

FAST

Freeway And Street-based Transit network



FAST Network Study and Implementation Playbook



February 2021

Funding partners



Consultant team



About the funding partners

The Regional Transportation Alliance (RTA) business coalition is the voice of the regional business community on transportation in North Carolina's Research Triangle region.

"The regional business community and our study partners are committed to the transformation of our highway network into true multimodal freeways and streets that provide significant and sustainable advantages for public transit, along with enhanced accessibility and mobility for all modes of travel." - Joe Milazzo II, PE, executive director, Regional Transportation Alliance

GoTriangle is the Triangle's regional transit provider, improving our area's quality of life by connecting people and places through safe, reliable and easy-to-use travel choices.

"GoTriangle is constantly looking for more efficient and innovative ways to serve the growing Triangle region. The FAST approach offers an additional array of tools that can be used by our agency and other transit providers in the region to continue to improve transit and transportation for our community." – Michael Parker, chair, GoTriangle Board of Trustees

The NC Department of Transportation mission is connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina.

"The Department believes the FAST approach could serve as a template for many areas across the state to advance regional transit—we greatly appreciate RTA for initiating the study effort." – Julie White, Deputy Secretary for Multimodal Transportation, NC Department of Transportation

What the Region is saying

"The FAST Study aligns with the City of Durham's goals, to identify the most cost-effective approaches to provide fast, frequent, and reliable transit that serves our community and connects across our region. The FAST study is a road map for delivering the transit priority improvements our community is calling for, in a matter of months rather than years. I want to start by thanking the FAST team for the creative, innovative approach they took to improving bus speed and reliability in the Triangle. We applaud the work of the FAST team and are excited to move their findings and recommendations forward to implementation for the Durham Freeway corridor as well as other corridors such as Fayetteville and Holloway recommended in the report." - Sean C. Egan, Director of Transportation, City of Durham Department of Transportation

"I congratulate the FAST team for their work on elevating the importance and opportunity of transit advantage infrastructure in the Triangle. As the City of Raleigh implements four Bus Rapid Transit corridors this decade, the additions of strategic "FAST" improvements like those described in this study would complement BRT and extend the network of enhanced transit in Raleigh and across the Triangle, and further the City's objectives of improving equity." - Michael Moore, Transportation Director for the City of Raleigh

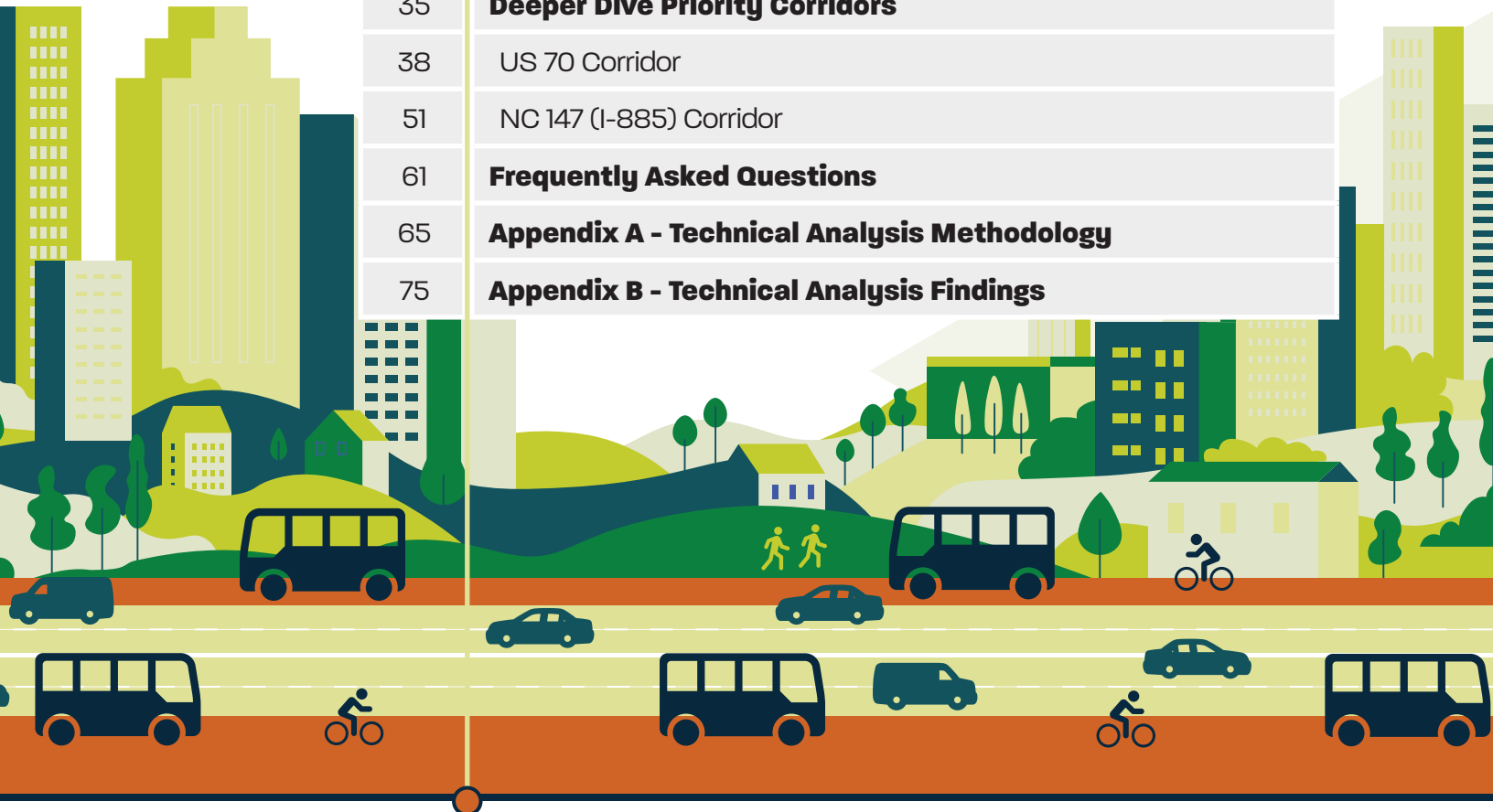
"The regional business community recognizes the need for effective transportation as our market grows. The preliminary findings from the FAST study provide a game plan to strengthen the mobility connections essential for our region's ongoing success." - Maeve Gardner, GlaxoSmithKline; chair, Regional Transportation Alliance

