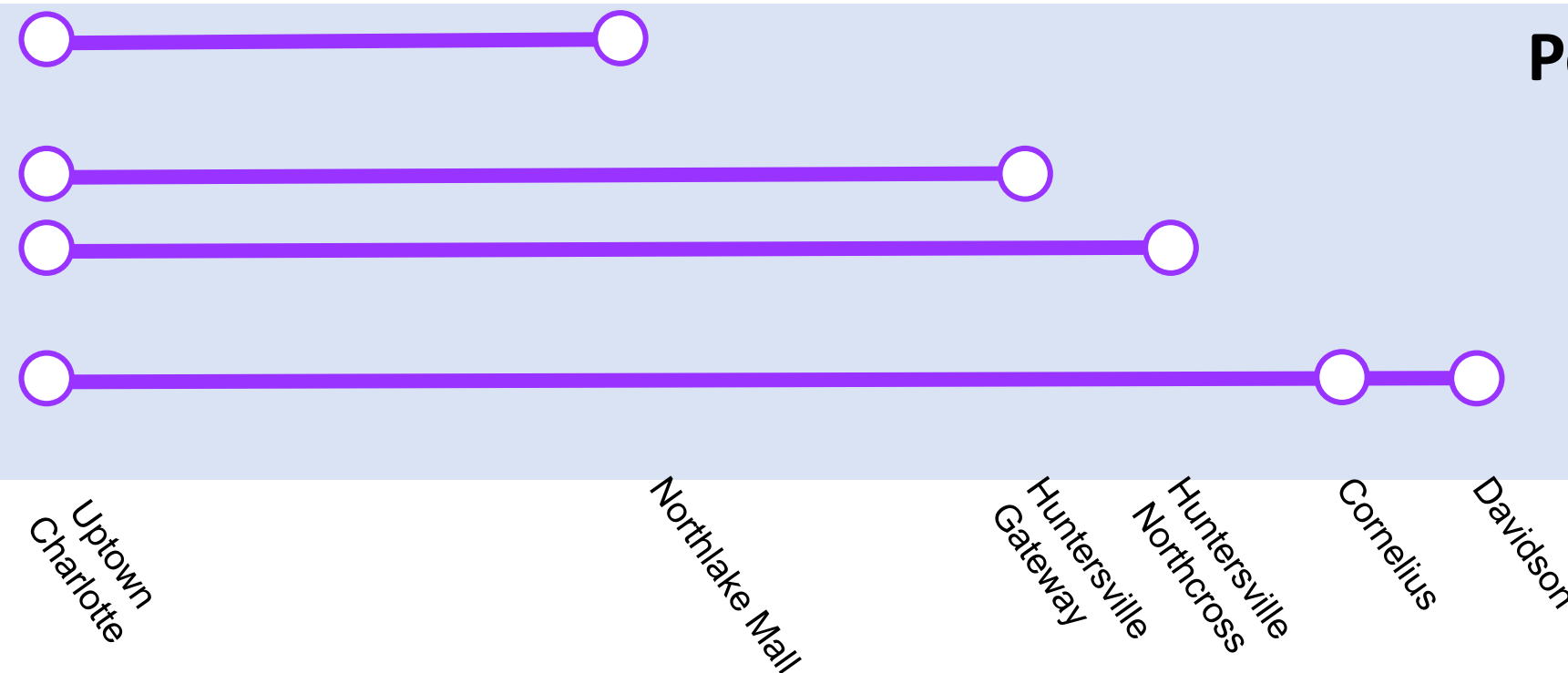


Family of services operating in the corridor



Mobility hub with flexibility to offer future autonomous service

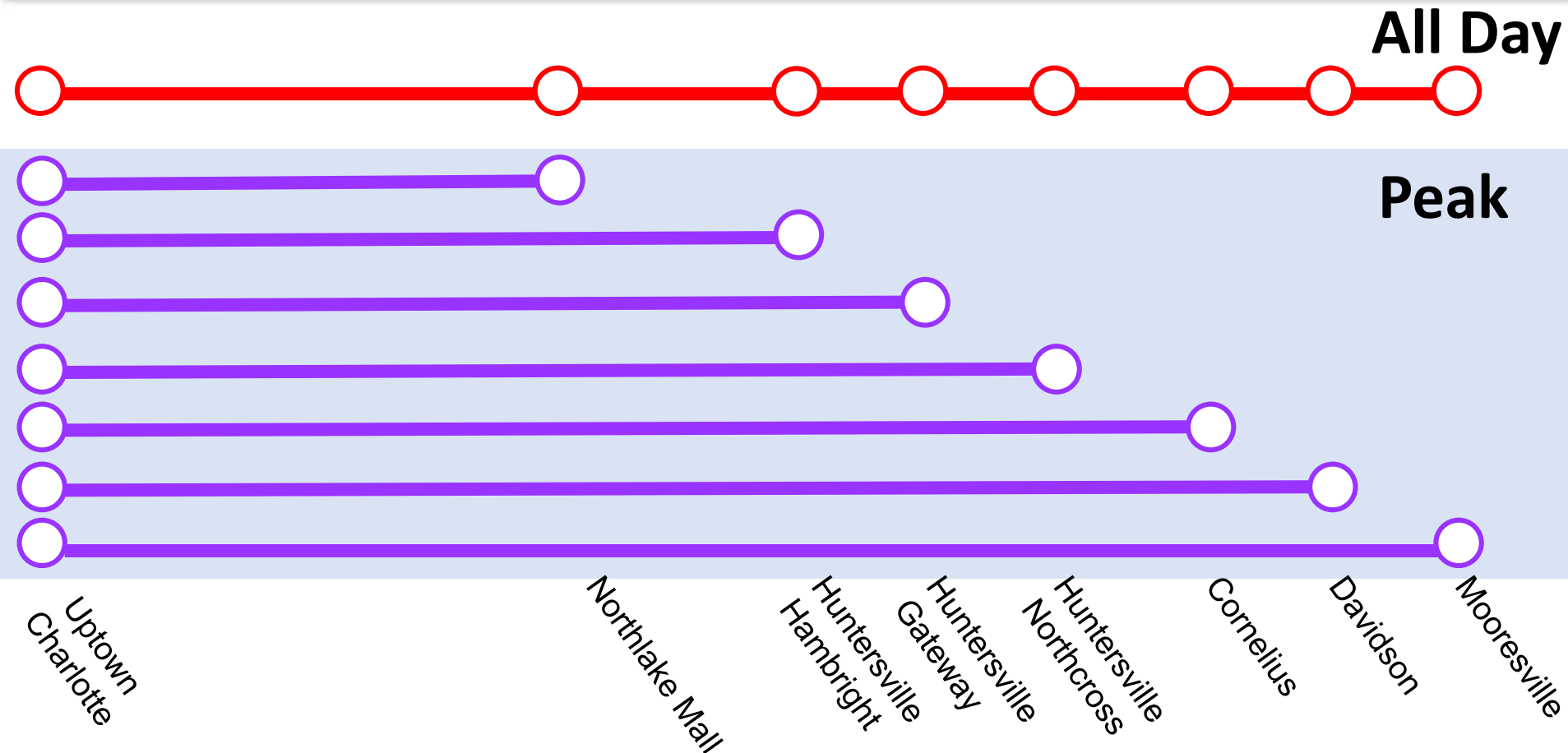
**Peak**



- **Peak direct service to existing park and rides**



# I-77 BRT Proposed Operating Plan



- **Peak direct service to existing and future park and rides**
- **Frequent service all day to each park and ride and stops**
- **Service would be provided in both directions**

