



City of Greenville Logo



Greenlink Logo

# Greenlink 2020-2024 Transit Development Plan

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Main Street, Greenville

**Final Report**  
**April 2018**

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## EXECUTIVE SUMMARY

The Greenville Transit Authority Board of Directors is proud to present this 2020-24 Transit Development Plan (TDP) for Greenlink. The plan is designed to improve the Greenlink fixed route and paratransit network so it is useful to more residents and businesses throughout the City and County of Greenville.

The need for service expansion has its roots in the Greenlink Comprehensive Operations Analysis (COA), which was completed in August 2017. The COA recommendations were cost neutral, meaning that all changes were made using only existing operating funds. While the plan works well for existing corridors and riders, the reality is that Greenville is growing both in the number of residents and number of businesses. The cost neutral nature of the recommendations mean that travel needs beyond the existing service area are unaddressed in the COA.

The TDP has two primary objectives to address future travel needs within the City and County of Greenville:

**Objective 1:** Prepare a prioritized service plan that demonstrates where and how Greenlink should operate expanded services in the next five years.

**Objective 2:** Make the case for additional transit funding for the service expansion.

### Service Improvements

Chapters 2 through 4 detail the development of the service plan improvements. Improvements were divided into two analyses:

**Analysis 1** considered improvements to the core network, including frequency, span, and Sunday improvements.

**Analysis 2** considered service expansion – additional radial and crosstown routes in the Greenville city core, as well as new routes to outer parts of Greenville County. A total of 23 new route ideas were tested in the analysis process.

Two main recommendations came from the service improvement analysis. The first recommendation is to introduce span and frequency improvements to the Greenlink routes recommended during the COA, as subsequently approved for implementation. The figure below details the priority order for these service improvements.

Flow Chart of Service Improvements



The second recommendation is to expand service where it makes the most sense to do so. Of the 23 routes evaluated, 19 are recommended for implementation. The Implementation Plan in Chapter 6 addresses how and when those routes could be implemented.

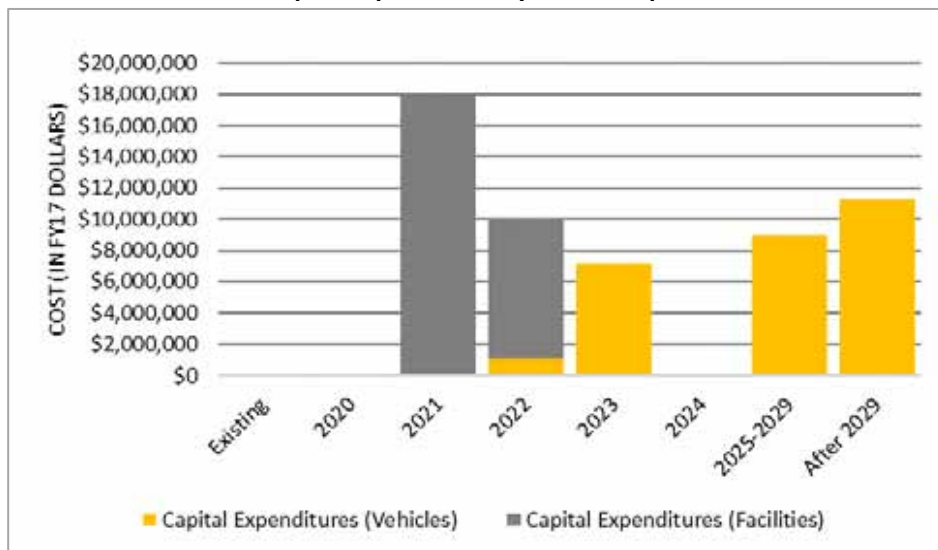
## Implementation

The implementation plan is presented in Chapter 6. All recommended projects and capital improvements are slotted into realistic time periods for implementation. While the five-year TDP covers the near term (2020-2024), the plan also includes short term (2025-2029) and long term (after 2029) implementation time periods to allow for the phasing of improvements.

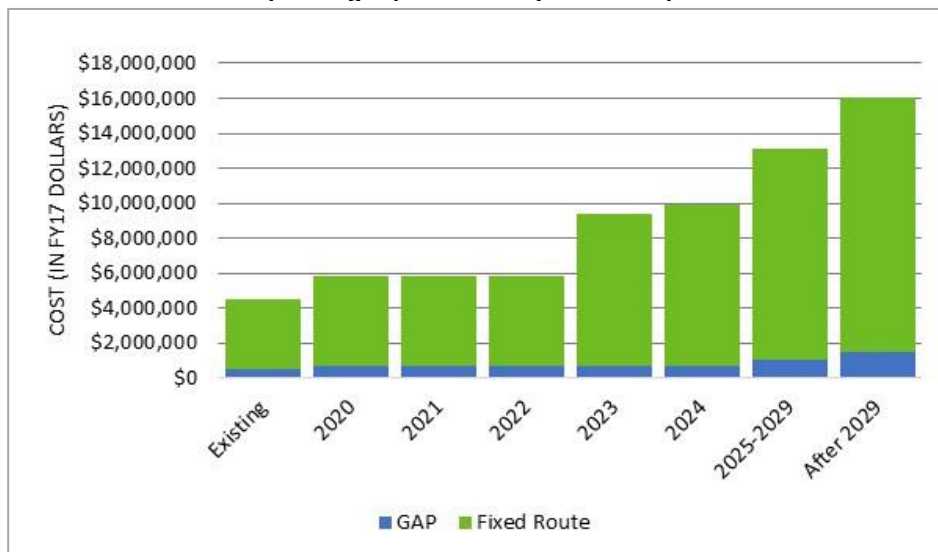
Phasing is required due both to the time required to implement capital “pre-requisites” to service expansion and to create a financially “realistic, but unconstrained” plan to grow the system over time. As it currently stands, implementing just the recommended 2020-24 span and frequency improvements projects is an ambitious undertaking.

When you add in the longer term improvements, the plan would roughly double the size of Greenlink, including construction of a new maintenance facility and a doubling of the fixed route fleet, as shown in the tables below. Thus, service expansion projects were placed beyond 2024 to include them in the plan, but give Greenlink time to grow into its new role before taking on additional expansion.

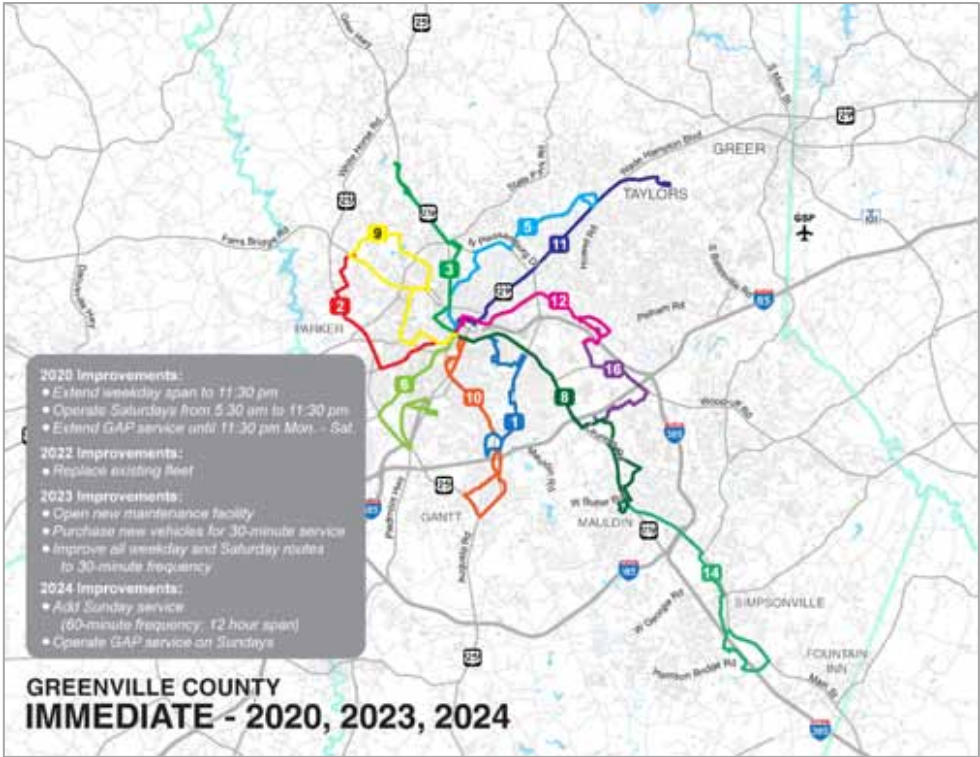
**Estimated Capital Expenditures by Year to Implement Plan**



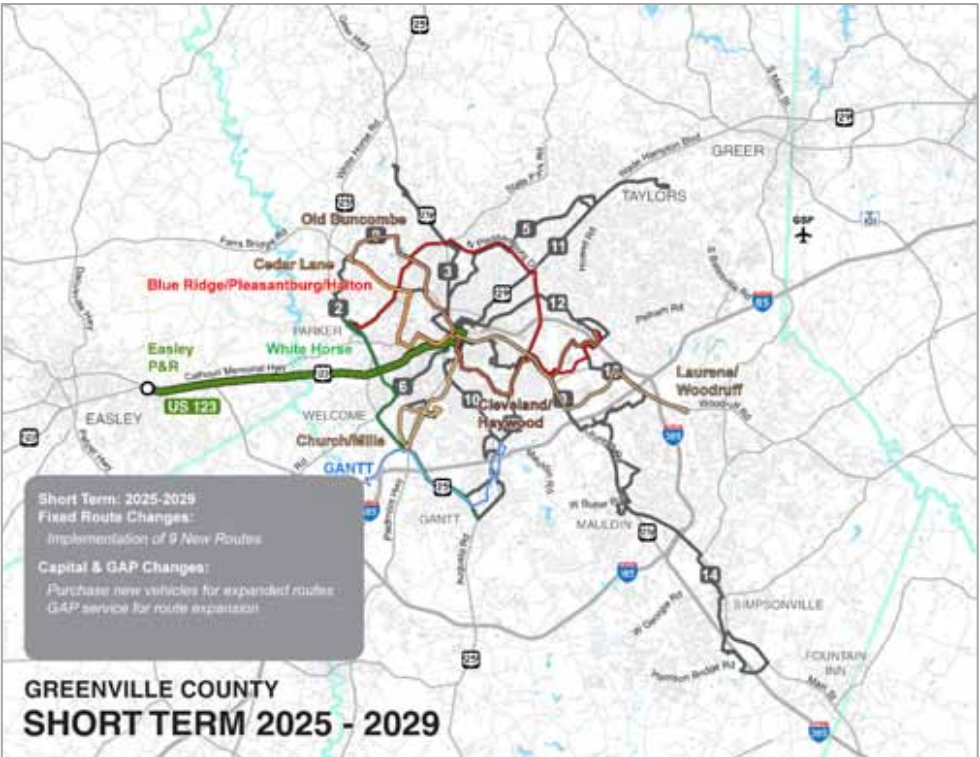
**Estimated Operating Expenditures by Year to Implement Plan**



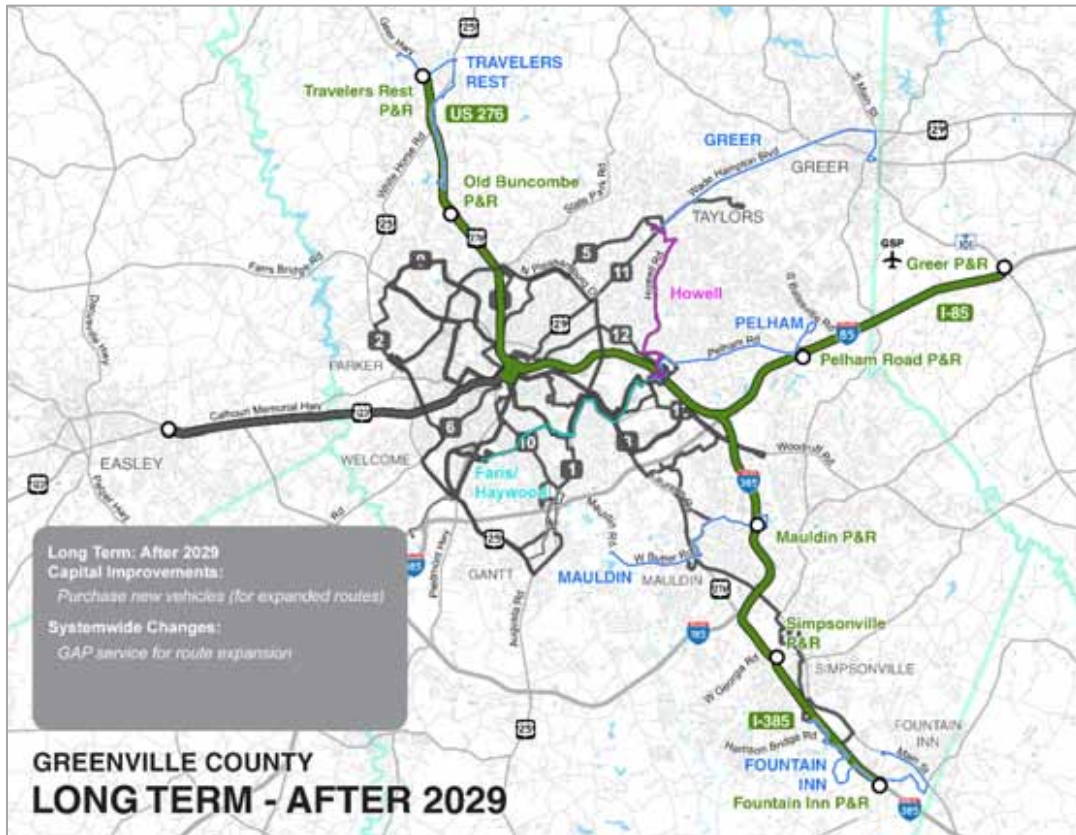
2020-2025 Map of Improvements



2025-2029 Map of Improvements



After 2029 Map of Improvements





## Funding Analysis

To help make the case for additional transit funding for service expansion, the TDP includes a peer funding analysis to determine how Greenlink compares to its peers regarding spending and funding sources. The peer group includes eight southeastern cities of similar size to Greenville. Key conclusions are:

- This data reaffirms previous findings that Greenville is underfunding its transit system. In FY 2016, Greenlink spent 69% less on operations and 98% less on capital than its peers in comparably sized urban areas.
- Greenlink is relying heavily on FTA Section 5307 funds for operations, rather than on local funds as its peers do. FTA Section 5307 funds in large urban areas are intended to be used primarily for capital.
- Other than fares, directly generated funds are generally not a significant source of funding. Greenlink benefits from its contractual relationships, while CARTA in Chattanooga benefits from parking revenues.
- The majority of Greenlink's transit peers (Charleston, Columbia, Baton Rouge, Greensboro, Winston-Salem) rely almost exclusively on sales or property taxes for their local funding.
- In FY 2016, several peers had significant infusions of FTA funds specifically for capital projects, including Section 5339 (Bus and Bus Facilities), Section 5309 (Capital Program), and Section 5337 (State of Good Repair).

