

CAMPO BRT Extension MIS

Capital Cost Estimate Memorandum

May 2023

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

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Contents

1	Introduction	3
2	Final Alternatives.....	3
	Western Extension.....	3
	Southern Extension.....	4
3	Capital Costs Methodology.....	6
	General Assumptions and Notes.....	6
	Exclusions.....	7
	Assumptions and Costs by SCC.....	7
	SCC 10: Guideway and Track Elements	7
	SCC 20: Stations.....	8
	SCC 30: Support Facilities.....	8
	SCC 40: Sitework & Special Conditions.....	8
	SCC 50: Systems.....	9
	SCC 60: ROW	10
	SCC 70: Vehicles.....	10
	SCC 80: Professional Services.....	11
	SCC 90: Unallocated Contingency	11
	Allocated Contingency	11
4	Capital Costs by Alternative	13
	Southern Extension.....	13
	Western Extension.....	15
	Appendix A Southern Extension Capital Cost Estimates	1
	Appendix B Western Extension Capital Cost Estimates.....	3

1 INTRODUCTION

The Capital Area Metropolitan Planning Organization (CAMPO) is conducting a major investment study (MIS) and alternatives analyses for proposed bus rapid transit (BRT) corridor extensions identified in the MPO's 2045 Metropolitan Transportation Plan (MTP) and 2020-2029 Transportation Improvement Program (TIP) – the Western BRT extension and the Southern BRT extension.

These rapid bus connections would be extensions of the planned Western Corridor BRT, connecting downtown Raleigh with Cary, and the planned Southern Corridor BRT that would connect Raleigh with Garner.

This memorandum provides a description of the methodology used to develop the capital cost estimates for detailed alternatives developed for two (2) potential rapid bus extensions. The rapid bus service would connect Cary to Research Triangle Park (RTP) in the Western rapid bus extension (Western Extension) and the Towns of Garner to Clayton in the Southern rapid bus extension (Southern Extension).

2 FINAL ALTERNATIVES

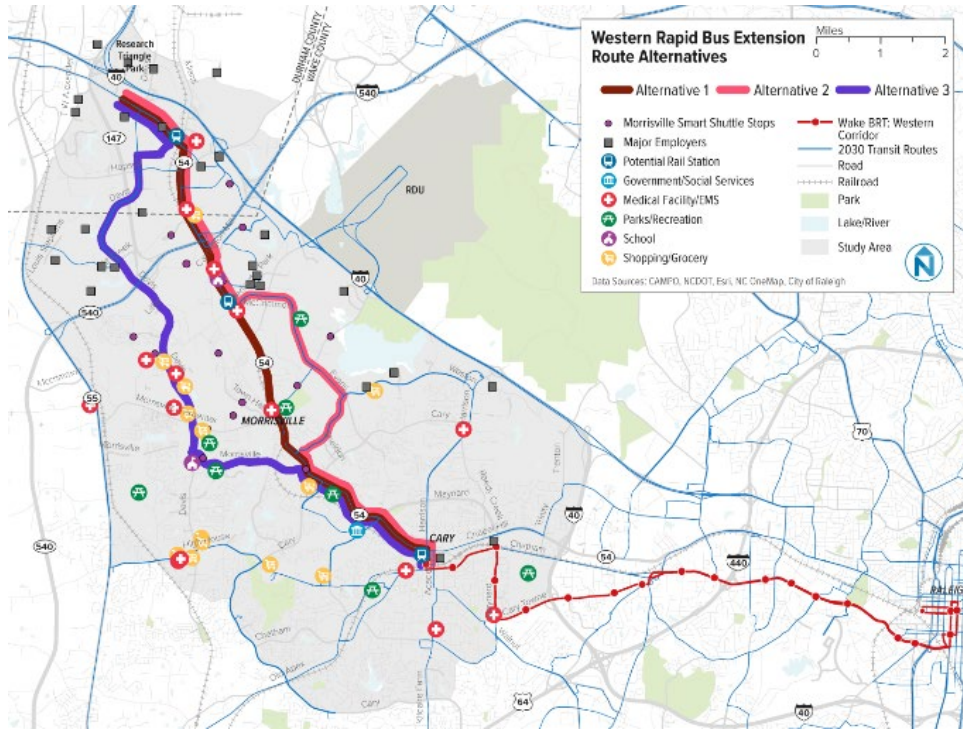
Western Extension

Initial screening results from step one of the route evaluation process identified three (3) final alternative alignments for consideration of the Western Extension rapid bus service between Downtown Cary and the HUB at RTP (Figure 1).