## Current Study

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

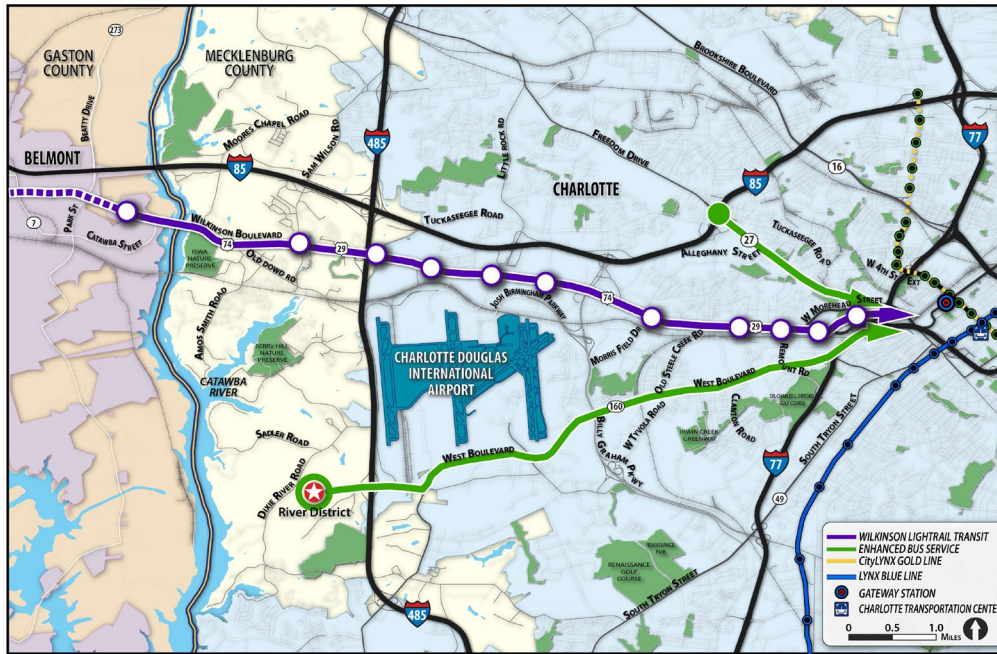
## Next Phase of Study

- 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



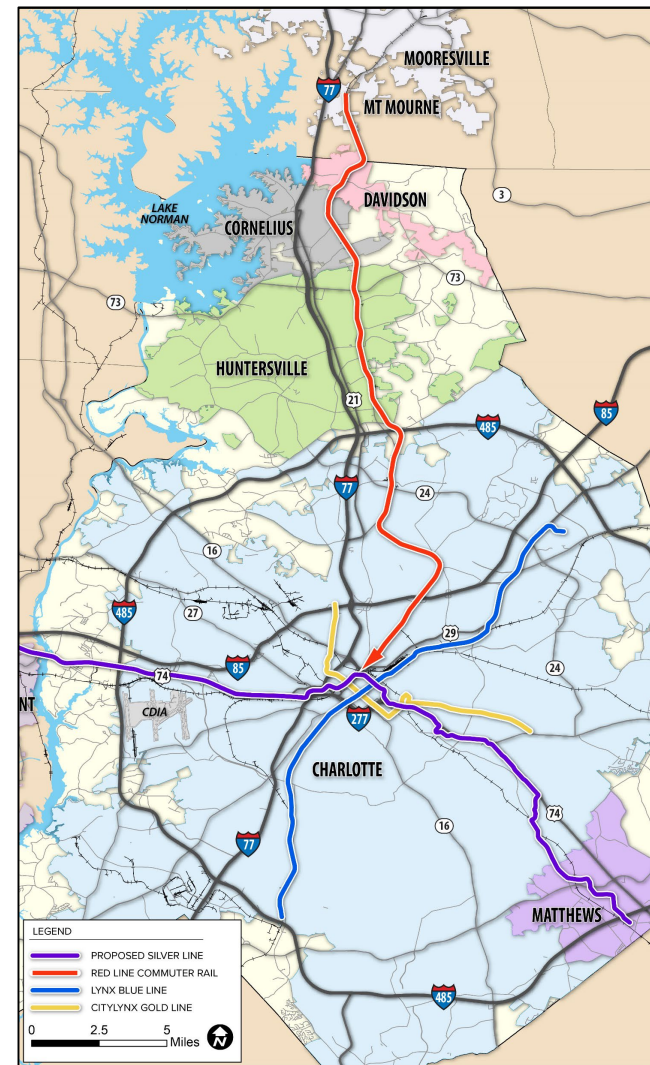


- Light rail replace streetcar as the West Corridor Transit Mode along Wilkinson Blvd.
- West Corridor be included in the LYNX Silver Line project
- Extend light rail across the Catawba River to the City of Belmont
- As part of the Regional Transit Study, evaluate light rail to downtown Gastonia



- During the LYNX System Update and the Regional Transit Engagement Series there was significant interest in rapid transit to 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

- Continue to meet with stakeholders including Affordable Housing Agencies
- Cornelius Town Board, February 4
- Davidson Town Board, February 12
- Lake Norman Transportation Commission, February 13
- Charlotte Regional Transportation Planning Organization, February 13
- Huntersville Town Board, February 18
- CATS staff will present the LYNX System Update Staff Recommendations as an action item at the February 27, 2019 MTC Meeting







# LYNX SYSTEM UPDATE

## Staff Recommendations

### Questions?

