

Wake BRT: Rapid Bus Extension Study

Durham-Chapel Hill-Carrboro (DCHC)

March 8, 2023



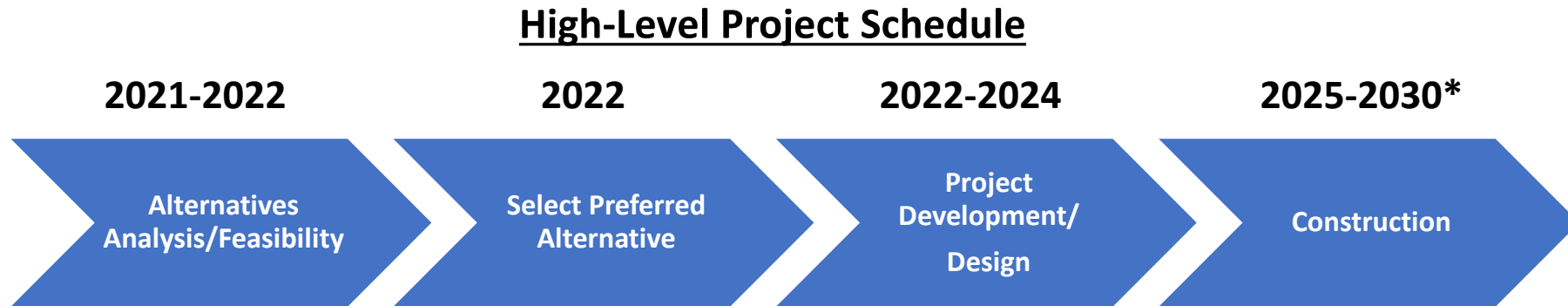
GO FORWARD
A COMMUNITY INVESTMENT IN TRANSIT

Agenda

- Project Overview
- Community Engagement Summary
- Alternatives Development and Evaluation Framework
- Recommendations
- Next Steps

Wake BRT Program

- **\$115M in State Funding for Supporting Infrastructure/Vehicles for Entire Corridor**
- **Funding Currently Programmed in FYs 25-31 (in TIP)**
- **Must Integrate with Other BRT Corridors Under Development**

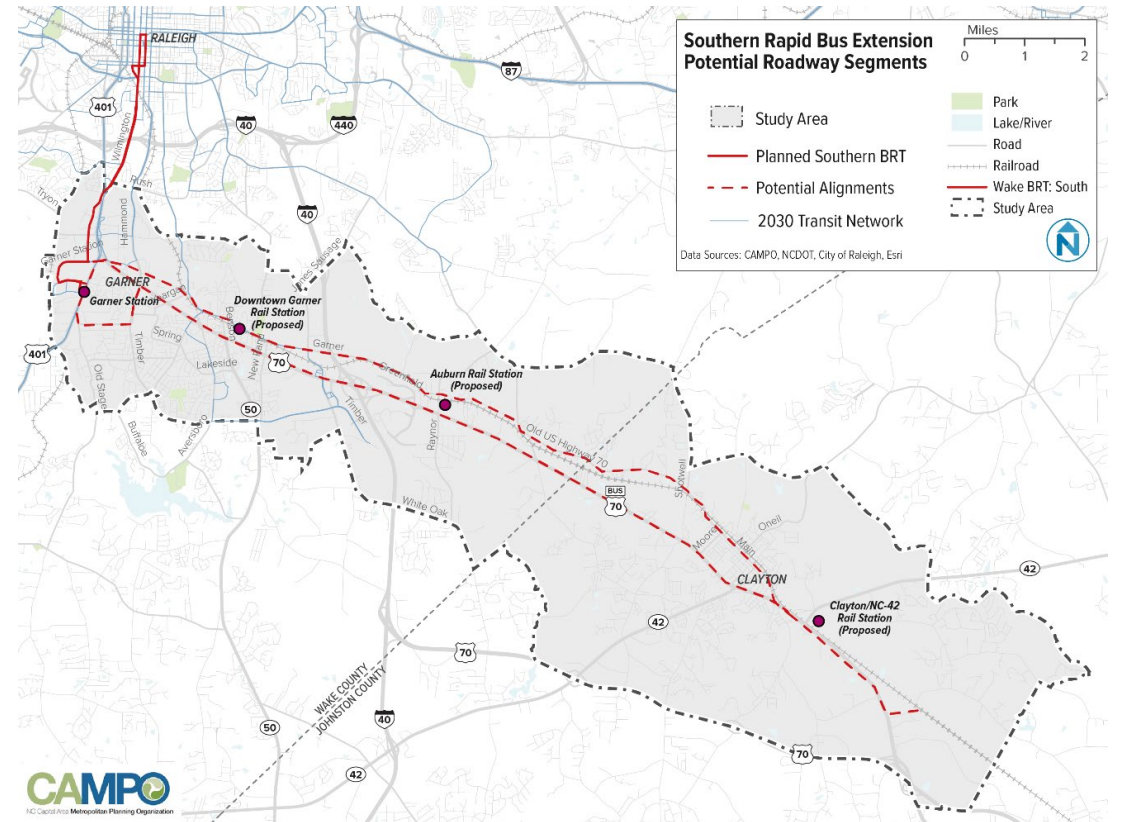
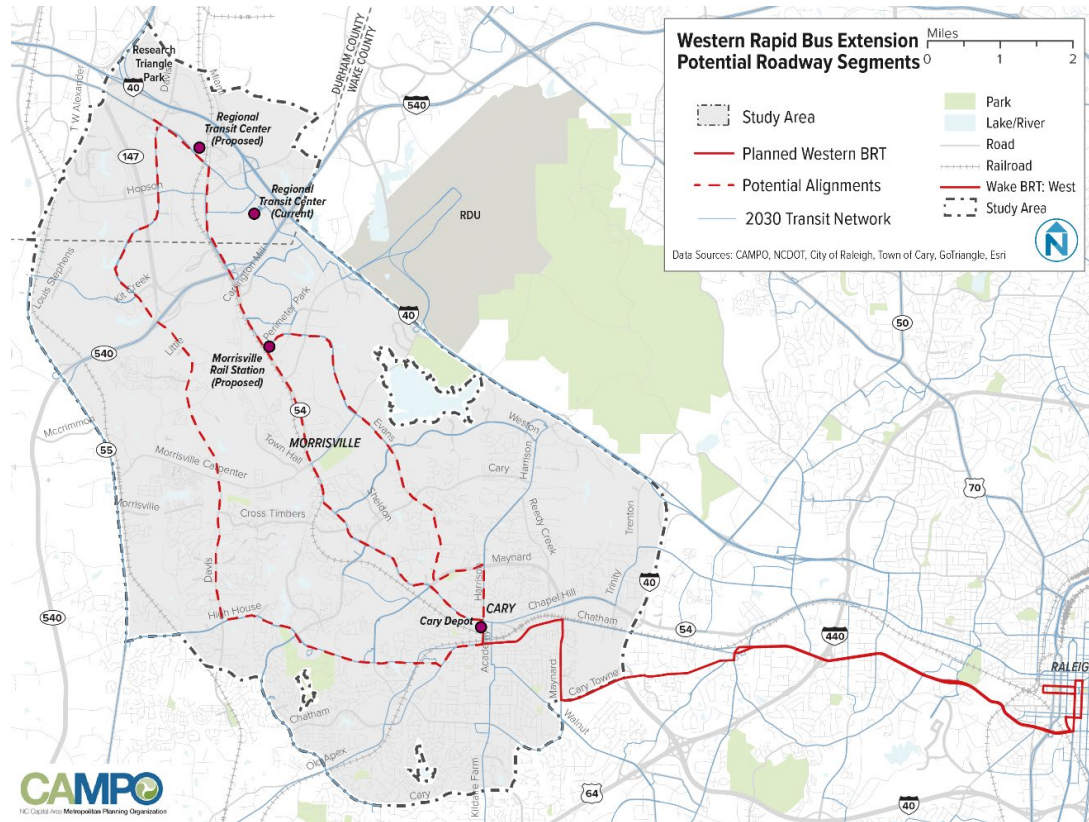