- **Alternative 1** is aligned primarily on Chapel Hill Road and NC 54.
- **Alternative 2** uses Chapel Hill Road but deviates mid-alignment along Evans Road/McCrimmon Parkway and Weston Parkway before returning to NC 54.
- **Alternative 3** begins on Chapel Hill Road but primarily uses Davis Drive via Morrisville Parkway.

CAMPO BRT Extension Major Investment Study and Alternatives Analysis

Figure 1: Western Extension Rapid Bus Alternatives



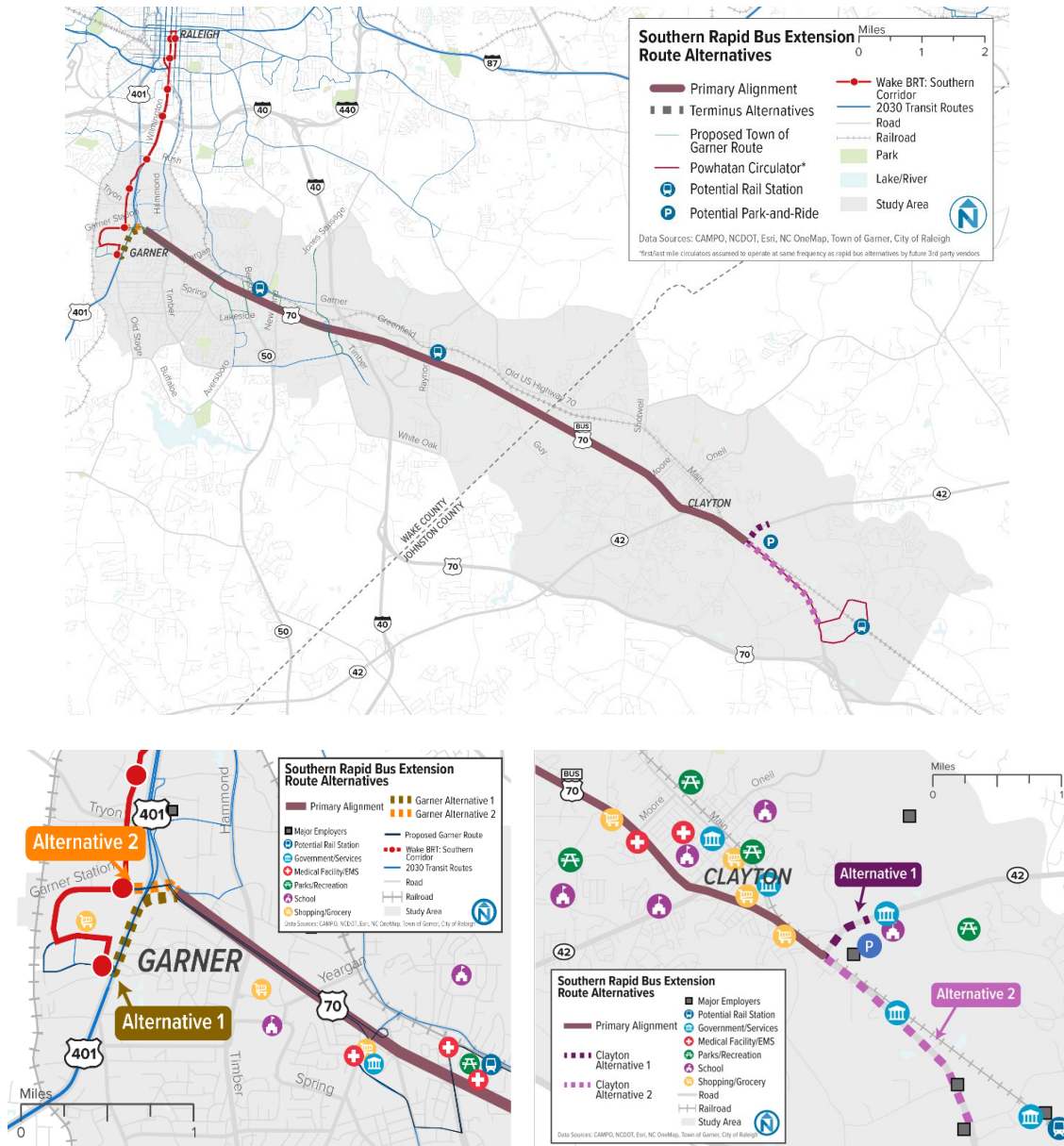
Each end-to-end alternative features approximately 10 to 15 stations, with average spacing varying based on surrounding land uses. Station area selection considerations included, but were not limited to:

Southern Extension

The Southern Extension features one primary alignment on US 70/US 70 Business that would operate between approximately US 401 in Garner and NC 42 in Clayton. Detailed analyses and public input helped identify preferred routing alternatives (Figure 2) at both the Garner Station and Clayton termini, including a potential extension beyond NC 42 to the East Clayton Industrial Area (ECIA).

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

Figure 2 Southern Extension Rapid Bus Alternatives



With marginal changes to the overall corridor ridership expected to result from a single terminal routing choice (at either end), the ridership forecasts developed for the Southern Extension considered only two end-to-end alignment alternatives representing the shortest and longest potential transit trips within the corridor.

- G1 (Fayetteville Road) to C2 (Powhatan Road)
- G2 (Garner Station Boulevard) to C1 (NC 42)

Each end-to-end alternative assumed approximately 10 to 12 stations, with average spacing varying based on surrounding land uses.

Additional detail on each of the alternatives can be found in the *CAMPO MIS Rapid Bus Operating Plan, Feasibility, and Operations Analysis (April 2023)*.

3 CAPITAL COSTS METHODOLOGY

The capital costs were developed as rough order of magnitude (ROM) costs estimates for comparative uses during the evaluation of the alternatives against each other. Capital costs were developed in alignment with the Federal Transit Administration's Standard Cost Categories (SCC) for the Capital Investment Grants (CIG) program (Rev.21, June 2019). The SCC's break down project costs into ten (10) categories.

Five (5) categories make up the Construction Subtotal:

- SCC 10: Guideway & Track Elements
- SCC 20: Stations, Stops, Terminals, Intermodal
- SCC 30: Support Facilities: Yards, Shops, Admin. Buildings
- SCC 40: Sitework & Special Conditions
- SCC 50: Systems

An additional three (3) categories make up the Soft Cost Subtotal:

- SCC 60: Right-of-way (ROW), Land, Existing Improvements
- SCC 70: Vehicles
- SCC 80: Professional Services

And two (2) additional categories are included in the project total:

- SCC 90: Unallocated Contingency
- SCC 100: Finance Charges

GENERAL ASSUMPTIONS AND NOTES

1. 2022 is the base year used for all unit costs and capital construction elements. Any historic unit costs were escalated to the current year (2022) based on local market conditions.
2. The planning estimates applied top-down approach to developing unit cost for capital construction elements.
3. Data sources used to develop rapid bus unit costs were developed and provided by the City of Raleigh in Summer and Fall 2022:
 - a. (30% design) Engineer's Estimate of the Wake BRT – Southern Corridor; and
 - b. New Bern Avenue 90% architectural and engineering plan drawings.