## CHAPTER 1 OUTREACH

Outreach is necessary for a planning effort to truly address the needs of the community. To that end, focus group meetings were conducted as part of the Greenlink 2020-24 Transit Development Plan. These meetings were conducted to engage stakeholders in the planning process and gain their input on the twin objectives of the study.

For objective 1, service expansion, focus groups were asked to help define desired travel patterns and prioritize projects for the plan. While participants had many opinions on how best to improve Greenlink, one of the main findings was support for improvements to the core network, particularly the need for more frequent service to attract new riders to the network. Discussion also focused on workforce development – connecting residents to job opportunities in other parts of Greenville County.

For objective 2, funding options, participants were asked to generate ideas on how Greenlink could best pay for improvements. Participants were generally supportive of more traditional revenue structures (typically a dedicated sales tax or property tax for transit). However, many lacked confidence that voters in Greenville County would support an increase to the sales or property tax. To counter anti-tax sentiments, participants emphasized the need to establish the vision of transit in the community and for the business community to make the economic case for transit expansion. The discussion also included ideas on “pay to play,” essentially the idea that the private sector needs to become involved in financing the transit system.

A total of five meetings were conducted over December 18-19, 2017. Appendix A includes further documentation of the focus group meetings.

## CHAPTER 2 DEFINITION OF PROJECTS

Chapter 2 presents the projects that were identified for evaluation for this Transit Development Plan. The potential projects were determined by both the consultant and Greenlink staff in a route workshop conducted on October 25-26, 2017. From that workshop came service improvements at both the route and system level. The projects were organized into two analyses: Analysis 1 Core Network Improvement<sup>1</sup> and Analysis 2 Service Expansion. Analysis 1 looks at improvements to frequency, span, and day of week additions to the core network that would improve the usefulness of the current network for both existing and future riders. Analysis 2 considered additional services that could be added to the network to extend its reach and create new transit connections across the City and County of Greenville.

The individual projects identified are discussed below in greater detail.

### Analysis 1: Core Network Improvement

Analysis 1 addresses improvements to frequency, span, and day of week additions to make the existing Greenlink network more useful. Five specific core network improvements were identified during the route workshop:

- 1.a Improve all weekday routes to 30-minute frequency
- 1.b Improve all Saturday routes to 30-minute frequency
- 1.c Extend weekday service span to 11:30 p.m.
- 1.d Extend Saturday service span to match 1.b (18 hours of service)
- 1.e Add Sunday service (60-minute frequency and 12 hours of service)

Figure 2-1 shows the network developed during the Comprehensive Operations Analysis (COA) that was used to develop the five core network options.

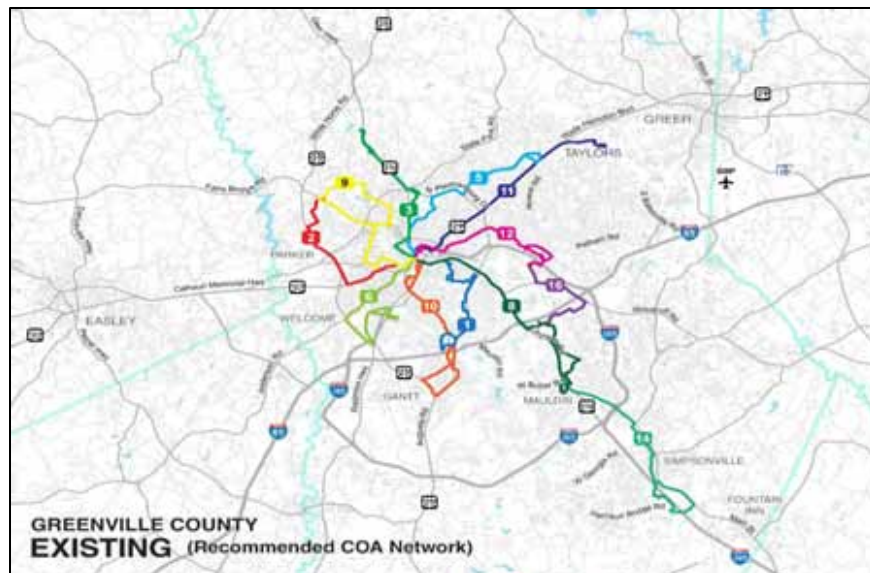


Figure 2-1. COA Core Network

<sup>1</sup> The core network is assumed to be the COA network as adopted by the Greenlink Board of Directors on December 19, 2017

## Analysis 2: Service Expansion

Analysis 2 considered the ways that Greenlink can expand service beyond the existing service footprint. As noted in the introduction, discussion of service expansion started during the COA. Figure 2-2 shows the transit propensity score developed during the COA. Areas with the most potential for service expansion are those adjacent to the existing Greenville core, including Gantt, Greer, Woodruff Road, Pelham Road, and Howell Road.

Regardless of the transit propensity scoring, the objective for Analysis 2 was to identify all potential routes for service expansion outside of the existing Greenlink service footprint. The more routes evaluated the better. First, it makes the case that the analysis was comprehensive and exhaustive in its efforts. Second, by evaluating many routes we can better determine the prioritized order for the time when funding does become available.

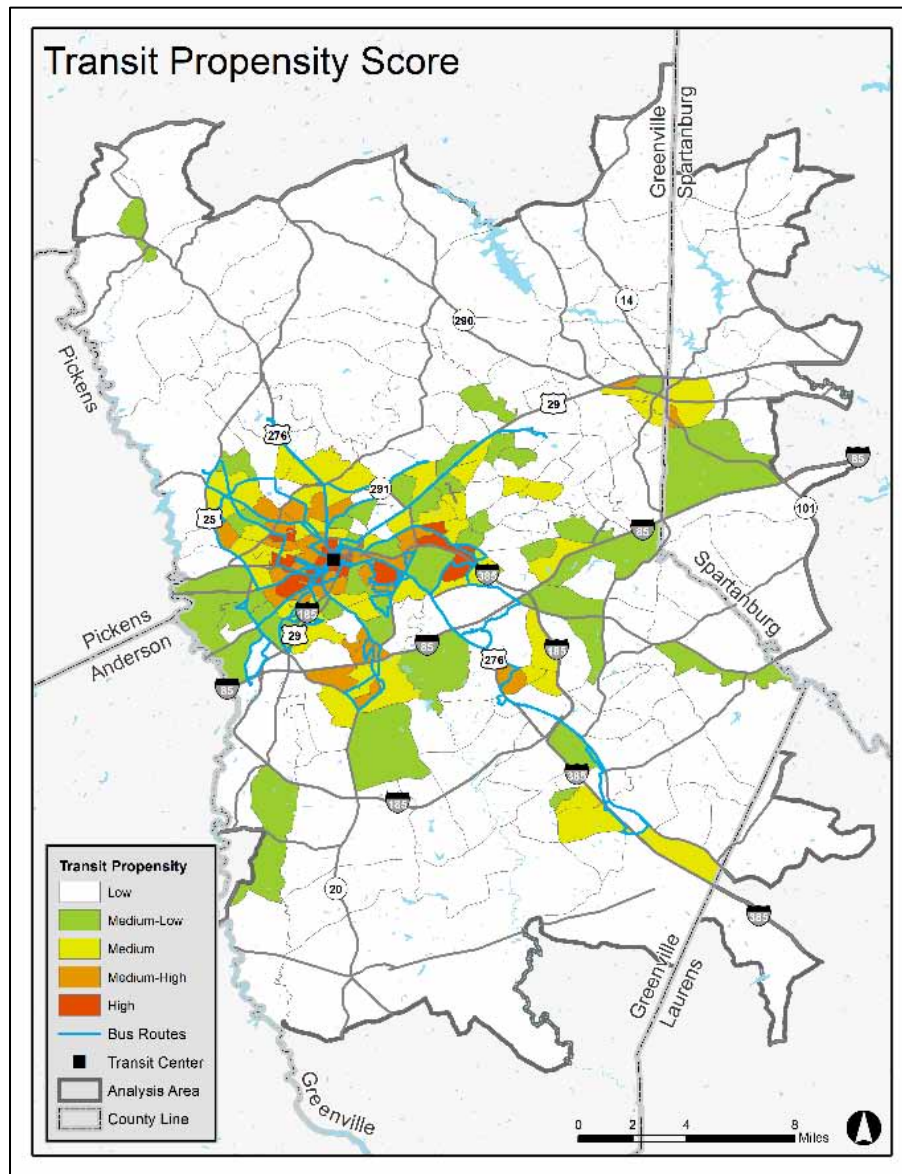


Figure 2-2. Greenville Transit Propensity Score

The route workshop identified 23 distinct route ideas. These routes fall into four categories:

- **Radials** are routes that start at the Transit Center and operate on main corridors out of town. Figure 2-3 shows radial routes evaluated for this analysis.
- **Crosstowns** are routes that begin and end on different sides of Greenville without going downtown. Figure 2-4 shows crosstown routes evaluated for this analysis.
- **Connectors** are routes that extend outward to connect to lower-density places in Greenville County. Figure 2-5 shows connector routes evaluated for this analysis.
- **Commuters** are routes that operate peak only and carry riders from park and ride lots to downtown. Figure 2-6 shows commuter routes evaluated for this analysis.

