



# Wake BRT Extension Concept of Operations

# Final Report

June 2026



NC Capital Area Metropolitan Planning Organization



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# 1 INTRODUCTION

## PROJECT OVERVIEW

The Wake Bus Rapid Transit (BRT) Extensions Concept of Operations study builds upon the recommended locally preferred alternatives defined in the 2023 Wake BRT Extensions Major Investment Study (MIS), with four key project goals:

- Develop BRT program guidelines and standards for future Wake Transit Plan BRT corridors
- Assess feasibility, costs, and benefits of different operational scenarios for the Western and Southern BRT Extensions
- Build upon previous MIS and confirm Locally Preferred Alternative for each corridor
- Develop detailed plans to prepare the BRT Extension corridors for potential future design work, funding, and implementation.

The BRT Guidelines are available as a separate document and helped to inform the development of final capital and operating plans in the later stages of the project.

## PRIOR STUDIES

Wake County voters approved the half-cent sales tax advisory referendum to support the Wake Transit Plan in November 2016. The plan called for approximately 20 miles of BRT corridors centered around Downtown Raleigh. The initial Wake BRT MIS was developed in 2018 that defined four “core” BRT corridors: New Bern, Southern, Western, and Northern.

After this original MIS was published, anticipated growth in the region suggested that extensions to the original BRT corridors would expand the number of residents in the region that would have access to high quality transit service and build upon the capital investments made with these core BRT corridors. CAMPO conducted the Wake BRT Extensions MIS, published in 2023, which recommends extending the Southern corridor from its core route terminus in Garner to Clayton and the Western corridor from its core route terminus in Cary to Research Triangle Park (RTP). This study recommended a preferred alternative for the two extension corridors, but the unique nature of the extensions left unanswered operational questions before the projects could move into design and engineering.

Since the Wake BRT Extensions MIS was published, GoRaleigh has also continued to advance the design and engineering of the core Southern and Western BRT corridors. GoRaleigh’s latest core BRT operating assumptions (as of Fall 2025)—including route alignments, hours of operation, headways, and station locations—were used as the foundation of the Western and Southern BRT Extension operating assumptions.

# SCENARIO DEVELOPMENT & SELECTION

To answer the remaining questions from the 2023 MIS and provide detailed capital, operating, and implementation plans in support of the design and engineering phases, this Concept of Operations Study developed and evaluated a series of operating scenarios through site visits, technical analysis, and stakeholder input. The following operating scenarios were analyzed for the two corridors:

- Western BRT Extension
  - **Scenario 1: Extend every trip** of Western BRT along extension corridor, operated by **GoRaleigh**
  - **Scenario 2: Extend alternating trips** of Western BRT along extension corridor, operated by **GoRaleigh**
  - **Scenario 3: Separate bus** serving extension corridor with timed transfer to Western BRT, operated by **GoTriangle**
  - **Scenario 4: Separate bus** serving extension corridor with timed transfer to Western BRT, operated by **GoCary**
- Southern BRT Extension
  - **Scenario 1: Extend alternating trips** of Southern BRT along extension corridor, operated by **GoRaleigh**
  - **Scenario 2: Separate bus** serving extension corridor with timed transfer to Southern BRT, operated by **GoRaleigh**
  - **Scenario 3: Separate bus** serving extension corridor with timed transfer to Southern BRT, operated by **GoTriangle**

Key partners on this project included potential project sponsors GoRaleigh, GoCary, and GoTriangle; municipalities including Town of Morrisville and Town of Clayton; business groups including Research Triangle Foundation/Park and Regional Transportation Alliance; and NCDOT. Representatives met monthly as part of the Core Technical Team (CTT) with members of the CAMPO project team to shape the scenarios, inform evaluation criteria, and approve the final recommended scenarios for each corridor. The Town of Garner was also a key stakeholder throughout the project process.

The recommended scenarios are **Southern BRT Extension Scenario 2** (separate bus operated by GoRaleigh) and **Western BRT Extension Scenario 2** (alternating extension operated by GoRaleigh). For full details on the scenario development and evaluation process, see the **Scenario Analysis Report**.

This Concept of Operations Final Report details the operating plan, capital plan, funding program, and implementation timeline for the selected scenarios.

## 2 RECOMMENDED SERVICE

The Concept of Operations Study finalized the recommended alternatives for the Western and Southern BRT Extensions. The original planned Western BRT is an 11.3-mile corridor that connects Downtown Raleigh with Downtown Cary, referred to in this study as the 'core' corridor. The Western BRT Extension is a proposed 11.4-mile corridor that extends from Downtown Cary to Research Triangle Park. The project would include 13 new stations with the possibility of 1 future infill station, defined in the station locations section below.

The original planned Southern BRT is a 5.1-mile corridor that connects Downtown Raleigh with Walmart in Garner. The Southern BRT Extension is a 17.2-mile corridor that extends from Garner to the Powhatan Road area in Clayton. The project would include 9 new stations with the possibility of 2 potential infill stations.

For both corridors, the new BRT stations would be uniquely branded for the service. Station platforms would provide level boarding, off-board fare collection, real-time bus arrival information, and schedule and route information. The route alignment, station locations, and transit priority treatments of the two corridors are detailed below.

### ROUTE ALIGNMENT

The Western BRT Extension would be served by extending every other trip on the core Western BRT to RTP, while the alternating trips end at Cary. The turn-by-turn alignment of the Western BRT Extension is as follows (also shown in the map in Figure 1):

- In the westbound direction, the core Western BRT would end at the Cary Multimodal Center, and either return to Raleigh or continue along the extension to RTP. For extension trips leaving the Multimodal Center area, vehicles would then follow N Harrison Avenue to Chapel Hill Road, turn left onto Chapel Hill Road, turn right onto Weston Parkway, turn left onto Evans Road, which becomes McCrimmon Parkway, turn left onto the off-ramp to Chapel Hill Road, right onto Chapel Hill Road which becomes S Miami Boulevard, turn left onto NC-54, and turn right on Park Offices Drive, operating clockwise to the end of line.
- In the eastbound direction, upon leaving Hub RTP – Park Offices Drive, vehicles operate clockwise along Park Offices Drive, turn left on NC-54, turn right onto S Miami Boulevard which becomes Chapel Hill Road, turn left onto the on-ramp to McCrimmon Parkway, turn right onto McCrimmon Parkway which becomes Evans Road, turn right onto Weston Parkway, turn left onto Chapel Hill Road, turn right onto N Harrison Avenue, and turn right into the Cary Multimodal Center, before continuing on the core Western BRT alignment.

The Southern BRT Extension would be served by a separate extension bus, with riders transferring onto the core Southern BRT in Garner. The turn-by-turn alignment of the Southern BRT Extension is as follows (also shown in the map in Figure 3):

- In the eastbound direction, upon departing the Walmart in Garner, vehicles continue straight via Rupert Road, turn right on Garner Station Boulevard which becomes Mechanical Boulevard, turn right onto US-70, which becomes Clayton Boulevard in Johnston County, turn left on Powhatan Road, turn right on Best Wood Drive, turn right on N Tech Drive, proceeding to arrive at the end of line.
- In the westbound direction, upon leaving the start-of-line, vehicles continue via N Tech Drive, turn right on Clayton Boulevard (US-70) which becomes US 70 in Wake County, turn left on Mechanical Boulevard which becomes Garner Station Boulevard, turn left onto Rupert Drive, proceeding to arrive at the end-of-line and entering the bus turnaround.

The study team also explored a potential extension of the Southern BRT Extension via Powhatan Road to serve Novo Nordisk past the planned Powhatan terminus. Further conversations with Novo Nordisk would be needed to determine feasibility of a park-and-ride on their site, which should be done during the design and engineering phase of this corridor.

## STATION LOCATIONS

Considerations for stop locations included agency and municipality input, overall stop spacing along the alignment, and remaining consistent with the Metropolitan Transportation Plan (MTP) by limiting changes from the MIS.

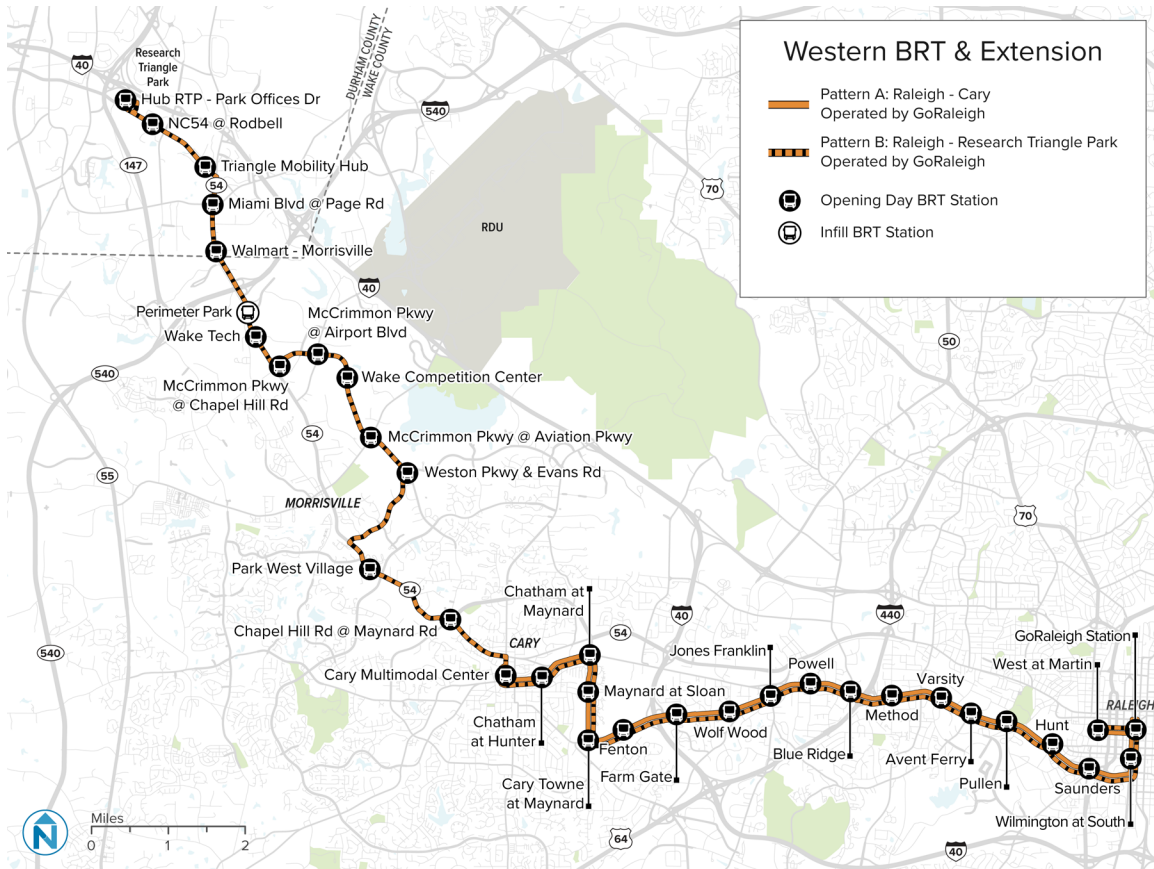
Stations along the extension alignments fall into the following four categories:

- **Core BRT station:** These stations will be constructed as part of the Core BRT corridor projects and can be utilized by the extension services without additional capital investment.
- **Transit facility:** Only applicable to the Western Extension, the Cary Multimodal Center is a planned transit facility that will not require capital investment as part of the extension project.
- **Opening day station:** These stops constitute the majority of planned stations for both extension corridors, with varying capital costs and operating considerations.
- **Future Infill station:** These locations will not have the development patterns to support a station on opening day but may be suitable for a station in the future as the region continues to grow. These stations are not taken into consideration when

calculating travel times, ridership, or capital costs, and are listed here solely to inform future development and planning decisions.