4. Bottom-up methods were used to estimate specialty work for elements where standard unit costs are not applicable.
5. Planning estimators developed approximate quantity takeoffs for top-down capital cost estimation of infrastructure rapid-bus related elements such as, but not limited to:
 - Proposed rapid bus station platform locations and amenities
 - Existing and proposed signalized intersections
 - Locations or lengths of potential transit specific speed and reliability improvements (ex – queue jumps)
 - Typical pedestrian access and circulation betterments at station area intersections

Exclusions

1. Advanced Planning activities prior to FTA CIG Project Development entry (or Preliminary Engineering / NEPA).
2. Public art.
3. Future operating and maintenance costs of the improvements.
4. Design and construction management costs for 3rd party private and public utility relocation costs.
5. Partner funded elements, such as franchise utility work.
6. Potential park-and-ride at the site of proposed redevelopment near US70 Business/NC42
7. Project Sponsor legal counsel and procurement costs for contract administration.
8. Due to the long-range revenue service dates of proposed extensions (beyond 2035), capital cost estimates are provided in base year (2022) dollars only, and no escalation factor was applied to estimate potential year of expenditure (YOE) costs.

ASSUMPTIONS AND COSTS BY SCC

SCC 10: Guideway and Track Elements

10.03 Guideway: At-grade in mixed traffic

Neither of the final Alternatives for the Southern nor Western rapid bus extensions were recommended to incorporate dedicated transit lanes within the ROW of proposed alignments. The rapid bus service in Southern Extension did not assume additional capital cost associated with BOSS opportunities identified along US 70 Business. The proposed widening of US 70 Business between Greenfield Pkwy and NC 42 would also support implementation of BOSS, allowing rapid buses to drive on the shoulder at low speeds during congested conditions and improve schedule reliability.

Capital costs included the following infrastructure components:

- Each Queue jump opportunities assumed roadway milling and resurfacing (12' lane x 100' storage), lane restriping, as well as new and replacement of impacted roadway signage
- Concrete bus pads (12' lane x 100') at all proposed rapid bus station platforms to accommodate potential articulated buses.
- Minor travel lane and crosswalk restriping at each station area intersection

SCC 20: Stations

20.01 At-grade station, stop, shelter, mall, terminal, platform

Alternatives of the Southern Extension would have approximately 10 to 12 stations, selected based on the presence of activity centers and development nodes, signalized intersections, and accessible pedestrian networks. Alternatives of Western Extension would have approximately 10 to 15 stations, selected based on the presence of activity centers and development nodes, signalized intersections, and accessible pedestrian networks.

The typical lump sum cost of approximately \$300,000 for each rapid bus station platform was based on Wake BRT: New Bern corridor's 90% architectural design plans for "Peripheral" station types, including components such as:

- 24 ft. branded shelters and amenities (seating, trash, etc.)
- Boarding platforms able to accommodate 40-ft or 60-ft buses
- Lighting and wayfinding

Note: Real-time information, fare payment and ticket vending costs included in SCC 50)

SCC 30: Support Facilities

No additional costs for maintenance and storage facility (MSF) upgrades or expansion were assumed.

SCC 40: Sitework & Special Conditions

40.01 Demolition, Clearing, Earthwork

Capital cost items included within this category are:

- Removal and clearing for rapid bus station platforms and shelters (8' x 50' Peripheral station)
- Removal and excavation for installation of pedestrian lighting fixtures (3)

40.02 Site Utilities, Utility Relocation

A 10% lump sum allowance of the subtotal from the direct costs in SCCs 10, 20, 30, 40 (non 40.02 elements), and 50 was assumed to account for potential utility and

stormwater/wastewater relocations and removals associated with those capital construction activities.

40.05 Site structures including retaining walls, sound walls

Costs are associated with construction of a 4-foot by 50-foot retaining wall along the back of Peripheral station platform locations, based on Wake BRT: New Bern corridor's 90% architectural design plans.

40.06 Pedestrian / bike access and accommodation, landscaping

Pedestrian and multimodal accessibility improvements are assumed at each rapid bus station area intersection are as follows:

- (8) ADA compliant curb ramps
- Minor streetscape improvements
- The amount of new sidewalk installation assumed at each station area intersection was determined based on a visual survey of existing facilities and surrounding, connected land uses.
 - "Low" need station areas assume 300 linear feet of sidewalk
 - "Moderate" need station areas assume 500 linear feet of sidewalk
 - "High" need station areas assume 750 linear feet of sidewalk

40.08 Temporary Facilities and other indirect costs during construction

A 15% lump sum allowance of the subtotal from the direct costs in SCCs 10, 20, 30, 40 (non 40.08 elements), and 50 was assumed to account for temporary construction facilities and traffic control/protection associated with those capital construction activities.