"We believe that the accelerated deployment of enhanced transit service using the FAST network approach will advance economic opportunity, equitable prosperity, fiscal responsibility, and environmental sustainability." - Jay Irby, First Citizens Bank; regional transit chair, Regional Transportation Alliance

"We look forward to using this study as a cooperative approach for building transit solutions that will better serve the community, strengthen our transportation network and maintain the region's reputation as a great place to live and work." - Charles Lattuca, president and CEO, GoTriangle

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Triangle FAST Network Study and Findings

Introduction

Visualizing a scalable, regional FAST network sets the framework for advancements in transit service across the region. To gain a better understanding of transit demand on a regional scale, a technical analysis screened potential corridors using mobility criteria inclusive of travel demand, transit performance, traffic, and context, as well as accessibility criteria comprising of equity, planned projects, and missing links. This screening in conjunction with spatial analysis of travel demand to activity centers and existing regional transit service were used to develop illustrative FAST corridors.

To ensure FAST corridors are truly fast, the team investigated best practices of transit advantage infrastructure from across the country. Treatments that were most promising in terms of potential and applicability to North Carolina were brought forth. These freeway and street transit advantage opportunities were then applied to each of the selected FAST corridors to highlight where each transit improvement may be most effective. The resulting FAST corridors and transit advantage infrastructure demonstrate a scalable approach to transform the region's roadways into "multimodal corridors" enhancing mobility and access.

FAST Network: Project and concept overview

The regional business community along with local and state transportation partners seek to **serve the entire Triangle by institutionalizing transit advantage measures** along the state highway network in our region.

Funded by RTA, GoTriangle and NCDOT, the Freeway And Street-based Transit (FAST) study developed an illustrative, scalable approach to transform our roadways into multimodal corridors that can provide rapid, frequent, and reliable transit service across the region.

The FAST study envisions a truly regional enhanced transit network, connecting our largest communities, activity centers, RDU Airport, and Research Triangle Park.

FAST Objectives: Aspirational and Actionable

- ▶ Define an illustrative regional FAST network for the Triangle
- ▶ Identify rapid projects and pilots for the next 18 months
- ▶ Create scalable network buildouts for High Priority, 0-5 Year, 5-10 Year, and 10+ Year horizons
- ▶ Develop a FAST guide with statewide applicability for prioritizing transit on roadways

The FAST study is the pre-planning work designed to inspire, inform, and advance ideas for improving regional connectivity, supported by technical analysis.

A FAST network will **Capitalize** on the great work that has already been done by the various agencies in the Triangle, **Complement** the existing investments being made on transit studies, plans and implementation, and become a **Champion** to leverage the existing freeway and street system with targeted transit advantage infrastructure to improve accessibility and opportunity.

Figure 1 shows the objective and purpose of the fast study which was to identify example investment opportunities to connect the BRT and Commuter Rail Line to develop a FAST mindset. Figure 2 shows the regional roadway, transit and rail network which was used to build the FAST network.