The recommended station locations for the Western BRT and Extension are shown on the map in Figure 1 and listed in the table in Figure 2. The station locations for the Southern BRT and Extension are shown in Figure 3 and listed in Figure 4.

**Figure 1 Western BRT Station Locations**

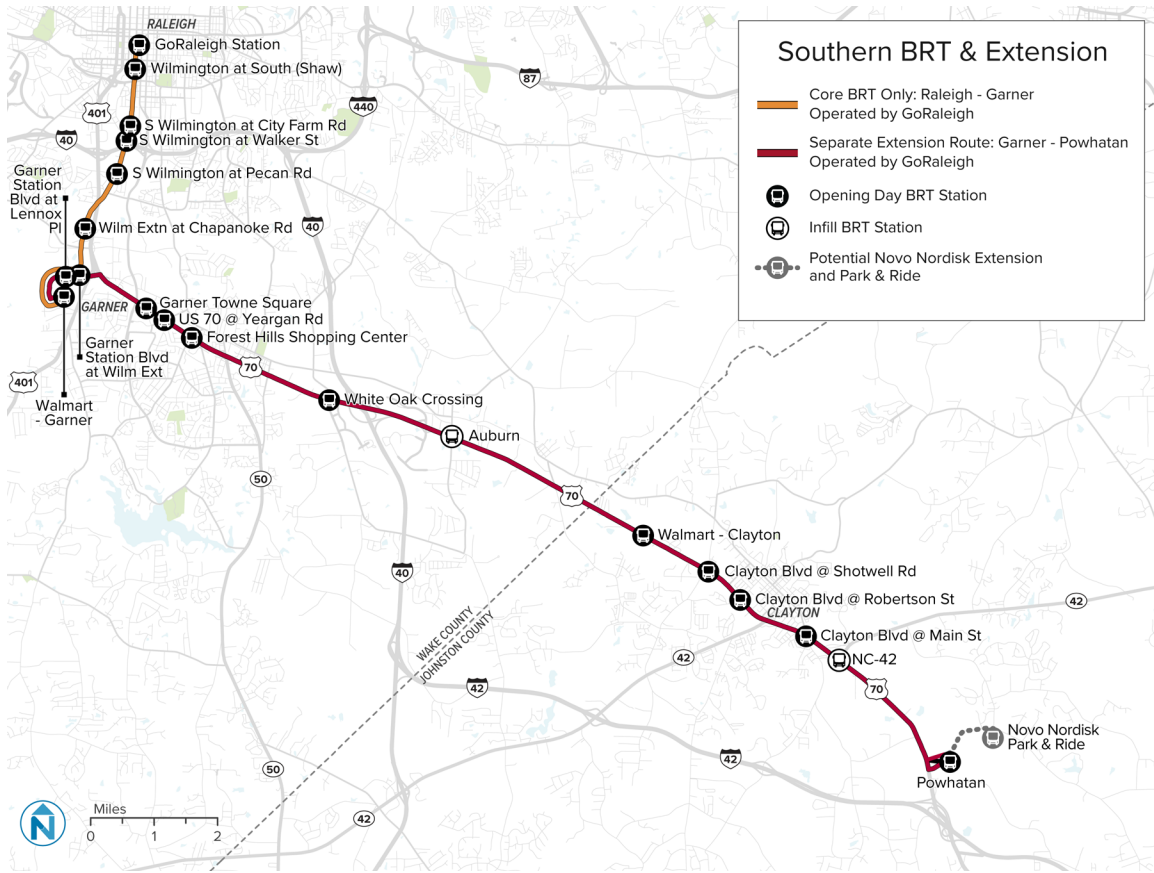


**Figure 2 Western BRT Stations, Direction and Type**

Corridor	Station	Direction	Station Type
Core	Blount St at Hargett St (GoRaleigh Station)	Eastern Terminus for All Trips	Core BRT
Core	West St at Martin St	EB Only	Core BRT
Core	Wilmington St at Hargett St (GoRaleigh Station)	EB & WB	Core BRT
Core	Wilmington St at South St	EB & WB	Core BRT
Core	Western Blvd at Saunders St	EB & WB	Core BRT
Core	Western Blvd at Hunt Dr	EB & WB	Core BRT

Corridor	Station	Direction	Station Type
Core	Western Blvd at Pullen Rd	EB & WB	Core BRT
Core	Western Blvd at Avent Ferry Rd	EB & WB	Core BRT
Core	Western Blvd at Varsity Dr	EB & WB	Core BRT
Core	Western Blvd at Method Dr	EB & WB	Core BRT
Core	Western Blvd at Blue Ridge Rd	EB & WB	Core BRT
Core	Western Blvd at Powell Dr	EB & WB	Core BRT
Core	Jones Franklin Rd at Western Blvd	EB & WB	Core BRT
Core	Western Blvd Ext. at Wolf Wood Dr	EB & WB	Core BRT
Core	Western Blvd at Farm Gate Rd	EB & WB	Core BRT
Core	Cary Towne Blvd at Trinity Rd	EB & WB	Core BRT
Core	Cary Towne Blvd at Maynard Rd	EB & WB	Core BRT
Core	Maynard Rd at Sloan Dr	EB & WB	Core BRT
Core	Chatham St at Maynard Rd	EB & WB	Core BRT
Core	Chatham St at Walker St	EB & WB	Core BRT
Core	Cary Multimodal Center	Western Terminus for Alternating Trips	Transit Facility
Extension	Cary Multimodal Center	EB & WB	Transit Facility
Extension	Chapel Hill Rd at Maynard Rd	EB & WB	Opening Day
Extension	Park West Village	EB & WB	Opening Day
Extension	Weston Pkwy & Evans Rd	EB & WB	Opening Day
Extension	McCrimmon Pkwy at Aviation Pkwy	EB & WB	Opening Day
Extension	Wake Competition Center	EB & WB	Opening Day
Extension	McCrimmon Pkwy at Airport Blvd	EB & WB	Opening Day
Extension	McCrimmon Pkwy at Chapel Hill Rd	EB & WB	Opening Day
Extension	Wake Tech	EB & WB	Opening Day
<i>Extension</i>	<i>Perimeter Park</i>	<i>EB &amp; WB</i>	<i>Future Infill</i>
Extension	Walmart - Morrisville	EB & WB	Opening Day
Extension	Miami Blvd at Page Rd	EB & WB	Opening Day
Extension	Triangle Mobility Hub	EB & WB	Opening Day
Extension	NC 54 at Rodbell St	EB & WB	Opening Day
Extension	Hub RTP – Park Offices Dr	Western Terminus for Alternating Trips	Opening Day

**Figure 3 Southern BRT Station Locations**



**Figure 4 Southern BRT Stations, Direction and Type**

Corridor	Station	Direction	Station Type
Core	Wilmington St at Hargett St (GoRaleigh Station)	Northern Terminus for All Trips	Core BRT
Core	Blount St at Hargett St	SB only	Core BRT
Core	Wilmington St at South St	NB & SB	Core BRT
Core	Wilmington St at Keeter Center Dr	NB & SB	Core BRT
Core	Wilmington St at Walker St	NB & SB	Core BRT
Core	Wilmington St at Pecan Rd	NB & SB	Core BRT
Core	Wilmington St Ex.t at Chapanoke Rd	NB & SB	Core BRT
Core	Wilmington St Ext. at Garner Station Blvd	NB & SB	Core BRT
Core	Garner Station Blvd at Lennox Place	NB & SB	Core BRT
Core	Walmart - Garner	Southern Terminus for All Trips	Core BRT

Corridor	Station	Direction	Station Type
Extension	Walmart - Garner	Northern Terminus for All Trips	Core BRT
Extension	Garner Station Blvd at Lennox Place	NB & SB	Core BRT
Extension	Garner Towne Square	NB & SB	Opening Day
Extension	US 70 at Yeargan Rd	NB & SB	Opening Day
Extension	Forest Hills Shopping Center	NB & SB	Opening Day
Extension	White Oak Crossing	NB & SB	Opening Day
<i>Extension</i>	<i>Auburn</i>	<i>NB &amp; SB</i>	<i>Future Infill</i>
Extension	Walmart - Clayton	NB & SB	Opening Day
Extension	Clayton Blvd at Shotwell Rd	NB & SB	Opening Day
Extension	Clayton Blvd at Robertson St	NB & SB	Opening Day
Extension	Clayton Blvd at Main St	NB & SB	Opening Day
<i>Extension</i>	<i>NC 42</i>	<i>NB &amp; SB</i>	<i>Future Infill</i>
Extension	Powhatan	Southern Terminus for All Trips	Opening Day