SCC 50: Systems

50.02 Traffic signals and crossing protection

Transit signal priority (TSP) will be installed at all signalized intersections. Since the routes are already developed, and signals will only need to be improved, the assumed cost to improve signals are as follows:

- Upgrade of existing signalized intersections (with mast arms) with TSP receivers (\$25,000 each) and upgrade of existing signal controller.
- Upgrade of existing signalized intersections with wire spans to install (2) mast arms at intersection approaches (\$125,000 each). Alternatives 2 and 3 of the Western Extension are the only alternatives that include costs for installation of a new traffic signal mast arms.

- Mounting of transit priority signal head (on existing mast arms) at proposed queue jump locations.

50.05 Communications

Rapid bus station area platform information technology systems (ITS) and communications equipment assumptions include:

- Real-time vehicle arrival and passenger information displays and CCTV at each rapid bus station platform
- ITS communications cabinet, cables, and controllers at each rapid bus station platform

Each rapid bus alternative also assumes installation of fiber optic communications along the entire length of the Rapid Bus extensions at \$20 per linear foot to support the implementation of TSP and intelligent information systems (real time arrival, ticket vending, etc...)

50.06 Fare Collection Systems and Equipment

A general lump sum cost for a ticket vending cabinet (\$130,000) capable of dispensing fares and accepting all payment types is assumed at each station platform.

SCC 60: ROW

All rapid bus alternatives are proposed to be built with no impacts to the existing ROW.

SCC 70: Vehicles

70.04 Bus

Rapid Bus alternative vehicles are assumed to utilize 40-foot CNG-fuel buses at an estimated cost of \$550,000 each. Buses would be compatible with maintenance and storage facility (MSF) requirements associated with Wake BRT and GoRaleigh preliminary engineering designs and specifications.

In determining the number of vehicles required for weekday peak/off-peak, Saturday and Sunday were considered. Route length, frequency, and peak hour speed were all considered in accordance with *CAMPO Rapid Bus Operating Plan, Feasibility, and Operations Analysis memorandum (April 2023)*. Once the initial number of vehicles was calculated an additional 20% spare ratio was also used added onto the number of peak service vehicles required.

Rapid bus extensions did not preclude the potential use and operation of 60-foot, articulated vehicles, or vehicles that can accommodate left door boarding, should the future implementation of rapid bus services recommend operating as a 1-seat ride service to downtown Raleigh. Incremental unit cost increases to 40-foot vehicles for left door boarding (additional \$150,000 each); or lump sum cost (\$1,030,000 each) for use

of 60-foot articulated, left-door boarding CNG buses were assumed based on the Wake BRT Southern corridor's 2022 Engineer's Estimate.

70.07 Spare Parts

A lump sum allowance of 5% of the estimated vehicle capital costs (70.01) was assumed for the purchase of spare parts to support standard maintenance needs.

SCC 80: Professional Services

Add-on items for indirect services required from Project Development entry to Construction completion are part of the project cost but may not be directly attributable to physical components ("hard costs"). These items, known as Professional Services, are incorporated into the capital cost estimate as a percentage of construction costs or directly negotiated fees with service providers. The estimated professional service costs are 25% of the construction subtotal costs, (SCC 10-50).

SCC	Description	Lump Sum Allowance
80.01	Preliminary Engineering	6.0%
80.02	Final Design	7.5%
80.03	Project Management for Design and Construction	5.0%
80.04	Construction Administration & Management	4.5%
80.05	Insurance	0.0%
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.	0.5%
80.07	Surveys, Testing, Investigation, Inspection	1.0%
80.08	Start up	0.5%

SCC 90: Unallocated Contingency

Unallocated contingency addresses scope and schedule costs, such as unanticipated discoveries, required field change orders, and regulatory changes. Unallocated contingency costs make up 20% of the total of construction subtotal and soft costs subtotal (SCC 10 – 80) for all rapid bus alternatives.