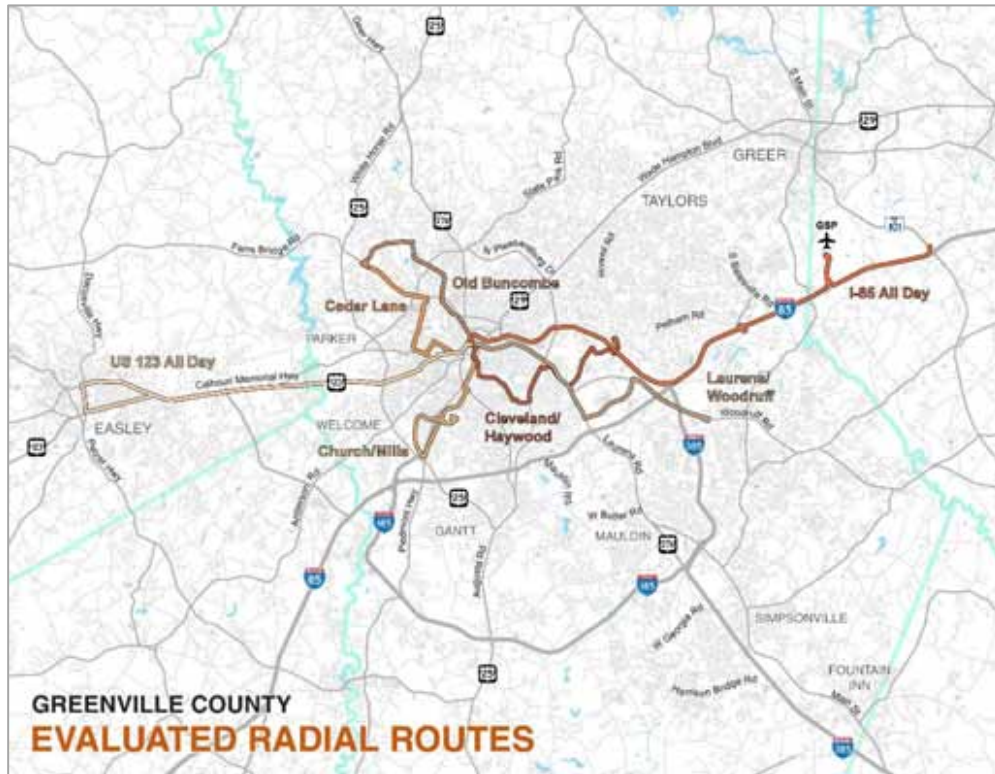


Figure 2-3. Radial Routes Evaluated in Analysis 2

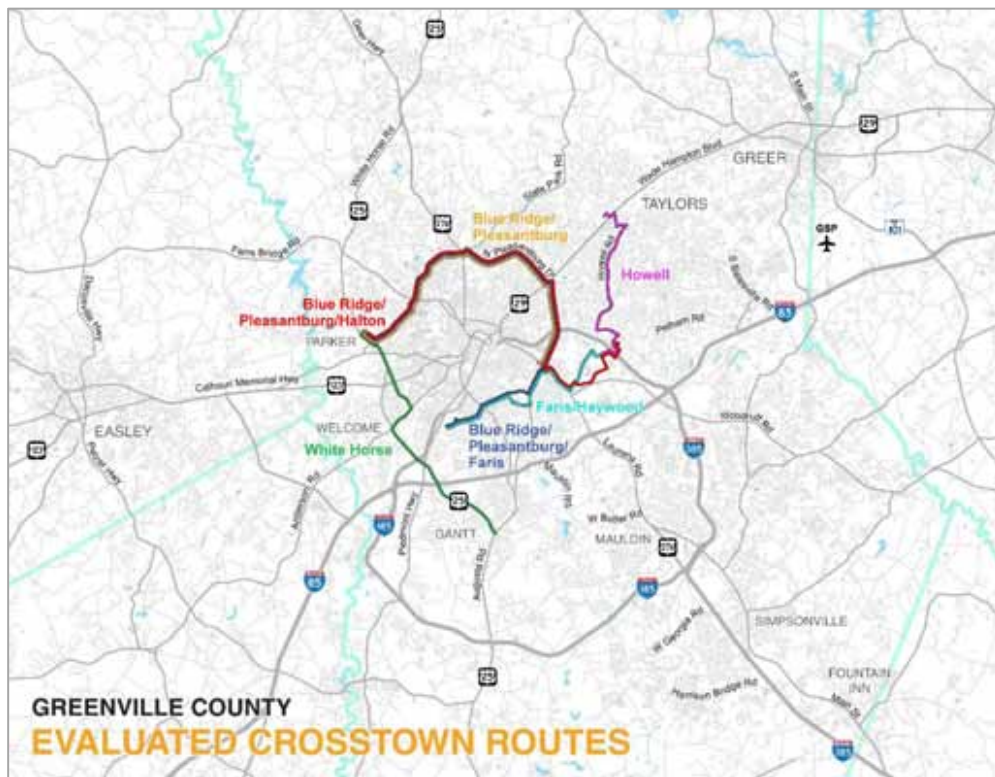


Figure 2-4. Crosstown Routes Evaluated in Analysis 2

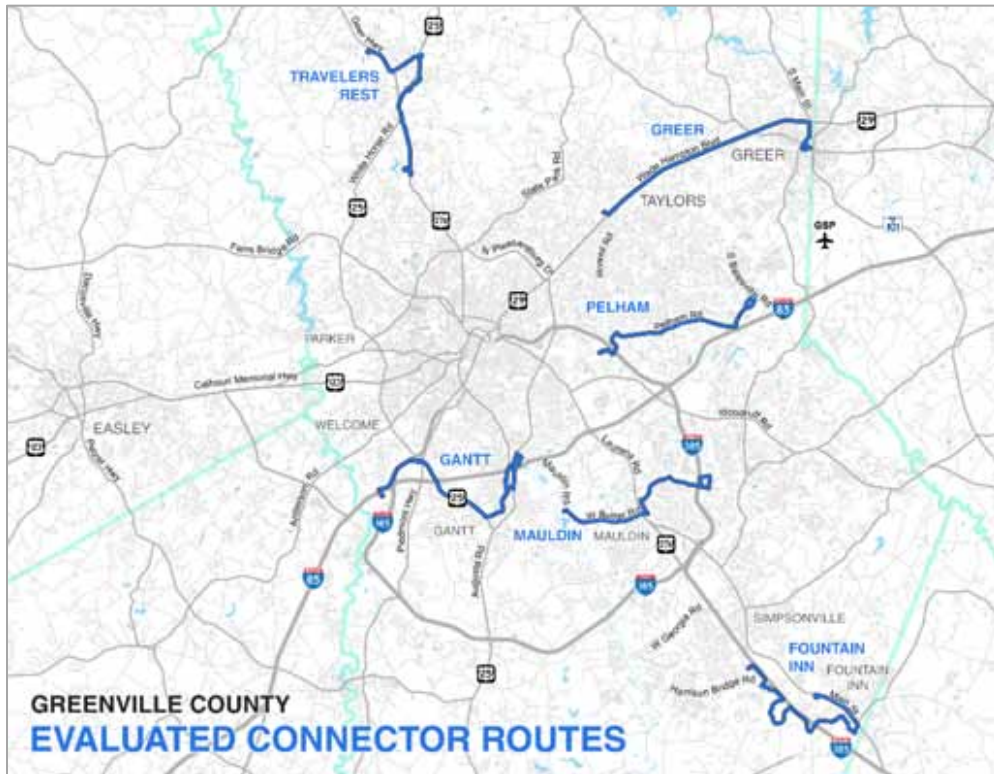


Figure 2-5. Connector Routes Evaluated in Analysis 2

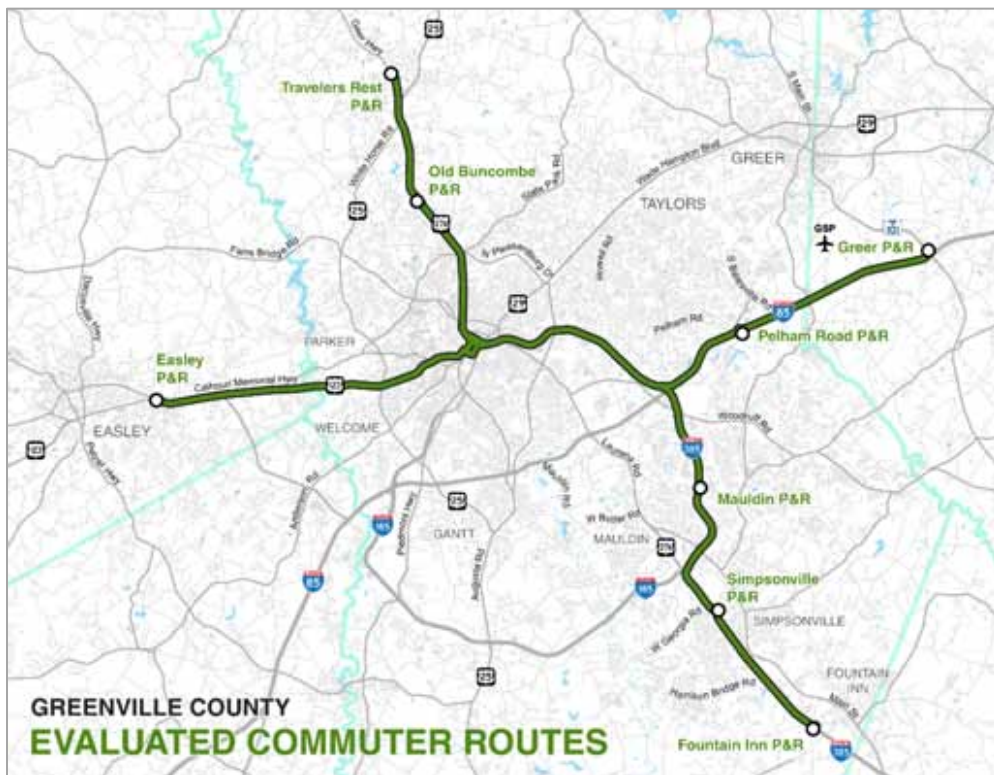


Figure 2-6. Commuter Routes Evaluated in Analysis 2

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## CHAPTER 3 COST AND RIDERSHIP ESTIMATE

The evaluation of projects for this TDP is principally a measure of cost and benefit. Cost is defined as the operating cost of the service or the capital cost to build infrastructure. Benefit is defined as ridership, that is, how many people will ride (and thus benefit) from the service improvements proposed.

Chapter 3 describes the methodology used for both cost and ridership estimates that are part of the evaluation presented in Chapter 4.

### Fixed Route Operations and Maintenance Costs

#### Cost Model

The operations and maintenance (O&M) costs for each element of this plan was estimated by first developing a multi-variable cost model based on Greenlink's fiscal year (FY) 2016 submittal to the National Transit Database. The cost model was inflated into FY 2017 dollars using a 3.0% inflation rate<sup>2</sup>. The cost model is shown in Table 3-1.

The four unit costs developed from the model include:

- **\$33.72 per revenue hour:** represents costs associated with operating the bus route (drivers, supervisors, etc.).
- **\$1.78 per revenue mile:** represents costs associated with maintaining the bus vehicle (mechanics, materials and supplies, etc.).
- **\$29,882 per peak bus:** represents costs associated with management and agency administration that change based on the amount of service in operation.
- **\$317,023 in fixed administration costs:** represents costs associated with management and agency administration that do not change.

#### Operating Statistics

Once unit costs were established, operating statistics were developed for each plan element defined in Chapter 2. Several assumptions were used in the development of operating statistics:

- Days of Operation included 260 weekdays, 51 Saturdays, 51 Sundays, and 3 holidays.
- A 15% layover and recovery time was assumed for each route in the calculation of cycle time.
- Route travel speeds ranged from 15-17 mph for in-town routes, 17-20 mph for suburban/rural routes, and 24-26 mph for freeway-based commuter routes.
- Service span for Analysis 2 Service Expansion is 14 hours per day on weekdays and 10 hours per day on Saturdays.
- Connector routes were assumed to operate on weekdays only.

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<sup>2</sup> The Bureau of Labor Statistics Consumer Price Index for Urban South calculates the 2016 to 2017 inflation rate of 2.0%. Three percent was used for Greenville due to the high economic growth in the region.

Table 3-1. Greenlink O&M Cost Model

Greenlink															
Bus O&M Cost Model														Inflation (2016-17)	
1.030															
Expense Line Item	2016 Bus Expenses	Variable Unit Cost (\$2016)		Operating Divisions	Peak Buses	Productivity Ratio			Base Year Resource Unit Cost	Inflation Factor	Model Results in \$2017				
		Revenue Bus-Hours	Revenue Bus-Miles			Resource Variable	Resource Value	Resource/Supply			Resource Unit Cost	Revenue Bus-Hours	Revenue Bus-Miles	Operating Divisions	Peak Buses
<b>Vehicle Operations</b>															
Operators' Salaries and Wages (501.01)	\$1,385,245	\$21.51				Work Hours	72,220	1.12	\$19.18	1.030	\$19.76	\$22.16			
Other Salaries and Wages (501.02)	\$67,258			\$67,258		Work Hours	3,506	0.05	\$1,235,220	1.030	\$1,272,277		\$69,275.74		
Fringe Benefits (Bus-hr driven)	\$554,511	\$8.61				Work Hours	72,220	1.12	\$7.68	1.030	\$7.91	\$8.87			
Fringe Benefits (Garage driven)	\$26,923			\$26,923		Work Hours	3,506	0.05	\$494,456	1.030	\$509,290		\$27,730.94		
Services (503)	\$168,187	\$2.61				Work Hours	75,726	1.18	\$2.22	1.030	\$2	\$2.69			
Fuels and Lubricants (504.01)	\$576,781		\$0.53			Gallons	246,341	0.23	\$2.34	1.030	\$2.41		\$0.55		
Tires and Tubes (504.02)	\$50,918		\$0.05			Bus Miles	1,085,142	1.00	\$0.05	1.030	\$0.05		\$0.05		
Other Materials and Supplies (504.99)	\$48,405		\$0.04			Peak Buses	17	0.00	\$2,847.35	1.030	\$2,933		\$0.05		
Utilities (505)	\$31,993		\$0.03			Peak Buses	17	0.00	\$1,881.94	1.030	\$1,938		\$0.03		
Miscellaneous Expenses (509)	\$4,063			\$4,063		Peak Buses	17	1.00	\$4,063.00	1.030	\$4,185		\$4,184.89		
<b>Vehicle Maintenance</b>															
Salaries and Wages (501.02)	\$342,808		\$0.32			Work Hours	16,861	0.02	\$20.33	1.030	\$20.94		\$0.33		
Fringe Benefits (502)	\$125,897		\$0.12			Work Hours	1,830	0.00	\$68.80	1.030	\$70.86		\$0.12		
Services (503)	\$279,104		\$0.26			Bus Miles	1,085,142	1.00	\$0.26	1.030	\$0.26		\$0.26		
Fuels and Lubricants (504.01)	\$9,477		\$0.01			Peak Buses	17	0.00	\$557.47	1.030	\$574		\$0.01		
Tires and Tubes (504.02)	\$0		\$0.00			Peak Buses	17	0.00	\$0.00	1.030	\$0.00		\$0.00		
Other Materials and Supplies (504.99)	\$250,068		\$0.23			Bus Miles	1,085,142	1.00	\$0.23	1.030	\$0.24		\$0.24		
Casualty and Liability Costs (50% rev mi driven)	\$19,535		\$0.02			Bus Miles	1,085,142	1.00	\$0.02	1.030	\$0.02		\$0.02		
Casualty and Liability Costs (50% peak bus driven)	\$19,535				\$1,149.09	Peak Buses	17	0.00	\$73,348,465	1.030	\$75,548,919			\$1,183.56	
Miscellaneous Expenses (509)	\$7,567			\$7,567		Bus Miles	1,085,142	1.00	\$7,567.00	1.030	\$7,794		\$7,794.01		
<b>Non-vehicle Maintenance</b>															
Salaries and Wages (501.02)	\$24,460			\$24,460		Work Hours	1,830	107.65	\$227.22	1.030	\$234.04		\$25,193.80		
Fringe Benefits (502)	\$9,249			\$9,249		Work Hours	1,830	107.65	\$85.92	1.030	\$88.50		\$9,526.47		
Services (503)	\$49,402			\$49,402		Peak Buses	17	1.00	\$49,402.00	1.030	\$50,884		\$50,884.06		
Other Materials and Supplies (504.99)	\$93,579			\$93,579		Peak Buses	17	1.00	\$93,579.00	1.030	\$96,386		\$96,386.37		
Casualty and Liability Costs (50% rev mi driven)	\$3,374		\$0.00			Bus Miles	1,085,142	1.00	\$0.00	1.030	\$0.00	\$0.00			
Casualty and Liability Costs (50% peak bus driven)	\$3,374				\$198.47	Peak Buses	17	0.00	\$12,668,751	1.030	\$13,048,814			\$204.42	
Miscellaneous Expenses (509)	\$0				\$0.00	Peak Buses	17	1.00	\$0.00	1.030	\$0.00			\$0.00	
<b>General Administration</b>															
Salaries and Wages (501.02)	\$318,501				\$18,735.35	Work Hours	25,638	1,508.12	\$12.42	1.030	\$12.80			\$19,297.41	
Fringe Benefits (502)	\$100,487				\$5,911.00	Work Hours	25,638	1,508.12	\$3.92	1.030	\$4.04			\$6,088.33	
Services (503)	\$17,326				\$1,019.18	Peak Buses	17	1.00	\$1,019.18	1.030	\$1,050			\$1,049.75	
Other Materials and Supplies (504.99)	\$9,960				\$585.88	Peak Buses	17	1.00	\$585.88	1.030	\$603			\$603.46	
Utilities (505)	\$25,288			\$25,288		Peak Buses	17	1.00	\$25,288.00	1.030	\$26,047		\$26,046.64		
Casualty and Liability Costs (506)	\$131,768		\$0.12			Bus Miles	1,085,142	1.00	\$0.12	1.030	\$0.13		\$0.13		
Taxes	\$0				\$0.00	Peak Buses	17	1.00	\$0.00	1.030	\$0.00			\$0.00	
Miscellaneous Expenses (509)	\$24,015				\$1,412.65	Peak Buses	17	1.00	\$1,412.65	1.030	\$1,455			\$1,455.03	
<b>TOTALS</b>	<b>\$4,779,057</b>	<b>\$32.73</b>	<b>\$1.72</b>	<b>\$307,789.24</b>	<b>\$29,011.62</b>							<b>\$33.72</b>	<b>\$1.78</b>	<b>\$317,022.92</b>	<b>\$29,881.97</b>
<b>Resource Variable Values</b>		<b>64,398</b>	<b>1,085,142</b>	<b>1</b>	<b>17</b>										

**Calculated O&M Costs**

Cross multiplying the unit costs and operating statistics results in the O&M cost for each individual project.