## TRANSIT PRIORITY TREATMENTS

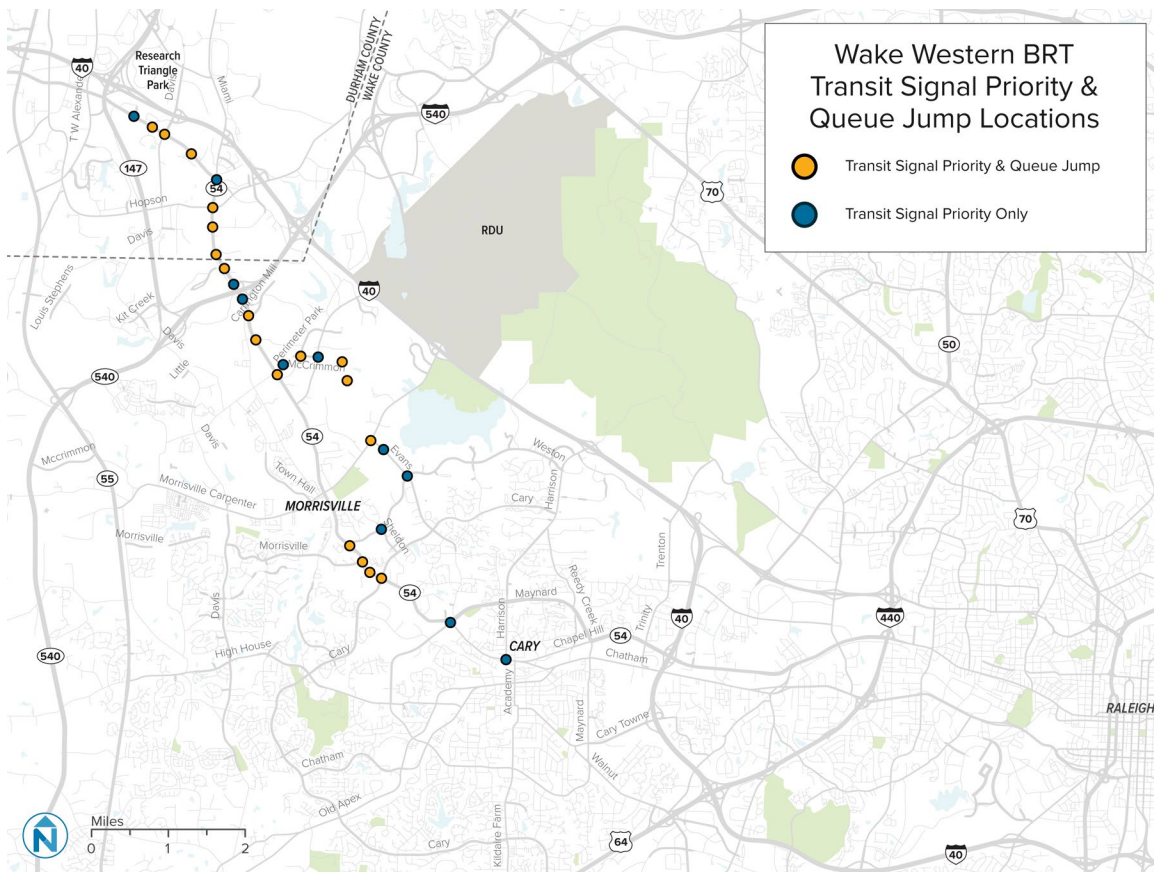
Transit priority treatments are infrastructure investments that improve bus speed and reliability. Three treatments were analyzed for implementation on the Southern and Western BRT Extension corridors: bus on shoulder systems, transit signal priority, and queue jump lanes. Refer to the Scenario Analysis Report for additional details about methodology and assumptions for identifying transit priority treatments.

**Bus on shoulder systems (BOSS)** allow operators to drive on the highway shoulder when certain conditions are met. BOSS is most effective when traffic in the general-purpose lanes slows below 35 mph due to traffic congestion and where the roadway has adequate shoulder width to accommodate bus traffic. The study team evaluated the shoulders and speeds along US 70 on the Southern BRT Extension and concluded that there were not sufficient sections of the highway where there were both wide shoulders and slow general traffic speeds. Thus, BOSS is not recommended for opening year of the BRT Extension. Additionally, there are projects planned for later years in the MTP that include the widening of US 70. These projects should be done with the BRT Extension in mind, potentially adding BOSS or dedicated lanes after the BRT has been implemented.

**Transit Signal Priority (TSP)** is a set of tools and traffic management systems that detect transit vehicles and modify traffic signals to prioritize transit movements. TSP is recommended at all signalized intersections along each extension corridor.

When paired with TSP, **queue jump lanes** provide buses with an early signal phase, allowing them to bypass congestion and re-enter the main traffic flow ahead of general traffic. Queue jumps are recommended only where feasible within the existing right-of-way at a relatively low cost, either simply through restriping an existing lane or shoulder or very minor geometric modifications. Ideally, queue jump lanes are accompanied by “receiving” lanes on the far side of the intersection where buses can smoothly transition back into general purpose lanes, though having a receiving lane was not a requirement for recommended queue jumps. Based on a queue jump feasibility analysis conducted at each intersection to identify the level of modification needed, queue jumps are recommended at 18 intersections along the Western BRT Extension corridor and at 21 intersections along the Southern BRT Extension corridor. Figure 5 and Figure 6 show the signalized intersections along the Western and Southern BRT Extension corridors, respectively, and the recommended level of transit priority treatment at each intersection.

**Figure 5 Western BRT Extension Transit Signal Priority and Queue Jump Locations**



**Figure 6 Southern BRT Extension Transit Signal Priority and Queue Jump Locations**

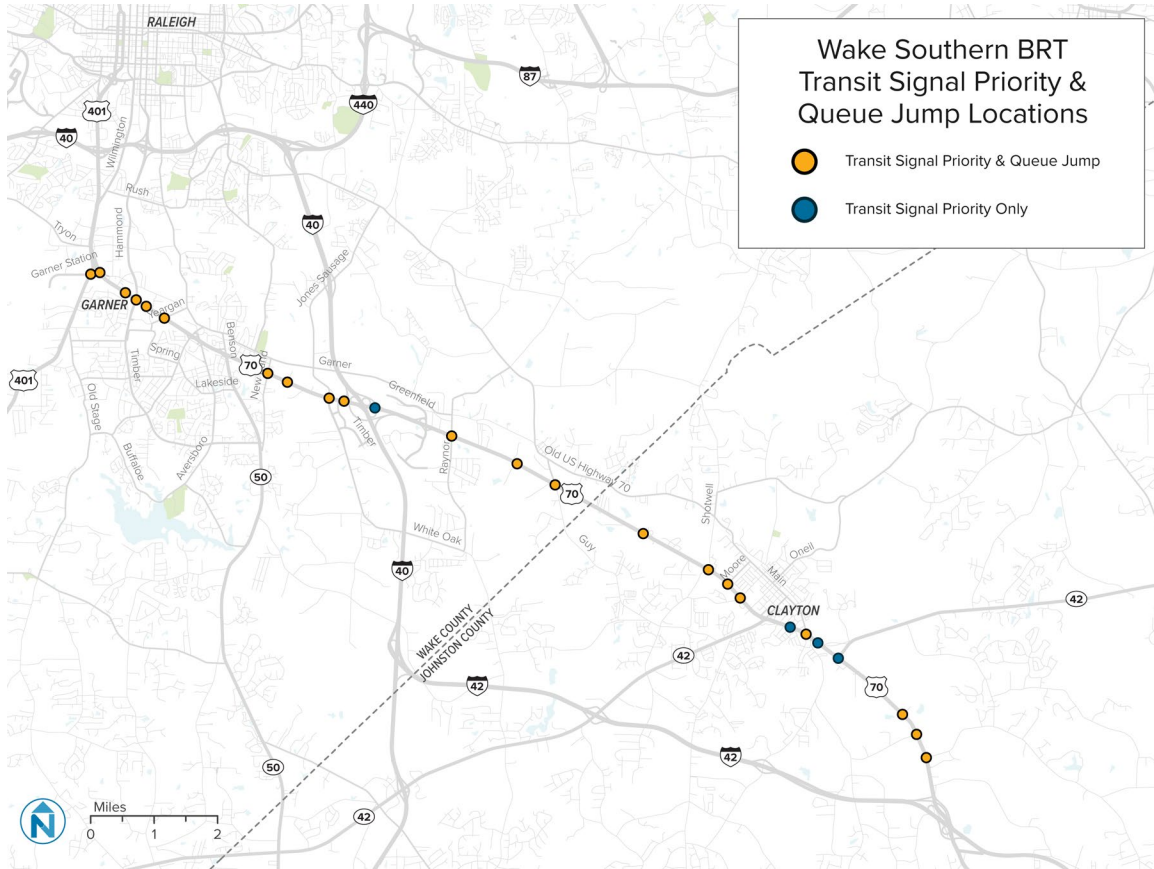


Figure 7 and Figure 8 list the proposed queue jump (QJ) intersections for the Western and Southern BRT Extension corridors respectively and indicates the presence of a receiving lane in each direction based on existing right-of-way.

**Figure 7 Recommended Queue Jump Locations, Western Extension (2035)**

On Street	Intersecting Street	Outbound QJ Direction	Outbound Receiving Lane?	Inbound QJ Direction	Inbound Receiving Lane?
Chapel Hill Rd/NC-54	NW Cary Pkwy			EB	No
Chapel Hill Rd/NC-54	Market Ctr Dr			EB	No
Chapel Hill Rd/NC-54	Morrisville Pkwy			EB	Yes
Chapel Hill Rd/NC-54	Weston Pkwy	WB	Yes		
Evans Rd	Aviation Pkwy	NB	No	SB	No
McCrimmon Pkwy	Strand St Future Signal	NB	No	SB	No
McCrimmon Pkwy	Future Odyssey Dr Extension, Future Signal			SB	No
McCrimmon Pkwy	Perimeter Park Dr	WB	Yes	EB	Yes
Chapel Hill Rd/NC-54	McCrimmon Pkwy	NB	Yes	SB	Yes
Chapel Hill Rd/NC-54	Watkins Rd			SB	Yes
Chapel Hill Rd/NC-54	Carrington Mill Blvd	NB	No		
Chapel Hill Rd/NC-54	Shiloh Glenn Dr	NB	No		
Chapel Hill Rd/NC-54	Surles Ct	NB	No		
S Miami Blvd/NC-54	Emperor Blvd	NB	No		
S Miami Blvd/NC-54	Hopson Rd/Page Rd	NB	No		
NC-54	New Millennium Wy	WB	No	EB	No
NC-54	Davis Dr	WB	No	EB	No
NC-54	Rodbell St	WB	No		

Source: Three Oaks Engineering for Nelson\Nygaard on behalf of CAMPO, 2025.