Allocated Contingency

Allocated contingencies are inclusive of Design contingency and Construction contingency. Design contingency covers minor items not yet quantified, likely increases in quantities, additional materials, and anticipated Project scope revisions as the design process progresses. Construction contingency covers unforeseen costs encountered during construction.

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

A 30% Allocated contingency was applied across all SCC's within the construction subtotal and soft cost subtotal (SCC 10 – 80). Percentages are based on the level of confidence in the quantities and unit costs developed for this conceptual planning estimate. Allocated Contingency is gradually phased out of capital cost during the Preliminary Engineering and Final Design phases as uncertainties in design decrease.

4 CAPITAL COSTS BY ALTERNATIVE

SOUTHERN EXTENSION

Garner Station Blvd to NC 42

Standard Cost Category (SCC)	Direct Cost (X000)	Allocated Contingency (X000)	TOTAL Cost (X000)
SCC 10: Guideway & Track Elements	\$227	\$68	\$295
SCC 20: Stations, Stops, Terminals, Intermodal	\$5,400	\$1,620	\$7,020
SCC 30: Support Facilities: Yards, Shops, Admin, Bldgs	\$0	\$0	\$0
SCC 40: Sitework & Special Conditions	\$3,795	\$1,138	\$4,933
SCC 50: Systems	\$5,325	\$1,598	\$6,923
Construction Subtotal (10-50)	\$14,747	\$4,424	\$19,171
SCC 60: ROW, Land, Existing Improvements	\$0	\$0	\$0
SCC 70: Vehicles	\$2,888	\$866	\$3,754
SCC 80: Professional Services	\$3,687	\$1,106	\$4,793
Soft Costs Subtotal (60-80)	\$6,574	\$1,972	\$8,546
SCC 90: Unallocated Contingency		\$4,264	\$0
SCC 100: Finance Charges	\$0	\$0	\$0
Total Project Costs (10-100)	\$21,321	\$10,660	\$27,717

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

Fayetteville Rd to Powhatan Rd

Standard Cost Category (SCC)	Direct Cost (X000)	Allocated Contingency (X000)	TOTAL Cost (X000)
SCC 10: Guideway & Track Elements	\$238	\$72	\$310
SCC 20: Stations, Stops, Terminals, Intermodal	\$5,700	\$1,710	\$7,410
SCC 30: Support Facilities: Yards, Shops, Admin, Bldgs	\$0	\$0	\$0
SCC 40: Sitework & Special Conditions	\$4,051	\$1,215	\$5,267
SCC 50: Systems	\$5,927	\$1,778	\$7,705
Construction Subtotal (10-50)	\$15,917	\$4,775	\$20,692
SCC 60: ROW, Land, Existing Improvements	\$0	\$0	\$0
SCC 70: Vehicles	\$2,888	\$866	\$3,754
SCC 80: Professional Services	\$3,979	\$1,194	\$5,173
Soft Costs Subtotal (60-80)	\$6,867	\$2,060	\$8,927
SCC 90: Unallocated Contingency		\$4,557	\$0
SCC 100: Finance Charges	\$0	\$0	\$0
Total Project Costs (10-100)	\$22,784	\$11,392	\$29,619

WESTERN EXTENSION

Alternative 1 – Chapel Hill Road / NC 54

Standard Cost Category (SCC)	Direct Cost (X000)	Allocated Contingency (X000)	TOTAL Cost (X000)
SCC 10: Guideway & Track Elements	\$347	\$104	\$451
SCC 20: Stations, Stops, Terminals, Intermodal	\$6,000	\$1,800	\$7,800
SCC 30: Support Facilities: Yards, Shops, Admin, Bldgs	\$0	\$0	\$0
SCC 40: Sitework & Special Conditions	\$3,830	\$1,149	\$4,978
SCC 50: Systems	\$4,680	\$1,404	\$6,084
Construction Subtotal (10-50)	\$14,856	\$4,457	\$19,313
SCC 60: ROW, Land, Existing Improvements	\$0	\$0	\$0
SCC 70: Vehicles	\$2,888	\$866	\$3,754
SCC 80: Professional Services	\$3,714	\$1,114	\$4,828
Soft Costs Subtotal (60-80)	\$6,602	\$1,980	\$8,582
SCC 90: Unallocated Contingency		\$4,292	\$0
SCC 100: Finance Charges	\$0	\$0	\$0
Total Project Costs (10-100)	\$21,458	\$10,729	\$27,895