**Core Network Improvement O&M Costs**

For Core Network Improvements, operating costs were estimated by first establishing the cost of the existing network, and then measuring the incremental cost increase associated with each improvement. This approach was used because administrative costs will not increase proportionally for each improvement. For example, adding service span to weekday nights will not necessarily increase Greenlink administrative costs. However, doubling the weekday frequency to every 30 minutes will effectively double the size of the agency and will require additional administrative cost.

**Table 3-2. Core Network Improvements O&M Cost Estimate**

	Revenue Hours	Revenue Miles	Peak Buses in Operation	Operating Divisions	Total Cost (FY17 dollars)	Incremental Cost (FY17 dollars)
<b>Core Network Improvement</b>						
Existing	53,040	838,195	13	1	\$3,981,611	
Improve all weekday routes to 30 minute frequency	94,000	1,481,877	24	2	\$7,150,900	\$3,169,289
Improve all Saturday routes to 30 minute frequency	100,120	1,578,338	24	2	\$7,528,464	\$377,564
Extend weekday span to 11:30p	66,960	1,057,921	13	1	\$4,840,958	\$859,347
Extend Saturday span to 11:30p	58,856	929,908	13	1	\$4,340,497	\$358,886
Add Sunday service (60 minute frequency; 12 hrs)	61,304	968,493	13	1	\$4,491,523	\$509,912

Thus, the operating division unit cost, which is described above as representing fixed administrative costs, was assumed to increase when more than 20 vehicles are required to operate the proposed improvement. This break point was used to reflect the need for a larger administrative cost to run the agency. The cost of each improvement was then subtracted from existing to measure the true increase in cost with each proposed improvement. Table 3-2 provides details on O&M cost for Core Network Improvements.

Table 3-3. Service Expansion O&amp;M Cost Estimate

	Reveune Hours	Revenue Miles	Peak Buses in Operation	Operating Divisions	O&M Cost (FY17 dollars)
<b>Service Expansion</b>					
<b>Connector Service</b>					
● Gantt Connector	3,640	53,945	1	0	\$248,362
● Greer Connector	3,640	60,206	1	0	\$259,475
● Mauldin Connector	3,640	44,153	1	0	\$230,981
● Pelham Connector	3,640	43,789	1	0	\$230,335
● Travelers Rest Connector	3,640	47,757	1	0	\$237,378
● Fountain Inn Connector	3,640	61,152	1	0	\$261,155
<b>Crosstown Service</b>					
● Blue Ridge/Pleasantburg	8,300	88,188	2	0	\$496,140
● Blue Ridge/Pleasantburg/Faris	8,300	122,467	2	0	\$556,989
● Blue Ridge/Pleasantburg/Halton	8,300	120,641	2	0	\$553,747
● Faris/Haywood	8,300	69,969	2	0	\$463,800
● Howell	4,150	54,490	1	0	\$266,523
● White Horse	4,150	68,019	1	0	\$290,539
<b>Radial Service</b>					
● Cleveland/Haywood	4,150	67,147	1	0	\$288,992
● Church/Mills	4,150	45,194	1	0	\$250,022
● Laurens/Woodruff	8,300	76,236	2	0	\$474,924
● Cedar Lane	4,150	55,278	1	0	\$267,923
● Old Buncombe	4,150	51,004	1	0	\$260,335
● I-85 all day	8,300	169,528	2	0	\$640,526
● US 123 all day	8,300	107,651	2	0	\$530,690
<b>Commuter Service</b>					
● 85 East Commuter	1,308	31,863	3	0	\$190,316
● 385 South Commuter	1,176	31,005	3	0	\$184,331
● 276 North Commuter	969	14,890	3	0	\$148,755
● 123 West Commuter	1,015	19,687	3	0	\$158,805

### Service Expansion O&M Costs

For Service Expansion, the O&M cost of each individual project is not dependent on any other project. As a result, no baseline for existing cost was necessary. Instead, operating statistics for each project were used to estimate O&M costs, as shown in Table 3-3.

## GAP Paratransit Operations and Maintenance Costs

An O&M cost estimate for GAP Paratransit is necessary for both Core Network Improvements and Service Expansion, but the reasoning behind each addition is different. For the Core Network Improvement, GAP expansion would be required for service span extension and Sunday service, but would not be required for frequency improvements. For Service Expansion, GAP service is related to geographic expansion. As Greenlink grows outward, GAP service will be required in new areas, thus necessitating an additional O&M cost.

### GAP Cost for Core Network Improvements

The GAP cost estimate started with Greenlink's FY 2016 GAP expenditure, which is reported to the National Transit Database as \$484,782. Using 3.0% inflation, this cost was inflated to \$499,325 in FY 2017 dollars.

This cost was then prorated between weekdays and Saturdays based on the number of reported annual revenue hours. Weekday service operates 93.2% of GAP revenue hours, while Saturdays account for the remaining 6.8%.

Finally, using the prorated costs, a cost per hour of fixed route service was developed for weekday and Saturdays, as shown in Table 3-4. Sunday cost was based on Saturday GAP service.

**Table 3-4. Core Network GAP Unit Costs**

Day of Week	Existing Total Cost (FY17 dollars)	Days of Operation	Existing Cost/Day	Existing Fixed Route Span	GAP Cost for each hour Fixed Route is in operation (FY17 dollars)
Weekday	\$465,596	260	\$1,791	14	\$128
Saturday	\$33,729	51	\$661	10	\$66
Sunday	-	-	-	-	\$66

The resulting analysis can be used to estimate the GAP paratransit cost associated with extending weekday service span, extending Saturday service span, or adding Sunday service.

### GAP Cost for Service Expansion

For service expansion, the additional GAP paratransit cost will come from serving new areas where Greenlink fixed route (and thus GAP) service does not currently operate. The existing GAP service is 22 weekday revenue hours and 8 Saturday revenue hours<sup>3</sup>. Dividing by the 14 fixed routes, this is 1.6 revenue hours per weekday fixed route and 0.6 revenue hours per Saturday fixed route.

Service expansion was then divided into two categories – core route and outer route. Core routes are new services that are being operated in the core, and therefore should add a similar number of GAP revenue hours as existing. Core routes are assumed to add 1.5 daily GAP revenue hours per route.

<sup>3</sup> According to FY 2016 National Transit Database submittal

**Table 3-5. Service Expansion GAP Unit Costs**

Day of Week	Daily Revenue Hours	Fixed Routes	Revenue Hours per Route	Core Route	Outer Route
Weekday	22	14	1.6	1.5	2.0
Saturday	8	14	0.6	0.5	1.0

Outer routes are those where service will be extended to a new area, and therefore should add a number greater than existing of GAP revenue hours. Outer routes are assumed to add 2.0 daily GAP revenue hours per route. Table 3-5 provides details on GAP cost for service expansion.

## Capital Costs

Capital costs were estimated for both vehicles and stop infrastructure. For vehicle cost, two types of new vehicles were used in the estimate:

- 35-ft diesel buses used for fixed route services, with an assumed cost of \$550,000 each (in FY 2017 dollars)
- 18-ft cutaways used for paratransit services, with an assumed cost of \$100,000 each (in FY 2017 dollars).

Fleet calculations took the required peak vehicles and added a 20% spare ratio, rounded up to the nearest whole vehicle.

Bus stop infrastructure costs were also assessed, but only for new routes in Analysis 2 Service Expansion. These are services in new areas which will require new stops and stations. The cost estimate assumed \$2,000 per new stop, with stops placed every 0.25 miles in both directions. A cost of \$10,000 was assumed for places where new route connections would occur, because this would require additional amenities for passengers waiting to transfer between routes.

## Ridership

Estimating ridership is an essential part of determining the benefit of each service improvements in this Transit Development Plan. Ridership was estimated for discreet projects in both Analysis 1 Core Network Improvement and Analysis 2 Service Expansion, as described below.

### Core Network Improvement

#### Service Span Improvement Ridership Estimate

For extended span options, the estimate started with ridership for the last trip of the day, a 6:30 p.m. departure from Greenlink Transit Center, and assumed a 10% decrease for each subsequent trip into the evening starting at 80%. Saturday span used a similar methodology, using stair-step functions and using 70% for the first morning trip backward (starting at 7:30 a.m.) and 80% for the first evening trip forward (starting at 6:30 p.m.).

Table 3-6 shows the ridership associated with weekday span improvement, while Table 3-7 shows ridership for Saturday span improvement.

**Table 3-6. Weekday Span Improvement Ridership Estimate**

Weekday		80%	70%	60%	50%	Weekday Total
Route	Boardings (last pm)	7:30 PM	8:30 PM	9:30 PM	10:30 PM	
1	8	7	6	5	4	22
2	13	11	10	8	7	36
3	24	20	17	15	12	64
5	16	13	12	10	8	43
6	16	13	12	10	8	43
8	12	10	9	8	6	33
9	10	8	7	6	5	26
10	11	9	8	7	6	30
11	11	9	8	7	6	30
12	6	5	5	4	3	17
14	8	7	6	5	4	22
16	6	n/a	n/a	n/a	3	3
<b>DAILY TOTAL</b>						<b>369</b>

**Table 3-7. Saturday Span Improvement Ridership Estimate**

Saturday		50%	60%	70%	80%	70%	60%	50%	40%	AM total	PM total	Saturday total	
Route	Boardings (first am)	Boardings (last pm)	5:30 AM	6:30 AM	7:30 AM	6:30 PM	7:30 PM	8:30 PM	9:30 PM				10:30 PM
1	11	2	6	7	8	2	2	2	1	1	21	8	29
2	32	21	16	20	23	17	15	13	11	9	59	65	124
3	20	13	10	12	14	11	10	8	7	6	36	42	78
5	14	9	7	9	10	8	7	6	5	4	26	30	56
6	23	18	12	14	17	15	13	11	9	8	43	56	99
8	8	6	4	5	6	5	5	4	3	3	15	20	35
9	15	13	8	9	11	11	10	8	7	6	28	42	70
10	33	25	17	20	24	20	18	15	13	10	61	76	137
11	25	6	13	15	18	5	5	4	3	3	46	20	66
12	20	8	10	12	14	7	6	5	4	4	36	26	62
14	4	1	2	3	3	1	1	1	1	1	8	5	13
16	5	6	3	3	4	5	5	4	3	3	10	20	30
<b>DAILY TOTAL</b>											<b>389</b>	<b>410</b>	<b>799</b>

### Frequency Improvement Ridership Estimate

Ridership for the weekday and Saturday frequency improvement was estimated by starting with productivity (expressed as passengers per revenue hour) and multiplying by the additional revenue hours of service. Greenlink's existing service productivity is approximately 16.0 passengers per revenue hour for FY 2016. However, improving service frequency typically results in lower service productivities, as there is not a one-to-one relationship between service hours and available riders.

Therefore, productivities were adjusted for the estimate. A peer agency, The Comet in Columbia, SC, was used because of their recent service expansion, which started with a new sales tax passed in 2012. Between FY 2012 and FY 2016, service productivity in Columbia declined 17%<sup>4</sup>. Adjusted productivities are presented in Table 3-8. Note Sunday service does not exist, so it was assumed to be 75% the productivity of Saturday.

**Table 3-8. Adjusted Productivities for Frequency Improvement Ridership Estimate**

<b>Day</b>	<b>Existing</b>	<b>Future (17% reduction)</b>
Greenlink Weekday	16.0	13.3
Greenlink Saturday	15.5	12.9
Greenlink Sunday	-	9.7

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<sup>4</sup> According to statistics in the National Transit Database, The Comet reported 16.5 passengers per revenue hour in FY 2012 and 13.7 passengers per revenue hour in FY 2016.



The ridership results by improvement is presented in Table 3-9.