**Figure 8 Recommended Queue Jump Locations, Southern Extension (2035)**

On Street	Intersecting Street	Outbound QJ Direction	Outbound Receiving Lane?	Inbound QJ Direction	Inbound Receiving Lane?
Fayetteville Rd/US-401	Mechanical Blvd/Garner Station Blvd	EB	No	WB	No
US-70	Mechanical Blvd			WB	No
US-70	Jessup Dr	EB	No		
US-70	Timber Dr	EB	No	WB	No
US-70	Garner Town Square	EB	No	WB	No
US-70	Yeargan Rd	EB	No	WB	No
US-70	New Rand Rd	EB	No	WB	No
US-70	Medical Park Ct	EB	Yes	WB	No
US-70	Jones Sausage Rd/White Oak Rd	EB	No	WB	No
US-70	I-40 WB Ramps (WB Only)			WB	Yes
US-70	Raynor Rd	EB	Yes	WB	No
US-70	TV Tower Rd	EB	No	WB	Yes
US-70	Guy Rd	EB	No	WB	No
US-70	Town Centre Blvd	EB	Yes	WB	Yes
US-70	Shotwell Rd	EB	Yes	WB	No
US-70	S Moore St	EB	Yes	WB	No
US-70	S Robertson St	EB	Yes	WB	No
US-70	Champion St			WB	No
US-70	Cutter Lab Access Rd			WB	No
US-70	Pony Farm Rd	EB	No	WB	Yes
US-70	Powhatan Rd	EB	No		

Source: Three Oaks Engineering for Nelson\Nygaard on behalf of CAMPO, 2025.

# 3 OPERATING PLAN

## OPERATING RECOMMENDATIONS

For each of the two BRT Extensions, the study team developed operating statistics, costs, and vehicle requirements and recommended the service span, headways, and travel times as well as the impact on existing routes, which are described in greater detail below. GoRaleigh is recommended as the project sponsor and operator for both the Western and Southern BRT Extension services.

### Recommended Span of Service

The operating hours are proposed to differ slightly between the core BRT services and their extensions across all service days, as detailed in Figure 9. The recommended weekday service spans are the same for both core BRT corridors, where buses would operate 20 hours per day, and on the two extension corridors, with service operating for 19 hours per day. Saturday spans of service are one hour shorter across all corridors, beginning one hour later than on weekdays, and Sunday service on the extension would be reduced to 16 hours, ending at 10:00 PM.

Figure 9 Service Span (Western and Southern)

Corridor	Weekday	Saturday	Sunday
Core	4:00 AM – 12:00 AM	5:00 AM – 12:00 AM	5:00 AM – 12:00 AM
Extension	5:00 AM – 12:00 AM	6:00 AM – 12:00 AM	6:00 AM – 10:00 PM

### Recommended Headways

The services on the two extension corridors are recommended to be half as frequent as the core BRT corridors, as shown in Figure 10. On the Western BRT Extension, this frequency is achieved by extending every other core Western BRT bus to RTP and ending the other half of the buses at Cary Multimodal Center. On the Southern BRT Extension, this frequency is achieved by running a separate extension bus between Garner and Powhatan and ending all core BRT buses at Garner.

**Figure 10 Recommended Headways (Western and Southern)**

Day and Time	Span of Service	Core Corridor Headways	Extension Corridor Headways
Weekday Very Early	4 AM – 5 AM	20 minutes	-
Weekday Early AM	5 AM – 6 AM	20 minutes	40 minutes
Weekday Peak/Day	6 AM – 7:30 PM	10 minutes	20 minutes
Weekday Night	7:30 PM – 12 AM	20 minutes	40 minutes
Saturday Early AM	5 AM – 6 AM	20 minutes	-
Saturday Day	6 AM – 7:30 PM	15 minutes	30 minutes
Saturday Night	7:30 PM – 12 AM	20 minutes	40 minutes
Sunday Early AM	5 AM – 6 AM	20 minutes	-
Sunday Day	6 AM – 7:30 PM	15 minutes	30 minutes
Sunday Evening	7:30 PM – 10 PM	20 minutes	40 minutes
Sunday Late Night	10 PM – 12 AM	20 minutes	-

## Existing Routes

When fully implemented, the full Western BRT and Extension corridor could replace two existing GoTriangle routes with similar alignments. The core Western BRT service could replace GoTriangle Route 300, and the Extension BRT service could replace the existing GoTriangle Route 310, which primarily serves the recommended BRT alignment. The FY 27 Wake Transit Work Plan estimated the cost savings of replacing the GoTriangle Route 300 and GoTriangle Route 310 in 2031 (estimated opening year of the Western BRT) to be approximately \$4 Million. It is assumed that other GoRaleigh, GoTriangle, and GoCary routes that serve any portion of the Western BRT and extension corridor could remain in place without any service modifications directly related to BRT implementation. Existing stops for routes that cross the corridor could remain adjacent to the recommended BRT stations.

The full Southern BRT and Extension corridor would not fully replace any existing route, but the implementation of the core BRT service may be timed with a reduction in service frequency of local GoRaleigh Route 7. The Southern BRT Extension service would not replace any existing service.

## OPERATING COST ESTIMATES

Unlike headways and service spans, where riders have distinct experiences on the core and extension corridors, operating estimates such as cycle times and revenue miles for Western BRT occur at the operating pattern level of the bus service, with the core pattern operating

between Raleigh and Cary and the secondary pattern operating on both the core and extension corridors between Raleigh and RTP. The following sections present findings for the full Western BRT and Extension by operating pattern rather than by corridor. The incremental costs of implementing the alternating extension pattern compared to the core Western BRT alone were estimated by comparing the full corridor total to the previous Western BRT Operations Plan. For the Southern BRT and Extension, results are presented by corridor, as the separate bus operations means the corridors and operating patterns represent the same trips.

All annualized figures are based on 255 weekdays, 52 Saturdays, and 58 Sundays/Holiday service levels in a calendar year.

## Travel Time

During the scenarios analysis stage of the study, travel times for each scenario were estimated based on forecasted traffic levels, standardized dwell times at each station, transit priority treatments, and an assumption that the bus would stop at every station along a route (refer to Scenario Analysis Report for more details). Once a preferred scenario was selected, the study team refined these travel times by assigning dwell times to each station based on estimated ridership: 15 seconds for stations expected to have high ridership, seven seconds for stations with medium ridership, and four for lower ridership stations. The team also assumed that buses would continue to stop at all stops at peak times but would skip approximately a quarter of stops during off-peak times. Figure 11 shows the refined corridor lengths, estimated speeds, and one-way travel times.

**Figure 11 Wake BRT Extension One-Way Corridor Length, Speed, and Travel Time**

	Western BRT Extension	Southern BRT Extension
Corridor Length	11.4 miles	17.2 miles
Estimated Speed at Peak Hours	22 mph	29 mph
One-Way Travel Time at Peak Hours	31 minutes	36 minutes
Estimated Speed at Off-Peak Hours	23 mph	31 mph
One-Way Travel Time at Off-Peak Hours	28 minutes	33 minutes

These travel times were then used to estimate the cycle time of each route, which is the amount of time a bus takes to travel round trip and layover before starting its next trip at the defined frequency. A minimum layover time of 10% of travel time is recommended to allow for adequate recovery and driver breaks.

GoRaleigh’s operating plans for the core Western and Southern BRT were used to define the cycle times for the core BRT segments as needed. For the full Western BRT and Extension, the Raleigh to Cary route pattern is estimated to have a cycle time of 100 minutes, and the

Raleigh to RTP route pattern is estimated to have a cycle time of 180 minutes. The core Southern BRT will operate with a 50-minute cycle time, round-trip between downtown Raleigh and Walmart-Garner with layover and recovery. The Southern BRT Extension has a peak cycle time of 100 minutes, including two-way travel time between Walmart-Garner and Powhatan, plus layover and recovery.

## Annual Revenue Hours and Miles

Annual operations of the full Western BRT and Extension are estimated to result in nearly 79,000 revenue hours and 1,119,000 miles of revenue service (Figure 12). The higher number of annual revenue miles for the extension is due to the overlapping service that also serves the Core BRT alignment between Raleigh and Cary. Implementing the alternating extension pattern is an annual incremental increase of approximately 24,000 hours and 251,000 miles over the original core Western BRT.

**Figure 12 Annualized Revenue Hours and Miles by Operating Pattern (Western)**

Operating Pattern	Annual Revenue Hours	Annual Revenue Miles
Core Pattern: Raleigh to Cary	30,491	393,528
Core + Extension Pattern: Raleigh to RTP	48,099	725,027
<b>Total</b>	<b>78,590</b>	<b>1,118,555</b>
Extension Portion (Incremental)	24,342	250,595

Annual operations of the full Southern BRT and Extension are estimated to result in nearly 54,000 revenue hours and 895,000 miles of revenue service (Figure 13). Despite lower frequency and slightly lower annual revenue hours, the longer distance travelled on the Southern BRT Extension results in a much higher annual revenue miles total than for the core Southern BRT.

**Figure 13 Annualized Revenue Hours and Miles (Southern)**

Corridor	Annual Revenue Hours	Annual Revenue Miles
Core	28,107	343,840
Extension	24,958	550,318
<b>Total</b>	<b>53,338</b>	<b>894,157</b>

## Annual Cost and Fleet Requirements

Annual operating costs are a reflection of the recommended service design, the assumed operator, scheduled service, and travel time assumptions. GoRaleigh operating costs per revenue hour are assumed to be \$120. The full Western BRT and Extension would require an estimated \$9,431,000 for annual operating costs and 14 vehicles during peak service, as

shown in Figure 14. For just the BRT Extension portion of the route, the annual operating cost would be \$2,921,000, with four peak vehicles required.

The Southern BRT Extension would add an estimated \$3,028,000 in annual operating costs for a total of \$6,400,000 annually to operate both the core Southern BRT and the BRT Extension. Both corridors are estimated to require five vehicles each, for a total of 10 vehicles in peak service, as shown in Figure 15. The similar operating costs and vehicle needs between the two segments despite the different frequencies are explained through the differences in the distances of the two segments.

**Figure 14 Annualized Costs and Vehicle Needs (Full Western BRT and Extension)**

Operating Pattern	Annual Operating Cost	Peak Vehicles Required
Core Pattern: Raleigh to Cary	\$3,659,000	5
Core + Extension Pattern: Raleigh to RTP	\$5,772,000	9
<b>Total</b>	<b>\$9,431,000</b>	<b>14</b>
Extension Portion (Incremental)	\$2,921,000	4

**Figure 15 Annualized Cost and Vehicle Needs (Full Southern BRT and Extension)**

Corridor	Annual Operating Cost	Peak Vehicles Required
Core	\$3,372,000	5
Extension	\$3,028,000	5
<b>Total</b>	<b>\$6,400,000</b>	<b>10</b>

In addition, as the Southern BRT Extension operates in both Wake and Johnston counties, Figure 16 delineates operating cost and mileage between the two counties. As shown in the table, the majority of the mileage (57%) remains in Wake County.

