CHAPEL HILL TRANSIT
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CHAPEL HILL TRANSIT PUBLIC TRANSIT COMMITTEE

NOTICE OF COMMITTEE MEETING AND AGENDA

APRIL 26, 2016 – 11:00 A.M. to 1:00 P.M.

CHAPEL HILL TRANSIT – FIRST FLOOR CONFERENCE ROOM

MEETING SUMMARY OF A REGULAR MEETING OF THE PUBLIC TRANSIT COMMITTEE
1ST FLOOR TRAINING ROOM, CHAPEL HILL TRANSIT

Thursday, March 22, 2016 at 11:00 AM

Present: Ed Harrison, Chapel Hill Town Council
Cheryl Stout, UNC Transportation & Parking
Michael Parker, Chapel Hill Town Council
Nate Broman, Assistant to Carrboro Town Manager
Damon Seils, Carrboro Alderman
George Cianciolo, Chapel Hill Town Council
Than Austin, UNC Transportation & Parking

Absent: Brad Ives, UNC Associate Vice Chancellor for Campus Enterprises, Bethany Chaney, Carrboro Alderman

Staff present: Brian Litchfield, Transit Director, Rick Shreve, Budget Manager, Flo Miller, Deputy Town Manager, Bergen Watterson, Carrboro Transportation Planner, Tim Schwarzauer, Grants Coordinator, Mila Vega, Transit Planner

Guests: Tim Payne & Christina Barone – Nelson Nygaard

1. The Meeting Summary of February, 2016 was received and approved.

2. **Employee Recognition** – Brian introduced Tim Schwarzauer, Grants Coordinator to the Partner's Committee. Tim joined Transit on February 10, 2015.

3. **Consent Items**

   A. February Financial Report – Rick reviewed this for the Partners.

4. **Discussion Items**

   A. Financial Sustainability Study – Brian introduced Tim Payne who provided an update on the Bus Replacement Plan. He reviewed the plan to date and focused on debt finance and purchases of buses. Chapel Hill Transit is part of a joint bus purchase with GoTriangle and GoDurham. The Contract Award is going to the Town Council in April.

   The bus purchase and finance plan will be flexible as needed due to any changes that warrant it. Twelve vehicles will be purchased outright and another 14 will be debt financed in FY 16. Mr. Payne noted that there will be a significant increase in Partner contributions for Capital in the coming years to accomplish this. The next steps include Adopting the Capital Plan and beginning longer term visioning and planning over the next 10-15 years for the system. UNC representatives asked what the projected completion date for the sustainability study would be. There is no projected completion date at this time.

B. Chapel Hill Transit's Title VI Program – Tim Schwarzauer reviewed this item for the Partners.

C. FY 16-17 Chapel Hill Transit Budget Development - Brian reviewed the update. The Orange County Bus and Rail Investment Plan dollar amounts are not available yet. Brian also reviewed the CHT goals going forward. Staff will be meeting with each Partner to go over the budget.

5. **Information Items**

A. North South Corridor Study Update – Mila reviewed this item and described the LPA #6 which is being recommended with 3 options. A formal presentation will be provided next month. She asked that the Partners make a recommendation to Council at that time. The Partners urged scheduling of a Council Work Session as soon as possible. They also asked about possible funding options for the next phase of the project.

B. Customer Survey Update – A draft report will be provided in April and a presentation will be provided at the May Partners meeting.

C. Regional Bus Procurement Update – Brian reviewed this item. The recommendation goes to Town Council on April 11th and the Financing plan will be presented as well. He noted that there is a petition for electric buses that will be brought to the Partners in April and CHT's response will be provided as well.

D. Federal Legislative Update – This was provided for the Partner's information.

E. February Performance Report – This was provided for the Partner's information.

6. **Departmental Monthly Reports**

A. Operations – This item was reviewed for the Partners.

B. Director – This item was reviewed for the Partners.

7. **Future Meeting Items**

8. **Partner Items**

9. **Next Meeting** – April 26, 2016

10. Adjourn

The Partners set a next meeting date for April 16, 2016

Consent Item	**April 26, 2016**
3A. March Financial Report	

Prepared by: Rick Shreve, Budget Manager

March 2016

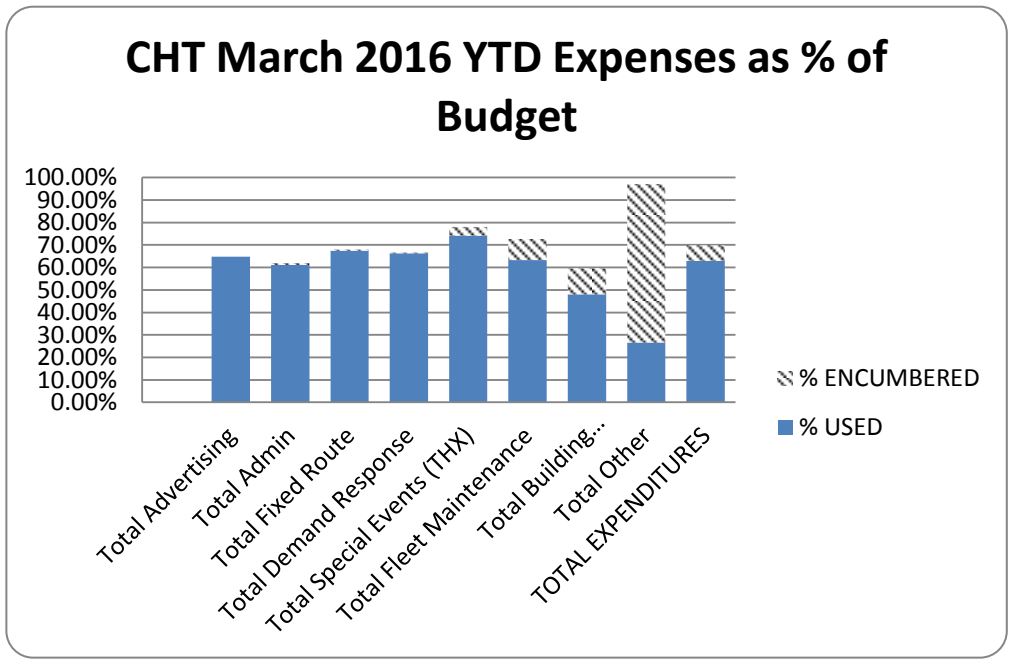
- Expenses for the month of March were $1,552,718. Along with the encumbrances, which are heavily weighted towards the beginning of the fiscal year, approximately 69.77% of our budget has been expended or reserved for designated purchase (e.g. purchase orders created for vehicle maintenance inventory supplies encumber those funds, and show them as unavailable for other uses).
    - The total budget that has been expensed or encumbered is somewhat skewed by the encumbrance of $760,000 for the financing of buses. That money appears in these numbers as budgeted funds that are encumbered, which affects the totality of the available budget. Looking at individual divisions, one can see that we are in line with monthly expenditures for operating purposes.

Highlights

- This aggregation of expenses and encumbrances is consistent with years past, and is perfectly in line with what we would expect at this point in the year.
- The attached data exhibits the financial information by division within CHT, and should be a useful tool in monitoring our patterns as the year progresses, and is a high-level representation of the data used by our division heads.
    - It is worth noting that the “Special Events” line is mostly comprised of Tar Heel Express expenses, and the line labeled “Other” is comprised primarily of special grant-funded expense lines that are not permanent fixtures in the division budgets.

Transit 640 Fund Budget to Actual at end of March 2016

	ORIGINAL BUDGET	REVISED BUDGET	ACTUAL MONTH EXPENSES	ACTUAL YTD EXPENSES	CURRENT ENCUMBRANCES	BALANCE AVAILABLE	% USED OR ENCUMBERED March = 75.00%
Total Advertising	$ 93,222	$ 93,222	$ 6,425	$ 60,349	$ -	$ 32,873	64.74%
Total Admin	1,472,385	1,519,248	97,110	927,630	13,359	578,259	61.94%
Total Fixed Route	11,181,804	11,151,648	893,247	7,528,367	56,497	3,566,784	68.02%
Total Demand Response	1,926,450	1,945,450	145,687	1,290,993	6,002	648,454	66.67%
Total Special Events (THX)	317,207	317,207	27,965	235,199	12,328	69,680	78.03%
Total Fleet Maintenance	4,193,542	4,258,922	305,557	2,695,445	398,135	1,165,342	72.64%
Total Building Maintenance	750,765	1,014,530	74,025	487,632	116,123	410,775	59.51%
Total Other	839,640	1,227,111	2,703	325,774	866,016	35,322	97.12%
TOTAL EXPENDITURES	**$ 20,775,015**	**$ 21,527,338**	**$ 1,552,718**	**$ 13,551,389**	**$ 1,468,460**	**$ 6,507,488**	69.77%



DISCUSION ITEM April 26, 2016

4A. North-South Corridor Study

Action: 1. Receive Locally Preferred Alternative (LPA) Recommendation from Study Committees.
2. Adopt LPA Recommendation or any other option(s) as the Partners deem Appropriate.
3. Forward Partner LPA Recommendation to Chapel Hill Town Council for consideration and adoption.

Staff Resource: Mila Vega, Transit Service Planner

Background

The North-South Corridor Study was initiated in January 2014 as one of the results of the Chapel Hill 2020 Comprehensive Plan. The study is managed by Chapel Hill Transit and guided by a Policy Committee, Technical Committee, Transit Partners Committee and a substantial public involvement process. The study corridor runs along the Martin Luther King, Jr. Boulevard (Historic Airport Road/NC Hwy 86), South Columbia Street (including the portion of Pittsboro Street along the one-way pairing in this corridor through UNC campus), and US 15-501 South. This corridor, which is approximately 7.3 miles long, has its northern terminus at Eubanks Road and Martin Luther King, Jr. Boulevard and its southern terminus at US 15-501 near the Southern Village mixed-use development.

Following public input sessions and a multi-phased alternative development and evaluation process (Attachment: Draft Report – Detailed Evaluation of Alternatives) a Locally Preferred Alternative (LPA) was selected by the Study Technical and Policy Committees (Attachment: Locally Preferred Alternative Recommendations). Staff and the Consultant Team will provide the Partners with an overview of the study and a detailed summary of the LPA recommendation during the meeting.

Additional information on the study is available on the project website: www.NSCStudy.org.

Next Steps

- Provide study updates to:
  - Chapel Hill Town Council – April 27, 2016
  - Town of Chapel Hill Planning Board – May 3, 2016
  - Town of Chapel Hill Transportation and Connectivity Board – May 24, 2016
  - Town of Carrboro Board of Alderman – TBD
  - University of North Carolina at Chapel Hill ACT Board – TBD
  - Orange County Board of County Commissioners (BOCC) – TBD

Attachments

- Draft Report – Detailed Evaluation of Alternatives
- Locally Preferred Alternative Recommendations

DISCUSION ITEM April 26, 2016

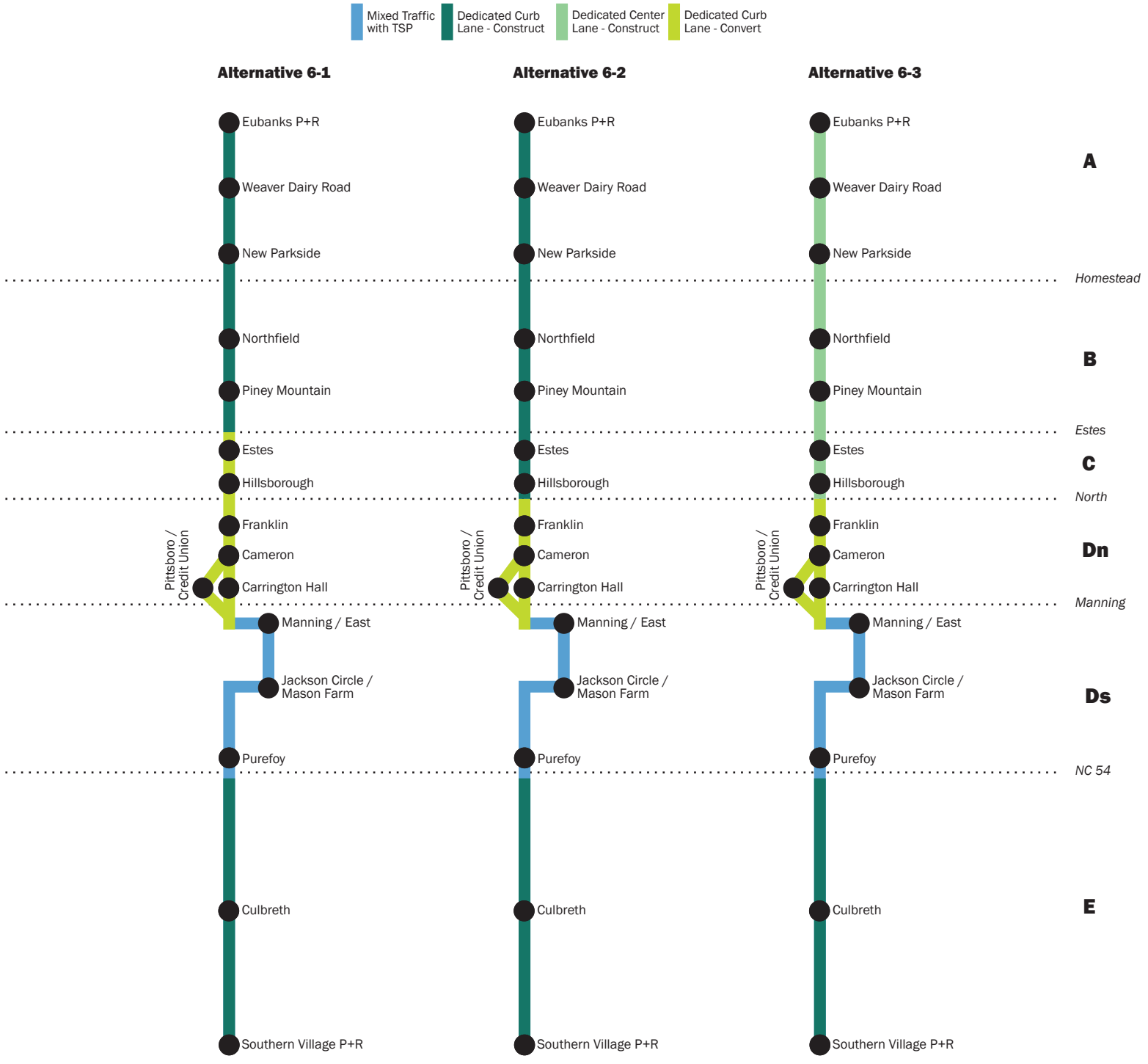
4A. North-South Corridor Study

Action: 1. Receive Locally Preferred Alternative (LPA) Recommendation from Study Committees.
2. Adopt LPA Recommendation or any other option(s) as the Partners deem Appropriate.
3. Forward Partner LPA Recommendation to Chapel Hill Town Council for consideration and adoption.

Recommendation

- That the Partners Committee consider the LPA recommendation from the Study Committees and adopt the LPA recommendation or any other option(s) as the Committee deems appropriate.

The Recommended Locally Preferred Alternative | March 2016



Chapel Hill transit

Detailed Evaluation of Alternatives Report

DRAFT April 20, 2016

Table of Contents

List of Tables

List of Figures

List of Appendices

Technical Memorandum 1:	Station Area Population and Employment
Technical Memorandum 2:	Station Area Population: Households below Poverty, Minority Population, and Zero-Car Households
Technical Memorandum 3:	Cultural Resources
Technical Memorandum 4:	Transit Connectivity
Technical Memorandum 5:	Environmental Benefits and Safety
Technical Memorandum 6:	Development Potential
Technical Memorandum 7:	Operations & Maintenance Cost
Technical Memorandum 8:	Ridership
Technical Memorandum 9:	Capital Cost Estimates
Technical Memorandum 10:	Bicycle and Pedestrian Facilities
Technical Memorandum 11:	Traffic Analysis
Technical Memorandum 12:	Parking Impacts
Technical Memorandum 13:	Tier 2 Public Involvement

1. Introduction

1.1 Overview of Evaluation Process

The North-South Corridor Study is following a three-step method in order to evaluate the different transit modes and alignment options and identify a preferred alternative.

- The first step ("Tier 1 Analysis") entailed the assessment of each mode and alignment relative to overall implementation viability.
- The second step ("Detailed Evaluation") assessed the modes and alignments that passed the Tier 1 Analysis. This report documents the Detailed Evaluation of Alternatives.
- The alternative(s) that fared best against the detailed criteria in the Detailed Evaluation step have been identified as Preferred Alternative(s) and will be further refined in the third step ("Refine LPA/Small Starts Analysis"). The Locally Preferred Alternative (LPA) will be identified at the conclusion of the third step.

The evaluation criteria associated with each step are a combination of quantitative and qualitative performance measures. The Tier 1 Analysis phase has applied fewer and broader measures, including information from previous corridor studies. The Detailed Evaluation phase applied more and finer performance measures, and the third step will evaluate the Preferred Alternative(s) against federal criteria to determine the Locally Preferred Alternative (LPA).