**Table 3-9. Systemwide Frequency and Sunday Service Ridership Estimate**

<b>Weekday Frequency Improvement</b>	Annual Revenue Hours	Service Productivity	Estimated Annual Riders
Existing	46,920	16.0	749,000
Improve all weekday routes to 30 minute frequency	87,880	13.3	1,170,000
<b>Difference</b>	-	-	<b>421,000</b>

<b>Saturday Frequency Improvement</b>	Annual Revenue Hours	Service Productivity	Estimated Annual Riders
Existing	6,120	15.5	95,000
Improve all Saturday routes to 30 minute frequency	12,240	12.9	158,000
<b>Difference</b>	-	-	<b>63,000</b>

<b>Sunday Service Addition</b>	Annual Revenue Hours	Service Productivity	Estimated Annual Riders
Existing	0	0.0	0
Add Sunday service (60 minute frequency; 12 hrs)	7,344	9.7	71,000
<b>Difference</b>	-	-	<b>71,000</b>

### Service Expansion

Ridership for new routes was estimated by using a multi-variable regression analysis. This analysis was based on daily ridership and block group demographic characteristics for the existing network (collected during the COA). Using this data, regression was run in Microsoft Excel. While 11 variables were tested, six were ultimately included in the final regression:

- **Household density** – variable measuring households per acre within each block group
- **Unemployed Household** – variable measuring percentage of households with unemployed adults within each block group
- **Households under 30k** – variable measuring percentage of households earning less than \$30,000 annually within each block group
- **Job density** – variable measuring number of jobs per acre within each block group
- **Service Miles** – variable measuring number of daily service miles operated by Greenlink buses within the block group
- **Bus Visits** – variable measuring number of times a bus stops daily within the block group.

The regression results (Table 3-10) show the coefficient of determination ( $R^2$ ) to be 0.73, meaning 73% of the observed ridership can be explained through the variables in the analysis.

**Table 3-10. Ridership Regression Result for Service Expansion Routes**

<i>Regression Statistics</i>	
Multiple R	0.854622
R Square	0.730379
Adjusted R Square	0.70713
Standard Error	12.12951
Observations	107

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>
Regression	6	40253.37	6708.895	45.59994	1.73E-26
Residual	101	14859.63	147.1251		
Total	107	55113			

	<i>Coefficients</i>	<i>standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
HH density	-0.89293	1.277917	-0.69874	0.486323	-3.42797	1.642117	-3.42797	1.642117
Unemployed HH	94.29775	34.49648	2.733547	0.007399	25.86602	162.7295	25.86602	162.7295
HH under 30k	8.000622	7.190124	1.112724	0.268468	-6.26265	22.26389	-6.26265	22.26389
Job density	-0.00156	0.241822	-0.00643	0.994881	-0.48126	0.478154	-0.48126	0.478154
Service Miles	0.141122	0.025288	5.580665	2.02E-07	0.090958	0.191286	0.090958	0.191286
Bus Visits	0.010959	0.009756	1.123225	0.264005	-0.0084	0.030313	-0.0084	0.030313

As a result, predicted daily ridership for each proposed route was estimated by using the following coefficients:

<b>-0.892</b>	<b>x Household density</b>
<b>94.298</b>	<b>x Unemployed Household</b>
<b>8.00</b>	<b>x Households under 30k</b>
<b>-0.00156</b>	<b>x Job density</b>
<b>0.141</b>	<b>x Service Miles</b>
<b>0.011</b>	<b>x Bus Visits</b>

Using the regression results, data was collected for each proposed route. Then this information was used to estimate daily ridership for each proposed route. Daily ridership was annualized using 260 weekdays, 51 Saturdays, 51 Sundays, and 3 holidays. Saturdays were assumed to be 60% of daily ridership and Sundays were assumed to be 40% of daily ridership. The results are shown in Table 3-11.

**Table 3-11. Service Expansion Ridership Result**

	Est. Daily Riders	Weekdays in operation	Saturdays in operation	Sundays in operation	Est. Annual Riders
<b>Connectors</b>					
Gantt Connector	236	260	0	0	61,400
Greer Connector	131	260	0	0	34,100
Mauldin Connector	122	260	0	0	31,800
Pelham Connector	99	260	0	0	25,800
Travelers Rest Connector	108	260	0	0	28,100
Fountain Inn Connector	119	260	0	0	31,000
<b>Crosstowns</b>					
Blue Ridge/Pleasantburg	366	260	51	0	106,400
Blue Ridge/Pleasantburg/Faris	466	260	51	0	135,500
Blue Ridge/Pleasantburg/Halton	421	260	51	0	122,400
Faris/Haywood	145	260	51	0	42,200
Howell	146	260	51	0	42,500
White Horse	292	260	51	0	84,900
<b>Radials</b>					
Cleveland/Haywood	183	260	51	0	53,200
Church/Mills	85	260	51	0	24,800
Laurens/Woodruff	183	260	51	0	53,200
Cedar Lane	205	260	51	0	59,600
Old Buncombe	198	260	51	0	57,600
I-85 all day	275	260	51	0	80,000
US 123 all day	237	260	51	0	68,900
<b>Commuters</b>					
I-85 commuter	30	260	0	0	7,800
I-385 commuter	30	260	0	0	7,800
US 276 commuter	30	260	0	0	7,800
US 123 commuter	30	260	0	0	7,800

## CHAPTER 4 SERVICE EXPANSION EVALUATION

Chapter 4 presents the methodology and evaluation results for both Analysis 1 Core Network Improvement and Analysis 2 Service Expansion. The results of this chapter were used to help Greenlink staff identify the projects to include in the implementation plan presented in Chapter 6.

### Analysis 1: Core Network Improvement

The five core network improvements were evaluated on five criteria: operating cost, capital cost, estimated annual passengers, service productivity (passengers per revenue hour), and ease of implementation. Table 4-1 presents the results of the screening.

While 1.a Weekday Frequency Improvement would provide the most additional passengers and has the best service productivity, it is also the costliest both in operating and capital dollars. 1.a would also be the most difficult to implement because of the long lead time in procuring vehicles, the need to add Greenlink staff, and the need to construct a new maintenance facility to handle additional vehicles.

In contrast, service span options 1.c and 1.d have zero capital cost, can be implemented with existing staff, and have a direct benefit to existing riders.

**Table 4-1. Analysis 1 Core Network Evaluation**

	1.a	1.b	1.c	1.d	1.e
<b>Analysis 1 - Improve Core Network</b>	Improve all Weekday routes to 30 minute frequency	Improve all Saturday routes to 30 minute frequency*	Extend weekday span to 11:30p	Operate Saturdays from 5:30a - 11:30p	Add Sunday service (60 minute frequency; 12 hrs)
<i>Fixed Route Cost</i>	\$2,976,000	\$367,000	\$671,000	\$293,000	\$509,000
<i>GAP Paratransit Cost</i>	-	-	\$129,000	\$26,000	\$39,000
Total Operating Cost	\$2,976,000	\$367,000	\$800,000	\$319,000	\$548,000
<i>Total Fleet Required</i>	14	0	0	0	0
Required Capital Cost	\$7,700,000	\$0	\$0	\$0	\$0
<i>Total Annual Revenue Hours</i>	92,310	98,430	64,260	57,936	61,536
<i>Additional Annual Revenue Hours Above Existing</i>	39,270	6,120	11,220	4,896	8,496
Estimated Annual New Passengers	398,000	63,000	94,000	41,000	82,000
Estimated Service Productivity of Improvement	10.1	10.3	8.4	8.4	9.7
Ease of implementation	Difficult	Difficult	Easy	Easy	Medium

\* Incremental difference assumes weekday frequency improvement has already occurred.

### Prioritized Recommendation

Based on the evaluation results, the following prioritized recommendation is recommended for Analysis 1 Add to Core Network. Extension of service span (nighttime, then Saturday) is recommended to be implemented first. Frequency improvements are recommended next (weekday, then Saturday). Finally, Sunday service is recommended to be added to the network. Additional implementation details are provided in Chapter 6.

Figure 4-1. Prioritized Analysis 1 Recommendation



## Analysis 2: Service Expansion

### Evaluation

An evaluation matrix was constructed consisting of five criteria and 16 evaluation measures to evaluate the 23 routes in Analysis 2. Those criteria and measures include the following.

**Criteria 1 Connectivity and Accessibility** measured how well each route connects to people and destinations, both now and in the future. Five evaluation measures were used:

- Population Served
- Employment Served
- Public Facilities Served
- 2015-40 Change in Population Density
- 2015-40 Change in Employment Density

**Criteria 2 Mobility Benefits** measured how well each route moved people across the Greenville metro area. Two evaluation measures were used:

- Route Connections
- Travel time savings

**Criteria 3 Cost Effectiveness** measured how effective each route would be in spending public dollars. Four evaluation measures were used:

- O&M Cost
- Cost per rider
- Capital Cost Buses
- Capital Cost Facilities

**Criteria 4 Productivity and Efficiency** measured how productive each route would be while operating. Three evaluation measures were used:

- Riders per revenue hour
- Riders per revenue mile
- Cycle Time Efficiency

**Criteria 5 Equity** measured how well each route served vulnerable populations in the Greenville metro area. Two evaluation measures were used:

- Low Income Population Served
- Minority Population Served

Table 4-2 shows the data collected on each expansion route. This data was converted into scoring, as shown in Table 4-3. For each category of data, each route was ranked relatively, meaning the top ranked route in each category received the highest point total, and then each subsequently ranked route received 1/23 fewer points. Rankings included ties, so not all points are evenly distributed.

Table 4-2. Analysis 2 Data for Evaluation

Option	Criteria 1 Connectivity and Accessibility					Criteria 2 Mobility Benefits		Criteria 3 Cost Effectiveness				Criteria 4 Productivity and Efficiency			Criteria 5 Equity	
	Population Served	Employment Served	Public Facilities Served	2015-40 Change in Pop Den	2015-40 Change in Emp Den	Route Connections	Travel time savings	O&M Cost	Cost per rider	Capital Cost Buses	Capital Cost Facilities	Riders per revenue hour	Riders per revenue mile	Cycle Time Efficiency	Low Income Population Served	Minority Population Served
<b>Connector Routes</b>																
Gantt	5,591	2,173	0	110	408	3	0	\$248,362	\$4.04	\$550,000	\$150,000	17.2	1.2	0.259	32.1%	80.9%
Greer	7,495	3,810	2	308	249	2	0	\$259,475	\$7.61	\$550,000	\$154,000	9.6	0.6	0.167	21.9%	32.9%
Mauldin	5,365	4,668	5	269	220	2	0	\$230,981	\$7.26	\$550,000	\$118,000	8.9	0.7	0.242	13.3%	47.2%
Pelham	5,955	9,265	3	183	538	2	0	\$230,335	\$8.93	\$550,000	\$118,000	7.2	0.6	0.248	9.3%	27.4%
Travelers Rest	2,494	1,307	4	169	86	1	0	\$237,378	\$8.45	\$550,000	\$116,000	7.9	0.6	0.180	17.4%	17.5%
Fountain Inn	2,912	1,581	2	300	222	1	0	\$261,155	\$8.42	\$550,000	\$146,000	8.7	0.5	0.167	13.5%	34.9%
<b>Crosstown Routes</b>																
Blue Ridge/Pleasantburg	12,746	8,651	2	137	488	8	0	\$474,543	\$4.66	\$1,100,000	\$250,000	13.0	1.2	0.882	30.5%	44.7%
Blue Ridge/Pleasantburg/Faris	17,794	14,128	5	131	506	10	0	\$532,623	\$4.11	\$1,100,000	\$338,000	16.6	1.1	0.447	26.0%	39.3%
Blue Ridge/Pleasantburg/Halton	15,484	18,984	4	318	492	9	0	\$529,529	\$4.52	\$1,100,000	\$324,000	15.0	1.0	0.470	29.5%	43.0%
Faris/Haywood	8,321	16,704	4	394	811	6	0	\$443,675	\$10.99	\$1,100,000	\$196,000	5.2	0.6	0.946	17.6%	29.9%
Howell	7,352	9,348	2	84	364	4	0	\$254,885	\$6.27	\$550,000	\$146,000	10.4	0.8	0.309	16.4%	27.9%
White Horse	7,288	3,037	2	41	380	3	0	\$277,808	\$3.42	\$550,000	\$162,000	20.8	1.3	0.137	31.2%	65.2%
<b>Radial Routes</b>																
Cleveland/Haywood	7,345	25,501	7	427	1,748	11	0	\$276,331	\$5.43	\$550,000	\$160,000	13.0	0.8	0.148	21.8%	31.2%
Church/Mills	6,419	21,066	6	47	2,694	10	0	\$239,135	\$10.08	\$550,000	\$98,000	6.1	0.6	0.319	18.9%	35.2%
Laurens/Woodruff	6,862	21,379	4	509	1,577	11	406	\$454,293	\$8.93	\$1,100,000	\$158,000	6.5	0.7	0.979	20.4%	40.1%
Cedar Lane	9,750	14,131	7	-42	2,084	10	0	\$256,221	\$4.50	\$550,000	\$118,000	14.6	1.1	0.280	44.5%	54.7%
Old Buncombe	7,894	12,704	5	0	1,455	10	0	\$248,979	\$4.52	\$550,000	\$110,000	14.1	1.1	0.336	36.3%	50.5%
I-85 all day	1,713	12,951	4	62	1,502	11	7	\$612,360	\$8.01	\$1,100,000	\$30,000	9.8	0.5	0.323	24.3%	32.7%
US 123 all day	1,713	12,951	9	228	982	10	120	\$507,521	\$7.70	\$1,100,000	\$10,000	8.4	0.7	0.663	24.3%	32.7%
<b>Commuter Routes</b>																
I-85	1,713	12,951	4	62	1,502	11	0	\$177,195	\$24.40	\$1,650,000	\$20,000	6.8	0.3	0.133	24.3%	32.7%
I-385	1,857	11,580	4	96	1,418	10	12	\$182,893	\$23.63	\$1,650,000	\$30,000	6.1	0.2	0.133	17.4%	29.9%
US 276	2,044	10,784	4	230	1,228	10	0	\$143,319	\$19.07	\$1,650,000	\$20,000	8.2	0.5	0.133	23.5%	30.5%
US 123	4,925	15,106	7	210	1,131	10	122	\$152,888	\$20.36	\$1,650,000	\$10,000	7.8	0.4	0.133	31.5%	45.8%