*BRT Extension projects cannot be constructed before Raleigh – Garner and Raleigh-Cary segments; and State funding must be available

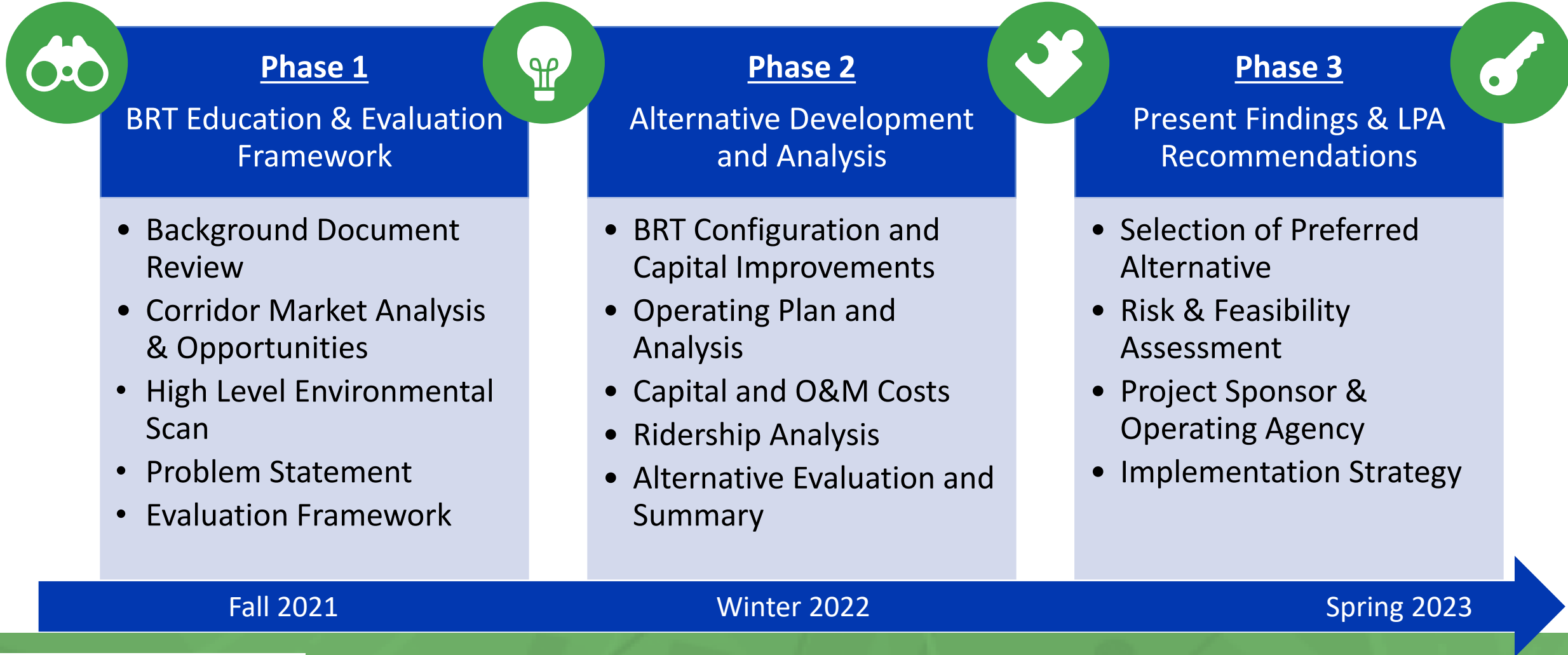
Rapid Bus Extension Study Areas

Western Extension

Southern Extension

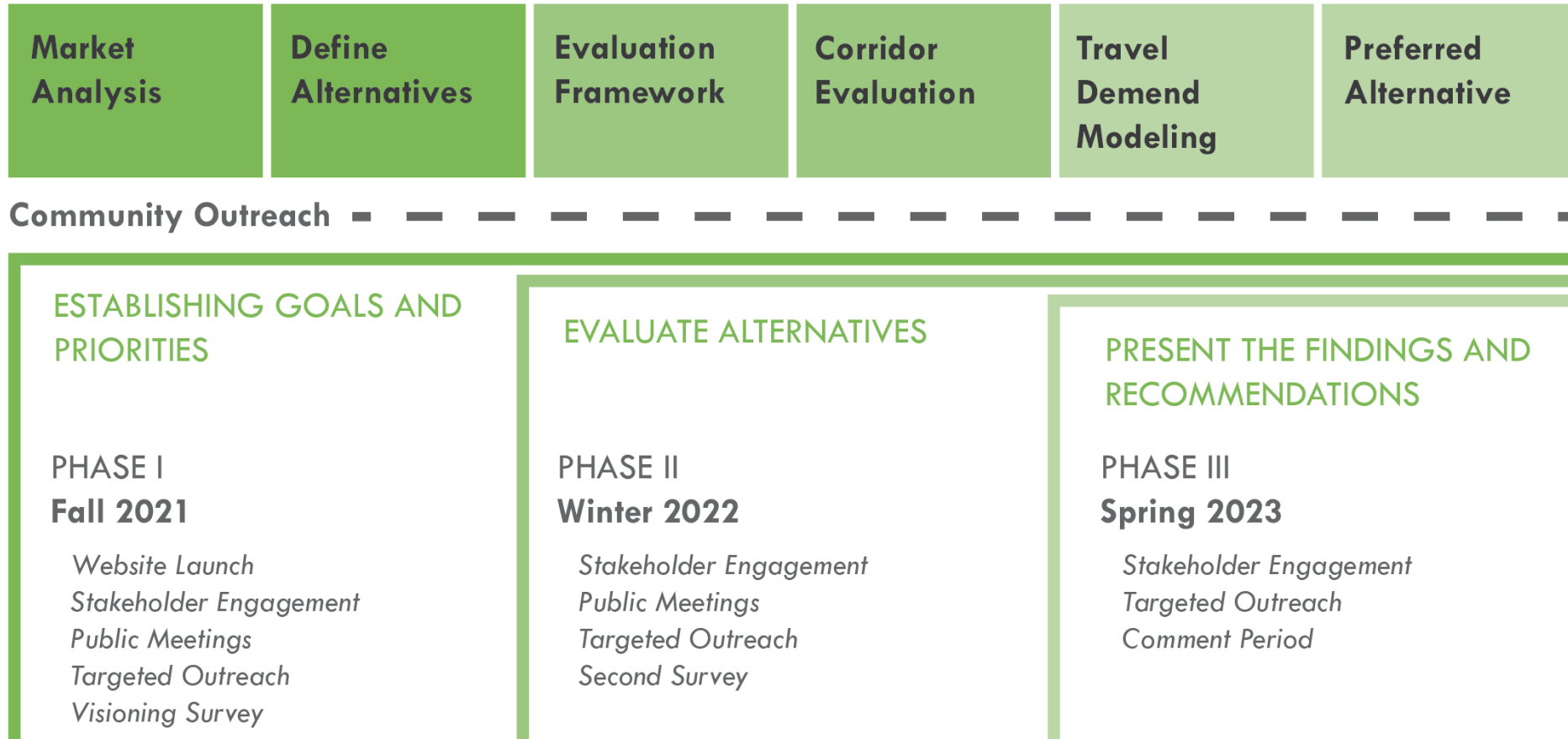


Alternatives Analysis Milestones



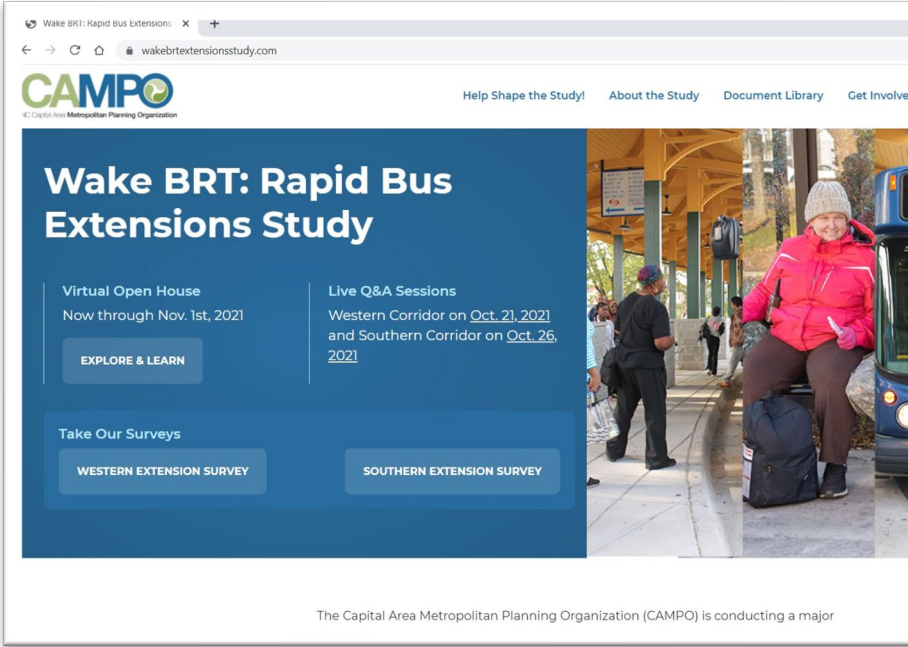
02 | Community Engagement Summary

Public and Stakeholder Engagement Schedule



Phase I Engagement

Wake BRT: Southern Corridor Rapid Bus Extension



Introduce the Wake BRT:
Rapid Bus Extension
Study

Educate the public about
rapid bus and BRT

Educate the public about
the study purpose and
importance for the
region

Seek input on the vision
for the corridor and
regional and community
transportation goals and
needs



Phase 1 Community Survey Results – Western

159 Survey Responses

Goal: Provide access to local and regional destinations and major activity centers.

- Connect to daily activities (grocery, retail, healthcare, and education facilities)
- Connect to transfer opportunities between different travel modes (other bus routes, trains, airplanes, etc.)
- Support economic development through connectivity with planned land-uses and transit-oriented development

Goal: Improve access to transit services.

- Locate stations and stops in areas to reach a wide range of potential transit users

Goal: Ensure safety and compatibility with the surrounding environment.