1.1 Results of the Tier 1 Analysis

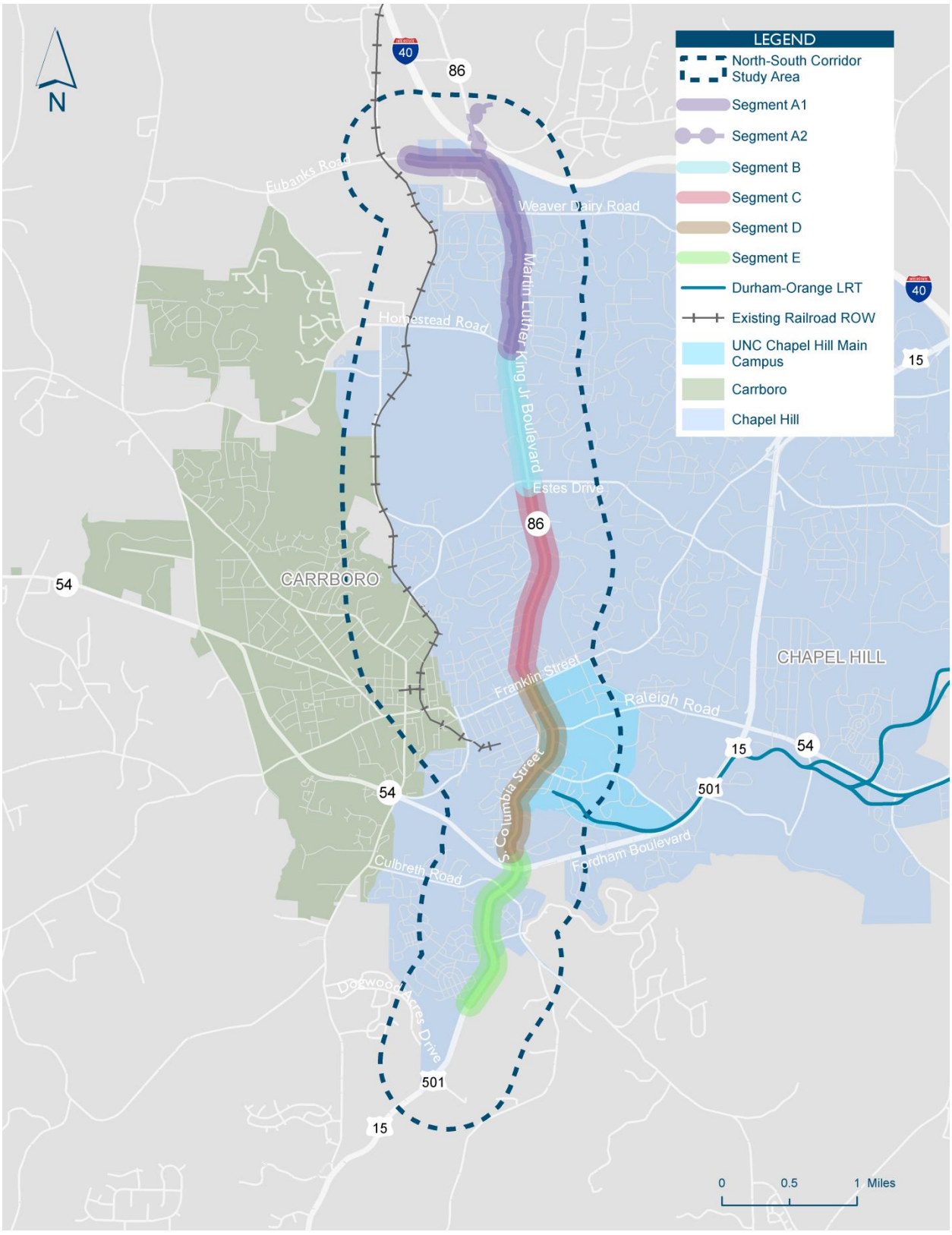
The Tier 1 Analysis was structured to efficiently identify the alternatives that do not meet the project purpose and need or goals and objectives, and to remove them from further consideration in future phases of the project. This initial level of screening focused on two areas:

- Transit modes
  - No Build (existing system), BRT Low, BRT High, Streetcar, Light Rail, Commuter Rail
- Alignments
  - Segments A1/2 through E and Rail ROW 1 and 2, as shown in Table 1-1 and Figure 1-1.

Table 1-1: Chapel Hill Tier 1 Corridor Segment Boundaries

Corridor Segment	Boundaries
Segment A1	Existing Eubanks P&R to Homestead Road along Martin Luther King, Jr. Boulevard
Segment A2	Relocated P&R (east of I-40) to Homestead Road along Martin Luther King, Jr. Boulevard
Segment B	Homestead Road to Estes Drive on Martin Luther King, Jr. Boulevard
Segment C	Estes Drive to Franklin Street to Martin Luther King, Jr. Boulevard
Segment D	Franklin Street to Fordham Boulevard along Columbia Street
Segment E	Fordham Boulevard to Dogwood Acres Drive on US 15-501
Rail ROW 1	Eubanks Road P&R to Franklin Street
Rail ROW 2	Franklin Street to Durham-Orange LRT end-of-line station

Figure 1-1: Tier 1 Corridor Segments



The analysis followed a two-step process: first, transit modes were subjected to evaluation; second, the alignments were subjected to evaluation.

This initial screening relied on readily available information and focused on high-level, qualitative assessment of modal and alignment options as a means to evaluate a comparatively large number of alternatives. In cases where there is not sufficient information to defer modes or alignments from further consideration, those options were recommended for continuation into the Detailed Definition and Evaluation phase of the project.

A series of evaluation criteria were developed to assess each alternative's ability to meet the stated project purpose and need, and its ability to ultimately be competitive for federal funding. Each of the modal and alignment options were evaluated against the criteria and rated as "pass" or "not pass."

The performance of the alternatives against each evaluation criteria was then aggregated, and an overall assessment of "pass" or "defer" was assigned to each alternative. An alternative that received one or more "not pass" rankings was assigned an overall assessment of "defer." An overall assessment of "defer" means that the mode or alignment does not meet the stated purpose and need for the North-South Corridor Study and will not be carried forwarded into more detailed definition and evaluation project phases, but may meet the needs of future studies conducted in the area and region.

1.1.1 Modes Recommended for Detailed Definition and Evaluation

The results of the Tier 1 Analysis (described in Section 1.1 of this report) recommended that the modes shown in Table 1-2 be carried into the Tier 2 Detailed Definition and Evaluation of Alternatives.

Table 1-2: Modes for Detailed Definition and Evaluation

Mode	Typical Characteristics	Example Service
No Build	• Mixed traffic operations • Frequent (10 minute) peak service; 30- to 60-minute service off-peak • Single (40-foot) and articulated (60-foot) low-floor, diesel buses • Stops spacing varies between ¼-mile and a half-mile • Stations vary between shelters and concrete pads	Chapel Hill, NC 
BRT Low	Substantial corridor-based investment that emulates rail fixed guideway service, including: • Defined stations • Traffic signal priority for transit vehicles • Frequent bidirectional service for a substantial part of weekday and weekend days • At the discretion of the FTA, any other features that support the transit investment (the majority of which does not operate in a separated right-of-way during peak periods) • Typical corridor length of five to 20 miles	Kansas City, MO MAX 

Mode	Typical Characteristics	Example Service
BRT High	• Exclusive bus lanes • Level boarding at high quality stations • 60-foot buses that have multiple doors, sleek styling, and onboard visual/automated next stop announcements • Wide stop spacing (typically one mile) and frequent, seven-day-a-week service • Branded service through use of a distinct name, logo, color scheme, bus wrap, and set of visual identifiers • Off-board fare payment • Signal priority • "Real time" bus arrival information available at stations and through web/mobile apps on desktop computer or smartphone • Typical corridor length of five to 20 miles	Cleveland, OH HealthLine 

1.1.2 Alignments Recommended for Detailed Definition and Evaluation

The results of the Tier 1 Analysis recommended that the following segments be carried into the Tier 2 Detailed Definition and Evaluation of Alternatives:

- Segment A (northern terminus to Homestead Road)
  - A1 (Eubank Road Park-and-Ride Lot to Homestead Road)
  - A2 (Potential Park-and-Ride Lot to Homestead Road)
- Segment B (Homestead Road to Estes Drive)
- Segment C (Estes Drive to North Street)
- Segment D (North Street to Purefoy Road)
- Segment E (Purefoy Road to Southern Village)

1.2 Alternatives for Detailed Definition

The key physical and service elements of the transit alternatives that advanced through the Tier 1 screening of the Chapel Hill North-South Corridor Study were refined and documented in the Detailed Definition of Alternatives report, which is summarized below and available under separate cover. The key characteristics used to define each detailed alternative included:

- Service plan
- Stop spacing
- Stop facilities
- Runningway
- Transit vehicles
- Technology and customer information
- Identity and branding
- Maintenance facility

The detailed alternatives are summarized below.

1.2.1 Detailed Mode Alternatives

The detailed mode alternatives, shown in Figures 1-2 through 1-5, included the No Build, BRT in Mixed Traffic, BRT in a Dedicated Side Lane, and BRT in a Dedicated Center Lane.

Figure 1-2: The No Build Alternative

Chapel Hill Transit, Chapel Hill, NC

The No Build Alternative assumes implementation of the Durham-Orange Light Rail Transit (LRT) project as part of the background transit service network. Bus service changes assumed in the Durham-Orange LRT project are also assumed in this project. The No-Build Alternative also assumes expansion of weekend Chapel Hill Transit (CHT) service by this project's horizon year (2040). This No Build assumes some expansion of Saturday service, and assumes Sunday service levels match proposed Saturday service levels.

Figure 1-3: BRT in Mixed Traffic

Silver Line, Boston, MA

The BRT in Mixed Traffic Alternative includes substantial changes to the service plan, vehicles and technology used within the North-South Corridor, but – like the current CHT service and the No Build Alternative – will operate in mixed traffic throughout the corridor.

Figure 1-4: BRT in a Dedicated Side Lane

Select Bus Service, New York, NY

The BRT in Dedicated Side Lane would include the service, vehicular, and technology improvements of the BRT in Mixed Traffic Alternative, but would operate in a curbside lane that is exclusively dedicated to transit service either at peak hour or 24 hours a day, seven days a week. Dedicated lane operations will offer many operational benefits, including reduced travel times, improved service reliability and reduced bus stacking.

Figure 1-5: BRT in a Dedicated Center Lane

Proposed Ashland Avenue BRT, Chicago, IL

Like the BRT in Dedicated Side Lane Alternative, the BRT in Dedicated Center Lane Alternative will operate in a lane that is exclusively dedicated to transit service either at peak hour or 24 hours a day, seven hours a week – but the BRT in Dedicated Center Lane Alternative will operate in a center-running (rather than side-running) lane.

1.2.2 Detailed Alignment Alternatives

As discussed in Section 1.1.2 of this report, the alignment options that were studied during the initial screening phase and recommended for detailed development:

- Segment A (northern terminus to Homestead Road)
  - A1 (Eubank Road Park-and-Ride Lot to Homestead Road)
  - A2 (Potential Park-and-Ride Lot to Homestead Road)
- Segment B (Homestead Road to Estes Drive)
- Segment C (Estes Drive to North Street)
- Segment D (North Street to Purefoy Road)
- Segment E (Purefoy Road to Southern Village)

For purposes of the detailed definition and evaluation phase, it was assumed that each mode alternative will maintain consistent runningway operations for the length of the corridor. For instance, the BRT in a Dedicated Side Lane will operate in a bus-only lane constructed along the curb from Segment A through Segment E. It is also assumed that dedicated lane operations could be either curb- or center-running, and those lanes could either be converted from existing traffic use or newly constructed.

The characteristics of each detailed alternative are summarized in Table 1-3 below.

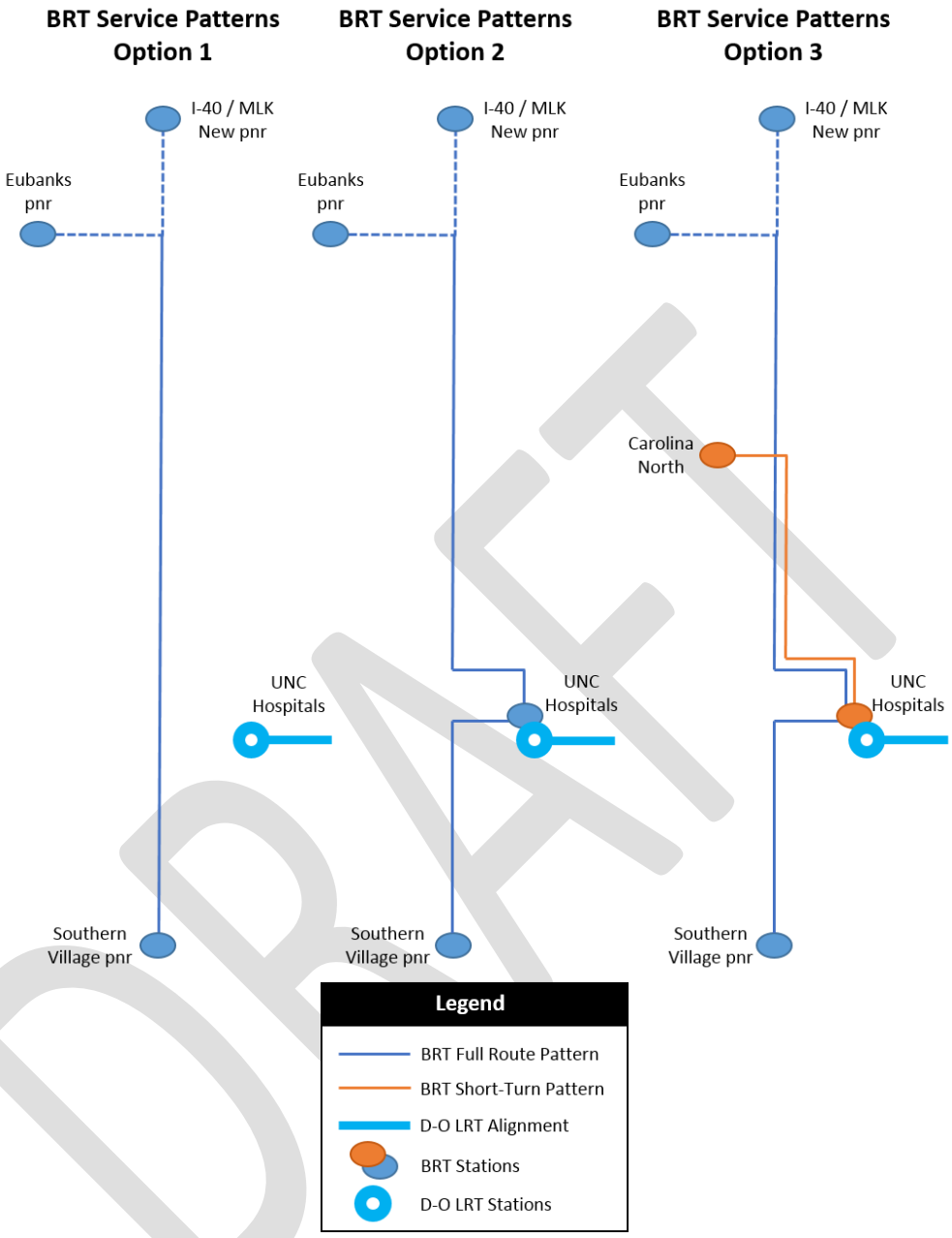
Table 1-3: Summary of Detailed Alternatives

	No Build	BRT in Mixed Traffic	BRT in Dedicated Side Lane	BRT in Dedicated Center Lane
Service Plan	Same as existing bus routes / services	Substantial increase in service levels throughout the week (i.e., more frequent weekday service and weekend service)		
Stop Spacing	No changes to existing stop location or spacing	Station locations altered to maximize ridership activity and community development impact. Fewer overall stations for rapid transit line. Stations generally spaced 1/2 mile to 1 mile apart. Underlying local bus service is present.		
Stop Facilities	No changes from existing	Station shelters and associated facilities to include level boarding, customer information, seating, and other features.		
Runningway	Operates in mixed traffic		Operates in dedicated side-running lane throughout corridor. A new dedicated lane could be constructed, or an existing traffic lane could be converted to transit-only use.	Operates in dedicated center-running lane throughout corridor. A new dedicated lane could be constructed, or an existing traffic lane could be converted to transit-only use.
Transit Vehicles	Uses existing 40-foot bus vehicles	Uses 40- or 60-foot articulated buses with right-door loading		Uses 40- or 60-foot articulated buses with right- and/or left-door loading
Technology/Customer Info	Uses existing technology and customer info	Integration of next-bus variable message signs at stations, online/mobile customer information, and traffic-signal priority for bus vehicles in the corridor		
Identity and Branding	No modifications to service branding	Unique identity and branding elements integrated into vehicles, stations and associated service materials		
Maintenance Facility	Utilizes existing maintenance facility			

Three service plans were developed for consideration along the North-South Corridor, as shown in Figure 1-6:

- **Service Plan Option 1** would operate a single BRT route pattern that operates from the northern end-of-line (either Eubanks Road park-and-ride lot or I-40/Martin Luther King, Jr. Boulevard park-and-ride lot) to the Southern Village park-and-ride lot. BRT buses would remain on the proposed BRT corridor (Martin Luther King, Jr. Boulevard, Columbia/Pittsboro Streets and US 15-501), with no direct connection into the UNC Hospitals campus.
- **Service Plan Option 2** also consists of a single BRT route pattern that would operate the service pattern described above, but will provide direct connection to the future UNC Hospitals Light Rail Transit (LRT) Station via Mason Farm Road and Manning Drive.
- **Service Plan Option 3** consists of two BRT route patterns – a full-length and a short-turn pattern. The full-length pattern would operate the same service pattern described in Option 2. The short-turn pattern would operate from UNC Hospitals Station to Carolina North, with buses deviating off of the corridor to a turnaround location within Carolina North.

Figure 1-6: Tier 2 Service Plan Options


BRT Service Patterns
Option 1
BRT Service Patterns
Option 2
BRT Service Patterns
Option 3
I-40 / MLK
New pnr
Eubanks
pnr
Carolina
North
UNC
Hospitals
Southern
Village pnr
Legend
BRT Full Route Pattern
BRT Short-Turn Pattern
D-O LRT Alignment
BRT Stations
D-O LRT Stations

1.3 Detailed Evaluation Criteria and Summary Results

A combination of quantitative and qualitative evaluation criteria were used to assess the degree to which each of the detailed alternatives meets project goals, as stated in the project Purpose and Need Statement.

For purposes of the detailed evaluation, the alternatives were divided into three elements: service plan options, service plan options combined with configurations (the combination of modes and runningways within a segment), and configurations by segment.

This three-part evaluation process facilitated a "mix-and-match" approach to the corridor, which means that different design elements could – based on their performance - be combined together to create the best-performing alternative along the length of the corridor.

Based on the results of the detailed evaluation phase, these design elements were combined to create one Preferred Alternative (with two variations) (described in Sections 5 and 6). The detailed evaluation criteria and summary results are shown in Tables 1-4 through 1-13 below. A summary of each alternative's performance against these criteria is presented in Sections 2 through 4 of this report; details of evaluation methodology and outcomes are included in the technical memos in Appendices 1 through 13.