Figure 1. FAST Study Objective and Purpose

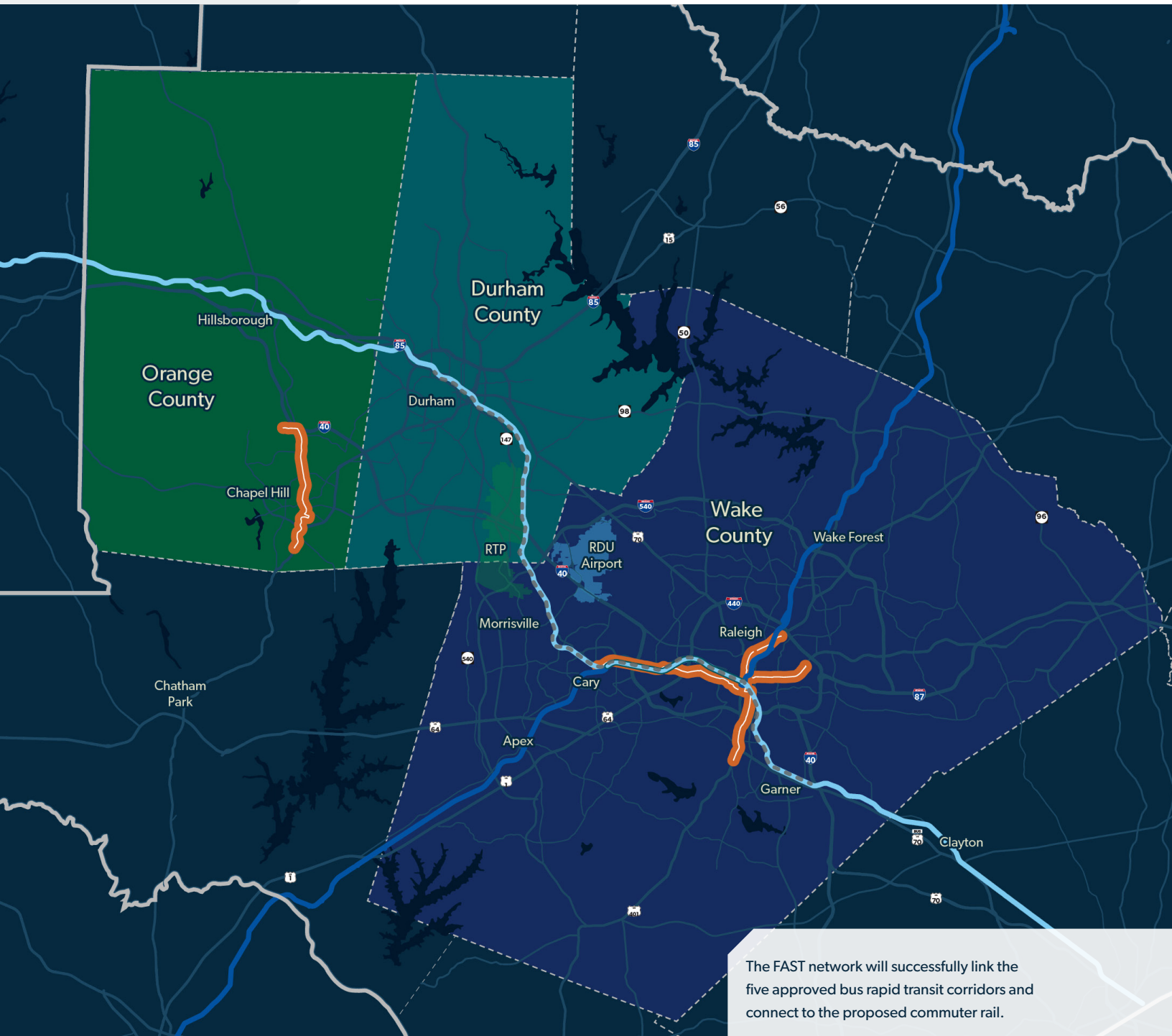
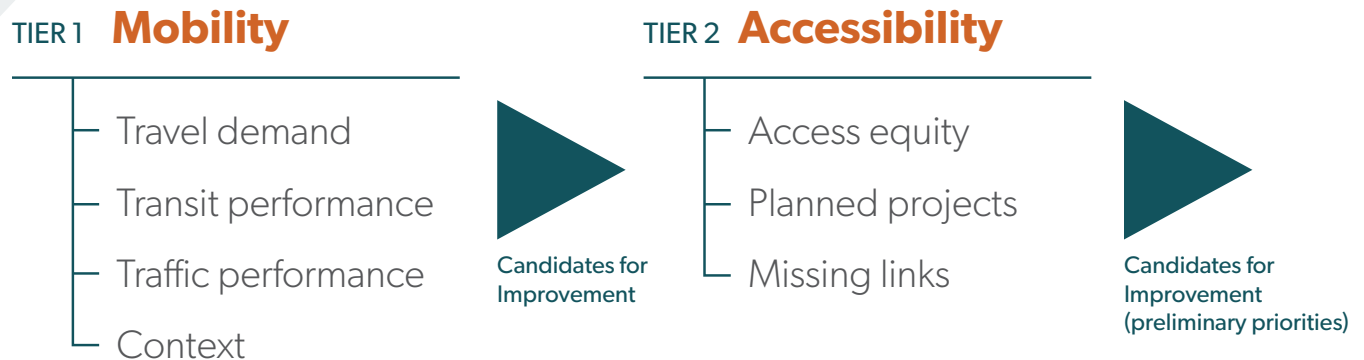


Figure 2. Study Area with Planned Rapid Transit

- BRT
- Commuter Rail
- NC By Train Service
- Future Inter-City Rail
- NC By Train Service and Future Inter-City Rail

FAST Network: Analysis Method and Preliminary Findings

A robust technical analysis was conducted that considered a host of evaluation measures for determining relative transit demand potential among various possible corridors:



Design Standards ► Measures & Targets

These factors incorporate existing and proposed or projected roadway, transit, land use, population, employment, and travel pattern elements. Refer to Appendix A for details of methodology used for technical analysis. Appendix B shows the results of the technical analysis including weights and composite scores of corridors analyzed.

Future potential transit demand to activity zones shown in Figure 3 was examined using spatial analysis to determine promising areas for enhanced regional connectivity. Figure 4 highlights the broad corridors that emerged from this portion of the analysis.