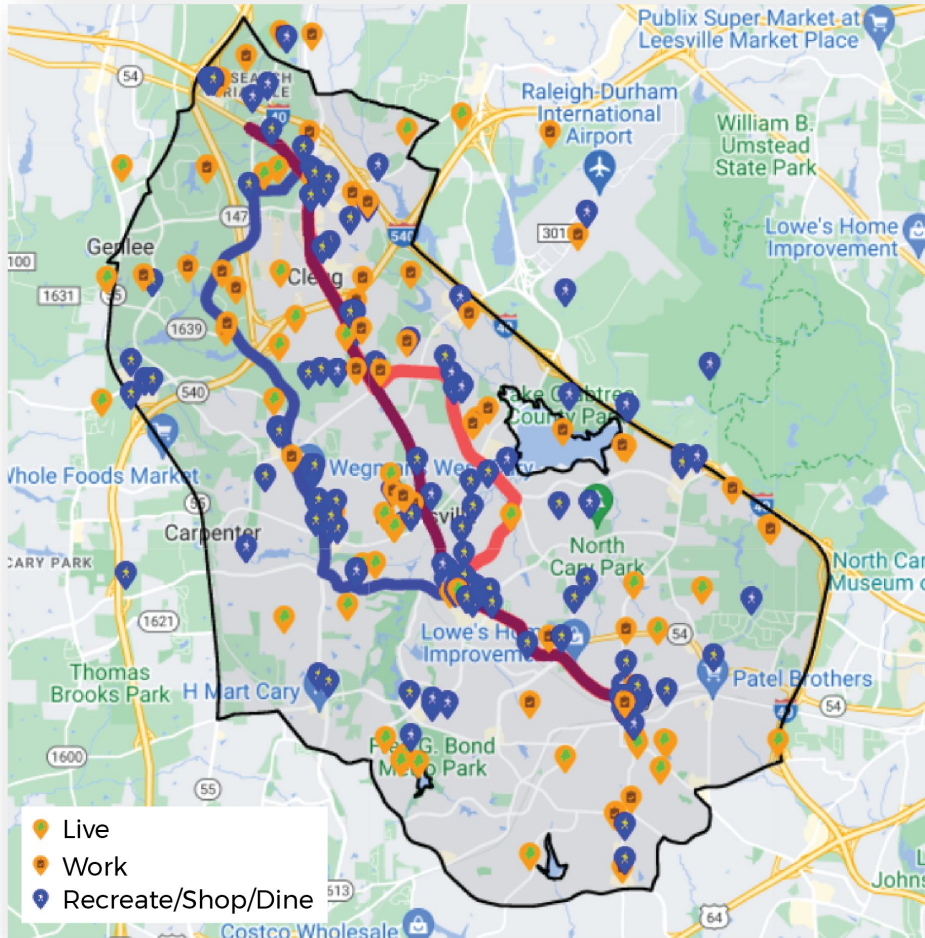
- Transit-specific infrastructure to improve service speed and reliability

Goal: Develop an efficient and sustainable service.

- Provide a reliable, convenient and competitive alternative to driving
- Provide rapid bus solutions that are scalable/can grow with future needs

94 Survey Responses

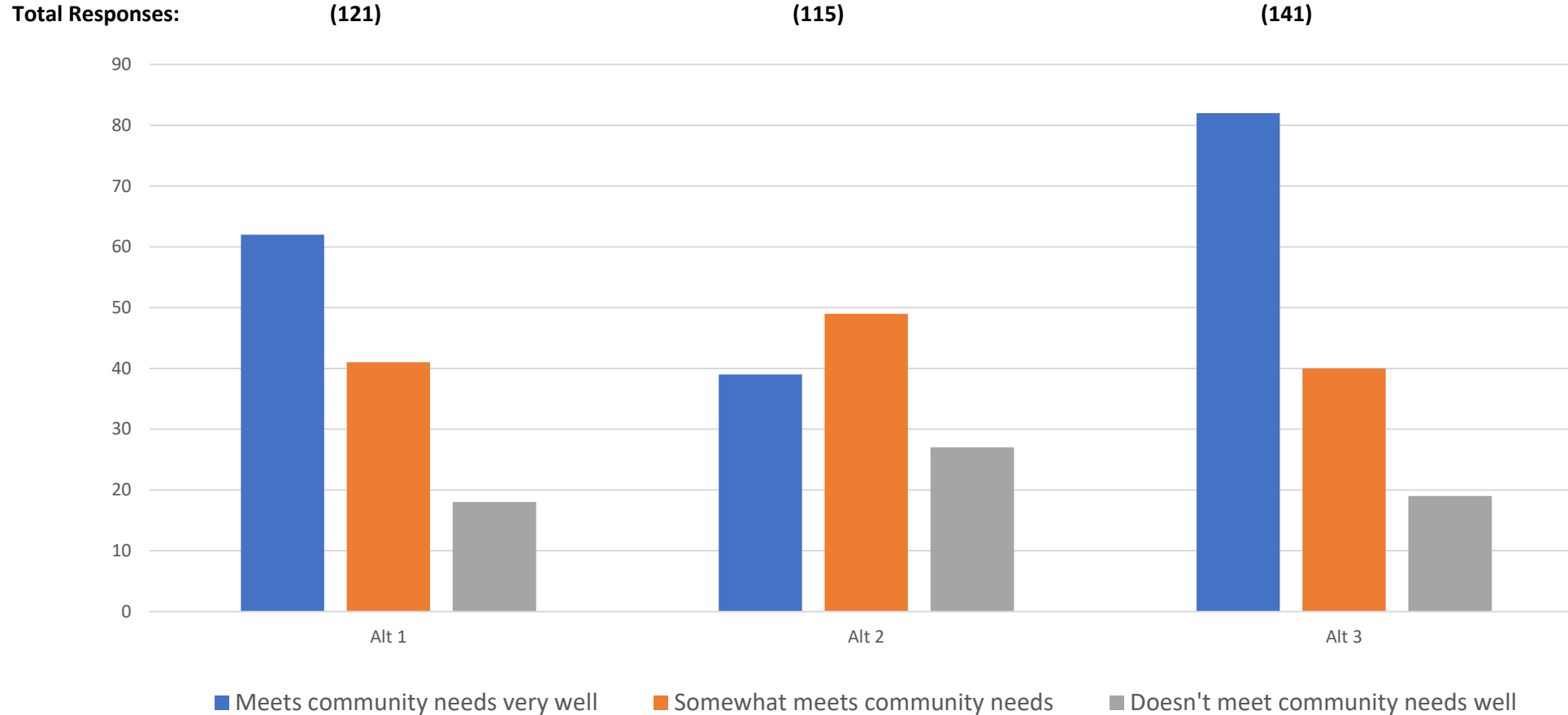
Online Survey Results – Western



Western Corridor Results – Online Survey	Alt 1	Alt 2	Alt 3
Meets community needs very well	43	17	40
Somewhat meets community needs	29	39	27
Doesn't meet community needs well	7	22	13
Total Responses	79	78	80

Qualitative feedback will be considered in the technically **Recommended Alternative**, and (future) selection of station locations

Western Corridor Results – All Responses (online + pop-up)



We Also Heard:

Safety (especially for pedestrians) needs to be strongly considered

How will potential Rapid Bus and CRT service work together?