Table 1-4: Summary Results: Evaluation by Service Plan Options

	Criteria Category / Metric		No Build	Service Plan 1	Service Plan 2	Service Plan 3
Goal 4	**Station area population and employment densities**					
		2010 population in proposed station areas	20,201	19,501	20,034	20,183
		2040 population in proposed station areas	39,937	36,445	39,799	40,578
		2010 employment in proposed station areas	31,822	30,825	31,768	32,012
		2040 employment in proposed station areas	47,311	39,874	47,142	41,670
Goal 5	**Households below poverty, minority populations, and zero-car households access to the transit network**					
		station area population below poverty	5,593	5,211	5,543	5,674
		percent of station area population that is below poverty	28%	27%	28%	28%
		minority station area population	6,513	5,949	6,445	6,572
		percent of station area population that is minority	32%	31%	32%	33%
		zero-car households in station areas	956	863	950	969
		percent of station area population that is zero-car	12%	9%	12%	12%
	Cultural/historic impacts					
		number of proximate cultural/historic resources	--	27	27	27
Goal 2	**Connectivity to the transit network**					
		number of station area transit transfer opportunities	--	120	103	129

Table 1-5: Summary Results: Evaluation by Configuration and Service Plans: Service Plan Option 1

Chapel Hill North-South Corridor Study: Summary of Detailed Evaluation of Alternatives - Configurations by Service Plan Options																											
	Criteria Category / Metric	No Build	Service Plan Option 1																								
			Mixed Traffic								Dedicated Lane																
											Dedicated Curbside Lane								Dediated Median Lane							
			No Traffic Signal Priority				With Traffic Signal Priority				Convert				Construct				Convert				Construct			
			2013		2040		2013		2040		2013		2040		2013		2040		2013		2040		2013		2040		
			Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	
Goal 1	**Ridership projections**																										
	total ridership	n/a	6,526	6,578	9,359	9,452	6,846	6,890	9,815	9,895	10,229	10,200	14,341	14,345	ridership the same for all dedicated lane configurations												
	other corridor routes	n/a	6,464	6,464	8,674	8,672	6,230	6,246	8,337	8,420	5,262	5,278	7,125	7,145	ridership the same for all dedicated lane configurations												
	new systemwide transit trips compared to the No Build	n/a	2,049	2,057	3,001	3,029	2,116	2,131	3,092	3,134	3,550	3,577	5,125	5,164	ridership the same for all dedicated lane configurations												
	ridership by transit dependents	n/a	232	246	442	459	249	251	487	491	452	449	763	760	ridership the same for all dedicated lane configurations												
Goal 2	**Safety impacts (2013)**																										
	reduced number of vehicular crashes compared to the No Build		--	--	--	--	--	--	--	--	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	
Goal 4	**Development Potential**																										
	potential to catalyze development within station areas	Low	Medium-low								Medium				Medium				Medium				Medium				
	Environmental impacts (2013)																										
	change in transportation energy usage (btu per year)	n/a	12,097	11,701	7,030	6,562	11,610	11,202	6,465	5,951	8,109	7,817	2,794	2,327	8,109	7,817	2,794	2,327	8,109	7,817	2,794	2,327	8,109	7,817	2,794	2,327	
	carbon monoxide impacts (kg per year)	n/a	-890	-1,599	-2,517	-3,253	-1,971	-2,707	-3,546	-4,366	-9,738	-10,217	-10,232	-10,967	-9,738	-10,217	-10,232	-10,967	-9,738	-10,217	-10,232	-10,967	-9,738	-10,217	-10,232	-10,967	
	mono-nitrogen oxides (kg per year)	n/a	3,568	3,509	345	328	3,510	3,449	325	306	3,088	3,041	195	178	3,088	3,041	195	178	3,088	3,041	195	178	3,088	3,041	195	178	
	volatile organic compounds (kg per year)	n/a	194	167	-15	-30	155	128	-36	-53	-123	-141	-173	-188	-123	-141	-173	-188	-123	-141	-173	-188	-123	-141	-173	-188	
	particulate matter (2.5) (kg per year)	n/a	206	204	7	7	205	204	6	6	201	199	--	-1	201	199	--	-1	201	199	--	-1	201	199	--	-1	
	greenhouse gases (carbon dioxide equivalents) (tons per year)	n/a	984	955	582	548	950	920	542	505	703	682	283	250	703	682	283	250	703	682	283	250	703	682	283	250	
	change in annual VMT automobile	n/a	-203,574	-245,014	-347,837	-418,803	-268,065	-311,059	-448,070	-527,324	-731,157	-758,870	-1,099,714	-1,170,680	-731,157	-758,870	-1,099,714	-1,170,680	-731,157	-758,870	-1,099,714	-1,170,680	-731,157	-758,870	-1,099,714	-1,170,680	
	change in annual VMT diesel bus	n/a	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	
	change in annual VMT hybrid bus	n/a	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	519,245	516,745	
Goal 6	**Operations and maintenance cost (systemwide costs)**	$500,896	$3,185,779	$3,348,297	--	--	$3,216,075	$3,263,043	--	--	$3,023,208	$3,196,926	--	--	$3,023,208	$3,196,926	--	--	$3,023,208	$3,196,926	--	--	$3,023,208	$3,196,926	--	--	
	Capital costs (2015 dollars)	--	$48.1 M	$57.7 M	--	--	$48.5 M	$54.6 M	--	--	$86.7 M	$90.9 M	--	--	$114.2 M	$122 M	--	--	$88.3 M	$92.6 M	--	--	$114.2 M	$122.8 M	--	--	

Table 1-6: Summary Results: Evaluation by Configuration and Service Plans: Service Plan Option 2

Chapel Hill North-South Corridor Study: Summary of Detailed Evaluation of Alternatives - Configurations by Service Plan Options																											
	Criteria Category / Metric	No Build	Service Plan Option 2																								
			Mixed Traffic								Dedicated Lane																
											Dedicated Curbside Lane								Dediated Median Lane							
			No Traffic Signal Priority				With Traffic Signal Priority				Convert				Construct				Convert				Construct			
			2013		2040		2013		2040		2013		2040		2013		2040		2013		2040		2013		2040		
			Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	
Goal 1	**Ridership projections**																										
	total ridership	n/a	6,115	6,311	8,884	9,163	6,436	6,741	9,319	9,705	10,334	10,413	14,483	14,716	ridership the same for all dedicated lane configurations												
	other corridor routes	n/a	6,413	6,633	8,529	8,660	6,321	6,442	8,418	8,408	5,234	5,501	7,084	7,219	ridership the same for all dedicated lane configurations												
	new systemwide transit trips compared to the No Build	n/a	1,844	1,606	2,726	2,364	2,043	1,826	2,996	2,671	3,586	3,513	5,153	5,006	ridership the same for all dedicated lane configurations												
	ridership by transit dependents	n/a	254	332	494	613	254	332	500	610	480	561	809	955	ridership the same for all dedicated lane configurations												
Goal 2	**Safety impacts**																										
	reduced number of vehicular crashes compared to the No Build		--	--	--	--	--	--	--	--	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	
Goal 4	**Development Potential**																										
	potential to catalyze development within station areas	Low	Medium								Medium-high				Medium-high				Medium-high				Medium-high				
	Environmental impacts																										
	change in transportation energy usage (btu per year)	n/a	13,597	14,438	8,524	9,257	12,876	13,841	7,679	8,637	10,157	10,541	4,706	5,061	10,157	10,541	4,706	5,061	10,157	10,541	4,706	5,061	10,157	10,541	4,706	5,061	
	carbon monoxide impacts (kg per year)	n/a	-82	1,961	-1,530	-74	-1,681	637	-3,069	-1,203	-7,714	-6,686	-8,485	-7,716	-7,714	-6,686	-8,485	-7,716	-7,714	-6,686	-8,485	-7,716	-7,714	-6,686	-8,485	-7,716	
	mono-nitrogen oxides (kg per year)	n/a	3,923	4,012	405	430	3,836	3,940	375	408	3,509	3,543	269	281	3,509	3,543	269	281	3,509	3,543	269	281	3,509	3,543	269	281	
	volatile organic compounds (kg per year)	n/a	242	314	9	39	185	267	-22	16	-31	5	-133	-118	-31	5	-133	-118	-31	5	-133	-118	-31	5	-133	-118	
	particulate matter (2.5) (kg per year)	n/a	224	224	9	11	223	223	8	10	219	219	3	3	219	219	3	3	219	219	3	3	219	219	3	3	
	greenhouse gases (carbon dioxide equivalents) (tons per year)	n/a	1,101	1,160	697	748	1,051	1,118	637	704	859	885	428	452	859	885	428	452	859	885	428	452	859	885	428	452	
	change in annual VMT automobile	n/a	-168,350	-45,584	-262,108	-119,399	-263,662	-124,579	-412,069	-229,474	-623,413	-561,253	-939,911	-864,283	-623,413	-561,253	-939,911	-864,283	-623,413	-561,253	-939,911	-864,283	-623,413	-561,253	-939,911	-864,283	
	change in annual VMT diesel bus	n/a	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	
	change in annual VMT hybrid bus	n/a	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	556,445	553,845	
Goal 6	**Operations and maintenance cost (systemwide costs)**	$500,896	$3,795,290	$3,788,284	--	--	$3,425,769	$3,537,738	--	--	$3,364,289	$3,368,484	--	--	$3,364,289	$3,368,484	--	--	$3,364,289	$3,368,484	--	--	$3,364,289	$3,368,484	--	--	
	Capital costs (2015 dollars)	--	$55.5 M	$61.6 M	--	--	$53.8 M	$59.9 M	--	--	$84.7 M	$87.1 M	--	--	$128.7 M	$134.4 M	--	--	$97.6 M	$100.1 M	--	--	$127 M	$133.8 M	--	--	

Table 1-7: Summary Results: Evaluation by Configuration and Service Plans: Service Plan Option 3

Chapel Hill North-South Corridor Study: Summary of Detailed Evaluation of Alternatives - Configurations by Service Plan Options																									
	Criteria Category / Metric	No Build	Service Plan Option 3																						
			Mixed Traffic								Dedicated Lane														
											Dedicated Curbside Lane								Dediated Median Lane						
			No Traffic Signal Priority				With Traffic Signal Priority				Convert				Construct				Convert				Construct		
			2013		2040		2013		2040		2013		2040		2013		2040		2013		2040		2013		2040	
			Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B	Option A	Option B
Goal 1	**Ridership projections**																								
	total ridership		5,788	6,300	8,376	9,109	6,303	6,311	9,080	9,142	10,209	10,226	14,316	14,441	ridership the same for all dedicated lane configurations										
	other corridor routes		6,613	6,621	8,860	8,701	6,271	6,618	8,386	8,659	5,234	5,523	7,086	6,678	ridership the same for all dedicated lane configurations										
	new systemwide transit trips compared to the No Build		1,741	1,577	2,576	2,332	1,887	1,680	2,773	2,494	3,531	3,414	5,073	4,873	ridership the same for all dedicated lane configurations										
	ridership by transit dependents		242	333	457	614	271	334	513	614	476	537	798	916	ridership the same for all dedicated lane configurations										
Goal 2	**Safety impacts**																								
	reduced number of vehicular crashes compared to the No Build	n/a	--	--	--	--	--	--	--	--	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Goal 4	**Development Potential**																								
	potential to catalyze development within station areas	Low	Medium-high								High				High				High				High		
	Environmental impacts																								
	change in transportation energy usage (btu per year)	n/a	13,804	14,404	8,728	8,970	13,383	14,218	8,266	9,284	10,413	10,616	4,974	5,183	10,413	10,616	4,974	5,183	10,413	10,616	4,974	5,183	10,413	10,616	4,974	5,183
	carbon monoxide impacts (kg per year)	n/a	174	1,655	-1,298	-755	760	1,243	-2,141	-183	-7,349	-6,749	-8,136	-7,653	-7,349	-6,749	-8,136	-7,653	-7,349	-6,749	-8,136	-7,653	-7,349	-6,749	-8,136	-7,653
	mono-nitrogen oxides (kg per year)	n/a	3,962	4,024	413	421	3,911	4,001	396	432	3,554	3,568	279	286	3,554	3,568	279	286	3,554	3,568	279	286	3,554	3,568	279	286
	volatile organic compounds (kg per year)	n/a	253	305	14	25	220	290	-3	37	-16	4	-126	-116	-16	4	-126	-116	-16	4	-126	-116	-16	4	-126	-116
	particulate matter (2.5) (kg per year)	n/a	226	225	10	10	225	225	9	11	221	220	3	3	221	220	3	3	221	220	3	3	221	220	3	3
	greenhouse gases (carbon dioxide equivalents) (tons per year)	n/a	1,117	1,158	712	729	1,087	1,145	679	751	878	892	448	462	878	892	448	462	878	892	448	462	878	892	448	462
	change in annual VMT automobile	n/a	-154,105	-65,009	-240,352	-131,054	-209,790	-89,614	-322,455	-186,739	-602,693	-566,174	-906,759	-859,103	-602,693	-566,174	-906,759	-859,103	-602,693	-566,174	-906,759	-859,103	-602,693	-566,174	-906,759	-859,103
	change in annual VMT diesel bus	n/a	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311	-86,311
	change in annual VMT hybrid bus	n/a	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245	559,445	557,245
Goal 6	**Operations and maintenance cost (systemwide costs)**	$500,896	$4,152,085	$4,146,157	--	--	$3,913,951	$3,919,224	--	--	$3,721,084	$3,759,415	--	--	$3,721,084	$3,759,415	--	--	$3,721,084	$3,759,415	--	--	$3,721,084	$3,759,415	--	--
	Capital costs (2015 dollars)	--	$59.8 M	$65.9 M	--	--	$58.1 M	$64.2 M	--	--	$90.8 M	$93.2 M	--	--	$134.8 M	$140.5 M	--	--	$103.7 M	$106.2 M	--	--	$133.1 M	$139.9 M	--	--

Table 1-8: Summary Results: Evaluation of Segment and Configuration: Segment A1

Segment A1										
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts (LOS Impacts)**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	NC 86 (Martin Luther King Jr Blvd) at I-40 WB Off Ramp	D	D	--	D	D	D	D	D	E	D	D
	NC 86 (Martin Luther King Jr Blvd) at I-40 EB Off Ramp	E	C	--	D	C	D	C	D	C	D	C
	NC 86 (Martin Luther King Jr Blvd) at SR 1727 (Eubanks Rd)	F	F	--	F	F	F	F	F	F	F	F
	NC 86 (Martin Luther King Jr Blvd) at Weaver Dairy Rd / Ext	D	F	--	F	F	D	F	F	F	D	F
	Parking impacts											
	number of on-street parking spaces removed	NA		0	0		0		0		0	

Table 1-9: Summary Results: Evaluation of Segment and Configuration: Segment A2

Segment A2												
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts *Same as Segment A1**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	NC 86 (Martin Luther King Jr Blvd) at I-40 WB Off Ramp	D	D	--	F	F	D	D	F	F	D	D
	NC 86 (Martin Luther King Jr Blvd) at I-40 EB Off Ramp	E	C	--	F	F	D	C	F	F	D	C
	NC 86 (Martin Luther King Jr Blvd) at SR 1727 (Eubanks Rd)	F	F	--	F	F	F	E	F	F	F	F
	NC 86 (Martin Luther King Jr Blvd) at Weaver Dairy Rd / Ext	D	F	--	F	F	D	F	F	F	D	F
	Parking impacts											
	number of on-street parking spaces removed	NA		0	0		0		0		0	

**0 = no impact, 1 = some positive impact, 2 = significant positive impact*

Table 1-10: Summary Results: Evaluation of Segment and Configuration: Segment B

Segment B												
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	LOS impacts	D	C	--	F	F	D	C	F	F	D	C
	Parking impacts											
	number of on-street parking spaces removed	NA		0	0		0		0		0	

**0 = no impact, 1 = some positive impact, 2 = significant positive impact*

Table 1-11: Summary Results: Evaluation of Segment and Configuration: Segment C

Segment C												
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	LOS impacts	F	F	--	F	F	F	F	F	F	F	F
	Parking impacts											
	number of on-street parking spaces removed	NA		0	0		0		0		0	

**0 = no impact, 1 = some positive impact, 2 = significant positive impact*

Table 1-12: Summary Results: Evaluation of Segment and Configuration: Segment D

Segment D												
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	NC 86 (N Columbia St) at E / W Rosemary St	C	D	--	D	E	D	E	D	E	D	E
	NC 86 (N / S Columbia St) at E / W Franklin St	D	D	--	D	E	D	E	D	F	D	F
	NC 86 (S Columbia St) at E / W Cameron Ave	E	D	--	E	E	E	E	F	F	E	E
	NC 86 (W Cameron St) at NC 86 (Pittsboro St)	C	C	--	E	E	E	D	E	E	E	D
	NC 86 (Columbia St) at McCauley St / South Rd	D	D	--	C	D	D	D	C	E	C	E
	NC 86 (Columbia St) at Manning Dr	D	D	--	D	D	D	D	D	D	D	D
	NC 86 (Columbia St) at Westwood Dr / Mason Farm Rd	C	D	--	C	D	C	D	C	D	C	D
	Parking impacts											
	number of on-street parking spaces removed	NA		0	13		13		5		5	