**Figure 16 Annualized Southern BRT Extension Cost and Mileage by County**

County	Alignment Mileage		% of Extension	Annual Operating Cost
	(Two-Way)	Annual Mileage		
Wake County	19.8	315,835	57%	\$1,738,000
Johnston County	14.7	234,483	43%	\$1,290,000
<b>Extension Total</b>	<b>34.5</b>	<b>550,318</b>	<b>100%</b>	<b>\$3,028,000</b>

# 4 CAPITAL PLAN

## CAPITAL RECOMMENDATIONS

The capital planning of the Western and Southern BRT Extensions is built upon the recommended new station locations, signalized intersections, and corridor length, as well as fleet requirements identified as part of the operations modeling. The capital plan focuses on the extension corridors and does not include components that are a part of the core Western and Southern BRT.

On the Western BRT Extension alignment, 27 side-running station platforms and 31 signalized intersections were assumed along the 11.4-mile corridor. The full Western BRT and Extension corridor will require 14 60-foot articulated vehicles during peak service. Ten vehicles are included in the Core BRT capital plan, so this capital plan only accounts for the remaining four vehicles.

On the Southern BRT Extension alignment, 21 side-running station platforms and 25 signalized intersections were assumed along the 17.2-mile corridor. The extension corridor will require five 40-foot vehicles during peak service.

## Related Capital Projects

Several projects are planned along the extension corridors and are assumed to be in place by the time the BRT service opens. The costs of these projects were not included as a part of the BRT cost estimates, but it is important for the BRT project development team to be aware of and coordinate with these other capital projects.

Along the Western BRT Extension corridor, the following projects will affect the final design of the BRT service:

- Triangle Mobility Hub – the design of new signalized intersections along NC-54, as well as the location of the BRT platform (on-street or within the transit center). The facility is expected to open in 2029.
- Downtown Cary Multi-Modal Center – the design of the BRT platforms or bays, as well as how the two different route patterns will circulate through the facility. The facility is expected to open in 2030.
- McCrimmon Parkway – a new intersection and street grid is planned through extending Odyssey Drive to meet McCrimmon Parkway. A new signalized intersection is also planned at Strand Street and Stephens Park Drive, which will be operational by 2028.

- McCrimmon Parkway & NC 54 – a grade separation project is planned at McCrimmon Parkway & NC 54, which will affect how the BRT Extension turns from McCrimmon Parkway onto NC 54 in Morrisville. The project let date is July 2027, with project completion expected three to four years after that.

Along the Southern BRT Extension corridor, the following projects are of note:

- US 401 – a superstreet is planned between Garner Station Rd and Old Stage Rd in 2035, which will restrict turning movements on US 401 near the start of the extension corridor.
- Vandora Springs Road – a bridge reconstruction is proposed at Vandora Springs Road and US 70, which would enable better pedestrian connectivity at the recommended BRT station platforms.

Additionally, it is important to track ongoing developments around Perimeter Park on the Western BRT Extension and Auburn and NC 42 on the Southern BRT Extension as these are the locations for potential infill stations.

## CAPITAL COST ESTIMATES

Final capital cost estimates include assumed construction and non-construction costs, as well as allocated and unallocated contingency. As these are high-level conceptual planning estimates, they include a significant portion of contingency that will gradually be phased out as uncertainties in design and engineering decrease in future project phases. Unit costs were developed for various capital construction elements, including stations and station areas, intersection transit priority treatments, and technology, as well as for vehicles. The base year for all unit costs is 2025, and any historic unit costs were escalated to the 2025 base year. The main data sources used were the New Bern Avenue 100% engineering estimates and vehicle and technology costs provided by GoRaleigh. For the Southern BRT Extension, capital construction costs are allocated to Wake and Johnston counties based on station and intersection locations. All other costs are split by the proportional corridor length within each county.

## Breakdown by Cost Type

### Construction Costs

Construction costs include stations and station areas, intersection transit priority treatments, technology, and sitework. Methodology for developing unit costs and lump sum allocations is summarized below:

- **Stations & Station Areas:** Station platform costs assume level boarding (or near-level boarding) and all amenities associated with core BRT stations as defined in the Wake BRT Guidelines, including the boarding areas, shelters and seating, lighting and wayfinding, ticket vending and fare validation machines, emergency telephones, real-time arrival information, CCTVs, and touch-screen kiosks with optional Wi-Fi. Ten percent of the estimated station platform cost is allocated to station area pedestrian and multimodal improvements. Southern BRT Extension costs include the planned Powhatan Park and Ride at the southern end-of-line. The estimated cost of this site is based on costs of a comparable project escalated from 2019.
- **Intersection Transit Priority Treatments:** Transit signal priority (TSP) is recommended at all signalized intersections along each extension corridor. Queue jumps are recommended only where feasible within the existing right-of-way at a relatively low cost, i.e. not requiring major street geometry reconfiguration. Based on a queue jump feasibility analysis conducted at each intersection, signalized intersections are assigned to one of three unit costs: TSP only, TSP with a low-cost queue jump, and TSP with a medium-cost queue jump. A low-cost queue jump involves just restriping an existing lane, while a medium-cost queue jump involves additional modifications.
- **Systems:** Communications fiber is assumed to run for the entire length of each extension corridor.
- **Sitework:** Sitework costs are estimated based on the sum of all other construction costs. The 25% allocation for sitework includes a 10% allocation for utilities and a 15% allocation for temporary facilities and other indirect construction costs.

Figure 17 summarizes capital construction unit costs and allocations by construction category and element. Construction contingency equals 30% of all direct construction costs and is intended to cover unforeseen costs encountered during construction.

Total construction costs for each corridor, including quantities when applicable, are presented in Figure 18 and Figure 19. The estimated construction cost of the Western BRT Extension including contingency is \$41,279,000. Southern BRT Extension construction costs are allocated to Wake and Johnston counties based on station and intersection locations and the proportional corridor length within each county (57% in Wake County, 43% in Johnston County). The estimated construction cost of the Southern BRT Extension including contingency is \$44,932,000, with \$20,660,000 allocated to Wake County and the remaining \$24,272,000 allocated to Johnston County. The Western BRT Extension has a higher construction cost per mile than the Southern BRT Extension due to a higher concentration of stations and intersections.

Figure 17 Construction Unit Costs and Allocations

Element	Unit Cost (\$) or Allocation (%)
<b>Stations &amp; Station Areas</b>	
BRT Station Platform	\$651,390
Powhatan Park and Ride (Southern BRT Extension only)	\$4,467,900
Station Area Pedestrian and Multimodal Improvements	10% of station costs
<b>Intersection Transit Priority Treatments</b>	
TSP Only	\$23,000
TSP and Low-Cost Queue Jump	\$34,000
TSP and Medium-Cost Queue Jump	\$160,000
<b>Systems</b>	
Communication Fiber	\$75 per linear foot
<b>Sitework</b>	
Utilities, Temporary Facilities, and Other Indirect Construction Costs	25% of all other construction costs
<b>Construction Contingency</b>	<b>30% of direct costs</b>

Figure 18 Total Construction Costs in FY2025\$ (Western BRT Extension)

Element	Quantity	Total Cost
<b>Stations &amp; Station Areas</b>		
BRT Station Platform	27	\$17,588,000
Station Area Pedestrian and Multimodal Improvements	27	\$1,759,000
<b>Intersection Transit Priority Treatments</b>		
TSP Only	13	\$299,000
TSP and Low-Cost Queue Jump	13	\$442,000
TSP and Medium-Cost Queue Jump	5	\$800,000
<b>Systems</b>		
Communication Fiber	60,200	\$4,515,000
<b>Sitework</b>		
Utilities, Temporary Facilities, and Other Indirect Construction Costs	N/A	\$6,351,000
<b>Construction Direct Cost</b>		<b>\$31,754,000</b>
Construction Contingency		\$9,526,000
<b>Construction Total Cost</b>		<b>\$41,280,000</b>

Figure 19 Total Construction Costs in FY2025\$ (Southern BRT Extension)

Element	Quantity: Wake County	Total Cost: Wake County	Quantity: Johnston County	Total Cost: Johnston County	Grand Total Cost
<b>Stations &amp; Station Areas</b>					
BRT Station Platform	10	\$6,514,000	11	\$7,165,000	\$13,679,000
Powhatan Park and Ride	0	\$0	1	\$4,468,000	\$4,468,000
Station Area	10	\$652,000	11	\$717,000	\$1,368,000
<b>Intersection Transit Priority Treatments</b>					
TSP Only	1	\$23,000	3	\$69,000	\$92,000
TSP and Low-Cost Queue Jump	10	\$340,000	7	\$238,000	\$578,000
TSP and Medium-Cost Queue Jump	3	\$480,000	1	\$160,000	\$640,000
<b>Systems</b>					
Communication Fiber	57%	\$3,917,000	43%	\$2,908,000	\$6,825,000
<b>Sitework</b>					
Utilities, Temporary Facilities, and Other Indirect Construction Costs	57%	\$3,967,000	43%	\$2,946,000	\$6,913,000
<b>Construction Direct Cost</b>		<b>\$15,893,000</b>		<b>\$18,671,000</b>	<b>\$34,564,000</b>
Construction Contingency		\$4,768,000		\$5,601,000	\$10,369,000
<b>Construction Total Cost</b>		<b>\$20,661,000</b>		<b>\$24,272,000</b>	<b>\$44,933,000</b>

## Non-Construction Costs

Non-construction costs include vehicle requirements and professional services. Methodology for developing unit costs and lump sum allocations is summarized below:

- **Vehicle Requirements:** The Western BRT Extension is assumed to utilize 60-foot articulated CNG buses, and the Southern BRT Extension is assumed to use 40-foot CNG buses. Vehicle needs are determined based on peak service, as described in the Operating Plan chapter. An additional 20% spare ratio is added onto the number of service vehicles required to determine the final fleet requirements. Vehicle contingency equals 10% of all other vehicle costs.
- **Professional Services:** Professional services include design and engineering, as well as associated project management, construction administration, and legal costs. 20%

of total construction costs (including construction contingency) are allocated towards professional services.