Rd 3 Comments Received

- 8 Public comments about Western Ext
 - alignment preferences, connectivity interests and opportunities
- 2 Public comments about Southern Ext
 - both supportive of recommendations
- 3 General comments
 - Zero emission vehicles, implementation timeline, network investment and frequency improvements
- NC Dept of Natural and Cultural Resources -- State Historic Preservation Office (SHPO)
 - Section 106 – National Historic Preservation Act
 - Section 4(f) – National Transportation Act
- Town of Morrisville
 - Supportive of Western Alt 2 recommendation
 - City's continued investment in TOD plans and land uses



03 | Alternative Development and Evaluation Framework

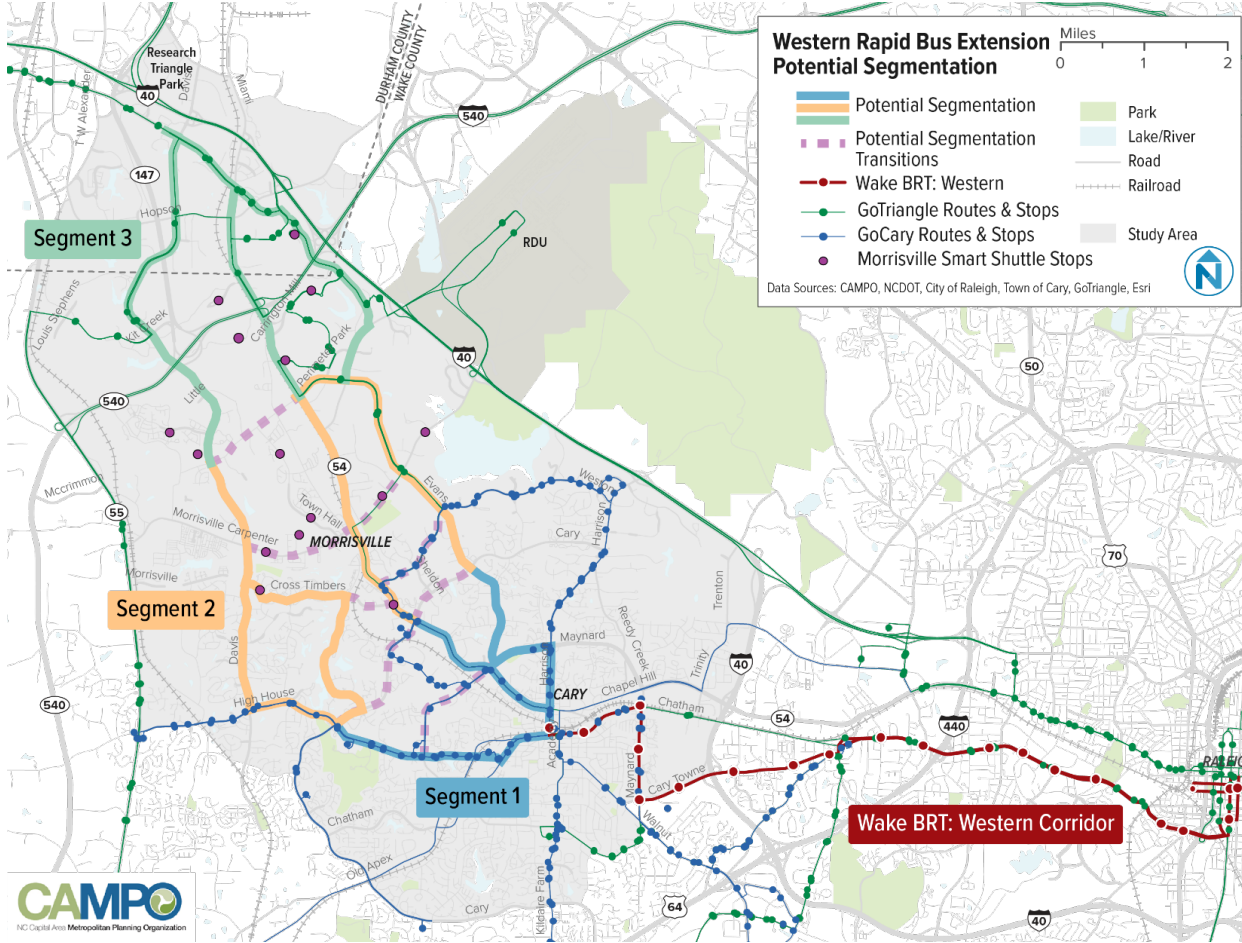
STEP 1: Identification & Initial Screening

- **Corridor Segmentation** – routing and alignment options throughout the corridor, and potential travel markets might they serve
- **Context and Fatal Flaws** – determine the critical factors, considerations, and components for transit supportive conditions
- **Initial Screening** – qualitative assessment of potential roadway segments to guide development of potential Alternatives
- **Draft Alignments** - combinations of roadway segments that best support rapid bud operation from terminus-to-terminus

Define Draft Alternatives

Approximate Segment Limits

	From	To
Segment 1	Cary Depot	Cary Pkwy
Segment 2	Cary Pkwy	McCrimmon Pkwy
Segment 3	McCrimmon Pkwy	(future) RTC site
Transitions	Varies (TBD)	Varies (TBD)



NOTE: I-40 Corridor does not address transit access and activity center connectivity needs within the corridor



04 | Western Corridor: Draft End-to-End Alignments

	Description	Rating
Alignment 1	Chapel Hill Rd >> NC 54	21
Alignment 1B	Chapel Hill >> Evans / McCrimmon >> NC54	18
Alignment 2	Chatham / High House >> Davis	17
Alignment 3	Chatham / High House >> Davis >> NC 54	19
Alignment 4	Chapel Hill >> Morrisville Pkwy >> Davis	16

- Tradeoffs between direct service to commercial/employment centers or residents in Southern segment
- Qualitative assessment did not include detailed operational constraints (traffic and transit; NC RR)
- Alignment 1B includes ‘hybrid’ roadway combination to take advantage of land uses and NCRR offset
- Alignments along High House were determined ‘too indirect’ and not carried forward

Step 2 Objectives and Criteria

STEP 1: INITIAL SCREENING

GOAL: Access to local or regional destinations and major activity centers

Station Area Connections
How do station areas connect and daily activities centers located?
What destinations (roadway, transit, etc.) are included in local and county plans?