**0 = no impact, 1 = some positive impact, 2 = significant positive impact*

Table 1-13: Summary Results: Evaluation of Segment and Configuration: Segment E

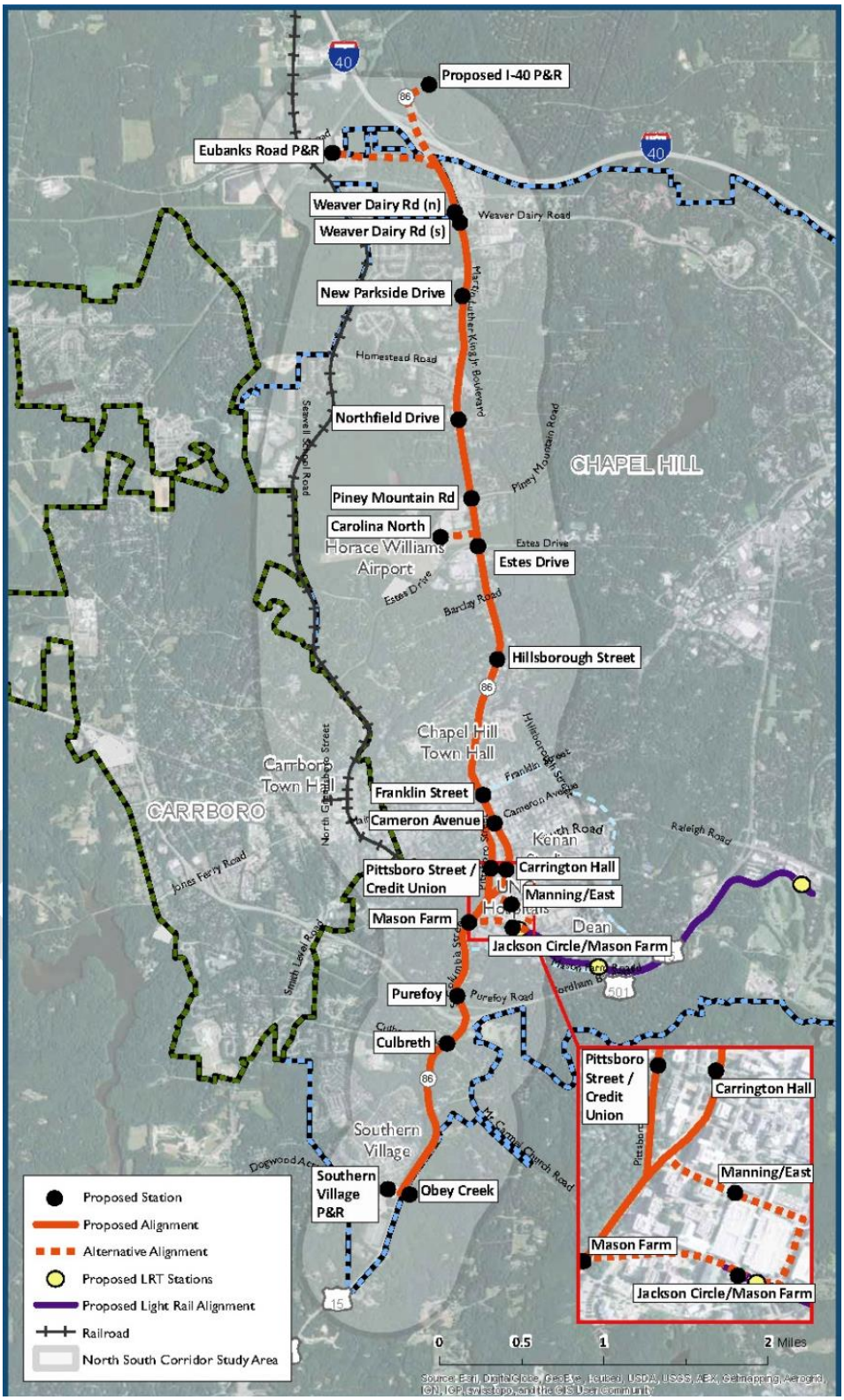
Segment E												
	Criteria Category / Metric	No Build		Mixed Traffic	Dedicated Curbside Lane				Dedicated Median Lane			
					Convert		Construct		Convert		Construct	
Goal 2	**Bicycle and pedestrian mobility impacts**											
	impacts on existing bike and ped facilities*	0		1	2		2		1		1	
	compliance with bike and ped plans	no		yes	yes		yes		yes		yes	
Goal 3	**Traffic impacts**	**AM**	**PM**	--	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
	NC 86 (Columbia St) at NC 54 WB Off Ramp	C	F	--	F	F	C	F	F	F	C	F
	US 15 / 501 at NC 54 EB Off Ramp	C	D	--	F	F	C	D	F	F	C	D
	US 15 / 501 at SR 1008 (Mt Carmel Church Rd) / Culbreth Rd	F	D	--	F	F	F	D	F	F	F	D
	US 15 / 501 at Market St	C	D	--	F	F	C	D	F	D	C	D
	Parking impacts											
	number of on-street parking spaces removed	NA		0	0		0		0		0	

**0 = no impact, 1 = some positive impact, 2 = significant positive impact*

2. Evaluation of Service Plan Options

During the Detailed Evaluation of Alternatives, the three service plan options were assessed to determine how each would fare against the criteria listed in Table 1-3. A summary of each service plan option's performance against the criteria is in Sections 2.1 through 2.4 of this report; additional details can be found in the report appendices. The alignment and potential station locations option are shown in Figure 2-1.

Figure 2-1: Station Locations for Detailed Evaluation



2.1 Station Area Population and Employment

Background and Methodology: When developing proposed station locations, consideration is given to the amount of development that exists along the corridor, specifically the quantity of population, housing units, and employment within a half-mile radius of each station. Higher levels of population and employment near stations generally correspond to utilization of service, and these are also key rating factors used by the Federal Transit Administration (FTA) when evaluating projects for their Small Starts program. Small Starts is an annual, competitive capital investment program that provides funding for fixed guideway investments, including BRT, which have a total estimated capital cost of less than $300 million and are seeking less than $100 million in Small Starts funds. Projects can receive up to 80 percent of their capital funding (or $100 million) through the Small Starts program.

Data on existing and future population and employment was provided by the U.S. Census and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization.

Evaluation Outcomes: Table 2-1 shows the estimated population and employment surrounding each station location for the existing (2010) and the future (2040) years. The population is spread fairly evenly throughout the corridor, with a greater number of people living near the town center. Population is anticipated to grow in and around the stations in the town center and near the University of North Carolina (UNC) campus. These station locations are highlighted in the table below. In contrast, employment is not spread evenly throughout the corridor; instead it is concentrated around the UNC campus. This trend is anticipated to continue through 2040, with the greatest number of jobs located near UNC and significantly fewer along the northern and southern portions of the corridor.

Additional details can be found in Technical Memorandum 1 in the appendices.

Table 2-1: Station Area Population and Employment, 2010 and 2040

Station	Service Plan Options Included	Population		Employment	
		2010	2040	2010	2040
Potential I-40 P&R	1, 2, 3	905	2,075	264	1,729
Eubanks P&R	1, 2, 3	2,040	3,714	203	2,672
Weaver Dairy Road (n)	1, 2, 3	3,317	5,671	1,232	4,786
Weaver Dairy Road (s)	1, 2	3,333	5,590	1,208	4,759
New Parkside Drive	1, 2	3,733	5,613	985	3,506
Northfield Drive	1, 3	3,689	5,832	425	2,759
Carolina North	UNC	911	1,648	1,029	2,876
Piney Mountain Road	1, 2, 3, UNC	1,529	2,622	375	1,476
Estes Drive	1, 2, 3, UNC	3,234	4,781	1,491	3,279
Hillsborough Street	1, 2, 3, UNC	4,301	6,181	1,718	3,264
Franklin Street	**1, 2, 3, UNC**	**6,078**	**14,688**	**22,440**	**27,792**
Cameron Avenue	**1, 2, 3, UNC**	**2,606**	**9,438**	**19,136**	**22,921**

Station	Service Plan Options Included	Population		Employment	
		2010	2040	2010	2040
Pittsboro Street/Credit Union	**1, 2, 3, UNC**	**3,427**	**11,962**	**25,616**	**32,126**
Carrington Hall	**1, 2, 3, UNC**	**2,650**	**11,127**	**25,482**	**31,504**
Manning/East	**UNC**	**2,070**	**8,242**	**18,170**	**22,756**
Jackson Circle / Mason Farm	**UNC**	**2,070**	**8,242**	**18,170**	**22,756**
Mason Farm	**1**	**2,873**	**9,672**	**21,523**	**26,531**
Culbreth	1, 2, 3, UNC	1,997	2,347	615	1,186
Purefoy	1, 2	4,232	5,025	3,829	5,942
Obey Creek	1, 2, 3	2,098	2,324	532	854
Southern Village P&R	1, 2, 3	2,098	2,324	532	854

2.2 Station Area Population: Households below Poverty, Minority Population, and Zero-Car Households

Background and Methodology: Access to proposed transit projects by households living below poverty, minority populations, and zero-car household population is also an important consideration in the federal funding and approvals process. Data from the American Community Survey 2007-2011 and 2009-2013 five-year estimates were used to identify the station area households living below poverty, minority populations, and zero-car household populations.

Evaluation Outcomes: The population living below poverty and zero-car households tend to be concentrated in the middle of the corridor, near the town center and the UNC campus (shown highlighted in the table below). This higher percentage of population below poverty and zero-car households is consistent with a higher number of students who live in the area and are more likely to be unemployed and not own a car. The share of population living below poverty is greatest (72 percent) at the Manning/East and Jackson Circle / Mason Farm stations, and one-third of people within a half-mile of these stations also do not own a car. The minority population is fairly evenly distributed throughout the corridor, averaging about 20 percent.

A summary of the analysis is shown in Table 2-2; additional details can be found in Technical Memorandum 2 in the appendices.

Table 2-2: Station Area Population below Poverty, Minority, and Zero-Car Households

Station	Service Plan Options Included	2010 Population	Average Low-Income Pop %	Average Minority Pop %	Average Zero-Car Household %
Potential I-40 P&R	1, 2, 3	905	5%	21%	4%
Eubanks P&R	1, 2, 3	2,040	8%	19%	3%
Weaver Dairy Road (n)	1, 2, 3	3,317	3%	26%	5%
Weaver Dairy Road (s)	1, 2	3,333	3%	26%	5%
New Parkside Drive	1, 2	3,733	4%	34%	6%
Northfield Drive	1, 3	3,689	23%	28%	7%
Carolina North	UNC	911	28%	19%	5%
Piney Mountain Road	1, 2, 3, UNC	1,529	24%	21%	6%
Estes Drive	1, 2, 3, UNC	3,234	28%	19%	5%
Hillsborough Street	1, 2, 3, UNC	4,301	37%	24%	10%
Franklin Street	**1, 2, 3, UNC**	**6,078**	**54%**	**20%**	**22%**
Cameron Avenue	**1, 2, 3, UNC**	**2,606**	**54%**	**20%**	**22%**
Pittsboro Street/Credit Union	**1, 2, 3, UNC**	**3,427**	**60%**	**23%**	**27%**
Carrington Hall	**1, 2, 3, UNC**	**2,650**	**62%**	**21%**	**27%**
Manning/East	**UNC**	**2,070**	**72%**	**21%**	**33%**
Jackson Circle / Mason Farm	**UNC**	**2,070**	**72%**	**21%**	**33%**
Mason Farm	**1**	**2,873**	**58%**	**26%**	**25%**
Culbreth	1, 2, 3, UNC	1,997	17%	25%	3%
Purefoy	1, 2	4,232	29%	23%	11%
Obey Creek	1, 2, 3	2,098	11%	23%	1%
Southern Village P&R	1, 2, 3	2,098	10%	22%	2%

2.3 Cultural / Historic Impacts

Background and Methodology: One of the goals in accommodating the increased travel demand throughout the North-South Corridor is to improve access to activity centers, such as cultural and historic resources, while also minimizing any negative impacts a new transit line could have on those resources.

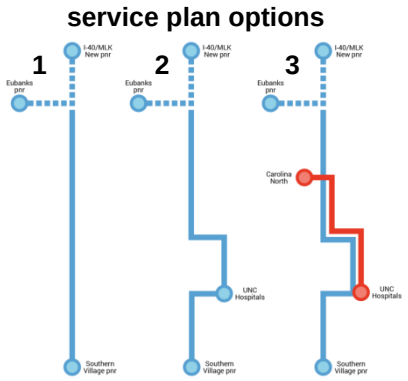
An analysis of the study corridor was conducted to determine the cultural and historic resources that are within a half-mile of the proposed service plan options, including attractions such as museums, performance venues, stadiums, and historic districts and buildings. A list of cultural resources was

compiled from various sources including the National Register of Historic Place and Visit Chapel Hill, as well as Google Maps and input from stakeholders.

Evaluation Outcomes: There are several cultural and historic resources within a half-mile of all three of the service plan options, as shown in Table 2-3. Due to the geographic similarity of the three service plan options, one does not provide a strong advantage over another in terms of providing access to cultural resources, and none are anticipated to negatively impact existing cultural and historic resources. Additional details can be found in Technical Memorandum 3 in the appendices.

Table 2-3: Cultural and Historic Resources

Service Plan Option	Number of Cultural Resources
1	27
2	27
3	27



2.4 Connectivity to the Transit Network

Background and Methodology: When developing proposed service plan options and station locations, consideration was given to the number of available connections to existing transit service because a purpose of the transit investment is to increase connectivity both within the corridor and throughout the region.

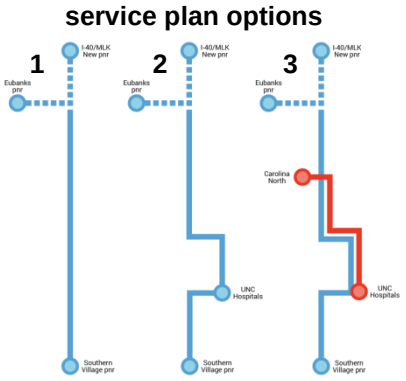
The evaluation of transit connectivity was conducted via a desktop review. Data for existing transit lines were made available by Chapel Hill Transit. The data was analyzed using ArcGIS through the following steps.

- Every transit line within a half-mile of each proposed station location was inventoried.
- The number of routes within a half-mile was recorded, along with the route name.

Evaluation Outcomes: As shown in Table 2-4, Service Plan Option 3 performs best against this evaluation criterion because it accommodates the greatest number of transfers to other existing transit routes. Connecting with other transit routes will contribute to corridor and regional transit connectivity. Additional detail can be found in Technical Memorandum 4 in the appendices.

Table 2-4: Connectivity to the Transit Network

Service Plan Option	Number of Transit Connections
1	120
2	105
3	129



3. Evaluation of Service Plan Options by Configuration

During the Detailed Evaluation of Alternatives, the three service plan options by runningway configuration (mixed traffic or dedicated lane) were assessed to determine how each would fare against the criteria listed in Table 1-4 through 1-6. A summary of each service plan option's performance against the criteria is in Sections 3.1 through 3.6 of this report; additional detail can be found in the report appendices.

3.1 Ridership Projections

Background and Methodology: To estimate trips on the proposed BRT system, the project team utilized the FTA national model, Simplified Trips-on-Project Software (STOPS). The STOPS model is designed to estimate transit project ridership using a streamlined set of procedures. STOPS includes many of the same computations of transit level-of-service and market share found in regional travel demand models. STOPS produces all of the reporting needed by project sponsors to review ridership forecasts in detail and to support grant applications to the FTA New and Small Starts program.

The project team evaluated 18 alternatives as part of the first round of the North-South Corridor Study. There were three service plan options with two northern termini options each (1A, 1B, 2A, 2B, 3A, and 3B) and three scenarios - BRT in a dedicated lane, BRT in mixed traffic with Transit Signal Priority (TSP), and BRT in mixed traffic with no TSP. Each was evaluated for performance.

Evaluation Outcomes: The first round of existing (2013) ridership results are shown in Table 3-1. BRT in dedicated lanes generated significantly higher ridership than BRT in mixed traffic in all three service plan options.

Additional detail (including 2040 ridership projections) can be found in Technical Memorandum 5 in the appendices.

Table 3-1: 2013 Ridership Forecasts: Service Plan Option 1

	To Eubanks Road P&R			To Potential I-40 P&R		
	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP
Total BRT Ridership	**10,229**	**6,846**	**6,526**	**10,200**	**6,890**	**6,578**
Transit-dependent riders	452	249	232	449	251	246
Other corridor routes	5,262	6,230	6,464	5,278	6,246	6,464
New riders systemwide	3,570	2,116	2,049	3,577	2,131	2,057

Table 3-2: 2013 Ridership Forecasts: Service Plan Option 2

	To Eubanks Road P&R			To Potential I-40 P&R		
	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP
Total BRT Ridership	**10,334**	**6,436**	**6,115**	**10,413**	**6,741**	**6,311**
Transit-dependent riders	480	254	254	561	332	332
Other corridor routes	5,234	6,321	6,413	5,501	6,442	6,633
New riders systemwide	3,586	2,043	1,844	3,513	1,826	1,606

Table 3-3: 2013 Ridership Forecasts: Service Plan Option 3

	To Eubanks Road P&R			To Potential I-40 P&R		
	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP	BRT in Dedicated Lane	BRT in Mixed Traffic – with TSP	BRT in Mixed Traffic – no TSP
Total BRT Ridership	**10,209**	**6,303**	**5,788**	**10,226**	**6,311**	**6,300**
Transit-dependent riders	476	271	242	537	334	333
Other corridor routes	5,234	6,271	6,613	5,523	6,618	6,621
New riders systemwide	3,531	1,887	1,741	3,414	1,680	1,577

3.2 Environmental and Safety Impacts

Background and Methodology: Each of the alternatives were evaluated for the impact that it would have on regional air quality pollutants, energy use, greenhouse gas emissions and safety, by applying the FTA formulas for evaluating New Starts and Small Starts projects on these elements. This methodology incorporates the change in distance traveled by automobiles and transit vehicles. The factors used to quantify these impacts are dependent upon the transit vehicle type, e.g. diesel buses, hybrid buses, compressed natural gas (CNG). The North-South Corridor is proposed to be served by an all hybrid-diesel bus fleet.

Evaluation Outcomes: The values shown in Tables 3-4 through 3-6 are the change in each impact compared to the No Build Alternative, with a negative value being a reduction. Dedicated Lane operations generate the largest reductions in emissions. Additional detail can be found in Technical Memorandum 6 in the appendices.

service plan options

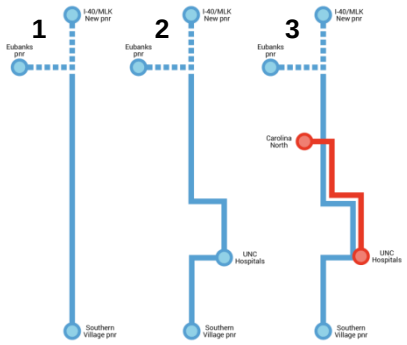


Table 3-4: Service Plan Option 1: 2013 Environmental Impacts

	Mixed Traffic - No Traffic Signal Priority		Mixed Traffic - Traffic Signal Priority		Dedicated Lane	
	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R
Safety: reduced fatalities	--	--	--	--	-0.01	-0.01
Transportation energy usage (btu per year)	+12,097	+11,701	+11,610	+11,202	+8,109	+7,817
Carbon monoxide impacts (kg per year)	-890	-1,599	-1,971	-2,707	-9,738	-10,217
Mono-nitrogen oxides (kg per year)	+3,568	+3,509	+3,510	+3,449	+3,088	+3,041
Volatile organic compounds (kg per year)	+194	+167	+155	+128	-123	-141
Particulate matter (2.5) (kg per year)	+206	+204	+205	+204	+201	+199
Greenhouse gases (carbon dioxide equivalents) (tons per year)	+984	+955	+950	+920	+703	+682

Table 3-5: Service Plan Option 2: 2013 Environmental Impacts

	Mixed Traffic - No Traffic Signal Priority		Mixed Traffic - Traffic Signal Priority		Dedicated Lane	
	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R
Safety: reduced fatalities	--	--	--	--	-0.01	-0.01
Transportation energy usage (btu per year)	+13,597	+14,438	+12,876	+13,841	+10,157	+10,541
Carbon monoxide impacts (kg per year)	-82	+1,961	-1,681	+637	-7,714	-6,686
Mono-nitrogen oxides (kg per year)	+3,923	+4,012	+3,836	+3,940	+3,509	+3,543

	Mixed Traffic - No Traffic Signal Priority		Mixed Traffic - Traffic Signal Priority		Dedicated Lane	
	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R
Volatile organic compounds (kg per year)	+242	+314	+185	+267	-31	+5
Particulate matter (2.5) (kg per year)	+224	+224	+223	+223	+219	+219
Greenhouse gases (carbon dioxide equivalents) (tons per year)	+1,101	+1,160	+1,051	+1,118	+859	+885

Table 3-6: Service Plan Option 3: 2013 Environmental Impacts

	Mixed Traffic - No Traffic Signal Priority		Mixed Traffic - Traffic Signal Priority		Dedicated Lane	
	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R	To Eubanks P&R	To I-40 P&R
Safety: reduced fatalities	--	--	--	--	-0.01	-0.01
Transportation energy usage (btu per year)	+13,804	+14,404	+13,383	+14,218	+10,413	+10,616
Carbon monoxide impacts (kg per year)	+174	+1,655	+760	+1,243	-7,349	-6,749
Mono-nitrogen oxides (kg per year)	+3,962	+4,024	+3,911	+4,001	+3,554	+3,568
Volatile organic compounds (kg per year)	+253	+305	+220	+290	-16	+4
Particulate matter (2.5) (kg per year)	+226	+225	+225	+225	+221	+220
Greenhouse gases (carbon dioxide equivalents) (tons per year)	+1,117	+1,158	+1,087	+1,145	+878	+892

3.3 Development Potential

Background and Methodology: An evaluation measure for the North-South Corridor Study is the ability to foster economic development within the corridor that is consistent with both transit-oriented development (TOD) principles as well as existing adopted plans from local municipalities and institutions. This evaluation measure is consistent with criteria examined by the FTA when rating potential projects for funding eligibility.