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

Alternative 2 – Evans Road / McCrimmon Parkway

Standard Cost Category (SCC)	Direct Cost (X000)	Allocated Contingency (X000)	TOTAL Cost (X000)
SCC 10: Guideway & Track Elements	\$406	\$122	\$527
SCC 20: Stations, Stops, Terminals, Intermodal	\$6,600	\$1,980	\$8,580
SCC 30: Support Facilities: Yards, Shops, Admin, Bldgs	\$0	\$0	\$0
SCC 40: Sitework & Special Conditions	\$4,294	\$1,288	\$5,582
SCC 50: Systems	\$5,483	\$1,645	\$7,128
Construction Subtotal (10-50)	\$16,782	\$5,035	\$21,817
SCC 60: ROW, Land, Existing Improvements	\$0	\$0	\$0
SCC 70: Vehicles	\$2,888	\$866	\$3,754
SCC 80: Professional Services	\$4,196	\$1,259	\$5,454
Soft Costs Subtotal (60-80)	\$7,083	\$2,125	\$9,208
SCC 90: Unallocated Contingency		\$4,773	\$0
SCC 100: Finance Charges	\$0	\$0	\$0
Total Project Costs (10-100)	\$23,865	\$11,933	\$31,025

Capital Cost Estimate Memorandum
CAMPO BRT Extension Major Investment Study and Alternatives Analysis

Alternative 3 – Davis Drive

Standard Cost Category (SCC)	Direct Cost (X000)	Allocated Contingency (X000)	TOTAL Cost (X000)
SCC 10: Guideway & Track Elements	\$362	\$109	\$471
SCC 20: Stations, Stops, Terminals, Intermodal	\$6,000	\$1,800	\$7,800
SCC 30: Support Facilities: Yards, Shops, Admin, Bldgs	\$0	\$0	\$0
SCC 40: Sitework & Special Conditions	\$3,918	\$1,176	\$5,094
SCC 50: Systems	\$5,323	\$1,597	\$6,920
Construction Subtotal (10-50)	\$15,603	\$4,681	\$20,284
SCC 60: ROW, Land, Existing Improvements	\$0	\$0	\$0
SCC 70: Vehicles	\$2,888	\$866	\$3,754
SCC 80: Professional Services	\$3,901	\$1,170	\$5,071
Soft Costs Subtotal (60-80)	\$6,788	\$2,036	\$8,825
SCC 90: Unallocated Contingency		\$4,478	\$0
SCC 100: Finance Charges	\$0	\$0	\$0
Total Project Costs (10-100)	\$22,391	\$11,195	\$29,109