The demand to these activity zones yielded several corridors with potential transit demand. The corridors studies included:

- US 15-501 Corridor
- NC 751
- NC 147
- NC 147 and I-40
- NC 55
- NC 540 (Western Boulevard)
- NC 540 (Northern Section)
- US 64 to Pittsboro
- Harrison Boulevard
- US 1 from east Raleigh to Regency Park
- Beltline (I-440) corridor
- Capital Boulevard
- US 70
- Six Forks Road
- US 401 S to Fuquay Varina
- Holly Springs Road
- NC 50/Creedmoor Road

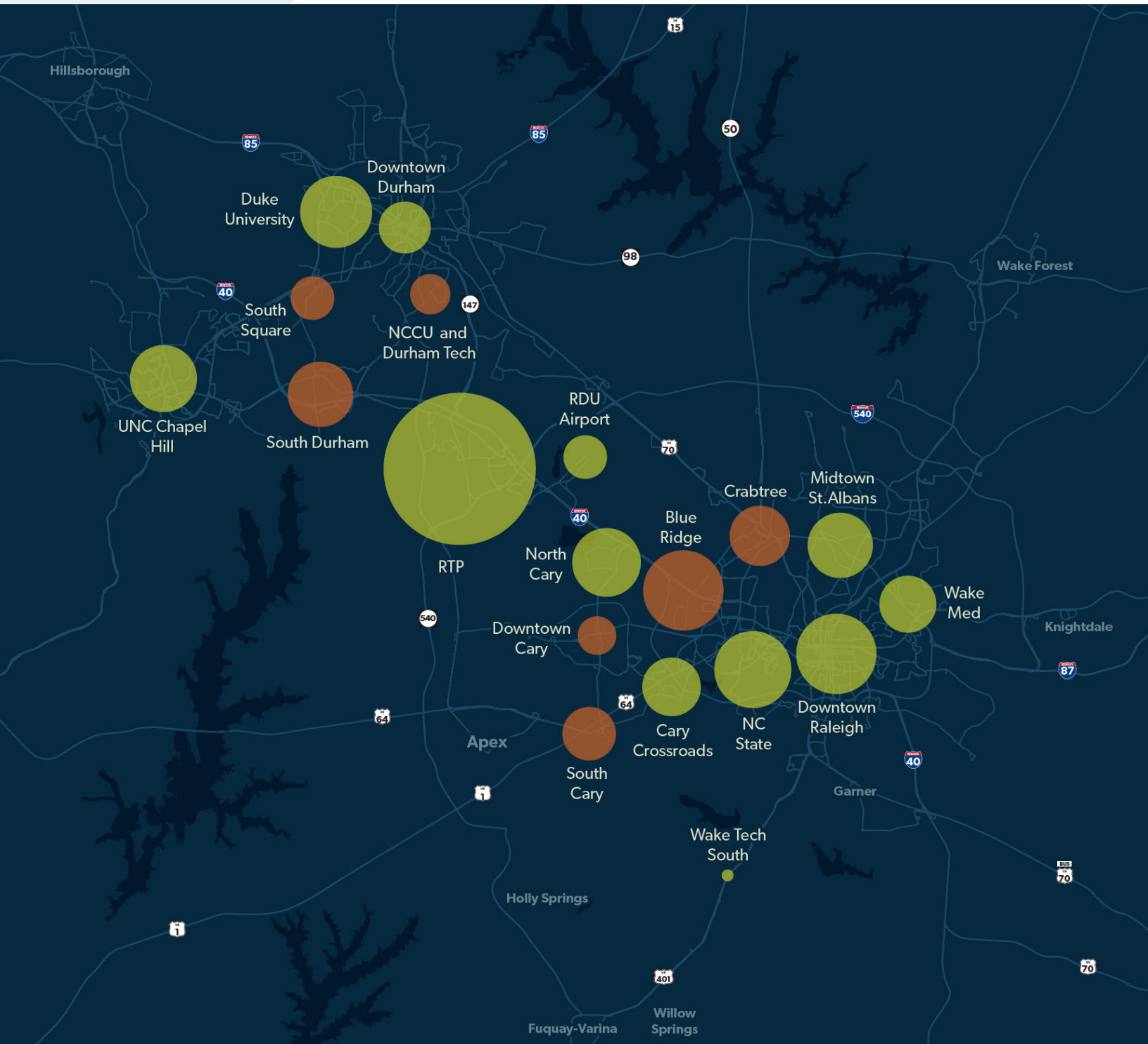
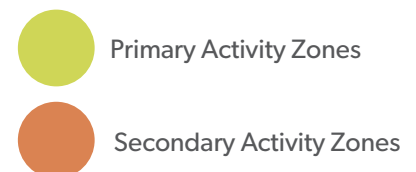


Figure 3. Core Activity Zones Analyzed for Travel Demand



The corridor analysis was based on the travel demand to the activity zones in the AM Peak period for the years 2018 and 2025. The table below shows the proportional demand to each activity zone when compared to 2025 demand to RTP. 2025 traffic demand to RTP zone is the highest of all zones.