**Table 4-3. Analysis 2 Route Scoring Matrix**
























	Criteria 1 Connectivity and Accessibility					Criteria 2 Mobility Benefits		Criteria 3 Cost Effectiveness				Criteria 4 Productivity and Efficiency			Criteria 5 Equity		Total Score	Group Rank	Overall Rank
	Population Served	Employment Served	Public Facilities Served	Population Density Change	Employment Density Change	Route Connections	Travel time savings	O&M Cost	Cost per rider	Capital Cost Buses	Capital Cost Facilities	Riders per revenue hour	Riders per revenue mile	Cycle Time Efficiency	Low Income Population	Minority Population Served			
<b>Connector Routes</b>																			
Gantt	1.3	0.4	0.0	0.4	0.3	0.3	0.0	2.0	1.0	1.0	0.4	1.9	1.8	0.5	2.7	3.0	17.1	1	5
Greer	2.2	0.7	0.1	0.8	0.2	0.1	0.0	1.4	0.6	1.0	0.3	1.1	0.7	0.7	1.4	1.4	12.9	3	13
Mauldin	1.2	0.8	0.7	0.7	0.1	0.1	0.0	2.3	0.6	1.0	0.5	1.0	1.2	0.6	0.3	2.5	13.8	2	12
Pelham	1.4	1.0	0.3	0.6	0.5	0.1	0.0	2.5	0.3	1.0	0.5	0.5	0.9	0.6	0.1	0.3	10.7	4	21
Travelers Rest	0.8	0.1	0.3	0.5	0.0	0.0	0.0	2.2	0.4	1.0	0.7	0.7	0.8	0.7	0.7	0.1	9.1	6	23
Fountain Inn	0.9	0.3	0.1	0.8	0.1	0.0	0.0	1.3	0.4	1.0	0.4	1.0	0.4	0.7	0.4	1.6	9.5	5	22
<b>Crosstown Routes</b>																			
Blue Ridge/Pleasantburg	2.7	0.9	0.1	0.5	0.3	0.4	0.0	0.7	0.7	0.4	0.1	1.4	1.9	0.1	2.3	2.2	15.0	4	10
Blue Ridge/Pleasantburg/Faris	3.0	2.1	0.7	0.4	0.4	0.5	0.0	0.3	0.9	0.4	0.0	1.8	1.7	0.3	2.1	1.8	16.5	3	8
Blue Ridge/Pleasantburg/Halton	2.9	2.6	0.3	0.9	0.4	0.5	0.0	0.4	0.8	0.4	0.1	1.7	1.5	0.2	2.2	2.1	17.0	1	6
Faris/Haywood	2.5	2.5	0.3	0.9	0.5	0.4	0.0	0.9	0.2	0.4	0.2	0.1	1.0	0.1	0.9	0.5	11.5	6	18
Howell	2.1	1.2	0.1	0.3	0.2	0.3	0.0	1.7	0.7	1.0	0.4	1.3	1.3	0.4	0.5	0.4	12.0	5	16
White Horse	1.8	0.5	0.1	0.1	0.3	0.3	0.0	1.0	1.0	1.0	0.2	2.0	2.0	0.8	2.5	2.9	16.6	2	7
<b>Radial Routes</b>																			
Cleveland/Haywood	2.0	3.0	0.9	1.0	0.9	0.9	0.0	1.2	0.7	1.0	0.3	1.4	1.4	0.8	1.3	0.9	17.6	3	4
Church/Mills	1.6	2.7	0.8	0.2	1.0	0.5	0.0	2.1	0.3	1.0	0.7	0.2	0.6	0.4	1.0	1.7	14.9	5	11
Laurens/Woodruff	1.7	2.9	0.3	1.0	0.9	0.9	1.0	0.8	0.3	0.4	0.3	0.3	1.1	0.0	1.2	2.0	15.2	4	9
Cedar Lane	2.6	2.2	0.9	0.0	1.0	0.5	0.0	1.6	0.9	1.0	0.5	1.7	1.6	0.5	3.0	2.7	20.7	1	1
Old Buncombe	2.3	1.6	0.7	0.1	0.7	0.5	0.0	1.8	0.8	1.0	0.7	1.6	1.7	0.3	2.9	2.6	19.5	2	2
I-85 all day	0.1	1.7	0.3	0.2	0.8	0.9	0.8	0.1	0.5	0.4	0.8	1.2	0.3	0.3	1.7	1.0	11.3	7	19
US 123 all day	0.1	1.7	1.0	0.7	0.6	0.5	0.9	0.5	0.5	0.4	1.0	0.9	1.0	0.2	1.7	1.0	12.7	6	15
<b>Commuter Routes</b>																			
I-85 commuter	0.1	1.7	0.3	0.2	0.8	0.9	0.0	2.7	0.0	0.1	0.9	0.4	0.2	0.9	1.7	1.0	12.0	3	16
I-385 commuter	0.5	1.4	0.3	0.3	0.7	0.5	0.9	2.6	0.1	0.1	0.8	0.3	0.1	0.9	0.7	0.5	10.7	4	20
US 276 commuter	0.7	1.3	0.3	0.7	0.7	0.5	0.0	3.0	0.2	0.1	0.9	0.8	0.5	0.9	1.6	0.8	12.9	2	14
US 123 commuter	1.0	2.3	0.9	0.6	0.6	0.5	1.0	2.9	0.1	0.1	1.0	0.6	0.3	0.9	2.6	2.3	17.7	1	3







## Results

The Service Expansion routes were ranked first through 23rd based on the scores in the ranking matrix. Table 4-4 shows this order.

**Table 4-4. Analysis 2 Routes with Final Score and Ranking**

Route	Screening Total Score	Group Rank	Overall Rank
 Cedar Lane	20.7	1	1
 Old Buncombe	19.5	2	2
 US 123 commuter	17.7	1	3
 Cleveland/Haywood	17.6	3	4
 Gantt	17.1	1	5
 Blue Ridge/Pleasantburg/Halton	17.0	1	6
 White Horse	16.6	2	7
 Blue Ridge/Pleasantburg/Faris	16.5	3	8
 Laurens/Woodruff	15.2	4	9
 Blue Ridge/Pleasantburg	15.0	4	10
 Church/Mills	14.9	5	11
 Mauldin	13.8	2	12
 Greer	12.9	3	13
 US 276 commuter	12.9	2	14
 US 123 all day	12.7	6	15
 I-85 commuter	12.0	3	16
 Howell	12.0	5	16
 Faris/Haywood	11.5	6	18
 I-85 all day	11.3	7	19
 I-385 commuter	10.7	4	20
 Pelham	10.7	4	21
 Fountain Inn	9.5	5	22
 Travelers Rest	9.1	6	23

Key:  Radials  Crosstowns  Connectors  Commuters

The final rankings are noteworthy in a couple of ways. First, radial routes do the best of the four groups, and crosstown routes do the second best. The evaluation matrix indicates that Greenlink would be best served by adding new routes to the core where densities are highest.

Second, a route from each category scores within the top six. There is merit in each of the proposed service categories from Analysis 2, if routes go to the right places and operate the correct number of service hours and frequency for the potential travel market.

Finally, the evaluation of the routes was based solely on quantitative data. The White Horse Road route scored higher than the Laurens/Woodruff route, but that does not mean that White Horse Road would be implemented first. Qualitative factors like intuition, wisdom, public acceptance and political opinion are all part of the equation not addressed here. The implementation plan in Chapter 6 takes the results here and orders it into a cohesive plan for Greenlink for the next five years.

## CHAPTER 5 FUNDING ANALYSIS

One of the objectives of the TDP is to make the case for additional transit funding for service expansion. Chapter 5 presents a funding analysis, based on peer comparisons and a case study of two of these peers.

### Funding Peer Analysis

A funding peer analysis was completed to determine how Greenlink compares to its peers regarding spending for operating and capital and funding sources used. A total of eight cities were selected from the peer analyses completed as part of the COA and from the Piedmont Health Foundation (PHF) revenue comparison study, with Baton Rouge added by the consultant team as case study for dedicated funding. These eight cities of similar size to Greenville and are all located in the southeast. In regard to size, the Greenville urbanized area population is just slightly (5%) less than the peer average. The selected cities are:

- Asheville, NC
- Baton Rouge, LA
- Charleston, SC
- Chattanooga, TN
- Columbia, SC
- Greensboro, NC
- Mobile, AL
- Winston-Salem, NC

Transit data from these eight cities was obtained from the National Transit Database for FY 2016, the most recent year available for public review. This data is provided in Tables 5-1 and 5-2. Data for each peer city is shown, along with the peer average, and the Greenlink data.

Table 5-1 focuses on funds spent in FY 2016 for all modes. While the Greenville urbanized area population is just slightly less than the peer average, Greenlink spent nearly 75% less than the peer average in FY 2016. Acknowledging that capital spending typically varies greatly from year to year at most transit agencies, the most telling statistic is that Greenlink's operating expenditures were 69% less than the peer average. Only ART in Asheville spent less than Greenlink on operations.

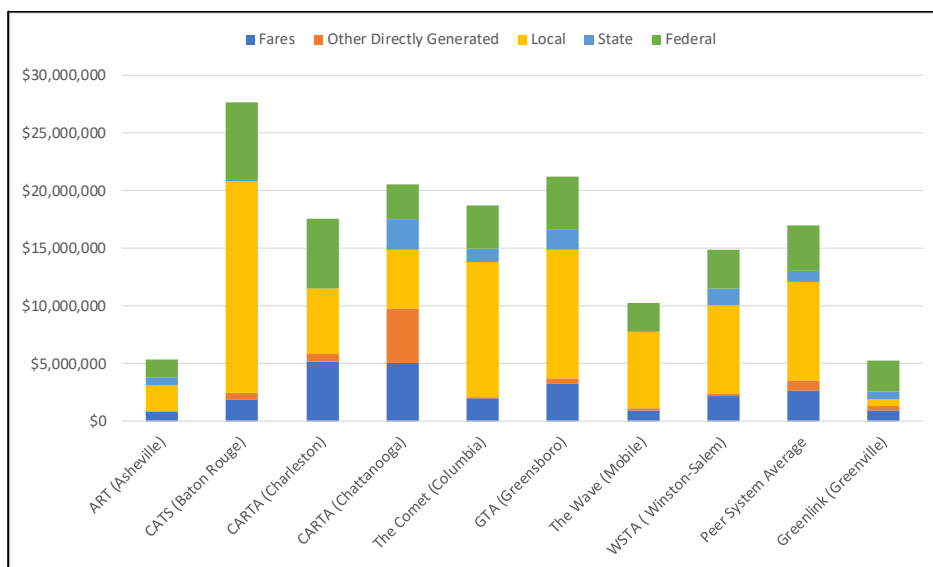
Figure 5-1 shows the relative amounts spent by each peer on operations, with the break-down of spending by fund source. Looking at the breakdown of fund sources, the percentage of Greenlink's operating expenses recovered from the farebox was 17%, exceeding the peer average of 15%. Only the two CARTA systems (Charleston and Chattanooga) had higher farebox recovery ratios. Other directly generated sources accounted for a small proportion of operating costs for most peers, although Greenlink's 8% significantly exceeds the peer average of 5%. Greenlink derives these revenues primarily from contractual agreements with organizations to provide service (e.g., Clemson University, Bon Secours). CARTA in Chattanooga is an outlier among the peers, with 23% of its operating cost coming from other directly generated sources, primarily from parking revenues.

Other sources of funding for operations are local, state and federal funds. Most notably, local sources accounted for about half of the peers' operations, while federal sources accounted for about half of Greenlink's operating funds. Such heavy use of federal funds for operations is unusual, as FTA funds are largely restricted to supporting capital purchases in large urban areas like Greenville. As a result, Greenlink has directed little towards needed bus replacement. Local funding sources accounted for between 25% (Chattanooga) and 66% (Baton Rouge) of the peers operating expenditures.