Figure 20 summarizes capital non-construction unit costs and allocations by category and element.

**Figure 20 Non-Construction Unit Costs and Allocations**

Element	Unit Cost (\$) or Allocation (%)
<b>Vehicles</b>	
Articulated 60-Foot Buses	\$1,200,000
40-Foot Buses	\$900,000
Spares	20% of fleet
Spare Parts	50% of vehicle costs
<b>Professional Services</b>	
Professional Services	20% of total construction costs
<b>Vehicles Contingency</b>	<b>10% of direct vehicle costs</b>

Total non-construction costs for each corridor, including quantities when applicable, are presented in Figure 21 and Figure 22. The estimated non-construction cost of the Western BRT Extension including contingency is \$15,186,000. Southern BRT Extension non-construction costs are allocated to Wake and Johnston counties based on the proportional corridor length within each county (57% in Wake County, 43% in Johnston County). The estimated non-construction cost of the Southern BRT Extension including contingency is \$15,223,000, with \$8,737,000 allocated to Wake County and the remaining \$6,486,000 allocated to Johnston County.

**Figure 21 Total Non-Construction Costs in FY2025\$ (Western BRT Extension)**

Element	Quantity	Total Cost
<b>Vehicles</b>		
Articulated 60-Foot Buses	4	\$4,800,000
Spares	1	\$1,200,000
Spare Parts	N/A	\$300,000
<b>Professional Services</b>		
Professional Services	N/A	\$8,256,000
Vehicle Contingency		\$630,000
<b>Non-Construction Total Cost</b>		<b>\$15,186,000</b>

Figure 22 Total Non-Construction Costs in FY2025\$ (Southern BRT Extension)

Element	Quantity (Total)	Total Cost: Wake County	Total Cost: Johnston County	Grand Total Cost
<i>Allocation by County</i>		57%	43%	
<b>Vehicles</b>				
40-Foot Buses	5	\$2,583,000	\$1,917,000	\$4,500,000
Spares	1	\$517,000	\$383,000	\$900,000
Spare Parts	N/A	\$155,000	\$115,000	\$270,000
<b>Professional Services</b>				
Professional Services	N/A	\$5,157,000	\$3,829,000	\$8,986,000
Vehicle Contingency		\$325,000	\$242,000	\$567,000
<b>Non-Construction Total Cost</b>		<b>\$8,737,000</b>	<b>\$6,486,000</b>	<b>\$15,223,000</b>

## Capital Costs Summary

Total capital cost estimates include construction elements, non-construction elements, and unallocated contingency. Unallocated contingency is applied to the total project costs and is designed to represent the costs of changes in scope as design and engineering progresses, as well as variance in market conditions that can affect capital costs. A 10% unallocated contingency is used for these estimates.

Figure 23 and Figure 24 summarize total capital cost estimates for the Western and Southern BRT Extension corridors, respectively. The estimated total capital cost of the Western BRT Extension is \$62,112,000, or approximately \$3.6 million per mile for the 11.4-mile extension corridor. Southern BRT Extension unallocated contingency is allocated to Wake and Johnston counties based on the proportional corridor length within each county (57% in Wake County, 43% in Johnston County). The estimated total capital cost of the Southern BRT Extension is \$66,171,000 (approximately \$3.8 million per mile for the 17.2-mile corridor), with \$32,850,000 allocated to Wake County and the remaining \$33,321,000 allocated to Johnston County.

Figure 23 Total Capital Costs in FY2025\$ (Western BRT Extension)

Cost Category	Total Cost (Including Contingency)
Construction	\$41,279,000
Vehicles	\$6,930,000
Professional Services	\$8,256,000
Unallocated Contingency	\$5,647,000
<b>Total Cost</b>	<b>\$62,112,000</b>
<b>Cost per Corridor Mile</b>	<b>\$3,621,000/mile</b>

**Figure 24 Total Capital Costs in FY2025\$ (Southern BRT Extension)**

<b>Cost Category</b>	<b>Total Cost (Including Contingency): Wake County</b>	<b>Total Cost (Including Contingency): Johnston County</b>	<b>Grand Total Cost (Including Contingency)</b>
Construction	\$20,660,000	\$24,272,000	\$44,932,000
Vehicles	\$3,580,000	\$2,657,000	\$6,237,000
Professional Services	\$5,157,000	\$3,829,000	\$8,986,000
Unallocated Contingency	\$3,453,000	\$2,563,000	\$6,016,000
<b>Total Cost</b>	<b>\$32,850,000</b>	<b>\$33,321,000</b>	<b>\$66,171,000</b>
<b>Cost per Corridor Mile</b>	-	-	<b>\$3,847,000/mile</b>

# 5 FUNDING PLAN

## ESTIMATED COSTS AND ALLOCATED FUNDING

The analysis in the prior chapters estimated operating and capital costs for the Western and Southern BRT Extension, as shown in Figure 25. Note that these costs do not include the core Western and Southern BRT costs, which have their own funding plans.

**Figure 25 Estimated Costs for Western and Southern BRT Extensions**

	Western BRT Extension	Southern BRT Extension (Total)	Southern BRT Extension (Wake County)	Southern BRT Extension (Johnston County)
Annual Operating Cost (FY25\$)	\$2,921,000	\$3,028,000	\$1,738,000	\$1,290,000
Total Capital Cost (FY25\$)	\$62,112,000	\$66,171,000	\$32,850,000	\$33,321,000

The most recent State Transportation Improvement Program (STIP) and Wake Transit Plan have allocated capital funding for the Wake BRT Extensions. For the entire Clayton to RTP corridor, the STIP has allocated \$100 million in funding, with half going to the core BRT corridors and the other half going to the extensions. For the Western BRT Extension, the STIP has allocated \$30 million and Wake Transit has allocated \$8.247 million. For the Southern BRT Extension, the STIP has allocated \$20 million and Wake Transit has allocated \$23.346 million. These funds were combined, then split up by year and category in the Wake Transit Financial Model, as shown in Figure 26.

**Figure 26 Allocated Funding for BRT Extensions**

	Western BRT Extension	Southern BRT Extension
Planning Funds (FY26\$)	\$702,000	\$796,000
Project Development & Engineering (FY27\$)	\$6,750,000	\$7,446,000
Construction (FY28\$)	\$15,184,000	\$17,208,000
Construction (FY29\$)	\$15,791,000	\$17,897,000
<b>Total (FY26-29\$)</b>	<b>\$38,247,000</b>	<b>\$43,346,000</b>

The funding allocated in the STIP and Wake Transit Plan covers a significant portion of the total capital cost of the Wake BRT Extensions, but there remains a funding gap. Across the two extensions, there is approximately a \$44-million capital funding gap, not including inflation. Operating costs, at least the Wake County portion, are assumed to be covered by the Wake Transit Plan.

The following sections detail potential funding sources that could be used to fill this funding gap.

## STANDARD FEDERAL, STATE, AND LOCAL FUNDING SOURCES

This section presents a menu of potential supplemental funding sources that could be explored by the project sponsor and its funding partners to fund the proposed BRT extensions. These sources could address potential funding gaps associated with planning, capital, and operational costs. Figure 27 summarizes a list of currently available funding sources that Wake BRT projects may qualify for, and that meet the specific needs of this region, with further details provided below the table. Using either a checkmark to signify yes or an X to signify no, the first two columns indicate whether the funding source was already assumed in the Wake Transit Plan (WTP) or, if it was not considered in the WTP, if it is likely to be a potential funding source for the Wake BRT Extension projects. The Planning, Capital, and Operating columns similarly use a checkmark or an X to indicate if the funding may be used for a specific type of expense.

Given the ever-changing landscape of the transit funding environment, the funding programs described in this document may change over time or may not be available when specific applications are pursued. Accordingly, this document is provided for informational and planning purposes to support funding discussions and decision-making related to the implementation and long-term operation of Wake BRT.

**Figure 27 Currently Available Federal, State, and Local Funding Sources**

Assumed in WTP	New Potential Source	Program Name	Planning	Capital	Operating	Relevant Counties
<b>Federal</b>						
X	X	FTA Section 5309 – Capital Investment Grants (Small Starts / New Starts)	✓	✓	X	Wake, Johnston
X	✓	FTA Section 5307 – Urbanized Area Formula	✓	✓	✓	Wake, Johnston
X	✓	FTA Section 5339 – Buses and Bus Facilities	X	✓	X	Wake, Johnston
X	✓	FTA Section 20005(b) – Transit Oriented Development (TOD) Pilot	✓	X	X	Wake, Johnston

Assumed in WTP	New Potential Source	Program Name	Planning	Capital	Operating	Relevant Counties
X	✓	Better Utilizing Investments to Leverage Development (BUILD)	✓	✓	X	Wake, Johnston
X	✓	FTA Section 5337 – State of Good Repair for Fixed Guideway	✓	✓	✓	Wake, Johnston
<b>State</b>						
✓	X	North Carolina Strategic Transportation Investments (STI)	X	✓	X	Wake, Johnston
X	✓	Congestion Mitigation and Air Quality (CMAQ)	X	✓	✓	Wake, Johnston
X	✓	SMAP State Maintenance Assistance Program - Operating Assistance	X	X	✓	Wake, Johnston
X	✓	ConCPT Coordination Program	X	X	✓	Wake, Johnston
<b>Local</b>						
✓	X	Local Transit Sales Tax (NCGS Ch. 105, Article 43)	✓	✓	✓	Wake
✓	X	Local County Sales Tax (NCGS Ch. 105, Article 46)	✓	✓	✓	Wake
✓	X	CAMPO Locally Administered Projects Program (LAPP)	✓	✓	X	Wake, Johnston
✓	X	TWTPO Regional Flexible Funding	✓	✓	X	Durham
✓	X	Vehicle registration tax for Wake Transit	✓	✓	✓	Wake
✓	X	Vehicle rental tax for Wake Transit	✓	✓	✓	Wake

## Federal Programs

It is important to remember that if more than one funding program is applied to a single project, whichever program's allowable federal share is lowest will be the controlling amount.

## **FTA Section 5309 – Capital Investment Grants**

FTA Section 5309, known as the Capital Investment Grants (CIG) program is the primary federal funding source for transit fixed-guideway capital investments, such as BRT. The competitive grant program can fund major capital elements such as guideway construction, stations, vehicles, intelligent transportation systems (ITS), and transit signal priority. Small Starts and New Starts are the two most common for fixed-guideway and corridor-based transit investments.