Table 1. AM Peak Travel Demand to Activity Zones

Name	2018 Demand	Proportion of 2025 RTP demand	2025 Demand	Proportion of RTP demand
Wake Med	2,085	12%	3,526	20%
Downtown Raleigh	4,139	24%	6,572	37%
NC State	3,746	21%	5,657	32%
Cary Crossroads	2,177	12%	2,485	14%
Midtown St. Albans	2,675	15%	3,437	20%
RDU Airport	1,164	7%	1,278	7%
North Cary	2,908	17%	3,621	21%
RTP	14,533	83%	17,612	100%
Wake Tech South	80	0%	138	1%
UNC Chapel Hill	2,761	16%	2,972	17%
Downtown Durham	1,715	10%	3,031	17%
Duke University	3,273	19%	4,218	24%
Crabtree	2,295	13%	2,540	14%
Blue Ridge	4,046	23%	5,010	28%
South Cary	1,819	10%	2,112	12%
Downtown Cary	895	5%	1,300	7%
South Durham	2,735	16%	2,915	17%
South Square	1,235	7%	1,502	9%
NCCU and Durham Tech	1,034	6%	1,236	7%

After identifying these corridors of promise, and examining the existing GoTriangle regional core transit network as well as the region's proposed five bus rapid transit (BRT) corridors, the consultant team then identified a series of example higher frequency enhanced transit corridors along the region's freeway and street network (i.e., proposed **FAST** corridors).

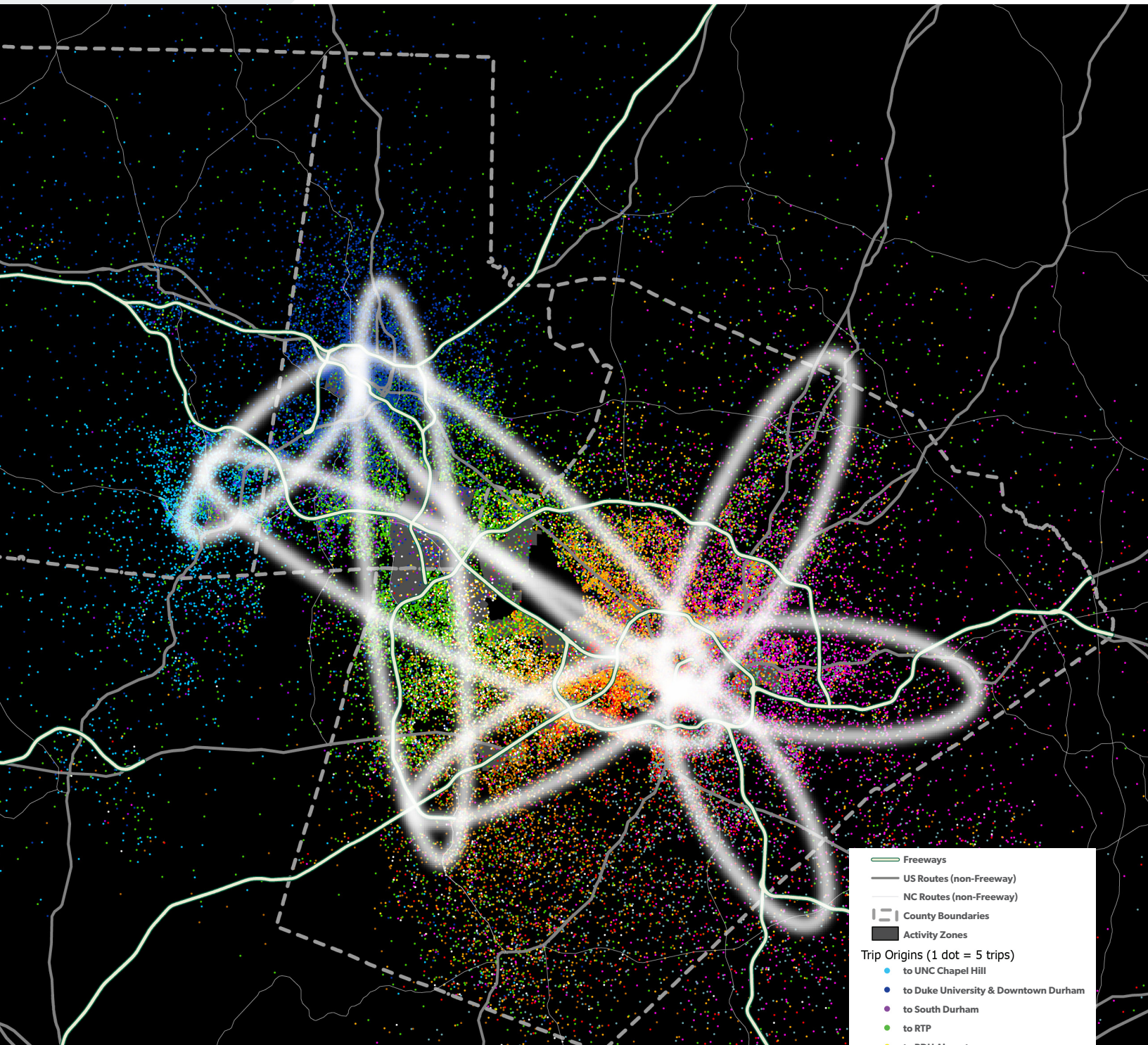


Figure 4. Potential FAST Corridors based on Demand

FAST Features: Sample Transit Advantages

- ▶ Freeway priority lanes for transit
- ▶ Bus On Shoulder System (BOSS) expansion
- ▶ Dedicated 'RED' transit lanes on streets
- ▶ Direct linkages, ramps, and bypass lanes for transit
- ▶ High quality stations that provide regional accessibility

The FAST study aims to institutionalize "transit advantage" accommodations as part of roadway projects to improve mobility for all travelers.