GOAL: Access to transit services

Fixed Route and Regional Services
How do fixed route services connect existing local and regional transit services?
Regional Travel Patterns
How do people travel now and in the future?

GOAL: Productive and sustainable service

Direct Services
How can rapid bus connect popular destinations?

GOAL: Safety and compatibility with the surrounding environment

Critical Infrastructure
What is the current state of roadways and how do they currently perform?
Transit Support
How do roadways support transit?
Station Area and Pedestrian Environment
How walkable is the study area now and what improvements are planned?
Congestion
What will traffic be like in 2045 and can current roadways support it?

STEP 2: DETAILED EVALUATION

- Station area connections to daily needs (supermarkets, hospitals, schools, retail, etc.)
- Future station area employment density and total jobs

GOAL: Access to local or regional destinations and major activity centers

- Station area population served
- Equitable station area access (low-income and carless households, affordable housing, etc.)
- Local and regional transit connectivity
- Non-motorized connections (existing/future bikeways and trails)
- Future commuter rail connections

GOAL: Access to transit services

- Construction costs (includes purchase of land and vehicles, other capital costs)
- Ongoing costs (includes cost of operation, salaries, repairs, insurance, etc.)
- Potential future ridership (all riders and transit-reliant riders)
- Rapid bus versus automobile travel times

GOAL: Productive and sustainable service

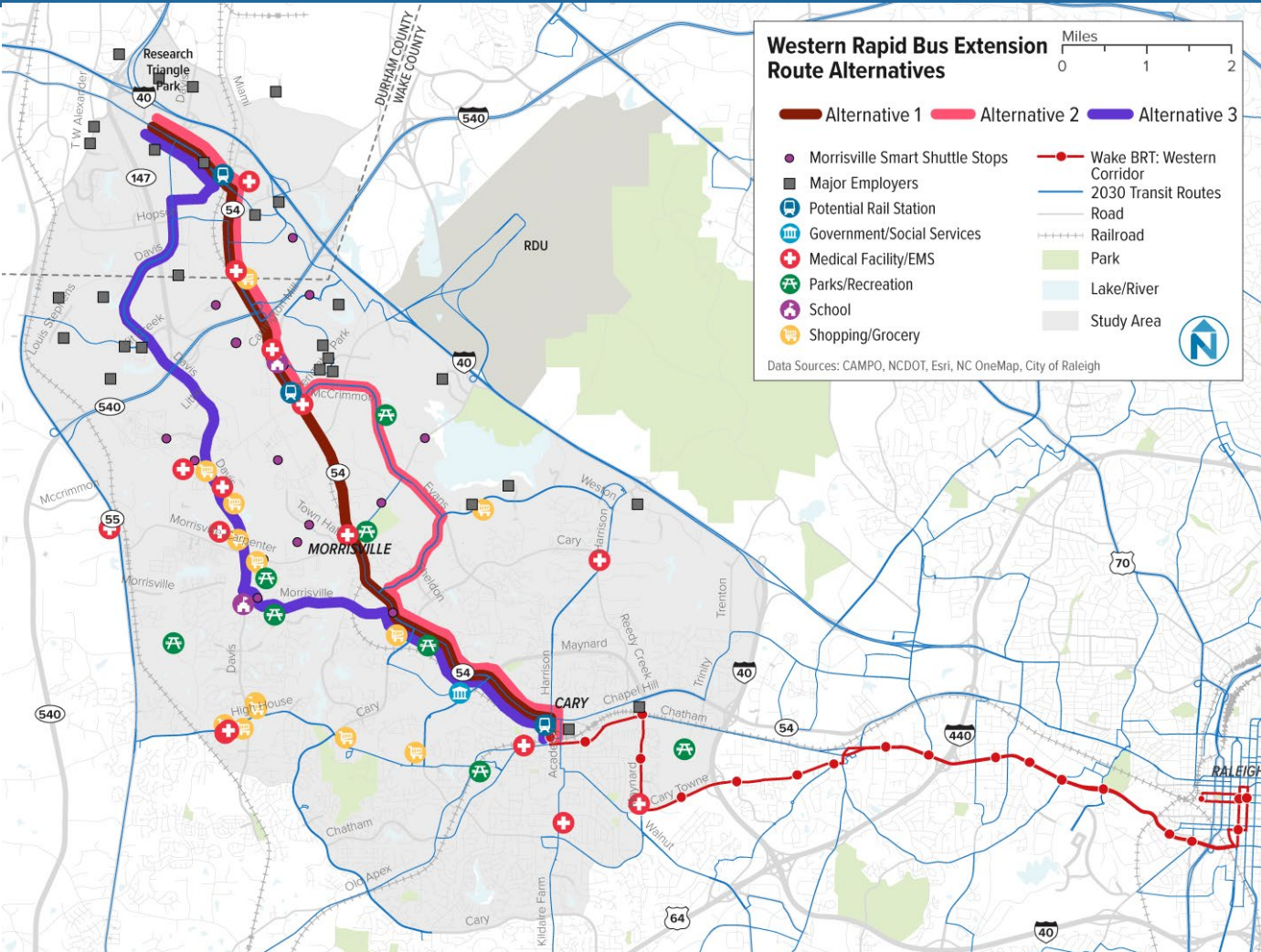
- Planned roadway improvements
- Roadways compatible with transit investments (speed & reliability treatments)
- Station area pedestrian safety (availability of existing/planned pedestrian safety and connections)

GOAL: Safety and compatibility with the surrounding environment

Alternative Refinement & Evaluation

- Develop detailed capital investment and operating assumptions to analyze potential benefits and tradeoffs

Western Extension Alternatives



Screening results from step one of the evaluation process identified three (3) alternatives that could support rapid bus service from Cary to RTP.