Evaluation Outcomes: Based on research from the FTA and the experience of other communities, the potential for economic development in a proposed transit station area can be assessed by examining planning and policy support, existing or projected future market demand, and underutilized opportunity sites. The results of the analysis are shown in Table 3-7 below; dedicated lane operations are more likely than mixed traffic operations to catalyze development within a station area.

Additional detail can be found in Technical Memorandum 7 in the appendices.

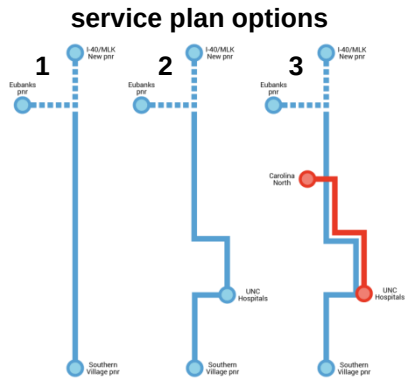
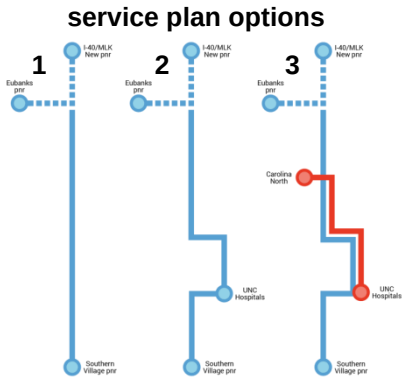


Table 3-7: Development Potential

Service Plan Option	Service Plan Option 1		Service Plan Option 2		Service Plan Option 3	
	Mixed Traffic	Dedicated Lane	Mixed Traffic	Dedicated Lane	Mixed Traffic	Dedicated Lane
Potential to catalyze development within station areas (average)	Medium-Low	Medium	Medium	Medium-High	Medium-High	High

3.4 Operations and Maintenance Cost

Background and Methodology: The annual cost to operate, maintain and administer BRT service on the North-South Corridor was estimated and expressed as the annual total of employee earnings and fringe benefits, contract services, materials and supplies, utilities and other day-to-day expenses incurred for operation and maintenance of the BRT service. The methodology used to calculate these estimates is consistent with FTA guidelines. The approach used a fully-allocated spreadsheet cost model format to identify differences in costs by mode and service type. Each expense incurred is "driven" by a key supply variable such as revenue hours, revenue miles or the number of peak vehicles. O&M cost data was combined with service supply statistics to establish unit costs and productivity ratios. Existing bus unit costs was adjusted as appropriate to account for potential differences in BRT operations.



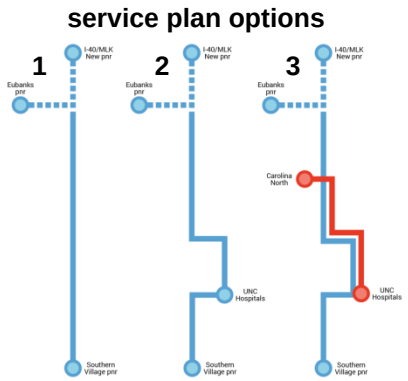
Evaluation Outcomes: Results of the analysis are shown in Table 3-8; note that the costs for the Build options reflect the cost in addition to the No Build. Additional detailed can be found in Technical Memorandum 8 in the appendices.

Table 3-8: Operating and Maintenance Cost Estimates

Service Plan Option	Mixed Traffic No TSP	Mixed Traffic with TSP	Dedicated Lane with TSP
No Build	$500,896		
1A – to Eubank P&R	$3,185,779	$3,216,075	$3,023,208
1B – to I-40 P&R	$3,348,297	$3,263,043	$3,196,926
2A – to Eubank P&R	$3,795,290	$3,425,769	$3,364,289
2B – to I-40 P&R	$3,788,284	$3,537,738	$3,368,484
3A – to Eubank P&R	$4,152,085	$3,913,951	$3,721,084
3B – to I-40 P&R	$4,146,157	$3,919,224	$3,759,415

3.5 Capital Cost

Background and Methodology: Estimating capital costs is a critical component of the FTA's New and Small Starts Program. Capital costs are the one-time expenditure required to build the system, including infrastructure costs and soft costs. Infrastructure costs typically include costs associated with the guideway, track, stops, structures, signalization and communication systems, support facilities, vehicles, and right-of-way acquisition. Soft costs for items such as engineering, construction services, project management, surveys, testing, insurance, legal, permits and owner's costs are also included as part of the overall capital cost. Contingencies are applied to the capital cost to account for uncertainty in both the estimating process and the scope of the project.



FTA's Standard Cost Categories (SCC) format has been utilized to estimate capital costs. Use of this format at this stage simplifies the process of estimating capital costs prior to entering FTA's project development process, and helps ensure that the estimation process is one that has been vetted.

It is important to note that the dedicated lane operations (curb or center lane) were further broken down into two categories (converting an existing travel lane to transit-only use and constructing a new lane for transit-only use).

Evaluation Outcomes: Results of the analysis are shown in Table 3-9; constructing new lanes for transit-only use result in the highest capital costs.

Additional analysis can be found in Technical Memorandum 9 in the appendices.

Table 3-9: Capital Cost Estimates (2013)

Service Plan Option	Mixed Traffic No TSP	Mixed Traffic with TSP	Convert to Curbside	Convert to Center-Running	Construct for Curbside	Construct for Center-Running
1A – to Eubank P&R	$48.1 M	$48.5 M	$86.7 M	$88.3 M	$114.2 M	$114.2 M
1B – to I-40 P&R	$57.7 M	$54.6 M	$90.9 M	$92.6 M	$122.0 M	$122.8 M
2A – to Eubank P&R	$55.5 M	$53.8 M	$84.7 M	$97.6 M	$128.7 M	$127.0 M
2B – to I-40 P&R	$61.6 M	$59.9 M	$87.1 M	$100.1 M	$134.4 M	$133.8 M
3A – to Eubank P&R	$59.8 M	$58.1 M	$90.8 M	$103.7 M	$134.8 M	$133.1 M
3B – to I-40 P&R	$65.9 M	$64.2 M	$93.2 M	$106.2 M	$140.5 M	$139.9 M

4. Evaluation of Segments by Configuration

The six segments by configuration were assessed to determine how each would fare against the criteria listed in Table 1-7 through 1-12. A summary of each segment's performance against the criteria is in Sections 4.1 through 4.3 of this report; additional detail can be found in the report appendices.

4.1 Bicycle and Pedestrian Mobility Impacts

Background and Methodology: The evaluation of non-motorized impacts of the alternatives is based on impacts to existing bike and pedestrian facilities and compliance with bike and pedestrian plans.

Evaluation Outcomes: The overall results, shown in Table 4-1, suggest that the BRT options, which include corresponding investments in bicycle and pedestrian access at and around station locations, are more supportive of non-motorized transportation than the existing (No Build) scenario. The Build alternatives would also not be expected to impact existing non-motorized facilities in the corridor. In addition, all alternatives would generally be consistent with plans regarding bicycle and pedestrian infrastructure. Additional detail can be found in Technical Memorandum 10 in the appendices.

Table 4-1: Bicycle and Pedestrian Mobility Impacts

	Existing / No Build	BRT in Mixed Traffic – with TSP	Dedicated Lane – Curb	Dedicated Lane - Center
Segment A1: Existing Eubanks P&R to Homestead Road				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes
Segment A2: I-40 P&R to Homestead Road				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes
Segment B: Homestead Road to Estes Drive				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes
Segment C: Estes Drive to Franklin Street				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes
Segment D: Franklin Street to Fordham Boulevard				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes
Segment E: Fordham Boulevard to Dogwood Acres Drive				
Impacts to Existing Facilities	0	1	1	2
Compliance with Plans	No	Yes	Yes	Yes

4.2 Traffic Impacts

Background and Methodology: At this level of alternative and project development, the traffic analysis was limited to a high-level analysis to aid in narrowing down the detailed alternatives.

Turning movement counts were obtained from various sources for the 17 study intersections, including recent traffic impact studies and other projects performed in the area. Turning movement counts from 2012, 2013 and 2015 were utilized. Traffic data was also obtained from previous project Synchro files that were available for the I-40 Interchange, Eubanks Road and the Westwood Road / Mason Farm Road intersections. Turning movement counts taken in 2012 and 2013 were grown to 2015. The growth rates for future traffic were developed by using the Triangle Regional Model (TRM), last updated September 2013.

The highway capacity analyses performed are based on methodologies from the Highway Capacity Manual (HCM 2010). Traffic modeling software used in the capacity analyses were Synchro 9.1 and SimTraffic 9.1, (Build 903, Rev 76).

The analyses were conducted in accordance with the latest NCDOT Congestion Management Unit's Capacity Analysis Guidelines for the TIP projects, dated January 2012.

Evaluation Outcomes: In summary, BRT operations in mixed traffic result in the lowest traffic impacts because it requires a minimal change from existing conditions within the corridor. Dedicated lane operations require either construction of a lane or the conversion of an existing travel lane to transit-only operations. Construction of a new dedicated lane has comparatively lower traffic impacts because it would not impact the capacity of the existing roadway; the transit lane would be in addition to the existing general traffic lanes. Detailed results of the traffic analysis can be found in Technical Memorandum 11 in the appendices.

4.3 Parking Impacts

Background and methodology: According to the FTA Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects, "Parking supply in proposed station areas can also be evaluated qualitatively using aerial photos or maps as available. A large amount of land dedicated to parking suggests an ample supply of parking, which may contribute to a lower rating."

The evaluation of parking impacts was completed through a desktop review. Google Earth and Google Street View were used to verify and analyze potential parking impacts along the corridor. Where applicable; measuring tools in Google Earth were used to determine approximate lengths of vehicles and lengths of parking zones. Parking space impacts were calculated from these measurements.

Evaluation Outcomes: Table 4-2 shows the number of on-street parking spaces that could be impacted by segment and runningway configuration. According to the desktop review, the only portion of the corridor that contained on-street parking was the southbound block between Rosemary and Franklin Streets through downtown Chapel Hill (Segment D). Additional detail can be found in Technical Memorandum 12 in the appendices.

Table 4-2: Number of Parking Spaces Impacted

Segment	Mixed Traffic	Dedicated Center Lane	Dedicated Curb Lane
A1: Existing Eubanks P&R to Homestead Road	0	0	0
A2: I-40 P&R to Homestead Road	0	0	0
B: Homestead Road to Estes Drive o	0	0	0
C: Estes Drive to Franklin Street	0	0	0
D: Franklin Street to Fordham Boulevard	0	5	13
E: Fordham Boulevard to Dogwood Acres Drive	0	0	0

5. Identifying the Preferred Alternatives

Following the development of the detailed technical analysis that is summarized above and provided in more detail in the appendices, the Technical and Policy Committees, the Chapel Hill Partners, elected officials from the Towns of Chapel Hill and Carrboro, and members of the public reviewed the results and identified a Preferred Alternative (with two variations) to take into Tier 3 of the study. The process of identifying and refining the preferred alternatives is described below.

5.1 The Technical Committee: September 2015

Using a spreadsheet-based tool that helped to combined capital and O&M costs, travel time, and traffic impacts in real-time, the Technical Committee – during its September 2015 meeting – designed a series of three alternatives that combined different service plans and runningway types as a means to achieve the project Purpose and Need.

It was apparent from the technical analysis the greatest number of riders, and the greatest travel time savings, could be achieved by operating in converted transit-only lanes through downtown Chapel Hill. It was acknowledged that Columbia Street could not be widened through the downtown. The Committee also wanted to suggest further evaluation of Service Options 1 and 2; it was determined that Service Option 3 (which included the short-turn service between UNC's main campus and Carolina North) should be removed from further consideration, but could be added as the Carolina North development moves forward in the future.

Figure 5-1: Initial Recommendations of the Technical Committee: September 2015

Note: blue = mixed traffic with TSP;
dark green = dedicated curb lane – construct;
light green = dedicated center lane – construct;
yellow = dedicated curb lane - convert

5.2 The Technical and Policy Committees: October 2015

The three alternatives that were initially recommended for further study by the Technical Committee at their September 2015 meeting were then taken to the Policy Committee for review at the joint Technical and Policy Committee meeting in October 2015. The Policy Committee added three alternatives to the original three alternatives (for a total of six alternatives) for further evaluation. The three new alternatives (shown in Figure 5-2 as alternatives 3, 4, and 6) reflected the Policy Committee's desire to further consider alternatives that included a higher level of capital investment in addition to the initial three alternatives. The Committees also wanted to add additional alternatives that serve the UNC Hospitals campus as a means to serve a major activity and employment generator and facilitate direct connections to the planned Durham-Orange light rail project.

5.3 Chapel Hill Transit Partners: October 2015

The six alternatives initially recommended for further consideration by the Technical and Policy Committees at their October 2015 meeting were than taken for review to the Chapel Hill Transit Partners. After review of the alternatives, the Partners recommended a few modifications, including:

- Modifying the northern end of alternative 4 (segments A and B) from constructing a dedicated lane to converting a general traffic lane to a dedicated lane
- Modifying segment Dn of alternative 4 from mixed traffic to converting a lane to dedicated transit use
- Modifying alternative 6 to feature mixed traffic operations through the UNC Hospitals portion of the alignment (segment Dn) due to right-of-way and operational constraints

It should be noted that – following the modifications listed above – the names of alternatives 3 and 4 were switched in order to be consistent with previous project naming protocols. See Figure 5-3.

5.4 Chapel Hill Town Council and Carrboro Board of Alderman: November 2015

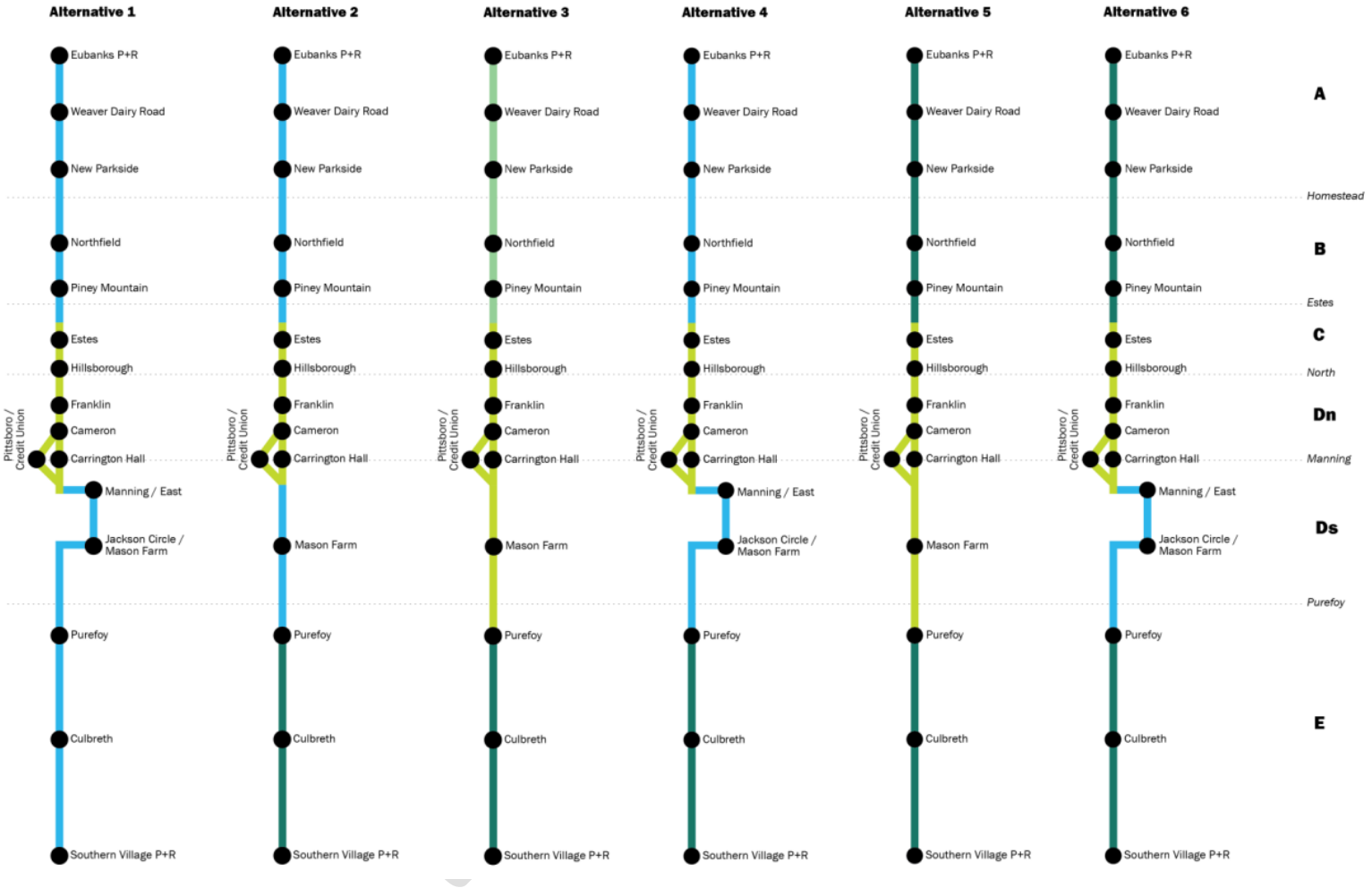
The alternatives recommended for further consideration by the Chapel Hill Transit Partners at their October 2015 meeting were then taken to the Chapel Hill Town Council on November 9, 2015 and the Carrboro Board of Aldermen on November 10, 2015. Both legislative bodies were generally supportive of the transit investment but had some concerns and questions, including property value impacts, provision of park-and-ride facilities, coordination with feeder service, and environmental impacts.