Identified FAST corridors were then examined at a pre-planning level for possible transit advantage opportunities (as shown in Figure 5 and Figure 6) for the High Priority, 0-5 Year, 5-10 Year, and 10+ Year horizons, including (partial list):



Figure 5. Freeway Transit Advantage Opportunities

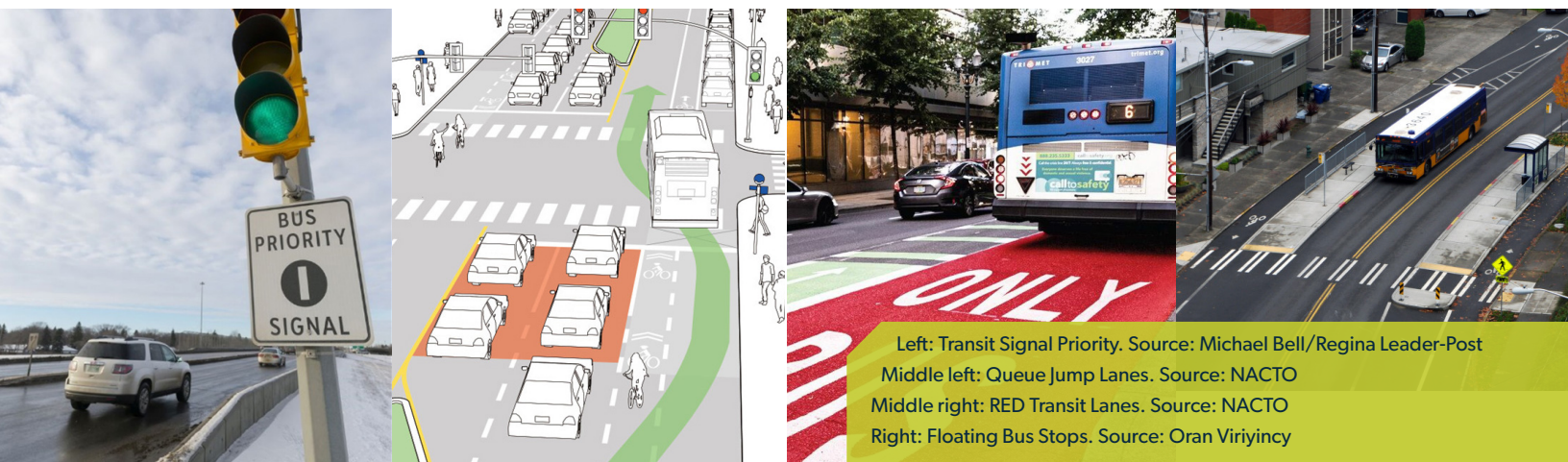


Figure 6. Street Transit Advantage Opportunities

Proposed Triangle FAST Corridors

The 10 proposed, interconnected corridors outlined in the table below directly serve Raleigh, Durham, Cary, Chapel Hill, RDU Airport, and Research Triangle Park.

Table 2. Proposed High Priority and 0-5 Years FAST Freeway and Street Corridors, with Future BRT linkages underlined.

Corridor	From	To
1. I-40	future South Wilmington Street <u>BRT</u>	NC 54 / Raleigh Road in South Durham
2. I-885 / NC 147	I-40 in RTP	Duke University
3. US 15-501 freeway	Erwin Road area	US 15-501 arterial
4. US 15-501	future MLK / NC 86 <u>BRT</u>	15-501 freeway
5. Raleigh Rd / NC 54	future MLK / NC 86 <u>BRT</u>	I-40
6. Main / Erwin / Holloway	US 15-501 freeway near Erwin Rd	Holloway Street / future I-885
7. US 70	future Downtown Raleigh <u>BRT</u>	Brier Creek/I-540
8. Six Forks Road	future Capital Boulevard <u>BRT</u>	I-540
9. Capital Boulevard	future Capital Boulevard <u>BRT</u>	I-540
10. Poole Road	future New Bern Avenue <u>BRT</u>	New Hope Road

Figure 7 below shows the 10 proposed, interconnected immediate freeway and street corridors. Table 3 shows various transit advantages recommended for each of the 10 corridors. These corridors and potential enhancements could yield immediate transit benefits.

5 of the 10 FAST corridors connect with current or future intercity rail.

7 of the 10 proposed immediate FAST corridors commence at an approved future BRT corridor.