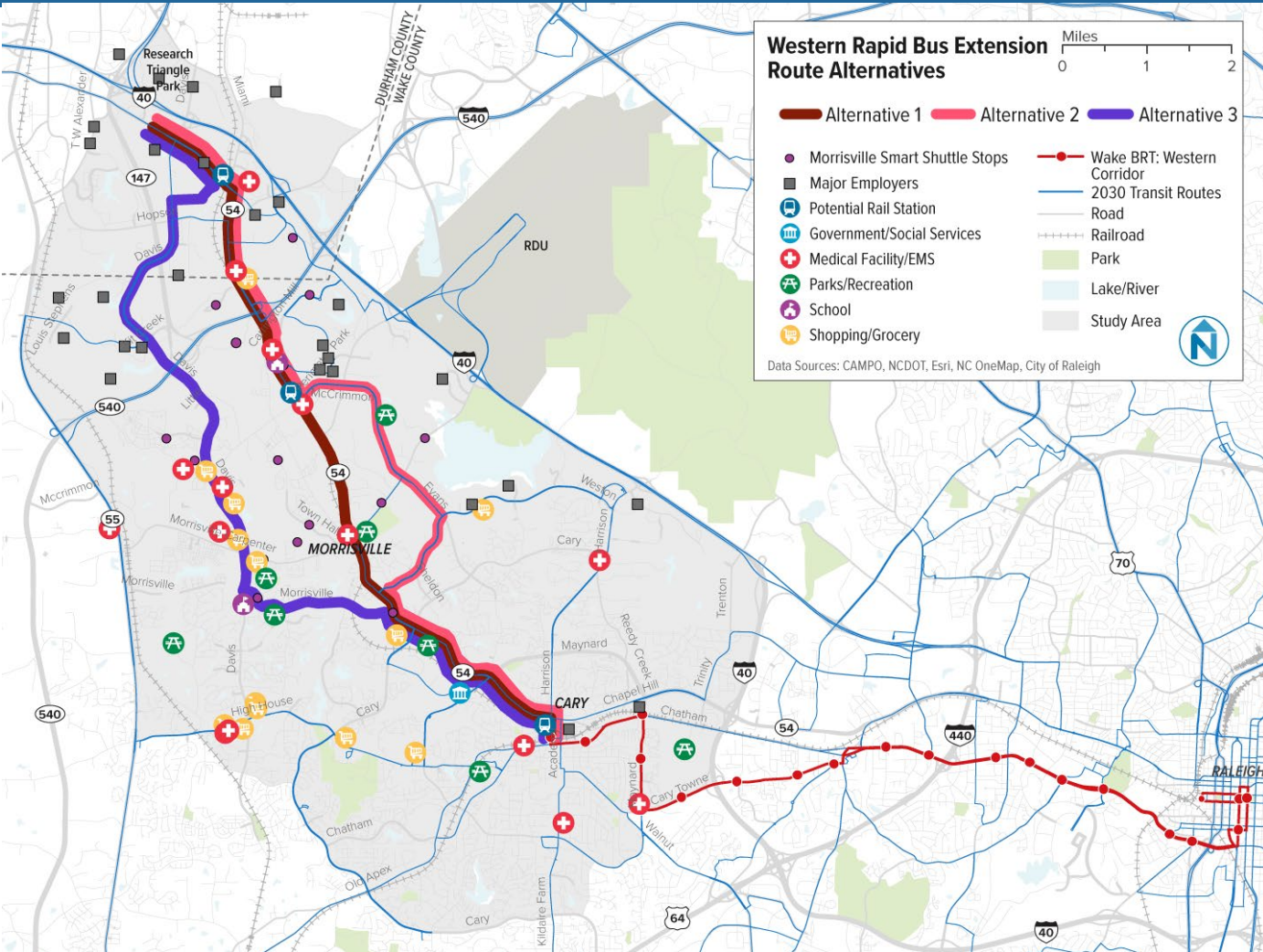
Alternative 1: Chapel Hill Road Route (NC 54)

Alternative 2: NC-54/Chapel Hill Road & Evans Road

Alternative 3: Davis Drive, Morrisville Pkwy & Chapel Hill Road

Each alternative supports connection to the (future) Hub at RTP but has unique strengths and challenges. Public input was collected to inform selection of a preferred alternative.

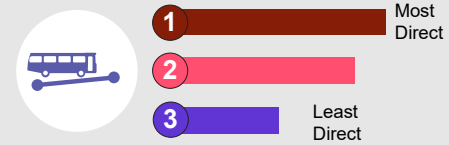
Western Extension Alternatives



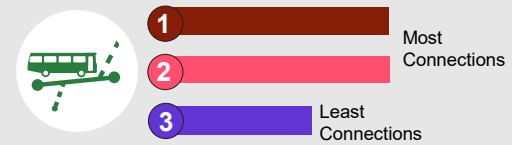
Screening results from step one of the evaluation process identified three (3) alternatives that could support rapid bus service from Cary to RTP. Each alternative also supports connection to the (future) Hub at RTP but has unique strengths and challenges.

Public input will help identify a preferred alternative.

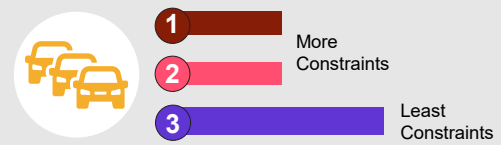
Direct Service



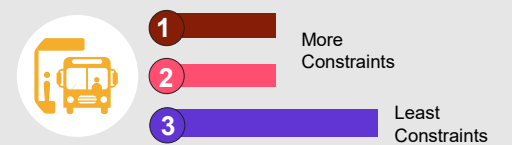
Transit Connections



Transit Priority and Traffic Operations



Capital infrastructure Needs/Costs



04 | Recommendations

Comparison of Alternatives - Western

Alt	Description	Weekday Ridership	Capital Cost	Annual O&M Cost	Pk Run Time	Annualized Cap Cost per Rider	Annualized Boarding/RH
1	Chapel Hill Rd / NC 54	1,050	\$26.1	\$1.8 to \$2.4 M	28:20	\$53	10 to 16
2	Evans / McCrimmon to NC 54	750	\$29.2	\$1.8 to \$2.4 M	30:35	\$60	
3	Davis Dr	600	\$27.6	\$1.8 to \$2.4 M	33:40	\$56	
--	1-Seat Ride (RTP to Raleigh)	2,200	\$36 M to \$43 M	\$3.6 M to \$4.8 M	(+) 26:20	\$19 to \$20	16 to 17