In response to public feedback at the meeting, the Chapel Hill Town Council provided the direction to shift the Ds/E segment boundary and station location from Purefoy Road to NC 54 as means to mitigate impacts that may accrue to the residents and small businesses in the area around the proposed Purefoy stop. See Figure 5-4.

Figure 5-2: Initial Recommendations of the Technical and Policy Committees, October 2015

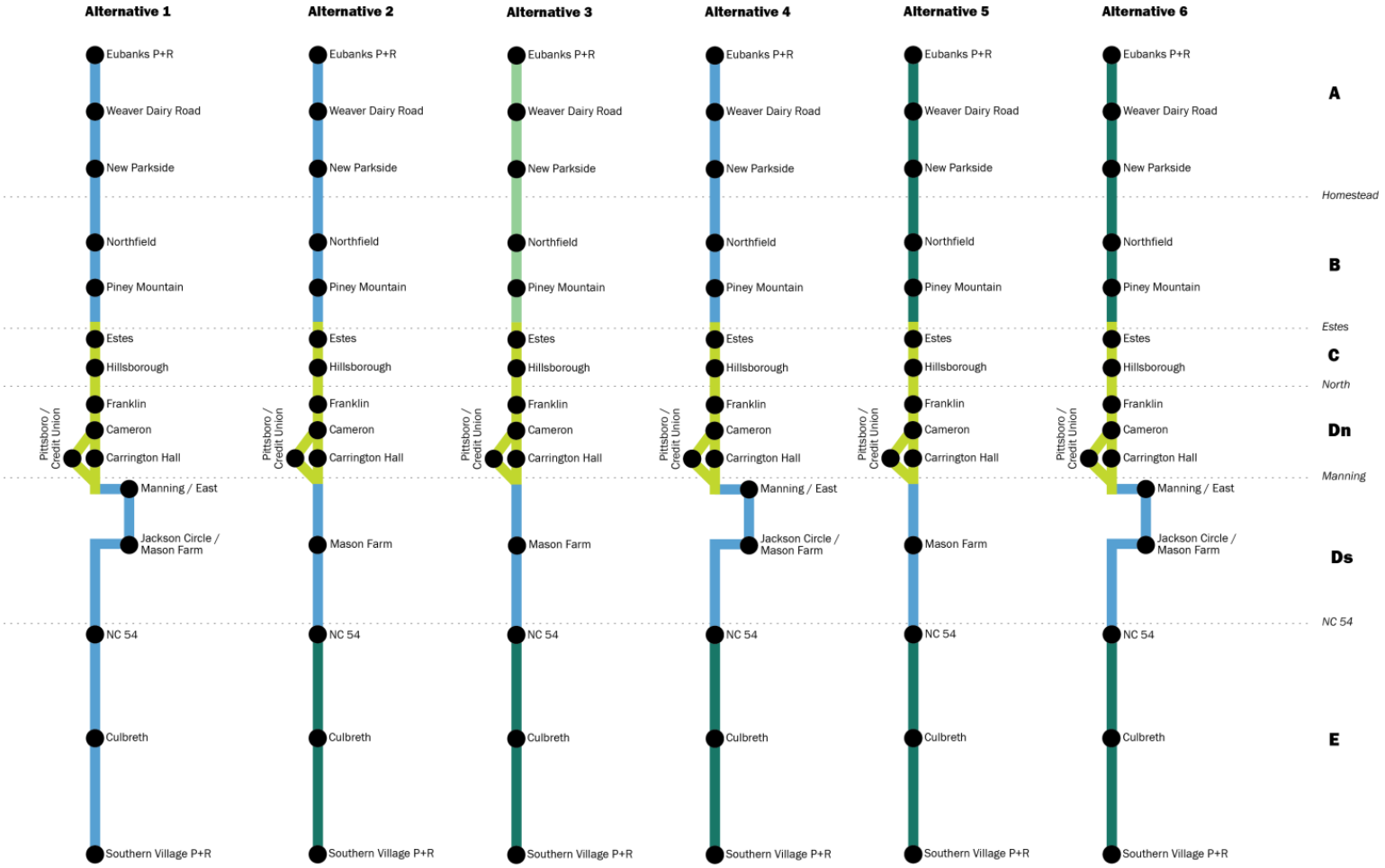
Note: blue = mixed traffic with TSP; dark green = dedicated curb lane – construct; light green = dedicated center lane – construct; yellow = dedicated curb lane - convert

Figure 5-3: Suggested Alternatives for Further Considerations, Recommended by the Chapel Hill Transit Partners, October 2015



Note: blue = mixed traffic with TSP; dark green = dedicated curb lane – construct; light green = dedicated center lane – construct; yellow = dedicated curb lane - convert

Figure 5-4: Suggested Alternatives for Further Consideration, Recommended by the Chapel Hill Town Council and Carrboro Board of Aldermen, November 2015



Note: blue = mixed traffic with TSP; dark green = dedicated curb lane – construct; light green = dedicated center lane – construct; yellow = dedicated curb lane - convert

5.5 Public Outreach Sessions: January/February 2016

The six alternatives that were recommended for further consideration were shared with members of the public at a series of five public outreach sessions along the study corridor during January and February 2016:

1. January 20, 2016: 11:00 – 1:00 PM at UNC Children's Hospital
2. January 20, 2016: 4:00 – 6:00 PM in the Southern Village retail area
3. January 21, 2016: 11:00 – 1:00 PM on UNC campus at Carolina Union
4. February 23, 2016: 11:30 - 1:30 PM at Town of Chapel Hill Town Hall
5. February 23, 2016: 4:00 - 6:00 PM at the Chapel Hill Public Library.

103 people attended the sessions. After reviewing the characteristics of the six alternatives (including capital and O&M costs, ridership, and travel time), 40 respondents indicated a preference for a specific alternative. Two respondents listed "Alternative 3 or 6." Alternative 3 was the public's favorite, with Alternative 6 as a second choice.

Additional details regarding the public outreach sessions and the input received can be found in Technical Memorandum 13 in the appendices.

Table 5-1: January/February 2016 Public Outreach Sessions: Preferred Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	No Build Alternative
# of responses (40)	3	4	**15**	1	4	**11**	2
percent of responses collected	8%	11%	**39%**	3%	11%	**29%**	5%

5.6 Cost Effectiveness

The cost effectiveness measure is designed to assist the FTA in identifying the projects which will result in the highest level of usage (trips) for the minimal amount of federal investment. The FTA's cost effectiveness rating for Small Starts has two basic components: (1) annualized federal share of the of the capital cost of the project and (2) annual trips taken on the project, as well as trips taken by transit dependent persons on the project.

The cost–effectiveness of the six alternatives shown in Figure 5-4 were calculated. The results of the analysis are down in Table 5-2; Alternatives 1 through 5 would receive a cost effectiveness rating between $2.00 and $3.99; Alternative 6 would receive a rating between $4.00 and $5.00. As a result, Alternatives 1 through 5 would receive a medium rating from the FTA for cost-effectiveness; Alternative 6 would receive a medium-low. Additional detail can be found in Technical Memorandum 9 in the appendices.

Table 5-2: Cost Effectiveness Ratings

Rating	Annualized Capital Cost	Federal Annualized Capital Cost Share	Daily trips (current year)	Annual trips (current year)	Cost Effectiveness	Cost Effectiveness Rating
Alternative 1	7,799,435	$6,239,548	8,575	2,220,925	$2.81	Medium
Alternative 2	8,633,738	$6,906,990	9,000	2,331,000	$2.96	Medium
Alternative 3	$11,314,870	$9,051,896	9,000	2,331,000	$3.88	Medium
Alternative 4	$9,134,000	$7,307,200	8,575	2,220,925	$3.29	Medium
Alternative 5	$11,447,000	$9,157,600	9,000	2,331,000	$3.93	Medium
Alternative 6	$11,931,492	$9,545,194	8,575	2,220,925	$4.30	Medium-Low

5.7 Technical and Policy Committees: March 2016

A combined Technical and Policy Committee meeting was held in March 2016 to review input received during the January/February 2016 public outreach session and review refined technical information. The consensus was that that one preferred alternative (alternative 6 with two variations) be carried forward for final refinement during Tier 3 of the study. The preferred alternatives are described in more detail in section 6.1 of this report.

6. Findings and Next Steps

6.1 Findings

Based on this detailed evaluation of alternatives, a preferred alternative has emerged that is a combination of modes, segments and configurations within the North-South Corridor that is responsive to the need for transportation investment within the corridor (as defined in the Purpose and Need Statement) and which will be competitive for federal funding.

The preferred alternative (see Figure 6-1) is BRT operating in a combination of mixed traffic and dedicated transit lanes between an end-of-line station at the Eubanks Road park-and-ride lot and an end-of-line station at Southern Village park-and-ride lot. Based on the iterative alternative design process described in Section 5 of this report, this preferred alternative (and its variations) best balance ridership, cost travel times, traffic impacts, and community support in meeting the stated goals and objectives of the project.

- **Alternative 6-1** would operate in dedicated curb lanes that are newly constructed in Segments A and B (between Eubanks park-and-ride and Estes). Between Estes and Manning Drive, the BRT would operate in a dedicated curb lane that is converted from existing traffic. South of Manning, through the UNC Hospitals campus, the BRT would operate in mixed traffic with transit signal priority through Purefoy to NC 54. South of NC 54, the BRT would operate in a dedicated curbside lane that is newly constructed.
- **Alternative 6-2** would be identical to Alternative 6-1, with the exception of segment C, which would operate as a dedicated curb lane that is newly constructed.
- **Alternative 6-3** would operate in a dedicated center-running lane that would be newly constructed between Eubanks park-and-ride through Hillsborough. South of Hillsborough, the BRT would operate identically to Alternatives 6-1 and 6-2.

Figure 6-1: The Preferred Alternatives, March 2016

Note: blue = mixed traffic with TSP; dark green = dedicated curb lane – construct; light green = dedicated center lane – construct; yellow = dedicated curb lane - convert

Preliminary stop locations, which may be modified during the refinement of the preferred alternative and the environmental clearance process, are:

- Eubanks Road park-and-ride lot
- Weaver Dairy Road
- New Parkside
- Northfield
- Piney Mountain
- Estes
- Hillsborough
- Franklin
- Cameron
- Pittsboro / Credit Union

- Carrington Hall
- Manning / East
- Jackson Circle / Mason Farm
- NC 54
- Culbreth
- Southern Village park-and-ride

6.2 Next Steps

The preferred alternative will be subject to further development in the next project phase, as specifics related to runningways and station locations are refined.

Concurrent with this refinement, the project team will continue development of the project financial plan, and will begin coordinating with the FTA on environmental clearance analysis and documentation. The completion of the refinement process will mark the transition of the preferred alternative to the Locally Preferred Alternative (LPA).

At that point, the Technical Committee will recommend the LPA to the Policy Committee, who will then recommend it to the Chapel Hill Transit Partners. The Chapel Hill Transit Partners will then recommend the LPA to the Chapel Hill Town Council for adoption. The Town Council will submit the LPA to the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) for adoption and integration into its *2040 Metropolitan Transportation Plan*.

DISCUSSION ITEM April 26, 2016

4B. Electric Bus Petition
Action: 1. Receive information and provide staff with feedback.

Staff Resource: Brian Litchfield, Transit Director

Overview of Petition

- The Chapel Hill Town Council received a petition (http://chapelhill.granicus.com/MetaViewer.php?view_id=7&clip_id=2698&meta_id=122640) requesting Town staff evaluate the usage and economic viability of electric buses.
- The Chapel Hill Mayor and Town Manager have referred the petition to the Chapel Hill Transit Partners Committee for review.

Background and Additional Information

- Staff has provided Council and the Partners with the following information:

    - Chapel Hill Transit and its funding Partners have long-supported investment in alternatively powered vehicles and environmentally sustainable practices. Transit plays a key role in the Town's efforts to reduce greenhouse gas emissions – by removing around 30,000 personal automobile trips from the transportation network. Additionally, Chapel Hill Transit was one of the first systems in the state to invest in hybrid buses and the first to implement hybrid articulated buses and the mini-hybrid system in diesel powered buses – along with solar powered bus stops, NextBus signs and sustainable maintenance practices.

      As noted, Chapel Hill Transit has 42 buses in need of replacement, that average almost 16 years of age. The funding Partners began discussing replacement options for these 42 buses in 2012-13 and at the time, reviewed options for alternatively fueled vehicles. Due to the significant number of buses needing to be replaced, cost of alternatively fueled vehicles and associated infrastructure, and scarce financial resources the funding Partners agreed to invest in clean-diesel buses – also understanding that a 2012 (or newer) clean diesel bus emits 94% less nitrogen oxide per mile, 98% less particulate matter, and 89% less hydrocarbon than a model year 2000 diesel bus. In 2014, the funding Partners discussed a joint bus procurement with the City of Durham and GoTriangle (TTA). In early 2015, the Town Council approved Transit to enter into a joint bus procurement. Following completion of the procurement, Gillig was awarded the bid and staff is recommending entering into a contract with Gillig. The contract allows the Town to purchase clean diesel buses over the next five years, but does not obligate the Town to purchase a specific number of buses.

      Most systems pursuing alternatively fueled buses are generally doing so with significant amounts of grant funding. For example, one of the transit systems mentioned in the petition, Antelope Valley Transit Authority, is funding their initial conversion to electric (29 buses) at a cost of $40M (~$1.3M/unit, includes charging infrastructure) - $24.4 million is being covered by a grant from the state of

California, $15M in federal funds and around $600K in matching funds from the transit system.
Transit staff strongly supports the spirit of the submitted petition and will continue to work with the Town's Sustainability Office and funding Partners to evaluate alternatively fueled vehicles and provide a detailed response to the petition.

- Link to reports provided by the Town of Chapel Hill's Sustainability Office and Transit's Sustainability Study consultant team: http://chapelhill.granicus.com/MetaViewer.php?view_id=7&clip_id=2698&meta_id=122638

Potential Next Steps

- Staff would recommend that any study look at all potential options for alternatively powered transit vehicles, including but not limited to: Electric, Compressed Natural Gas, and Hydrogen.
- Staff would also recommend reviewing options for implementing alternatively powered demand response vehicles and service vehicles in the short-term.
- Discuss study options with Town and Partner Sustainability staff.
- Request proposal from Nelson/Nygaard and/or other firm(s) to assist with study.
  - Note Nelson/Nygaard assisted Antelope Valley Transit Authority in setting up their electric bus program.

Fiscal Note

- Partners would need to identify/dedicate funds to provide outside resources to assist with a fully detailed study.

Recommendation

- Partners discuss the petition and provide staff with feedback on next steps.

DISCUSSION ITEM April 26, 2016

4C. Summer Construction Projects
Action: 1. Receive information and provide staff with feedback.

Staff Resource: Brian Litchfield, Director

Overview

Over the summer several road construction and development projects may impact Chapel Hill Transit services. These projects include:

- **Frontage Road Connection at Super Street U-Turn:** This Town of Chapel Hill project will allow motorists to cross Fordham Boulevard and access Ram's Plaza from the north. This project is scheduled for April to October 2016 and will require rerouting the D/Saturday D and closing stops along the frontage road.
- **Frontage Road Improvements at Ram's Plaza:** This Town of Chapel Hill project will provide new ways to enter and exit the Plaza. This project is scheduled for April to October 2016 and will require rerouting the D/Saturday D and closing the stop at Ram's Plaza.
- **Intersection Improvements at Ephesus Church-Fordham**: This Town of Chapel Hill project will make improvements to assist traffic by aligning Ephesus Church Road with the entrance to Eastgate Shopping Center. This project will also improve safety and connectivity for pedestrian and bicycle traffic, including new bike lanes, bike detection loops, sidewalks and crosswalks**.** This project is scheduled for April to October 2016 and may cause delays for routes operating in this area: D, DX, CL, F, Saturday D and Saturday FG.
- **Rosemary Street Improvement Project:** The $1.6 million project funded by Town of Chapel Hill bond funds will make Rosemary Street safer and more pleasant for pedestrians. On Rosemary Street between Henderson Street and Merritt Mill Road, the project will widen sidewalks; improve sidewalk ramps so they meet ADA standards; install new pedestrian level light fixtures with LED lights; replace curb and gutter sections and driveway ramps; and repave the street. This project is scheduled for mid-May to late 2016. Considering other projects on Rosemary may be occurring during this time, may lead to detours for the CW, A and Saturday CW.
- **Water Pipe Replacement on East Rosemary, Henderson, and Hillsborough Streets:** Contractors for OWASA will install new pipes and change meters that serve both residents and businesses. The contractor will work initially on Hillsborough Street, then on Henderson Street and then East Rosemary Street. OWASA and their contractors have agreed to provide access to Chapel Hill Transit buses along Hillsborough Street, although delays may occur due to construction. Additional project information: http://www.owasa.org/plans-to-replace-water-pipes-on-part-of-east-rosemary-henderson-and-hillsborough-streets.

DISCUSSION ITEM April 26, 2016

4C. Summer Construction Projects
Action: 1. Receive information and provide staff with feedback.