**Table 5-1. Peer Funding Expenditures (From 2016 NTD)**

	Asheville, NC ART	Baton Rouge, LA CATS	Charleston, SC CARTA	Chattanooga, TN CARTA	Columbia, SC The Comet	Greensboro, NC GTA	Mobile, AL The Wave	Winston-Salem, NC WSTA	Peer Average	Greenville, SC Greenlink
<b>Financial Expenditure Summary</b>										
Operations Cost	\$5,365,859	\$27,672,852	\$17,614,007	\$20,537,360	\$18,759,660	\$21,284,939	\$10,259,682	\$14,917,664	\$17,051,503	\$5,263,839
Total Capital Cost	\$0	\$7,686,943	\$3,821,911	\$2,030,149	\$0	\$6,200,118	\$1,293,647	\$9,241,184	\$3,784,244	\$69,019
<b>Total</b>	<b>\$5,365,859</b>	<b>\$35,359,795</b>	<b>\$21,435,918</b>	<b>\$22,567,509</b>	<b>\$18,759,660</b>	<b>\$27,485,057</b>	<b>\$11,553,329</b>	<b>\$24,158,848</b>	<b>\$20,835,747</b>	<b>\$5,332,858</b>
% Spent on Operations	100.0%	78.3%	82.2%	91.0%	100.0%	77.4%	88.8%	61.7%	81.8%	98.7%
% Spent on Capital	0.0%	21.7%	17.8%	9.0%	0.0%	22.6%	11.2%	38.3%	18.2%	1.3%
<b>Sources of Funds Expended on Operations (All Modes)</b>										
Fares	\$790,462	\$1,899,765	\$5,132,634	\$5,031,949	\$1,998,270	\$3,252,169	\$920,748	\$2,178,858	\$2,650,607	\$916,864
Other Directly Generated	\$3,204	\$610,746	\$748,169	\$4,729,331	\$60,425	\$479,869	\$168,661	\$219,659	\$877,508	\$426,393
Taxes & Fees Levied by Transit Agency	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Local	\$2,317,510	\$18,392,071	\$5,621,240	\$5,166,700	\$11,763,076	\$11,124,698	\$6,696,320	\$7,681,386	\$8,595,375	\$591,427
State	\$698,301	\$18,953	\$0	\$2,551,184	\$1,197,252	\$1,759,890	\$0	\$1,417,868	\$955,431	\$614,013
Federal	\$1,556,382	\$6,751,317	\$6,111,964	\$3,058,196	\$3,740,637	\$4,668,313	\$2,473,953	\$3,419,893	\$3,972,582	\$2,715,142
<b>Total Funds Expended</b>	<b>\$5,365,859</b>	<b>\$27,672,852</b>	<b>\$17,614,007</b>	<b>\$20,537,360</b>	<b>\$18,759,660</b>	<b>\$21,284,939</b>	<b>\$10,259,682</b>	<b>\$14,917,664</b>	<b>\$17,051,503</b>	<b>\$5,263,839</b>
% from Fares	14.7%	6.9%	29.1%	24.5%	10.7%	15.3%	9.0%	14.6%	15.5%	17.4%
% from Other Directly Generated Sources	0.1%	2.2%	4.2%	23.0%	0.3%	2.3%	1.6%	1.5%	5.1%	8.1%
% from Taxes & Fees Levied by Transit Agency	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% from Local Sources	43.2%	66.5%	31.9%	25.2%	62.7%	52.3%	65.3%	51.5%	50.4%	11.2%
% from State Sources	13.0%	0.1%	0.0%	12.4%	6.4%	8.3%	0.0%	9.5%	5.6%	11.7%
% from Federal Sources	29.0%	24.4%	34.7%	14.9%	19.9%	21.9%	24.1%	22.9%	23.3%	51.6%
<b>Sources of Funds Expended on Capital (All Modes)</b>										
Fares	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other Directly Generated	\$0	\$0	\$0	\$148	\$0	\$0	\$0	\$0	\$19	\$0
Taxes & Fees Levied by Transit Agency	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Local	\$0	\$1,502,458	\$517,785	\$218,811	\$0	\$940,359	\$294,239	\$765,593	\$529,906	\$13,804
State	\$0	\$40,000	\$386,315	\$235,219	\$0	\$435,564	\$0	\$644,662	\$217,720	\$0
Federal	\$0	\$6,144,485	\$2,917,811	\$1,575,971	\$0	\$4,824,195	\$999,408	\$7,830,929	\$3,036,600	\$55,215
<b>Total Funds Expended</b>	<b>\$0</b>	<b>\$7,686,943</b>	<b>\$3,821,911</b>	<b>\$2,030,149</b>	<b>\$0</b>	<b>\$6,200,118</b>	<b>\$1,293,647</b>	<b>\$9,241,184</b>	<b>\$3,784,244</b>	<b>\$69,019</b>
% from Fares	n/a	0.0%	0.0%	0.0%	n/a	0.0%	0.0%	0.0%	0.0%	0.0%
% from Other Directly Generated Sources	n/a	0.0%	0.0%	0.0%	n/a	0.0%	0.0%	0.0%	0.0%	0.0%
% from Taxes & Fees Levied by Transit Agency	n/a	0.0%	0.0%	0.0%	n/a	0.0%	0.0%	0.0%	0.0%	0.0%
% from Local Sources	n/a	19.5%	13.5%	10.8%	n/a	15.2%	22.7%	8.3%	14.0%	20.0%
% from State Sources	n/a	0.5%	10.1%	11.6%	n/a	7.0%	0.0%	7.0%	5.8%	0.0%
% from Federal Sources	n/a	79.9%	76.3%	77.6%	n/a	77.8%	77.3%	84.7%	80.2%	80.0%

**Figure 5-1. Peer Comparison of Operations Expenses and Sources**



State operating funds are available to Greenlink and other large urban systems in South Carolina, as they are in nearly every state (Alabama and Louisiana being exceptions). It should be noted that while CARTA in Charleston typically receives state funding for operations, it received an advance during a prior fiscal year and thus did not report state funding in 2016.

Turning to capital expenditures, the transit systems in Asheville and Columbia had no capital expenditures in FY 2016. Of those that had capital expenses in FY 2016, FTA funds accounted for approximately 80% with local funds or a combination of state and local funds generally accounting for the remaining 20%, consistent with federal and state policies for funding transit capital expenses.

Table 5-2 focuses on funds earned in FY 2016 and provides a more detailed breakdown of fund sources than Table 5-1. Looking first at the summary, it is evident that Greenlink received much less than its peers, with ART in Asheville again being the only exception. The breakdown between directly generated, local, state, and federal funds drives home the previous observation that Greenlink’s peers rely much more heavily on local funds than Greenlink. Conversely, Greenlink relies more heavily on federal funds compared to its peers.

Turning to local funds, in FY 2016, Greenlink relied exclusively on general funds, as did CARTA in Chattanooga, the Comet in Columbia, and the Wave in Mobile, according to the NTD. It should be noted, however, that funding for the Comet comes via the Richland County penny sales tax for transportation, so it is unclear why the local funding is characterized as general funds in the NTD. CARTA in Charleston is another South Carolina peer benefiting tremendously from a sales tax program. The rest of Greenlink’s peers, CATS in Baton Rouge, GTA in Greensboro, and WSTA in Winston-Salem, rely heavily on property taxes as their local source of funding.

Looking at federal fund sources, Greenlink and all of its peers relied heavily on FTA Section 5307 (Urbanized Area Formula Program) funds in FY 2016, as would be expected. Several peers had infusions of FTA funds specifically for capital projects, including Section 5339 (Bus and Bus Facilities), Section 5309 (Capital Program), and Section 5337 (State of Good Repair). A significant portion of Asheville’s federal funding came from other FTA sources, namely Section 5310 (Elderly and Disabled Individuals) and Section 5316 (Jobs Access and Reverse Commute).

**Table 5-2. Peer Funding Earned (From 2016 NTD)**

	Asheville, NC ART	Baton Rouge, LA CATS	Charleston, SC CARTA	Chattanooga, TN CARTA	Columbia, SC The Comet	Greensboro, NC GTA	Mobile, AL The Wave	Winston-Salem, NC WSTA	Peer Average	Greenville, SC Greenlink
<b>Summary of Operations and Capital Funding Earned</b>										
Directly Generated Funds	\$793,666	\$2,510,511	\$5,880,803	\$9,761,428	\$2,058,695	\$3,732,338	\$1,089,409	\$2,398,517	\$3,528,171	\$1,445,627
Local Funds	\$2,317,510	\$18,824,451	\$6,139,025	\$5,385,511	\$11,763,076	\$9,098,452	\$6,990,559	\$7,931,177	\$8,556,220	\$710,000
State Funds	\$698,301	\$0	\$386,315	\$2,786,403	\$1,232,998	\$2,195,454	\$0	\$2,062,530	\$1,170,250	\$614,013
Federal Funds	\$1,556,382	\$12,895,802	\$9,029,775	\$4,634,167	\$3,740,637	\$9,492,508	\$3,473,361	\$11,250,822	\$7,009,182	\$2,770,357
<b>Total</b>	<b>\$5,365,859</b>	<b>\$34,230,764</b>	<b>\$21,435,918</b>	<b>\$22,567,509</b>	<b>\$18,795,406</b>	<b>\$24,518,752</b>	<b>\$11,553,329</b>	<b>\$23,643,046</b>	<b>\$20,263,823</b>	<b>\$5,539,997</b>
% from Directly Generated Funds	14.8%	7.3%	27.4%	43.3%	11.0%	15.2%	9.4%	10.1%	17.4%	26.1%
% from Local Funds	43.2%	55.0%	28.6%	23.9%	62.6%	37.1%	60.5%	33.5%	42.2%	12.8%
% from State Funds	13.0%	0.0%	1.8%	12.3%	6.6%	9.0%	0.0%	8.7%	5.8%	11.1%
% from Federal Funds	29.0%	37.7%	42.1%	20.5%	19.9%	38.7%	30.1%	47.6%	34.6%	50.0%
<b>Sources of Directly Generated Funds Earned (All Modes, Operating and Capital)</b>										
Fares	\$790,462	\$1,899,765	\$5,132,634	\$5,031,949	\$1,998,270	\$3,252,169	\$920,748	\$2,178,858	\$2,650,607	\$916,864
Concessions	\$0	\$1,275	\$0	\$228,876	\$0	\$29,793	\$0	\$10,861	\$33,851	\$5,081
Advertising	\$2,451	\$398,902	\$716,928	\$390,635	\$30,630	\$85,551	\$103,310	\$70,478	\$224,861	\$90,483
Other	\$753	\$210,569	\$31,241	\$4,109,968	\$29,795	\$364,825	\$65,351	\$138,320	\$618,853	\$433,199
Purchased Transportation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$793,666</b>	<b>\$2,510,511</b>	<b>\$5,880,803</b>	<b>\$9,761,428</b>	<b>\$2,058,695</b>	<b>\$3,732,338</b>	<b>\$1,089,409</b>	<b>\$2,398,517</b>	<b>\$3,528,171</b>	<b>\$1,445,627</b>
% from Fares	99.6%	75.7%	87.3%	51.5%	97.1%	87.1%	84.5%	90.8%	75.1%	63.4%
% from Concessions	0.0%	0.1%	0.0%	2.3%	0.0%	0.8%	0.0%	0.5%	1.0%	0.4%
% from Advertising	0.3%	15.9%	12.2%	4.0%	1.5%	2.3%	9.5%	2.9%	6.4%	6.3%
% from Other Sources	0.1%	8.4%	0.5%	42.1%	1.4%	9.8%	6.0%	5.8%	17.5%	30.0%
<b>Sources of Local Funds Earned (All Modes, Operating and Capital)</b>										
General Fund	\$1,984,652	\$0	\$479,000	\$5,385,511	\$11,763,076	\$0	\$6,990,559	\$0	\$3,325,350	\$710,000
Income Tax	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sales Tax	\$0	\$0	\$5,660,025	\$0	\$0	\$52	\$0	\$0	\$707,510	\$0
Property Tax	\$0	\$16,862,111	\$0	\$0	\$0	\$7,774,546	\$0	\$7,931,177	\$4,070,979	\$0
Other Tax	\$0	\$1,962,340	\$0	\$0	\$0	\$0	\$0	\$0	\$245,293	\$0
Other Funds	\$332,858	\$0	\$0	\$0	\$0	\$1,323,854	\$0	\$0	\$207,089	\$0
<b>Total</b>	<b>\$2,317,510</b>	<b>\$18,824,451</b>	<b>\$6,139,025</b>	<b>\$5,385,511</b>	<b>\$11,763,076</b>	<b>\$9,098,452</b>	<b>\$6,990,559</b>	<b>\$7,931,177</b>	<b>\$8,556,220</b>	<b>\$710,000</b>
% from General Fund	85.6%	0.0%	7.8%	100.0%	100.0%	0.0%	100.0%	0.0%	38.9%	100.0%
% from Income Taxes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% from Sales Taxes	0.0%	0.0%	92.2%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%
% from Property Taxes	0.0%	89.6%	0.0%	0.0%	0.0%	85.4%	0.0%	100.0%	47.6%	0.0%
% from Other Taxes	0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%
% from Other Funds	14.4%	0.0%	0.0%	0.0%	0.0%	14.6%	0.0%	0.0%	2.4%	0.0%
<b>Sources of Federal Funds Earned (All Modes, Operating and Capital)</b>										
FTA 5307 (Urbanized Area Program)	\$1,018,794	\$11,185,994	\$6,111,964	\$3,638,318	\$3,669,804	\$8,137,321	\$3,354,344	\$3,274,037	\$5,048,822	\$2,710,443
FTA 5309 (Capital Program)	\$0	\$822,368	\$0	\$323,812	\$0	\$0	\$0	\$0	\$143,273	\$0
FTA 5337 (State of Good Repair)	\$0	\$0	\$0	\$76,251	\$0	\$0	\$0	\$0	\$9,531	\$0
FTA 5339 (Bus and Bus Facilities)	\$0	\$429,363	\$2,902,907	\$223,979	\$0	\$1,084,710	\$0	\$7,830,929	\$1,558,986	\$0
Other FTA Funds	\$537,588	\$458,077	\$14,904	\$25,320	\$70,833	\$270,477	\$119,017	\$145,856	\$205,259	\$59,914
Other USDOT Funds	\$0	\$0	\$0	\$346,487	\$0	\$0	\$0	\$0	\$43,311	\$0
<b>Total</b>	<b>\$1,556,382</b>	<b>\$12,895,802</b>	<b>\$9,029,775</b>	<b>\$4,634,167</b>	<b>\$3,740,637</b>	<b>\$9,492,508</b>	<b>\$3,473,361</b>	<b>\$11,250,822</b>	<b>\$7,009,182</b>	<b>\$2,770,357</b>
% from FTA 5307 (Urbanized Area Program)	65.5%	86.7%	67.7%	78.5%	98.1%	85.7%	96.6%	29.1%	72.0%	97.8%
% from FTA 5309 (Capital Program)	0.0%	6.4%	0.0%	7.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%
% from FTA 5337 (State of Good Repair)	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
% from FTA 5339 (Bus and Bus Facilities)	0.0%	3.3%	32.1%	4.8%	0.0%	11.4%	0.0%	69.6%	22.2%	0.0%
% from Other FTA Funds	34.5%	3.6%	0.2%	0.5%	1.9%	2.8%	3.4%	1.3%	2.9%	2.2%
% from Other USDOT Funds	0.0%	0.0%	0.0%	7.5%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%

### Peer Funding Comparison Conclusions

The peer analysis provided five main conclusions regarding funding sources:

- This data reaffirms previous findings that Greenville is underfunding its transit system. In FY 2016, Greenlink spent 69% less on operations and 98% less on capital than its peers in comparably sized urban areas.
- Greenlink is relying heavily on FTA Section 5307 funds for operations, rather than on local funds as its peers do. FTA Section 5307 funds in large urban areas are intended to be used primarily for capital.
- Other than fares, directly generated funds are generally not a significant source of funding. Greenlink benefits from contractual relationships, while CARTA in Chattanooga benefits from parking revenues.
- Some of Greenlink's peers rely almost exclusively on sales and property taxes for their local funding.
- In FY 2016, several peers had significant infusions of FTA funds specifically for capital projects, including Section 5339 (Bus and Bus Facilities), Section 5309 (Capital Program), and Section 5337 (State of Good Repair).