[†] includes 30% allocated + 20% unallocated contingencies

^{††} Variations in 1-seat ride run time may require additional resources to maintain frequency, resulting in increased O&M cost



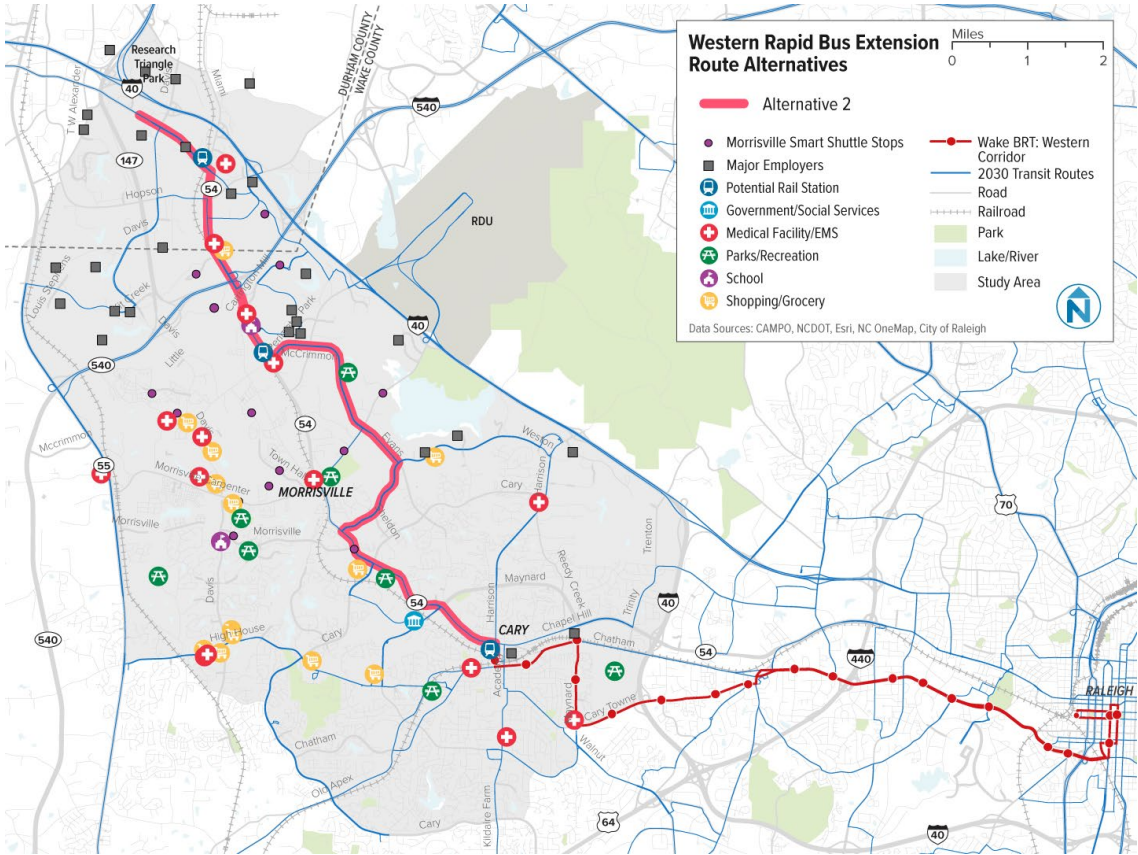
Recommended Locally Preferred Alternative (LPA)

Recommended Mode: Zero-emission buses, with speed and reliability investments (TSP and queue jump lanes) were feasible.

Recommended Alignment: **Alternative 2 (NC 54 and Evans Rd)** has better redevelopment opportunity and potential for transit speed and reliability treatments. It also avoids constrained segments of NCRR right of way.

Opening year: beyond 2035

LPA may be amended following future studies



05 | Recap and Next Steps

Path to Project Development

- Update Wake BRT standards
- Rapid Bus Ext: Concept of Operations (Con-Ops) and analyses
- Update demand-modeling forecasts
- Project Sponsorship determination
- Local funding and FTA competitiveness and/or application

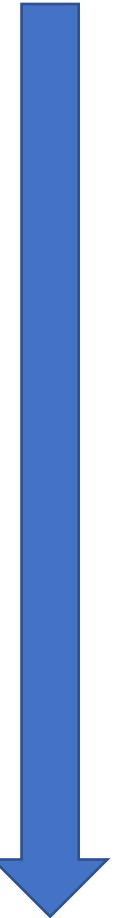
2023 - 24

2024 - 25

2025 - 26

2025 - 26

2026 - 27



Further Study and Analyses

Operational Questions

- Should Express Bus extensions operate at the same (or lower) frequency as Core BRT?
- Can Express Bus segment operate at different frequency than BRT if they are using the same/interlined fleet?
- Will Rapid Bus operate as an overlay to BRT (Cary to Raleigh)?
 - If yes, is Rapid Bus serving all stops vs skip-stop?

Zero Emissions Vehicles

- Compatibility with Western BRT (Cary to Raleigh)
 - 40' standard or 60' articulated
 - Equipped for left-door boarding at center-running BRT stations
- Supporting facilities

Additional Considerations and Inputs

Future Iterations

- Wake Bus Plan updates
- MTP updates
- Land Use and Travel Demand Modeling
 - Effects of Commuter rail
 - Changes to regional travel patterns
 - Continued land use changes
- Operation of critical first-last mile mobility services (circulators, microtransit, shuttles, etc.)

Project Funding and Sponsorship

- Incorporation into MTP
- Unfunded in TIP/STIP
- End operator of Rapid Bus extensions - TBD

Rapid Bus Corridor Extension: LPA Adoption Process Next Steps

- TCC (Mar 2)
- CAMPO Exec Board, TPAC (Mar 15)
- DCHC (Mar 8, 22)
- Additional Operational Study; Project Sponsor Determination; LPA Adoption
- Wake Transit concurrence



Thank You