- **Porthole Alley Project** is a UNC-Chapel Hill project to improve pedestrian, bicycle, and vehicular access from Franklin Street to Cameron Avenue. This project will make it safer and more enjoyable for all that use one of the major access points between the campus and downtown. We do not anticipate any impacts from this project.
- **Ridge Road Reconstruction**: Ridge Road will be reconstructed from Manning Drive to Stadium Drive. Reconstruction includes new curb/gutter, sharrow markings for bicycles, new crosswalks and pavement resurfacing. Ridge Road will also be resurfaced between Stadium Drive and Country Club Road. Ridge Road will be closed to through traffic, and traffic will be detoured to Stadium Drive and South Road. This $400,000 project is led by the NC Department of Transportation and scheduled for June to August 2016. We will likely need to detour the following routes: A, CCX, DX, NU, RU and U routes.
- **Friday Center Drive**: Friday Center Drive will be reconstructed/resurfaced between June and October 2016. This project will not cause any route detours; however, schedule delays may occur due to construction activity.
- **Market Street Resurfacing**: Market Street in Southern Village will be resurfaced from May to July 2016. This project will not cause any route detours; however, schedule delays may occur due to construction activity.
- **NCDOT Resurfacing Projects**: South Road and Columbia Street/US 15-501 (from Merritt Store to Southern Village) will be resurfaced. Nighttime work will occur 8 p.m. to 6 a.m. May to August 2016. This project will not cause any route detours; however, schedule delays may occur due to construction activity.
- **NCDOT Storm Drain Improvements at South Greensboro Street**: Project will install a new storm drain under South Greensboro Street between Old Pittsboro Road and the bypass. This project will require a substantial detour for the J and we will not provide direct access to Rocky Brook.

Other Projects that may impact us:

- **Fiber Installation**: Chapel Hill has been selected as one of the destinations for both AT&T gigabit Internet and Google Fiber. AT&T installation has been occurring since late 2014. Google's network design is underway.
- **AC Marriott Hotel on Rosemary Street:** A new AC Hotel will be located on Rosemary Street between Church Street and La Residence. During construction pedestrian traffic will be re-routed to the south side of Rosemary Street to maintain pedestrian safety. Traffic markings on Rosemary Street will be modified during the project to maintain two-way traffic and minimize impacts from construction activities. This project is scheduled for May 2016 to June 2017.
- **Carolina Square Development**: Carolina Square, formerly known as University Square, will include one 11-story and two five-story buildings with about 285 apartment

units, 170,000 square feet of office space, and 72,500 square feet of retail space. The project will have landscaped green space within an urban park including public art and structured parking decks with 880 total spaces.

- **Developments along Martin Luther King Jr. Boulevard:** As part of the Town's approval of the Charterwood (also known as Evolve) mixed-used (residential, retail and office uses) development along Martin Luther King Jr. Boulevard at the intersection of Weaver Dairy Road, the developers are required to make traffic improvements including new turn lanes at the major intersection, crosswalks, bike-activated loops and a new bike lane. The Weaver Crossing developer will be extending the right turn lane on Martin Luther King Jr. Blvd. along the property frontage.

Staff will be finalizing detour routes and schedules as the dates for these projects are finalized. We will work with our Partners to share information as widely as possible, similar to the efforts we undertook during the summer of 2013. Also similar to 2013, the Town of Chapel Hill's Emergency Manager will be assisting with coordinating the projects and public information.

Recommendation

- Partners discuss the information on the projects and provide staff with feedback.

INFORMATION ITEM April 26, 2016

5A. Project Updates

Staff Resource: Tim Schwarzauer, Grants Coordinator

Overview

During the February 3, 2016 Partners Meeting we provided an update on several projects that we have underway. The following is an update on where each of these projects stand:

Estes Park Bus Stop – The Estes Park bus stop reopened for use on April 2nd to serve the N and JN routes. Total project cost was $31,671.00.

University Place Bus Stop – Construction of the University Place bus stop is complete, and reopened on April 16th. In partnership with University Place ownership, Chapel Hill Transit installed a new 15' shelter, and provided sidewalk access to both University Place and Willow Drive, at a cost of $18,846.00.

EZ Rider Mobile Data Terminals (MDT) – Following Council approval of the sole-source contract, 21 Mobile Data Terminals were purchased from Trapeze at a cost of $88,482.31. The MDTs are scheduled to ship on May 16th. The units will integrate with existing proprietary software that we have been using since 2008. The contract includes the equipment, installation support, on-site training, and equipment warranty.

Building Renovations – Renovations, to allow us to better utilize existing space, along with correcting HVAC and electrical issues, began on March 25 and we expect them to be completed in the next 6 weeks.

Shop Equipment – In response to a safety audit completed by the Town's insurance provider, we will be purchasing mobile lifts for the maintenance shop. These mobile lifts will allow more flexibility in repairing the fixed route and demand response fleets as well as increasing safety. Chapel Hill Transit has solicited bids for six mobile lifts. Bids are due May 23rd.

Shop Floor – In order to extend the life of the maintenance floor and repair the existing wear and tear, we will be installing a urethane cement resinous floor system in the maintenance bay, parts room and associated storage areas. Chapel Hill Transit has solicited bids for this work; bids are due April 29th.

ADA Bus Stop Compliance – In order to ensure system-wide ADA compliance, Chapel Hill Transit has requested statements of qualifications from interested A & E firms to review our bus stops and recommend changes and upgrades. This work will be done on a task-order basis and will include a thorough onsite review, detailed drawings and independent cost estimates for each site. Chapel Hill Transit is currently reviewing proposals and developing a shortlist for negotiations.

We will continue to provide updates on the projects as they move forward. Most projects are coming in under budget and we expect to utilize savings to support next year's budget.

INFORMATION ITEM April 26, 2016

5B. Automatic Passenger Counter (APC) System and Ridership Review

Staff Resource: Mila Vega, Transit Service Planner

Background

As part of the Financial Sustainability Study, Chapel Hill Transit is conducting an assessment of our Automatic Passenger Counters (APCs) system. It is essential that our APCs are functioning properly as our state and federal formula funding is directly connected to ridership and passenger miles travelled.

Overview

The first step of the assessment is to validate APC data – compare on-board counts to the data produced by APC reports. This will include a 10% ridecheck (on-board counts) of select routes in April 2016 and a 5% ridecheck of select routes in October 2016. Nelson/Nygaard staff will survey routes J, NS, and S — three existing high ridership routes that together account for approximately 30% of our ridership. Surveyed routes and runs will occur only on vehicles with APC systems installed to allow direct comparison of data.

Next Steps

Onboard ridership validation will occur Monday, April 25th through Wednesday, April 27th and again in October (typically one of our largest ridership months). The work will be conducted by Nelson/Nygaard in coordination with Transit staff. Staff will provide updates as the assessment progresses over the next couple of months.

Attachment

- Scope of Work: Automatic Passenger Counter System and Ridership Review

April 7, 2016

Mila Vega
Transit Service Planner
Town of Chapel Hill
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514

The Federal Transit Administration (FTA) provides formula funding to transit agencies based on a variety of data points, including bus passenger miles. As such, having accurate ridership counts is incredibly important to transit agencies in terms of maintaining financial sustainability through funding apportionment from Federal formula grants.

Chapel Hill Transit (CHT) wants to ensure that the present automatic passenger counter (APC) system is calibrated to produce data that provides an accurate assessment of fixed-route ridership. To accomplish this objective, CHT is asking that an on-board ridecheck survey of the fixed-route system be completed as part of the current Strategic & Financial Sustainability Plan and compared directly against APC data. It is recommended that the initial ridecheck take place when the University of North Carolina-Chapel Hill (UNC-Chapel Hill) is in session in April 2016—completing work prior to the end of spring semester regular classes on April 27. Additional sampling will occur in October 2016 to capture peak passenger loads associated with UNC-Chapel Hill and provide another data point to assess APC calibration.

This task will include a 10% ridecheck of select routes in April 2016 and a 5% ridecheck of select routes in October 2016. Nelson\Nygaard will survey Route J, NS, and S—three existing high ridership routes that together account for approximately 30% of system ridership. Surveyed routes and runs will be occur only on vehicles with APC systems installed to allow direct comparison of data. The ridecheck will collect information about passenger activity, including:

- Passenger boarding and alighting activity
- Wheelchair and bicycle boarding and alighting (optional)
- Stop-by-stop arrival and departure information

This information will then be compiled into a series of reports that summarize the following:

- A narrative summary of survey results
- Summary tables that depict passenger activity from ridecheck and APC data, including boardings/alightings, load factors, max load points, and ridership
- A Final Report that summarizes findings and suggests recommendations on calibrating the APC system to improve accuracy, an action plan, institutional policies, and performance measures

The following tasks describe the approach and budget.

TASK 1 PRELIMINARY DATA COLLECTION

At the beginning of this task, we will send CHT's project manager a data needs list requesting any relevant documents and data that might have an impact on the project. Relevant data may include:

- Fleet assignment sheets
- Operator Assignment Sheets (paddles)

- List and GIS layer of all bus stops (electronic format)
- Existing information on route-by-route running time issues

A preliminary data collection meeting will be scheduled in April 2016 to discuss the following tasks:

- Finalize objectives
- Finalize scope of work and schedule
- Discuss logistics and dates for data collection effort
- Reach consensus on format and content for draft and final reports

The meeting will be documented in the final report that summarizes discussions and conclusions reached. Information collected during meeting will allow us to refine the logistical details for the data collection, prepare final versions of the data collection instruments, and make final staffing arrangements for the data collection effort. The meeting can be conducted in person or via teleconference.

TASK 2 PASSENGER RIDECHECK SERVICES

2.1 Sampling Plan

To maintain the highest level of survey accuracy, precision, and completeness, we have developed a thorough surveying procedure and data verification process over many years that allows us to collect a large accurate sample in a short amount of time and results in precise and accurate survey information. Training for surveyors be held on a Monday, with data collection occurring on a Tuesday and Wednesday. It is anticipated that data collection will occur during daytime hours only to capture peak and midday ridership. As part of the 10% sample, approximately 70 revenue hours total will be surveyed in April 2016—equating to roughly 100 round-trips on Routes J, NS, and S. A 5% sample will be conducted on the same routes in October 2016.

We develop surveyor assignments from the driver and coach block assignments, and these often mirror existing driver assignment time blocks, although this is not always the case. It is assumed that CHT will allow Nelson\Nygaard to use the operations facility located at 6900 Millhouse Road as an operations base for the data collection. This will also allow surveyors and operators to be paired up before pullouts so that our surveying does not have any impact on bus service. We will request operating information, such as coach operator assignments (trip sheets), coach block assignments, and bus stop inventory listings in computer format from CHT so that surveyor shifts may be scheduled efficiently and data may be easily loaded into our ridership and on-time performance processing database once collected.

Overall, the sampling plan must ensure that APC buses will be operational on routes and trips scheduled to be surveyed on ridership count days. Nelson\Nygaard staff will coordinate with CHT to ensure dispatch and operations staff is aware of the sampling plan and has adequate time and notice to prepare for the survey effort.

2.2 On-Board Ridership Count

An on-board ridership count on selected routes and runs will be administered by Nelson\Nygaard with the assistance of a temporary staffing agency to collect the sample of daily boardings at the stop and trip level on vehicles in the system containing APCs.

The actual surveying of boarding and alighting passengers will be performed by individuals hired and screened by a temporary staffing agency. After pre-employment screening, all temporary personnel attend a training session to foster a thorough understanding of the purposes and requirements of the survey process before any actual counting is commenced. It is desirable for this training to be conducted at the CHT facility, but if space is not available, other arrangements will be made.

No person is permitted to survey any trips without first having attended a training session. The content of the training sessions includes a thorough explanation of survey requirements, procedures and expectations, dress code, required equipment, on-board deportment, and the importance of promptness and responsibility. Surveyors are shown the survey forms they will be responsible for filling out, and they are required to pass a test measuring their ability to record boardings, alightings, on-board load, arrival time, and departure time in the appropriate parts of the survey instrument. A sample form is provided below:

Figure 1 Sample Ridecheck Form

AVTA Route 1 Northbound				Date:						
				Start Time:		Weather:				
				Your Name:						
				Total	Time			Trip		
ID	Street	ONS	OFFS	On Bus	Scheduled	Arrival	Departure	Wheelchair	Bike	Notes
RIDERS REMAINING ON BOARD FROM PREVIOUS TRIP----->										
380	Avenue S & 47th Street East				9:40 AM					
70	Avenue S & 45th Street East									
71	Avenue S & 40th Street East									
118	Avenue S & Dawson Drive									
80	Avenue S & Pond Avenue									
119	Avenue S & 30th Street East									
120	Avenue S & 27th Street East									
121	Avenue S & 25th Street East				9:50 AM					
	Avenue S & 20th Street East									
123	Avenue S & Casa Verde Drive									
127	10th Street East & Avenue S									
134	10th Street East & Avenue R									
135	10th Street East & Avenue Q-11									
23	Palmdale Blvd. & 9th Street East				10:00 AM					
1123	6th Street East & Palmdale Blvd.									
897	6th Street East & Avenue Q									
1008	Palmdale Transportation Center				10:10 AM					
RIDERS LEFT ON BUS AT END (CARRY OVER TO NEXT TRIP) ---->										

Staff members from Nelson\Nygaard will be present at the operations base throughout survey hours, acting as supervisors to survey staff. On-site personnel will conduct quality control checks throughout each day, making spot checks in the field and checking all forms when surveyors sign out at the end of their shifts.

Nelson\Nygaard will ensure that surveyors in the field have the ability to communicate with survey supervisors independent of CHT operations and communications. Supervisory staff will also have access to a vehicle to transport surveyors, as necessary, to accommodate survey logistics or recover from unexpected situations. Apart from coordinating with Nelson\Nygaard to ensure that surveyors get on the correct bus number to complete their assignments, we anticipate no involvement on the part of CHT staff members in conducting the ridership count.

DELIVERABLES: Sampling Plan
Boardings and Alightings to be Tabulated and Analyzed

TASK 3 FINDINGS AND RECOMMENDATIONS

3.1 Survey Data

After conclusion of each ridecheck sample, Nelson\Nygaard will enter and organize collected data with assistance from temporary staff, including the following information:

- Passenger boarding and alighting activity
- Wheelchair and bicycle boarding and alighting (optional)
- Stop-by-stop arrival and departure information

Within 90 days after completion of each data collection effort, Nelson\Nygaard will provide CHT with the raw data from this survey in Excel format.

3.2 APC Data Analysis

In order to develop recommendations for calibrating APCs to improve accuracy, Nelson\Nygaard will request specific APC trip data from CHT for comparison purposes. After receiving the appropriate APC data from CHT, we will analyze the ridecheck and APC datasets to document findings, identify deficiencies, and develop final recommendations.

3.3 Develop Action Plan, Policies, and Performance Measures

Based on the results of the APC data analysis, Nelson\Nygaard will identify deficiencies and develop an action plan of implementable steps to address deficiencies and instill confidence in the quality of data generated from APCs in the system. The action plan will include a set of institutional policies and performance measures for the agency, to be approved and formalized by the Transit Director.

As part of this task, Nelson\Nygaard anticipates two on-site visits to help identify current practices and issues, as well as troubleshooting deficiencies related to the APC analysis. In addition to policies and performance measures, steps in the action plan could include (but are not limited to) maintenance practices, vehicle sampling and assignments, data reporting, coordination with GoTriangle or Urban Transportation Associates (the current APC contractor), migrating data to CHT's internal server, and/or specifications for calibration.

3.4 Final Report

Nelson\Nygaard will produce a final report documenting the survey, findings, and recommendations. This report will compile information from the data collection effort as well as analysis and comparison with APC data. The report will include the following:

- A narrative summary of survey results
- Summary tables that depict passenger activity from ridecheck and APC data, including boardings/alightings, load factors, max load points, and ridership
- Findings and recommendations for calibrating the APC system to improve accuracy
- Identification of deficiencies, action plan, policies, and performance measures

Nelson\Nygaard will provide a draft version of the final report. The final report will be submitted in electronic format after CHT has provided one set of non-conflicting, consolidated comments to Nelson\Nygaard.

Nelson\Nygaard staff can be available for a presentation of this report to the Partners Committee during a scheduled site visit if needed.

Deliverable: Summary of Raw Data
Final Report

BUDGET

		Nelson\Nygaard Labor Costs					Subconsultant Costs			
							Temp Staffing Agency			
		Tim Payne	Cristina Barone	Lucien Bruno			Temp			
		Principal 4	Associate 4	Associate 2						
	Base Rate	69.42	42.98	31.40						
	Overhead 175.00%	121.49	75.21	54.96						
	Profit 10%	19.09	11.82	8.64	NN Labor			Temp Staffing Agency Labor	Total	Total
	Total Billing Rate	$210.00	$130.00	$95.00	Hours	Cost	$20.00	Cost	Direct Expenses	Costs
Task	Description									
	PROJECT MANAGEMENT	6	6		12	$2,040		$0	$0	$2,040
1	Preliminary Data Collection	2	2	2	6	$870		$0	$0	$870
2	Passenger Ridecheck Services	2	2	108	112	$10,940	185	$3,700	$3,356	$17,996
3	Findings and Recommendations	40	86	90	216	$28,130	13	$260	$5,496	$33,886
	TOTAL HOURS	50	96	200	346		198			
	TOTAL LABOR COST	$10,500	$12,480	$19,000		$41,980	$3,960	$3,960	$8,852	$54,792
	GENERAL & ADMINISTRATIVE ON SUBCONTRACTOR COSTS							$198		$198
	TOTAL COSTS							$4,158		$54,990

SCHEDULE

		2016																													
		April			May					June				July				August					September				October				
Task	Description	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10	17	24	31
1	Preliminary Data Collection																														
2	Passenger Ridecheck Services																														
3	Findings and Recommendations																														

INFORMATION ITEM April 26, 2016

5C. Customer Survey Update

Staff Resource: Tim Schwarzauer, Grants Coordinator

Overview

Chapel Hill Transit's Customer Survey was conducted February 22nd - 27th, by ETC Institute. ETC's Survey Team rode the Chapel Hill Transit system in order to conduct the surveys while on routes. The survey instrument was evenly distributed across the system, based on 2015 ridership data. ETC collected a total of 1,200 completed surveys for this project. These surveys not only represent weekday morning and evening ridership, but also include a sampling of weekend riders. Customers were also able to fill-out the survey online.

Raw data tables were provided to Chapel Hill Transit on March, 30th and were included in our Title VI submission to the Federal Transit Administration (FTA). A draft report was provided on April 22nd and is currently being reviewed by transit staff. A final report and presentation will be scheduled, following a review of the draft report, for the May Partner's meeting.