APPENDIX A SOUTHERN EXTENSION CAPITAL COST ESTIMATES

CAMPO BRT Extension Major Investment Study and Alternatives Analysis

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APPENDIX B WESTERN EXTENSION CAPITAL COST ESTIMATES

Capital Cost Estimate Memorandum

CAMPO BRT Extension Major Investment Study and Alternatives Analysis

	10.04 miles					11.54 miles					12.39 miles				
	Alt 1 - Chapel Hill Rd >> NC 54					Alt 2 - Chapel Hill Rd >> Evans Rd >> NC 54					Alt 3 - Chapel Hill Rd >> Morrisville Pkwy >> Davis D				
	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)		347,089	104,127	451,216			405,528	121,658	527,186			362,067	108,620	470,687	
10.01 Guideway: At-grade exclusive right-of-way															
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)															
10.03 Guideway: At-grade in mixed traffic		347,089	104,127				405,528	121,658				362,067	108,620		
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		6,000,000	1,800,000	7,800,000			6,600,000	1,980,000	8,580,000			6,000,000	1,800,000	7,800,000	
20.01 At-grade station, stop, shelter, mall, terminal, platform	10	6,000,000	1,800,000			11	6,600,000	1,980,000			10	6,000,000	1,800,000		
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.															
20.05 Joint development															
20.06 Automobile parking multi-story structure															
20.07 Elevators, escalators															
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		0	0	0			0	0	0			0	0	0	
30.01 Administration Building: Office, sales, storage, revenue counting															
30.02 Light Maintenance Facility															
30.04 Storage or Maintenance of Way Building															
40 SITEWORK & SPECIAL CONDITIONS		3,829,531	1,148,859	4,978,391			4,293,650	1,288,095	5,581,746			3,918,348	1,175,504	5,093,852	
40.01 Demolition, Clearing, Earthwork		2,899	870				3,189	957				2,899	870		
40.02 Site Utilities, Utility Relocation	*****	1,188,511	356,553			*****	1,342,597	402,779			*****	1,248,252	374,476		
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments															
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks															
40.05 Site structures including retaining walls, sound walls		374,140	112,242				411,554	123,466				420,678	126,204		
40.06 Pedestrian / bike access and accommodation, landscaping		481,215	144,364				522,416	156,725				374,140	112,242		
40.07 Automobile, bus, van accessways including roads, parking lots															
40.08 Temporary Facilities and other indirect costs during construction		1,782,766	534,830				2,013,895	604,169				1,872,378	561,713		
50 SYSTEMS		4,679,767	1,403,930	6,083,697			5,483,281	1,644,984	7,128,266			5,322,737	1,596,821	6,919,558	
50.02 Traffic signals and crossing protection		254,267	76,280				554,781	166,434				623,237	186,971		
50.05 Communications		1,825,500	547,650				2,068,500	620,550				2,099,500	629,850		
50.06 Fare collection system and equipment		2,600,000	780,000				2,860,000	858,000				2,600,000	780,000		
50.07 Central Control															
Construction Subtotal (10 - 50)		14,856,387	4,456,916	19,313,304	0		16,782,460	5,034,738	21,817,198			15,603,152	4,680,946	20,284,098	
60 ROW, LAND, EXISTING IMPROVEMENTS		0	0	0			0	0	0			0	0	0	
60.01 Purchase or lease of real estate															
60.02 Relocation of existing households and businesses															
70 VEHICLES (number)		2,887,500	866,250	3,753,750			2,887,500	866,250	3,753,750			2,887,500	866,250	3,753,750	
70.04 Bus (40' CNG)	5	2,750,000	825,000			5	2,750,000	825,000			5	2,750,000	825,000		
70.07 Spare parts		137,500	41,250			5%	137,500	41,250			5%	137,500	41,250		
80 PROFESSIONAL SERVICES		3,714,097	1,114,229	4,828,326			4,195,615	1,258,684	5,454,299			3,900,788	1,170,236	5,071,024	
80.01 Preliminary Engineering		891,383	267,415				1,006,948	302,084				936,189	280,857		
80.02 Final Design		1,114,229	334,269				1,258,684	377,605				1,170,236	351,071		
80.03 Project Management for Design and Construction		742,819	222,846				839,123	251,737				780,158	234,047		
80.04 Construction Administration & Management		868,537	200,561				755,211	226,563				702,142	210,643		
80.05 Insurance		0	0				0	0				0	0		
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		74,282	22,285				83,912	25,174				78,016	23,405		
80.07 Surveys, Testing, Investigation, Inspection		148,564	44,569				167,825	50,347				156,032	46,809		
80.08 Start up		74,282	22,285				83,912	25,174				78,016	23,405		
Subtotal (10 - 80)		21,457,984	6,437,395	27,895,379			23,865,575	7,159,672	31,025,247			22,391,440	6,717,432	29,108,872	
90 UNALLOCATED CONTINGENCY				4,291,597					4,773,115					4,478,288	
Subtotal (10 - 90)															
100 FINANCE CHARGES															
Total Project Cost (10 - 100)		21,457,984	10,728,992	32,186,976			23,865,575	11,932,787	35,798,362			22,391,440	11,195,720	33,587,160	