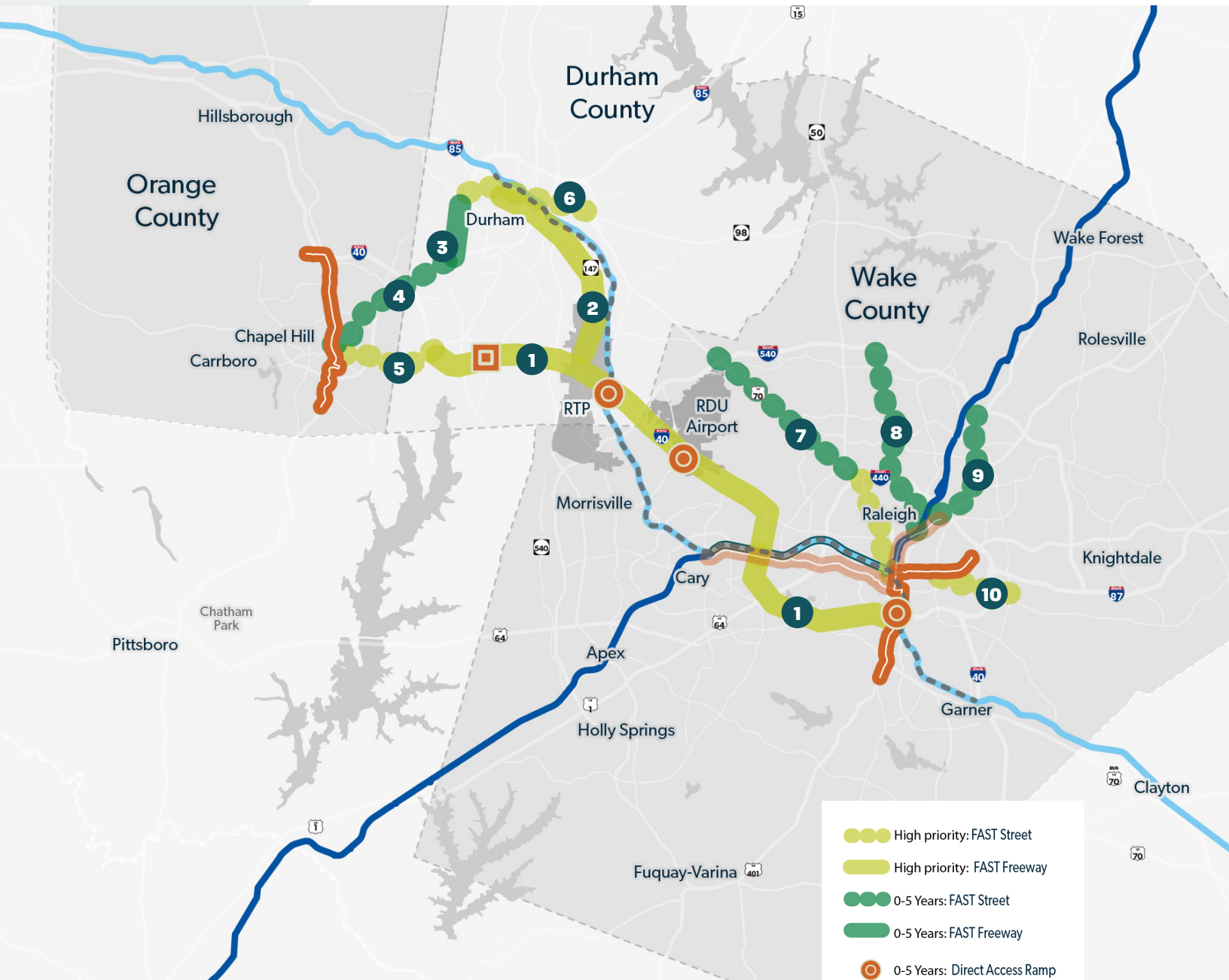











Figure 7. Immediate Freeway and Street Corridors

(Note: Refer to [Table 2](#) for numbers)

Table 3. Recommended Transit Advantages for Proposed Corridors

Transit Advantage		Corridor (reference table 2 for numbering)									
		1	2	3	4	5	6	7	8	9	10
	Bus On Shoulder System (see page 24)	●	●	●	●						
	Transit Priority Lanes (see page 25)									●	
	Transit Signal Priority (see page 26)				●	●	●	●	●	●	●
	Queue Jump Lanes (see page 27)				●	●	●		●	●	●
	RED Bus Lanes (portion) (see page 30)					●		●	●		
	Floating Bus Stops (see page 32)						●		●		●
	Enhanced Access/ Stops/Boarding (see page 33)				●	●	●	●	●	●	●
	Increased Frequency	●	●	●	●	●	●	●	●	●	●
	Off-Board Fare Collection (see page 33)	●	●	●	●	●	●	●	●	●	●

Note that seven of the 10 proposed FAST corridors connect with an approved future BRT corridor, which will leverage and strengthen the upcoming investment in the region's enhanced transit network over the next few years. In addition, potential trunkline segments can eliminate the need for transferring between BRT and FAST networks for some or all of those corridor linkages.

The resulting proposed Freeway And Street-based Transit (FAST) network concept is a scalable approach for transforming our roadways into “multimodal corridors” that could quickly provide significant and sustainable advantages for public transit, while also enhancing access and mobility for all modes of travel.



Proposed Triangle SuperFAST Corridors

The following projects and transit advantages could be implemented as Super FAST corridors within next 18-24 months:

- a. NC 54/Raleigh Rd (Corridor 5):** City of Durham/Town of Chapel Hill can coordinate with the I-40 BOSS Feasibility study and include these transit improvements: Transit Signal Priority and RED Bus Lanes quickly and Queue Jump Lanes and Enhanced Access/Stops/Boarding in the long run.
- b. Holloway/Main/Erwin (Corridor 6):** City of Durham can work with the GoDurham Planning and Operations Analysis (POA) consultant to look at this corridor for implementing Transit Signal Priority, Queue Jump Lanes, Enhanced Access/Stops/Boarding and Floating Bus Stops.
- c. Durham Station Connection (Part of Corridor 1):** while this was not an individual project but the deeper dive options (included later in the document) provided for connecting to downtown Durham as part of NC 147 and can be implemented in next 18-24 months.
- d. Poole Road (Corridor 10):** City of Raleigh can implement these improvements: Queue Jump Lanes, Enhanced Access/Stops/Boarding and Floating Bus Stops. This corridor also connects to New Bern BRT which is the first corridor to be built and would benefit transit improvements along Poole Road.
- e. Glenwood Ave (east of I-440 – ITB) (Corridor 7 - High Priority Street Corridor):**
Enhanced Access/Stops/Boarding, RED Bus Lanes and Contra Flow lanes.
Other recommendations such as:
 - a. Enhance access to transit.
 - ▶ Identified stops on route that have no sidewalks or signage.
 - Potential stop locations at Glen Eden Drive.
 - ▶ Use existing crossings and/or add crossings and signal modifications.
 - b. Center turning lane at Oberlin an opportunity for transit priority lane
 - c. Downtown Raleigh - Address bus speed and reliability by implementing:
 - ▶ Peak hour/peak direction bus lanes by removing existing parking -
Can be piloted immediately and then made permanent.

Initial review of potential freeways and streets with longer-term “FAST” opportunities for the 5-10 and 10+ horizon years, including potential connections to future commuter rail, was also recommended. Figure 8 highlights potential future corridors and transit advantages.

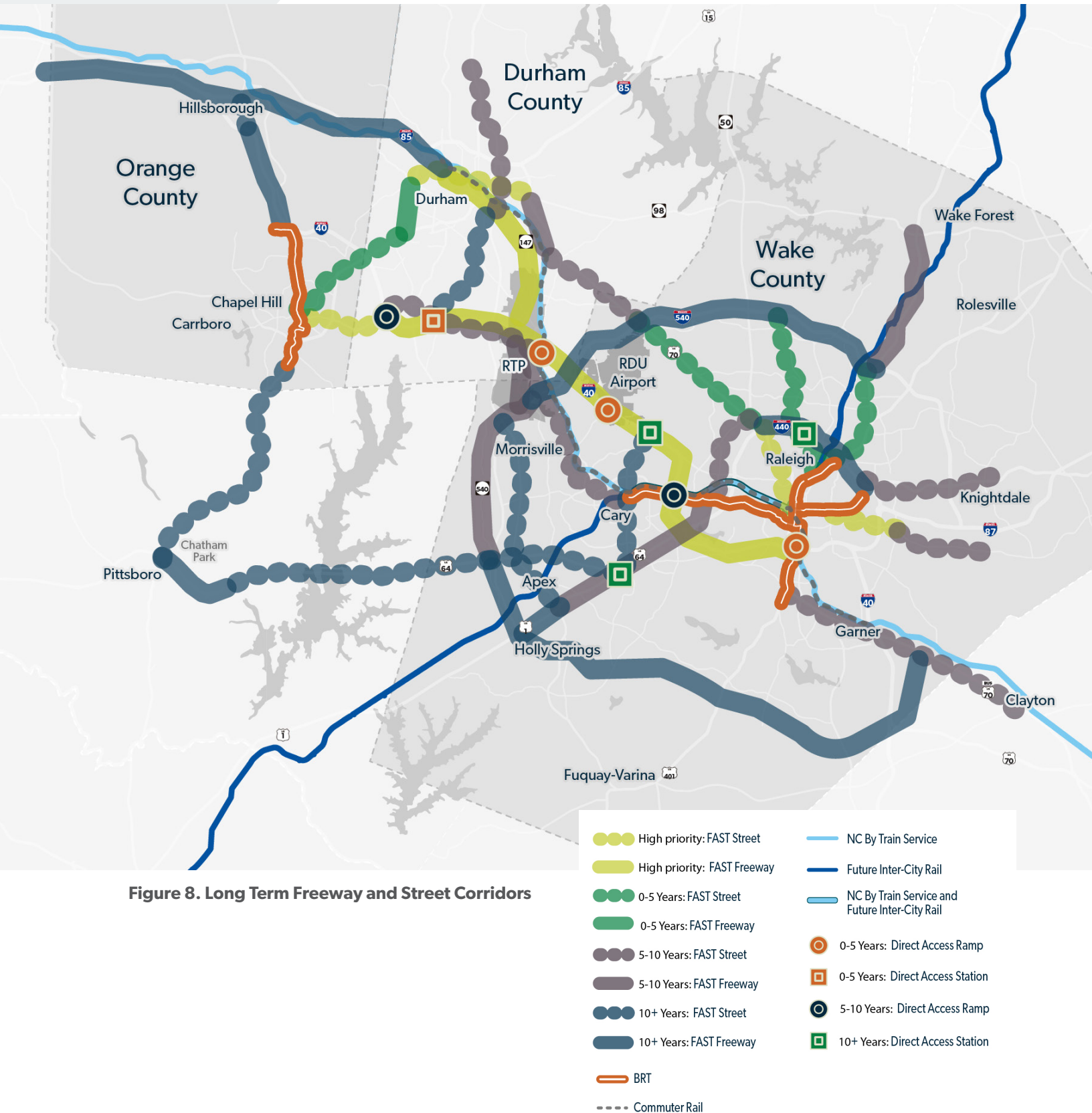


Figure 8. Long Term Freeway and Street Corridors