Attachment

- Link to Draft Customer Survey Report: http://www.townofchapelhill.org/home/showdocument?id=31936

INFORMATION ITEM April 26, 2016

5D. Bus Procurement Update

Staff Resource: Buck Marks, Procurement Specialist
Rick Shreve, Budget Manager
Brian Litchfield, Director

Overview

- The Chapel Hill Town Council authorized the Town Manager to execute a five-year contract with Gillig, LLC to purchase up to 53 new, low-floor, clean diesel buses to replace vehicles well beyond their useful life. Council did so during their April 11, 2016 Meeting (http://chapelhill.granicus.com/MetaViewer.php?view_id=7&clip_id=2735&meta_id=125701).
    - The contract has been finalized, signed by Gillig, and is being routed for signatures. Once complete, the Town will issue a purchase order to Gillig, LLC for 16 buses in the next 30 days.
    - The estimated price for the first 16 buses will be $455,423 per bus. The final price may vary slightly (+/-5%) depending upon the pre-production needs of Chapel Hill Transit.
    - Twelve (12) of the buses will be financed and four (4) will be purchased using Chapel Hill Transit Capital Reserve Funds.
- The Chapel Hill Town Council also authorized the Town Manager to enter into an agreement for the financing of new buses for public transportation services among the Town of Chapel Hill, Town of Carrboro and The University of North Carolina at Chapel Hill at the same meeting on April 11. (http://chapelhill.granicus.com/MetaViewer.php?view_id=7&clip_id=2735&meta_id=125708).
    - Transit staff will work with the Partners and their legal representatives to finalize the agreement.
    - Because the ordering of the buses is not dependent on first securing financing, we do not need to rush the financing process. There is potential for savings by combining this financing with other Town projects.
        - The payment for the buses will not be due until delivery of the buses. That gives us additional time to find more advantageous financing structure. Also, we can minimize the interest on borrowed funds by timing the financing to coincide with the delivery.
        - Financing will not exceed the $760,000 annual payment the Partners have committed to providing. This years payment will be rolled into a Capital Reserve Account and used to buy down the debt and/or future payments on the financed buses.

- The financing package will need to be approved by the Chapel Hill Town Council in the future (likely next fiscal year).
- Transit staff will continue to work with Business Management Department on the financing and will provide updates to the Partners.

Next Steps

- Town completes execution of the contract with Gillig, LLC and issues a purchase order for 16 vehicles within 30 days.
- Once the PO is in place, establish a date of pre-production meeting with Gillig, LLC.
- Conduct on-site quality inspections during the manufacturing process.
- Take delivery of buses (date to be determined).

DISCUSSION ITEM April 26, 2016

5E. FY16-17 Budget Development Update

Staff Resource: Rick Shreve, Budget Manager
Brian Litchfield, Director

Overview

Staff will provide an update on the FY16-17 Chapel Hill Transit budget at the April 26, 2016 Partners meeting. Staff anticipates that FY15-16 budget savings, as the result of additional one-time SMAP funding from the State will likely be able to reduce the Partners estimated contributions discussed during the March 22, 2016 meeting.

Next Steps

- May 9: Presentation of Chapel Hill Town Manager's Recommended Budget.
- May: Individual meetings with Partner Committee representatives.
- May 11: Budget Work Session.
- May 16: Public Hearing on Recommended Budget and budget work session.
- May 24: Budget Update at May Partners Meeting.
- June 1: Budget work session (if needed).
- June 6: Budget work session (if needed).
- June 13: Consider Adoption of FY16-17 budget.

INFORMATION ITEM April 26, 2016

5F. March Performance Reports

Staff Resource: Mila Vega, Transit Service Planner

- The March Performance Report will be provided to the Partners at the meeting on April 26, 2016.

MONTHLY REPORT April 26, 2016

6A. Operations

Staff Resource: Maribeth Lewis-Baker, Fixed Route Operations Manager
Peter Aube, Maintenance Manager
Mark Lowry, Safety Officer
Katy Luecken, Training Coordinator

Fixed Route Operations Manager – Maribeth Lewis-Baker

- Perfect Attendance – March 2016 – 35% or 39 Fixed Route Operators had perfect attendance for the month
- On time Performance – March 2016 – 81%
- March Operations/Safety Meetings – Chapel Hill Works Project, Estes Park Bus Stop, and Operating Standards were reviewed
- Resumed service at the Estes Park Apartments bus stop on Saturday, April 2, 2016
- Provided support services to local Emergency Management by shuttling police and EMS personnel to downtown for the NCAA Elite 8, Final 4, and the Championship Game.
- Mr. Joseph "Joe" McMiller, Transit Supervisor - Fixed Route, successfully completed the Transportation Leadership Development Program (TLDP), that is sponsored by the Institute for Transportation Research and Education at North Carolina State University (ITRE) and the North Carolina Department of Transportation Public Transportation Division. This is an intensive 12-week program that provides executives and managers the opportunity to examine their leadership and communication style and connect with transportation professionals around North Carolina.
- March 21 Training Class - (4) candidates in training

Catch us at our Best

Fixed Route Transit Operator Michelle Sykes-Parker was operating J-91 on March 4th and received the following compliment:
"I was running to catch the JFX bus at the light but JUST missed it. But then, the driver of the J bus who was right behind called the driver of the JFX bus to wait at the following stop for me. The driver of the J bus picked me up and drove me to that next stop. I wish I had gotten the name of the driver of the J bus. I just wanted to say how much I appreciated her kindness!" Cynthia Kahn

Fixed Route Transit Operator Jerry Williams was operating FCX-30 on March 31st and received the following compliment for his service at the Friday Center. "This is a great bus driver, saw people running and waited even though people kept trickling in and it was time to go. I didn't get his name, but he is very considerate." John Shorter

Upcoming Events

4/4/16 Training Class - (2) candidates in training
4/10/16 CHT had the Carrboro Bus on display at the Carrboro Open Streets event
4/17/16 CHT had a bus on display for Touch a Truck
4/23/16 Tarheel 10-miler – CHT will have detours on the Saturday FG and T Routes
5/2/16 Training Class will have (2) candidates
5/6/16 Go Chapel Hill Bike event
5/8/16 UNC Spring Commencement

5/21 Regional Bus Roadeo at Go Raleigh
5/23-5/25 Providing support for the Valor Games

Safety – Mark Lowry

- Working jointly with Police Department and Fire Department to conduct an overall Safety Assessment of the Transit Facilities.
- Hosting Smith System Defensive Driving Course at Transit to train supervisors on the training of this defensive driving course.
- Vehicle Accidents Summary:

TOTAL ACCIDENTS	Mar 2016	Mar 2015
Fixed Route		
Preventable	1	4
Non-Preventable	2	1
Demand Response		
Preventable	0	0
Non-Preventable	0	0
Maintenance		
Preventable	0	0
Non-Preventable	0	0

Training Coordinator – Katy Luecken

- We have two training classes in progress. The first class of four Fixed Route trainees began on 3/21/2016 and the second class of two Fixed Route trainees and one Maintenance trainee began on 4/4/2016. Both classes will be completed by the middle of May.
- Our next training class will begin on May 2nd. So far we are estimating three trainees.
- Estes Park Apartments Training has been completed and the new bus stop has been reopened.
- Fill-In Supervisors will be graduating from training on May 2nd.

Maintenance Manager – Peter Aube

- Fixed route ran 191,497 miles in March.
- Demand response ran 37,273 miles in March.
- Nonrevenue vehicles ran 25,260 miles in March.
- Maintenance performed 37 Preventive Maintenance Inspections (100% on-time).
- Provided the following training for Mechanics:
  - Thermo-king two day training for three techs.
  - Supplied in house A/C training to all Techs with A/C certification.
- Maintenance performed 18 road calls from March. (10,638 miles per road call)
- Collaborated with HR to fill two open Mechanic positions.

- Collaborated with Procurement Coordinator to complete IFB for new vehicle Lifts and floor resurfacing project .
- Installed backup cameras on buses 0309, 0409, 0509 and 0609 to assist with Estes turn around.
- Worked with Seon to install and begin beta testing of the New 16 camera systems on buses 0109, 0209, 0309, 0409, 0509, and 0609.
- Completed 35 seasonal A/C PM inspections previously done by Thermo-king.
- Completed major cleaning on entire fleet.
- Completed tire survey of fleet performed by Michelin Engineer
- Started tests of three different tire tread patterns to track fuel mileage and tire run out.

MONTHLY REPORT April 26, 2016

6B. Director

Staff Resource: Brian Litchfield

- The Director's Report will be provided at the meeting on April 26, 2016.

CHAPEL HILL TRANSIT
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CHAPEL HILL TRANSIT PUBLIC TRANSIT COMMITTEE

FUTURE MEETING ITEMS

APRIL 26, 2016

May 24, 2016	
Action Items	Informational Items
FY 16-17 Budget Update Customer Service Survey	Regional Bus Procurement Financial Sustainability Study Update Electric Bus Petition

June 28, 2016 11:00 a.m.	
Action Items	Informational Items
FY 16-17 Budget Update	Regional Bus Procurement Financial Sustainability Study Update

July, 2016 No Meeting	
Actions Items	Informational Items

Key Meetings/Dates

MPO Board – May 11, 2016, 9-11AM, Committee Room, Durham City Hall

TCC Meeting – May 25, 2016, 9-11AM Committee Room, Durham City Hall

APTA Bus and Paratransit Conference, May 16-18, 2016, Charlotte, NC

NCPTA State Roadeo and Annual Conference, June 10-15, 2016, Charlotte, NC

APTA Bus & Paratransit Conference, Roadeo to proceed in Charlotte

Posted on April 19, 2016

Riction

Over the weekend, the American Public Transportation Association (APTA) announced that this year's Bus & Paratransit Conference and Bus Roadeo would proceed as planned in Charlotte, N.C., from May 15 to 18. APTA was weighing the possibility of cancelling event due to a controversial N.C. law, which some consider discriminatory towards members of the lesbian, gay, bisexual, and transgender (LGBT) community.

APTA's announcement is below:

"With news of the current political situation affecting the LBGT community in North Carolina, APTA has received many inquiries on the status of its 2016 Bus & Paratransit Conference and International Bus Roadeo.

APTA is committed to being inclusive and does not condone discrimination of any kind against anyone who works for, or uses, public transportation. APTA's long-standing Diversity Policy and our recent LGBT initiative reflect the values we stand by.

This message is inform you that on Saturday APTA's Executive Committee met and made the decision to move forward with the conference as planned.

This decision was not made lightly and we know it will not please everyone. One chief reason we decided to proceed is to support the City of Charlotte, which has long had a track record of creating an environment that not only values diversity, but strongly embraces it. We feel that our attendees will feel welcome in Charlotte.

Public transportation serves and employs a diverse universe of people, and we are working with the City of Charlotte and will spotlight the impact and strength that diversity brings to our industry during the conference."

CHAPEL HILL NEWS APRIL 12, 2016 8:29 AM

Chapel Hill Transit to buy up to 53 new buses

HIGHLIGHTS

Nearly half of the fleet's 99 buses are between 14 and 20 years old

25 clean diesel buses could be bought over next 12 months at $450,000 each

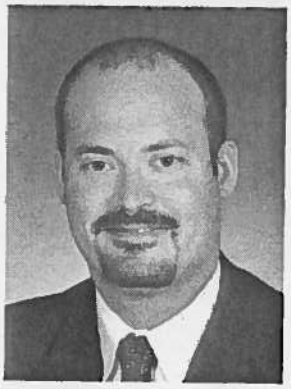
Town, transit partners will continue to study electric bus technology

Robert Farrell, a Chapel Hill Transit bus service technician, checks the transmission fluid level on a 2002 bus in this 2015 file photo. Farrell said at the time that the bus had logged 399,000 miles. The town authorized staff Monday to begin purchasing some of the 53 new buses that could be added to the fleet over the next few years. Harry Lynch - hlynch@newsobserver.com

BY TAMMY GRUBB
tgrubb@newsobserver.com

CHAPEL HILL — The Town Council approved a five-year contract Monday for up to 53 clean diesel Chapel Hill Transit buses but also left the door open to add electric buses in the future.

The contract does not guarantee the town will buy all the clean diesel buses that were authorized, but the need is critical now, transit director Brian Litchfield said. Each new bus could cost roughly $450,000.



Nearly half of the fleet's 99 buses are more than 14 years old, and the oldest buses are more than 20 years old; the federal standard is to replace buses after 12 years. The town last added new buses to its fleet in 2013 and could buy up to 25 buses over the next 12 months, he said.

"It's even affecting our newer buses," he said. "As our older buses have gotten older, we're putting more and more miles on our newer buses as well, too, so some of our newer buses have miles on them for buses that are about twice their age, which is a challenge."

There's also a significant amount of staff time involved in

maintaining older buses, he said.

Brian Litchfield. HARRY LYNCH - hlynch@newsobserver.com

The first buses could be paid for through a combination of debt financing, capital reserve money and grants, he said. Five buses could be purchased using Orange County bus and rail tax revenues, four using $2 million in town funds, and three using state transportation funding.

The council also approved a financing agreement with transit partners Carrboro and UNC for up to 15 buses. Litchfield estimated the annual debt payment would be $760,000 over roughly 10 years; the university would pay 58 percent, Carrboro would pay 11 percent and Chapel Hill, 31 percent.

State funding, which previously paid 80 percent of a new bus cost, has fallen sharply over several years, Litchfield said.

"The picture is dire," Litchfield said. "It looks a little bit better than it was a few months ago when I was talking to you about this, and we have some good options available to us."

A group of citizens recently petitioned the town to consider buying electric buses instead.

While electric buses are more expensive to buy – roughly twice the cost of a clean diesel bus, Litchfield said – and have higher labor costs, they use less energy than diesel buses, have lower maintenance costs and cut noise and emissions. The lithium-ion or iron-phosphate batteries that power electric buses recover energy at every stop.

The transit partners will discuss the petition at their April 26 meeting, Litchfield said. They also are exploring the possibility of using Duke Energy funds to buy an electric charging station. The cost for a station ranges from $300,000 to $1 million, he said.

Five Chapel Hill Transit buses already use a mini-hybrid system, Litchfield said, which relies on electricity to run the engine cooling system instead of a more traditional and expensive hydraulic system.

The town could benefit from improvements in the technology by waiting, council member Maria Palmer said. Council member Ed Harrison, a liasion to the transit partners, suggested the town spend its time on a formal study of alternatives to clean diesel buses, including compress natural gas systems.

Tammy Grubb: 919-829-8926, @TammyGrubb

MORE CHAPEL HILL NEWS

COMMENTS

CantonRep.com

By Shane Hoover

Print Page

January 04. 2016 7:00AM

SARTA to break ground for hydrogen fuel station

The Stark Area Regional Transit Authority plans to start carrying riders on a fuel-cell bus next fall, and will have a seven-bus fleet by the end of 2017. To fuel them, SARTA is building a hydrogen station in front of its Gateway Boulevard SE headquarters.

Clean and quiet hydrogen fuel cell buses are cutting-edge public transportation.

The Stark Area Regional Transit Authority plans to start carrying riders on a fuel-cell bus next fall, and will have a seven-bus fleet by the end of 2017.

To fuel them, SARTA is building a hydrogen station in front of its Gateway Boulevard SE headquarters.

The agency will break ground ceremonially on the new $1.6 million station Tuesday. Actual construction will begin around February and take six to eight months to complete.

Like SARTA's compressed natural gas station, the hydrogen station will be open to the public.

"This will be the largest hydrogen station outside of California," said Kirt Conrad, SARTA's executive director.

ULTIMATE FUEL

Hydrogen is the most abundant element in the universe. Through a chemical reaction, fuel cells turn oxygen and hydrogen into electricity that can power a vehicle, such as a bus. The only byproduct is water.

"It has the allure of being a completely sustainable, completely renewable source of fuel," said Jim Durand, program manager of the Renewable Hydrogen Fuel Cell Collaborative at Ohio State University's Center for Automotive Research.

But there are drawbacks. Hydrogen needs to be stored under high pressure, and the still-developing technology is expensive.

"A big key is the refueling infrastructure," Durand said.

DEVELOPING TECHNOLOGY

In 2006, the Federal Transit Administration started the National Fuel Cell Bus Program to improve the technology and reduce its cost.

Three-quarters of the $19 million price tag of SARTA's fuel-cell buses and hydrogen station will come from federal grants. The rest of the funding comes from federal dollars administered by the Ohio Department of Transportation.

"We're part of this team that's taking this product and trying to commercialize it," Conrad said.

SARTA's seven fuel-cell buses will give it the third largest fuel-cell fleet in the country, and the largest outside of California.

SARTA will get two fuel-cell buses next year, but they won't immediately be on the road.

One will be used at Ohio State as part of SARTA's collaboration with the Center for Automotive Research. After a year, the bus will be transferred to Canton.

The other bus has to go through benchmark safety testing in Pennsylvania. It should be on the road in October or November, Conrad said.

Five more buses will be delivered throughout 2017.

The buses, built by ElDorado National using fuel cells made by Ballard Power Systems and a drivetrain from BAE Systems, will seat 35 passengers and cost about $60,000 to operate a year, including driver salaries, maintenance and fuel.

TOPPING OFF

Pennsylvania-based Air Products will help build and maintain the fueling station, and supply the hydrogen.

SARTA will pay the equivalent of $2.20 a gallon for hydrogen. That's more than SARTA currently pays for CNG and diesel, but hydrogen prices are less volatile, Conrad said.

Fuel cell buses also are more efficient. Testing has shown they have 1.73 times the fuel economy of diesel buses and almost double that of CNG buses, according to a December report by the National Renewable Energy Laboratory.

The rest of SARTA's 100-bus fleet will include 40 CNG buses and four diesel-electric buses, with the rest running on a low-level biodiesel blend.

SLEEPER INDUSTRY

Congressman Bob Gibbs, R-Lakeville, and U.S. Sen. Sherrod Brown, D-Cleveland, have supported the hydrogen project at the federal level.

And Lt. Gov. Mary Taylor is scheduled to attend Tuesday's event in recognition of the state's role.

"Without the state of Ohio's support for this, we would not be where we're at," Conrad said.

He said he hopes SARTA's role in testing fuel-cell buses will help Ohio businesses compete in the growing industry.

So far, California leads the nation in using hydrogen as a transportation fuel. The state has nine refueling stations and another 42 were planned as of November, according to the California Fuel Cell Partnership.

Ohio doesn't have a network of hydrogen stations and you can't buy fuel-cell cars.

But the state has companies that make tanks for storing hydrogen, high-pressure fittings, fueling stations and even fuel cells, said Durand, the Ohio State professor. "You might call it a 'sleeper industry.'"

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