- New Starts are designed for large-scale, high-capacity transit investments that involve substantial capital construction and transformative regional impacts. Usually \$400 million or more.
- Small Starts is typically used to fund BRT and Corridor-Based Bus projects due to the lower project costs that align with the grant thresholds (projects less than \$400 million in total project cost and that are seeking CIG funding of less than \$150 million).
  - CIG program shares are capped at 80% federal share / 20% local match, though FTA typically encourages sponsors to cap the federal share below 50-60%.
  - Federal law requires transit agencies seeking CIG funding to complete a series of steps over several years to compete and remain grant-eligible for the funding.

At the time of this study, the Western and Southern BRT Extensions are not likely to be competitive for CIG funding, due to the nature of the corridors. However, this funding source is included in this compilation in case future conditions drastically change the potential ridership on these corridors.

## **FTA Section 5307 – Urbanized Area Formula**

FTA Section 5307 provides flexible formula-based funding for transit agencies serving urbanized areas. Urbanized areas with populations between 50,000 and 200,000 are also eligible to receive operating funds, which means that Johnston County may soon have access to these funds given Clayton’s urbanized area reaching 50,000 in population in the 2020 US Census.

- This source is commonly used for stations, vehicles, and corridor improvements.
- Section 5307 is often paired with Section 5309 funding to help advance BRT projects or is used during early project phases such as preliminary engineering or initial corridor enhancements.
- Bus-related operating expenses are only eligible if the operator operates 100 or fewer buses during peak service, a threshold GoRaleigh is likely to soon cross, although the funds can be used for preventative maintenance.

## **FTA Section 5339 – Buses and Bus Facilities**

The Section 5339 program supports capital investments related to buses and associated facilities. Eligible activities include the replacement, rehabilitation, and purchase of buses and vans, as well as the construction or improvement of maintenance facilities. There are both formula funds 5339(a) and competitive funds 5339(b) and (c) available.

- The program also allows funding for technological upgrades and innovations, including infrastructure to support low- or no-emission vehicles.
- Section 5339 is well-suited for funding BRT vehicles, maintenance and storage facilities, and charging infrastructure, and is often used to complement corridor funding from Section 5309 or other federal sources.
- For 5339, if the planning activity is clearly tied to the capital project and the project is in the STIP, and if FTA awards pre-award authority, the costs after NEPA (e.g., Final Design, construction-related engineering or post-NEPA environmental mitigation activities) may be reimbursable.

## **FTA Section 20005(b) – Transit Oriented Development Pilot**

The FTA Transit Oriented Development (TOD) Planning Pilot Program is designed to be layered with the Capital Investment Grants program, though it can be used for projects without CIG funding. It provides funding for planning efforts associated with an eligible transit capital project.

- In Fiscal Year 2022, a TOD study grant was awarded to NCDOT for stations along the proposed S-Line project corridor.<sup>1</sup>
- In Fiscal Year 2024, the program funded multiple TOD planning efforts along BRT corridors.<sup>2</sup>
- Eligible activities include both comprehensive corridor planning and site-specific station area planning aimed at supporting equitable development and ridership growth.

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<sup>1</sup> <https://www.ncdot.gov/divisions/rail/s-line-projects/raleigh-richmond/Documents/r2r-s-line-project-january-2024.pdf>

<sup>2</sup> <https://www.transit.dot.gov/funding/grants/grant-programs/fiscal-year-2024-transit-oriented-development-tod-planning-projects>

## **Better Utilizing Investments to Leverage Development (BUILD)**

The BUILD grant program, previously known as TIGER and later RAISE, provides competitive federal funding for surface transportation infrastructure projects that demonstrate significant local or regional impacts. The program can be a strong fit for BRT projects, particularly those that span multiple jurisdictions, integrate roadway, transit, pedestrian, and safety improvements, or include capital elements that do not align well with existing FTA programs.

- The program layers effectively with CIG funding by helping fill funding gaps. BUILD can fund capital construction and capital-eligible costs, including:
  - BRT stations and platforms (level boarding, shelters, real-time info)
  - Dedicated or semi-exclusive bus lanes (where transit-only or transit-priority)
  - Transit centers and intermodal hubs supporting BRT
  - Signal priority and corridor ITS
  - Pedestrian, bicycle, and ADA improvements that support BRT access
  - Streetscape and safety improvements along the BRT corridor
  - Bus storage, layover, or support facilities tied to the BRT corridor
- BUILD cannot (or rarely) fund:
  - Operating costs
  - Vehicle purchases (funded through 5339)
  - Standalone Planning studies (unless applying under a planning-only category)
- BUILD grants require a 20% local match if in urban areas, but there is no local match requirement if in rural areas, Areas of Persistent Poverty, or Historically Disadvantaged Communities; however because it is highly competitive, projects typically provide 20-50% non-federal match.

## **FTA Section 5337 – State of Good Repair for Fixed Guideway**

FTA Section 5337, the State of Good Repair (SGR) Formula Program, provides funding for fixed guideway and high-intensity motorbus systems, including eligible BRT corridors, that have been in revenue service for at least seven full federal fiscal years. The program is primarily intended for preventive maintenance and rehabilitation to keep existing assets in a state of good repair, with funds most commonly supporting operating-related capital needs such as vehicle overhauls, stations, guideway elements, and support equipment.

## State Sources

### **North Carolina Strategic Transportation Investments**

The Strategic Transportation Investments (STI) program is North Carolina's primary state-funded capital source for Bus Rapid Transit (BRT) projects.

- Projects compete regionally and statewide.
- These funds are frequently used as local match for federal grants.

This program is used to develop the STIP, which has allocated significant funding to the Western and Southern BRT corridors (core and extensions).

### **Congestion Mitigation and Air Quality (CMAQ)**

The Congestion Mitigation and Air Quality (CMAQ) program supports BRT and other transit capital investments in areas designated as air quality nonattainment or maintenance areas. All of Wake, Johnston, and Durham counties are within a designated maintenance area. Many types of projects are eligible under the CMAQ program including electric vehicles and charging stations, diesel engine replacements and retrofits, transit improvements, bicycle and pedestrian facilities, shared micromobility projects and more. In addition to improving air quality and reducing congestion, CMAQ projects can improve safety, and promote application of new and emerging technologies.

- Funding is then subject to the same rules and requirements as FTA 5307 formula funds.
- Funds may be used for any transit capital expenditures otherwise eligible for FTA funding as long as they have an air quality benefit.
- CMAQ funds may be used to support the initial years of BRT operations in eligible air quality nonattainment or maintenance areas. This flexibility can help agencies launch new BRT service by covering operating costs during startup and ridership ramp-up periods.
- Funding requires long-term replacement with local revenue.

### **SMAP State Maintenance Assistance Program - Operating Assistance**

North Carolina's State Maintenance Assistance Program (SMAP) provides operating support for fixed-route transit services by helping cover the non-federal share of net operating costs. Funds are administered by NCDOT's Integrated Mobility Division (IMD) through the Unified Grant Application process and are generally allocated annually.

- This source is helpful but limited relative to BRT service costs and is best used as supplemental operating assistance.

## **NCDOT ConCPT Coordination Grant**

The ConCPT Coordination Grant is intended to enhance coordination between two or more transit systems. Administered by NCDOT IMD, operating funding is provided for transit services where three or more public transportation grantees agree to establish formal relationships to maximize resources, gain efficiencies, and improve access to public transportation. In some cases, ConCPT projects involving two agencies instead of three or more may be approved. ConCPT funding is limited to a maximum of \$200,000 per year for each grantee involved in the coordination project.

- ConCPT could potentially offset operating costs of the Western and Southern BRT Extensions.

## **Local Sources**

The Wake Transit Plan, which is funded through a combination of some of the local sources listed below, has allocated \$31.593 million to the Western and Southern BRT Extensions.

### **Local Transit Sales Tax (NCGS Chapter 105, Article 43)**

The local transit half-cent sales tax authorized under North Carolina General Statutes (NCGS) Chapter 105, Article 43 is available only in Wake, Durham, Orange, and Mecklenburg Counties, unless expanded by future legislation.

- Most reliable and scalable operating funding source
- Dedicated to transit operations and service expansion
- Essential for frequent, all-day BRT service

### **Local County Sales Tax (NCGS Chapter 105, Article 46)**

The quarter-cent county sales tax authorized under NCGS Chapter 105, Article 46 is not dedicated to transit and requires a voter referendum.

## **State Funds allocated by MPOs**

- CAMPO Locally Administered Projects Program (LAPP)
  - Includes Surface Transportation Block Grant – Direct Attributable (STBG-DA), Transportation Alternatives Program – Direct Attributable (TAP-DA), and Congestion Mitigation for Air Quality (CMAQ) funds

- Must be used to fund NEPA/PE, Transit Capital, Right of Way Acquisition and/or Construction of a project
- TWTPO Regional Flexible Funding
  - Includes Surface Transportation Block Grant – Direct Attributable (STBG-DA), Transportation Alternatives Program – Direct Attributable (TAP-DA), Congestion Mitigation and Air Quality Direct Attributable (CMAQ-DA), and Bonus Allocation (BA)
  - Must be applied to one of the following phases: NEPA/Design, Land or Right-of-Way Acquisition, Construction (including environmental mitigation and utility relocation), Transit Capital, Travel Demand Management (TDM) Projects, Utilities, or Construction Engineering & Inspection (CEI)
  - Applicable only for the limited portion of the project occurring within Durham County at RTP

## Wake Transit Plan Vehicle Taxes

The two vehicle taxes available for funding transit are already assumed by the Wake Transit Plan. The vehicle registration tax for Wake Transit includes a \$7 Wake County Vehicle Registration Tax and \$3 of the regional Vehicle Registration Tax, and the vehicle rental tax for Wake Transit is a dedicated portion of the regional 5% Vehicle Rental Tax for Wake County. The vehicle rental tax revenue assumed in the Wake Transit Financial Model is currently under discussion for removal from the Financial Model.

## INNOVATIVE FUNDING SOURCES

In addition to traditional federal, state, and local funding sources, transit agencies can pursue several innovative financing strategies to bridge capital funding gaps and strengthen the long-term financial sustainability of BRT projects. These strategies include capital leasing arrangements, joint development initiatives, real property exchanges, and in-kind contributions.

**Figure 28 Potential Innovative Funding Sources**

Financing Strategy	Description	Typical BRT Applications	Key Benefits
<b>Capital Leasing Arrangements</b>	Allows transit agencies to lease facilities, vehicles, or equipment rather than purchase them outright, reducing upfront capital costs and spreading payments over time.	Maintenance facilities, park-and-ride structures, support infrastructure, vehicles or equipment	Improves cash flow; reduces upfront capital expenditures; accelerates project delivery; aligns payments with available revenue streams; preserves financial flexibility

Financing Strategy	Description	Typical BRT Applications	Key Benefits
<b>Joint Development</b>	Transit agencies partner with private developers to leverage surplus or station-adjacent property for transit-supportive development (TOD), generating revenue and advancing community goals.	Mixed-use TOD at BRT stations, multimodal hubs	Generates long-term revenue; increases ridership; supports housing and economic development; enhances station area vibrancy
<b>Real Property Exchanges &amp; In-Kind Contributions (Private Sector)</b>	Private entities donate land or property interests to support BRT implementation, often to improve access, proximity to service, or development potential.	Station sites, access improvements, maintenance facilities	Reduces capital costs; helps close funding gaps; may count as eligible local match for federal programs (subject to valuation rules)
<b>Real Property Exchanges &amp; In-Kind Contributions (Public Sector)</b>	Public land or right-of-way is made available through intergovernmental agreements, easements, or long-term use agreements rather than direct land transfer.	Use of municipal or state-owned ROW for BRT guideways and stations	Minimizes land acquisition costs; facilitates interagency coordination; accelerates project delivery
<b>Transportation Infrastructure Finance and Innovation Act (TIFIA) Loans</b>	TIFIA is a federal initiative designed to support major transportation projects by offering low-interest loans, loan guarantees, and lines of credit, TIFIA loans can finance up to 49% of eligible project costs and have a maximum term of 35 years with no pre-payment penalties. The interest rates are fixed and equivalent to Treasury rates, which are often lower than those found in the private market.	BRT corridor construction, station construction, bicycle and pedestrian infrastructure	Considered local match to federal grants, can fill funding gaps; however, the loan must be repaid within the repayment period with non-federal funds
<b>Community Project Funding (Congressionally Directed Spending)</b>	Discretionary federal funding directed by members of Congress to specific local projects through the annual appropriations process. Funds are typically administered through USDOT or FTA programs.	BRT corridor construction, station improvements, fleet electrification, safety and accessibility upgrades	Can supplement or fill gaps in traditional grant programs; flexible use for project phases or elements

# EXAMPLE BRT FUNDING SOURCE DISTRIBUTION

The American Public Transportation Association (APTA) conducted interviews with small or midsized agencies on the funding composition of BRT projects as part of the August 2025 report *Bus Rapid Transit Program Development and Financing*. Figure 29 highlights recent examples that show a distribution of BRT funding sources.

**Figure 29 APTA BRT Program Development and Financing Examples**

Agency	BRT Project	Federal Share	Other Funding Sources
Chapel Hill Transit (Chapel Hill, NC)	North-South BRT	80%	Local sales tax; MPO and state funds
Transfort (Fort Collins, CO)	MAX BRT Elizabeth Corridor	67%	RAISE Grant, Low or No Emissions Grant; Parks & Rec, Transit & Climate 2050 Tax; multimodal options funding; CDOT FASTER Funds; Colorado State University Partner Funding; Xcel EV Infrastructure Funding
MCDOT (Montgomery County, MD)	Flash BRT Viers Mill Road Corridor	60%	Low or No Emissions Grant; State BRT Fund; state aid; GO Bonds; local mass transit fund
GoRaleigh (Raleigh, NC)	New Bern Corridor	50%	Local county sales tax

All listed projects utilized Small Starts CIG grants, which the Western and Southern BRT Extensions are not expected to be competitive for and thus would likely rely more heavily on state and local sources.

## ADDITIONAL FUNDING CONSIDERATIONS

As the funding framework advances, several jurisdiction-specific considerations and implementation steps will need to be addressed to support successful project delivery. One such consideration involves where proposed BRT service extends into jurisdictions that do not currently participate in the dedicated Wake County transit tax, such as municipalities in Johnston County. In these cases, formal funding agreements, such as memoranda of understanding (MOUs) or memoranda of agreement (MOAs), will be required to clearly define commitments related to planning, capital investment, and ongoing operating costs. These agreements would establish how costs are shared among participating entities and ensure long-term financial support for service provided outside the existing transit tax base.

In addition, the applicability of funding sources will vary depending on whether project elements are located in urban versus rural areas, requiring careful alignment with eligibility requirements for funding programs. As project development continues, a more detailed funding plan should be prepared once funding gaps identified through this plan are better understood, including strategies to address those gaps.

Further coordination will also be necessary to define cost-sharing arrangements among Johnston County, the Town of Clayton, CAMPO, and the project sponsor (GoRaleigh), as well as reach agreement on the lead entity for future grant applications. Establishing a clear lead for grant development and submission will help ensure consistency, strengthen competitiveness for discretionary funding, and streamline coordination among partner agencies.

Successful funding will depend on aligning project development with the most appropriate funding sources, particularly for competitive federal and state programs. Clearly defining project scope, costs, phasing, and funding needs, and advancing project readiness activities such as environmental clearance, design, local match commitments, and governance agreements, will position projects to compete effectively for available funding. As funding opportunities arise, a strategic approach that matches each BRT project to the grants and programs best suited to its characteristics will be essential to supporting timely delivery and long-term operational sustainability.

# 6 IMPLEMENTATION

As project sponsor, GoRaleigh will continue to develop, design, and engineer the Wake BRT Extensions, building upon the results of this Concept of Operations Study. The following chapter details guidance on the implementation schedule and coordination with local partners.

## IMPLEMENTATION SCHEDULE

The Southern and Western BRT Extensions are both envisioned to open for service in 2032. The key steps of completing the MIS, preparing the Concept of Operations Study, and recommending a preferred alternative have been completed. The immediate next step following this study is to begin the Wake Transit Concurrence Process, as well as bring the Locally Preferred Alternative (LPA) to be adopted by necessary governing bodies. To achieve an opening year of 2032, several additional milestones should be completed in the timeframes identified in Figure 30. Once design is underway, these milestones should be verified, and the schedule should be updated. This schedule assumes the BRT extensions will not be funded through the FTA CIG process, which would require additional steps not included in this schedule. Because the corridors cross multiple jurisdictions and include state facilities, close interagency coordination will be required throughout design, NEPA, and construction, which may influence milestone durations and the anticipated opening year.

**Figure 30 Southern and Western BRT Extensions Implementation Schedule**

Milestone	Timeframe
MIS Completed	Spring 2023
Concept of Operations Study Completed	Summer 2026
Locally Preferred Alternative (LPA) Selected	Summer 2026
Design and NEPA	2027 – 2029
Right-of-Way Acquisition	2029 – 2030
Construction	2030 – 2032
Revenue Service	2032

## Design and NEPA

Design is anticipated to begin in 2027 and during the design process, the locations of queue jumps, TSP, any BOSS segments, and stations will be refined and confirmed based on additional information from traffic analysis, available right-of-way, and site conditions. The design process will follow the typical 30%, 60%, 90%, and 100% milestones. Close

coordination including multidisciplinary design reviews with the municipalities, counties, and NCDOT will be needed. It is also critical to identify third-party agreements that will be necessary for the construction and operation of the BRT extensions.

The National Environmental Policy Act (NEPA) is the primary law governing the environmental review process for all federal agencies. NEPA requires a process to consider reasonably foreseeable environmental, social, and economic impacts before carrying out a major project. Environmental review, documentation, and public involvement requirements for complying with NEPA vary depending on the type of project and the significance of the project's potential impacts. The NEPA process will be closely coordinated throughout the design process.

## Right-of-Way Acquisition

The Southern and Western BRT Extensions have been planned to minimize the need for additional right-of-way acquisition. However, there may be locations where additional right-of-way is required to accommodate stations or transit priority treatments. Temporary construction easements may be needed when additional area is temporarily needed for accessing a site or the staging or storing of equipment during construction. Once design has reached the 60% milestone, permanent right-of-way acquisitions and temporary easements can be identified. Right-of-way acquisition must be completed prior to starting construction.

## Construction

Currently no design has been completed so the construction schedule is unknown. However, based on previous experience on similar scale projects, construction for both extensions is anticipated to take approximately two years, occurring simultaneously. Once design begins and the extent of the construction is better determined this schedule should be verified and updated. The project sponsor may split the corridors into separate construction packages or create construction packages by discipline (e.g. roadways, stations) to expedite construction. During the construction period, the operator will need to initiate vehicle procurement given the long lead times typical for buses. In this project phase, Intelligent Transportation Systems (ITS) including TSP and communications systems will need to be integrated, tested, and accepted.

## Revenue Service

Prior to opening the BRT extensions for revenue service, the operating agency will need to test the new vehicles, systems equipment, and stations as well as train bus operators. If the agency contracts with a private operator for their service, they will need to update their contract to include BRT Extension operations. The operator will also need to prepare a public

education campaign, publish route schedules and provide updated information for the new BRT service.

## COORDINATION AND LOCAL INVESTMENTS

While GoRaleigh is the project sponsor and will design and build the BRT Extensions, continued coordination with local partners and NCDOT will be needed to ensure the success of this project.

### Improving Access to Transit

While some funding for pedestrian improvements has been included as a part of the BRT Extension station costs, further improvements to the pedestrian and biking environment are needed beyond the immediate station area to ensure that riders can safely get to and from BRT stations on both sides of the street. As the Towns of Garner, Clayton, Cary, and Morrisville and RTP plan for future transportation investments, connections to BRT stations should be prioritized.

Local transit services, such as the Morrisville Smart Shuttle, RTP Connect, GoRaleigh Route 20 in Garner, and all GoCary routes should be well coordinated with the proposed BRT service and stations. Additionally, new local transit services should be explored to expand the reach of the BRT service in the following locations:

- Downtown Clayton, to connect to the Clayton Blvd at Robertson St and/or Clayton Blvd at Main St stations
- White Oak Crossing, to connect the vast shopping area to the White Oak Crossing station
- Perimeter Park, to connect the job sites to the future infill Perimeter Park station

### Tracking Future Projects and Developments

Wake County and Clayton are growing, with many new developments under construction or planned. Transit Oriented Development (TOD) planning for each of the partner municipalities should continue to take the planned BRT stations into consideration, as there may be opportunities to work with developers to site and build the BRT stations in a way that is integrated with the new developments.

NCDOT also has plans for roadway expansion throughout the service area, including on US 70, US 401, and NC 54. The planning for these projects should keep the BRT service in mind,

finding opportunities to add transit priority and pedestrian improvements alongside the roadway expansion.