### Funding Case Studies

The following section summarizes key takeaways from two case studies of peer transit agencies that have already been successful securing new dedicated local funding sources. As shown in the peer funding analysis, two widely used and high-yield local funding mechanisms are sales taxes and property taxes. For the case studies, one example of each was selected:

- Sales tax: CARTA in Charleston and
- Property tax: CATS in Baton Rouge.

#### Charleston Area Regional Transportation Authority (CARTA)

CARTA operates Charleston's public transportation system covering the metro area of Charleston, and is South Carolina's largest public transportation provider. CARTA was formed by the City of Charleston, the City of North Charleston, the Town of Mt. Pleasant, and Charleston County in 1997.

The formation of a new transit agency became necessary after South Carolina Electric and Gas (SCE&G) announced its intent to divest themselves of the public transportation system in 1996, after 75 years of operations. SCE&G agreed to pay for public transit operations until 2003 while a new operator and funding for the system was identified.

Recognizing there was not a sufficient funding mechanism to meet the Charleston area's needs for roads, transit, parks and greenspace, in June 2000 the Governor of South Carolina signed a bill into law allowing a sales and use tax for transportation projects. Charleston leaders acted quickly to place a referendum on the November 2000 ballot, but the measure failed by less than 1%. If it had passed, it would have provided a half-cent sales tax for a maximum of 25 years or until \$1.3 billion had been generated. Funds from the sales tax were proposed to be spent as follows:

- Roads/bridges: 45%,
- Transit: 30%, and
- Parks/greenspace: 25%.

After the narrow defeat of the 2000 sales tax referendum, work began to prepare for a second referendum in November 2002. Actions taken to improve the odds of passage included preparing more specific plans for how the money would be used with needs prioritized, extensive community and government input, and Chamber of Commerce involvement with the public education effort and a survey of Chamber members and citizens. The proposed tax allocation was then modified as follows:

- Roads/bridges: 65% or \$847 million
- Transit: 18% or \$234.5 million
- Parks/greenspace: 17% or \$221.5 million

The referendum narrowly passed by less than 1%. However, the South Carolina Supreme Court overturned the results in August 2003, citing insufficient detail in the spending plan and ballot wording that was clearly biased.

When the subsidy from SCE&G ended in 2003 with no dedicated funding source in place, CARTA was forced to take drastic steps in January 2004. CARTA cut its routes by 75%, borrowed money, and sold its building. Emergency assistance from the federal, state and local governments propped up CARTA to maintain a minimal level of service. Essentially, CARTA was on life-support.

That same month, the Governor of South Carolina issued an Executive Order for a November 2004 referendum that, as before, would be a half-cent sales tax until 2030 or until \$1.3 billion has been generated. This time, the referendum passed overwhelmingly with 58.5% approval. Efforts to promote passage of the referendum included:

- Modified ballot wording
- A detailed spending plan requiring public input, annual audits, plan reviews, and citizen committees
- Chamber led education efforts
- Focus on public relations, special events, speaking engagements
- Advertising dollars strategically used in last two weeks

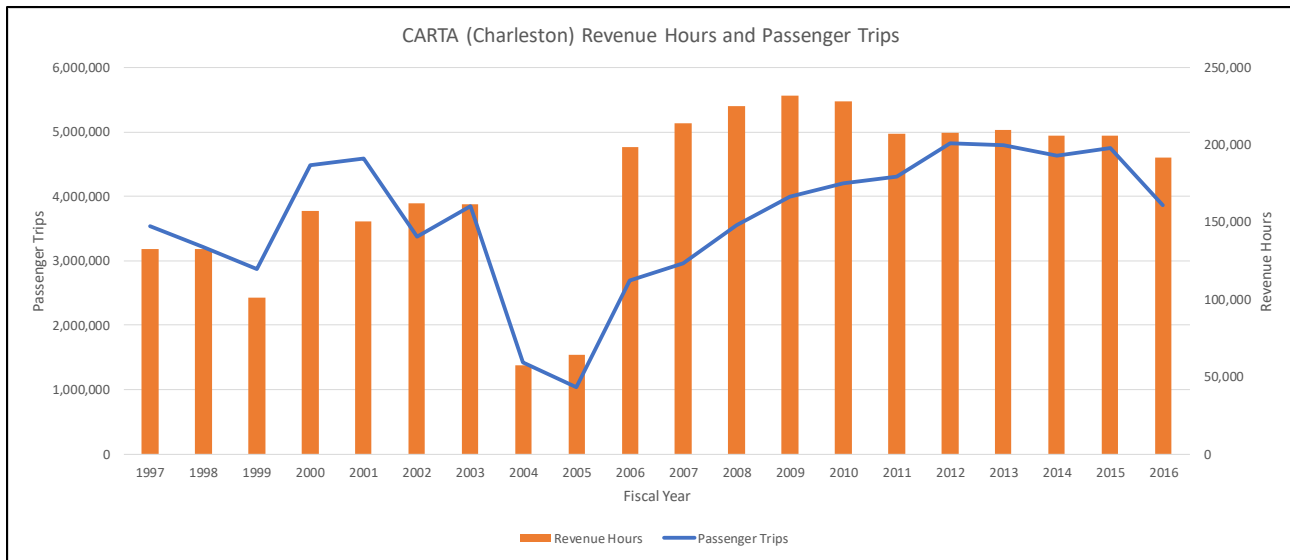
The passage of the referendum brought new life and growth to CARTA over the next several years. Milestones included:

- Most of the fixed route service that had been cut was restored,
- Promotions and community relations brought ridership back,
- Bus shelters were added,
- CARTA embarked on its first-ever external advertising campaign,
- New Express service from Park and Ride lots was very successful,
- Completion of a COA and Bus Rapid Transit (BRT) study, and
- Groundbreaking on the North Charleston Intermodal Center.

Figure 5-2 visually shows the highs and lows of CARTA ridership and revenue hours from 1997 to 2016.

In November 2016, a referendum for an additional half-penny sales tax passed with 51% approval. Voters also approved allowing Charleston County to issue \$200 million in bonds for large projects. The 2016 sales tax will be collected until 2042 or until \$2.1 billion is generated, and is allocated as follows:

- Roads/bridges: 61% or \$1.28 billion
- Transit: 29% or \$609 million
- Parks/greenspace: 10% or \$210 million

**Figure 5-2. CARTA (Charleston) Revenue Hours and Passenger Trip History**

Of the transit portion, the break-down is as follows:

- CARTA operations: \$280 million
- CARTA capital replacements (buses): \$73 million
- BRT implementation (local match to federal funds): \$72 million
- BRT operations: \$184 million

At a total of \$256 million is identified for the Lowcountry Rapid Transit Project, a proposed 23-mile BRT corridor from Charleston to Summerville. Estimated construction cost for the project is \$360 million. Charleston will be pursuing FTA Capital Investment Grant Program (formerly known as New Starts) to leverage the local half-cent funds.

Table 5-3 presents a summary of CARTA's FY 2017 budget (capital and operating) broken down by funding source. The Charleston County sales tax generated nearly 25% of the total CARTA budget. The \$18 million in federal grants includes anticipated funding for the Lowcountry Rapid Transit Project.

Key takeaways from CARTA's successful referenda are as follows:

- 2004 Referendum:
  - Include area governments, organizations and groups in the planning process
  - Consensus was reached only after business community came together to support the tax
  - The Chamber of Commerce provided the leadership, talent and commitment needed to make it a success
- 2016 Referendum:
  - The County developed a specific list of projects in six categories
  - The referendum built on a strong public desire to reduce congestion
  - There was strong support for transit improvements, particularly BRT



**Table 5-3. CARTA FY 2017 Budget Summary**

<b>Funding Source</b>	<b>Amount</b>	<b>Percentage</b>
Farebox	\$2,697,890	7.6%
Passes	\$585,388	1.7%
College of Charleston Shuttle	\$452,580	1.3%
Med. Univ. of SC	\$807,000	2.3%
City of Charleston - DASH	\$516,000	1.5%
City of North Charleston	\$1,151,600	3.3%
Federal Grants	\$18,279,154	51.7%
State Mass Transit Funds	\$661,636	1.9%
Sales Tax – Charleston County	\$8,147,000	23.0%
Charleston County – Intermodal	\$1,241,870	3.5%
Advertising	\$825,000	2.3%
<b>Total</b>	<b>\$35,365,048</b>	<b>100.0%</b>

### Capital Area Transit System (CATS)

Capital Area Transit System (CATS) provides bus service to residents of and visitors to Baton Rouge, Louisiana. Originally formed as the Capital Transit Corporation by the City of Baton Rouge, the system came to be known as the CATS in 2004 during a re-branding of the agency. CATS was later defined by an act of the Louisiana Legislature in 2005. The act established the transit agency and dictates its governance but did not create any revenue source for CATS.

As a political subdivision of the State of Louisiana and a Regional Transit Authority (RTA), CATS is governed by Board of Commissioners appointed by the East Baton Rouge Metro Council, the area's combined city-parish government. Because of the operating agreement between the Metro Council and CATS, Metro Council oversees CATS, approves fare changes and provides limited local funding for CATS from the general fund and a hotel/motel sales tax rebate.

The long-beleaguered transit system worked for 10 years towards voter approval of dedicated tax revenue for the system. Leading up to the narrow defeat of a referendum in 2010:

- In November 2002, voters in East Baton Rouge Parish voted down a 1.25-mill, five-year property tax to fund the transit agency.
- In April 2003, the Metro Council denied request to hold election on a new sales tax to support bus system, indicating a preference for a property tax.
- In November 2003, the Transit Board abandoned efforts to get a four-mill property tax on the March 2004 ballot.
- In 2006, CATS scrapped plans for 8.5-mill, 20-year property tax after it was opposed by City's Mayor and the Baton Rouge Area Chamber (BRAC).

Leading up to the failed 2010 referendum, significant planning efforts aimed at galvanizing community support took place. These efforts included community survey efforts in 2009 on transit and transportation funding alternatives showing support for expanded transit (including BRT) and the initiation of both a Future BR comprehensive planning process and a CATS COA (My CATS Study) in 2010.

Prior to the completion of the COA, CATS staff developed its own transit plan, which was taken to the voters for the October 2010 referendum. The service area included the City of Baton Rouge, East Baton Rouge Parish, the City of Baker, and the City of Zachary.

The October 2010 referendum called for a 3.5-mill, 12-year property tax to fund CATS. It narrowly failed, with 47% voting yes and 53% voting no.

In the meantime, CATS faced funding struggles and a series of service cuts. Attempts to reduce service further and increase fares were rejected by the Metro Council, leaving CATS facing a budget shortfall that would have resulted in a complete system shutdown by mid-year 2012.

Leading up to a successful referendum in 2012, the COA near, short and long-term plans were completed in late 2010 and the 2010 referendum results were examined in detail to understand where the property tax was supported. As a result, the taxing district boundaries were changed to whittle it down to only the city limits of Baton Rouge, Baker and Zachary, excluding the City of Central and unincorporated areas of the parish. Additionally, a provision was added for the vote totals in Baker and Zachary to be counted separately.

Community support efforts ramped up, led by Together Baton Rouge, a faith-based, grassroots organization addressing community issues. Together Baton Rouge also agreed to be a watchdog to hold CATS accountable to its promises.

The April 2012 referendum was for a 10.6-mill, 10-year property tax to fund CATS. It passed in Baton Rouge and Baker, but failed in Zachary. Thanks to the provision allowing for Zachary to be excluded, CATS finally found stable funding and avoided shutdown.

Shortly after the referendum, CATS refined the COA recommendations and began working towards implementation of the short-range plan, which took place in the spring of 2014. CATS' accomplishments to date have included:

- Increased the number of local routes from 19 to 29
- Added 24 new buses
- Three of the four new transfer hubs are now in place, though two are still in temporary locations
- Five new express routes (two of which since eliminated due to low ridership)
- Frequencies have been improved (15-minute service on the top two routes, 30 minutes on most other routes)
- AVL is in use on all buses and the Route Shout rider app was introduced
- 100 new bus shelters with lighting were added, and an additional 177 shelters were refurbished
- CATS will soon be initiating planning for BRT implementation and beginning a new COA

Figure 5-3 visually shows the highs and lows of CATS ridership and revenue hours from 2006 to 2016.

Key takeaways from CATS' successful referendum are as follows:

- 2012 Referendum:
  - My CATS Study completed and rolled out to public
  - Improvements promised in seven specific categories
  - Smaller taxing district and service area than the prior 2010 failed referendum
  - Fate of tax in Baton Rouge independent of Baker and Zachary results
  - Faith-based, grassroots campaign to get the votes
  - Don't dawdle on bus facility plans and construction

**Figure 5-3. CATS (Baton Rouge) Revenue Hours and Passenger Trip History**

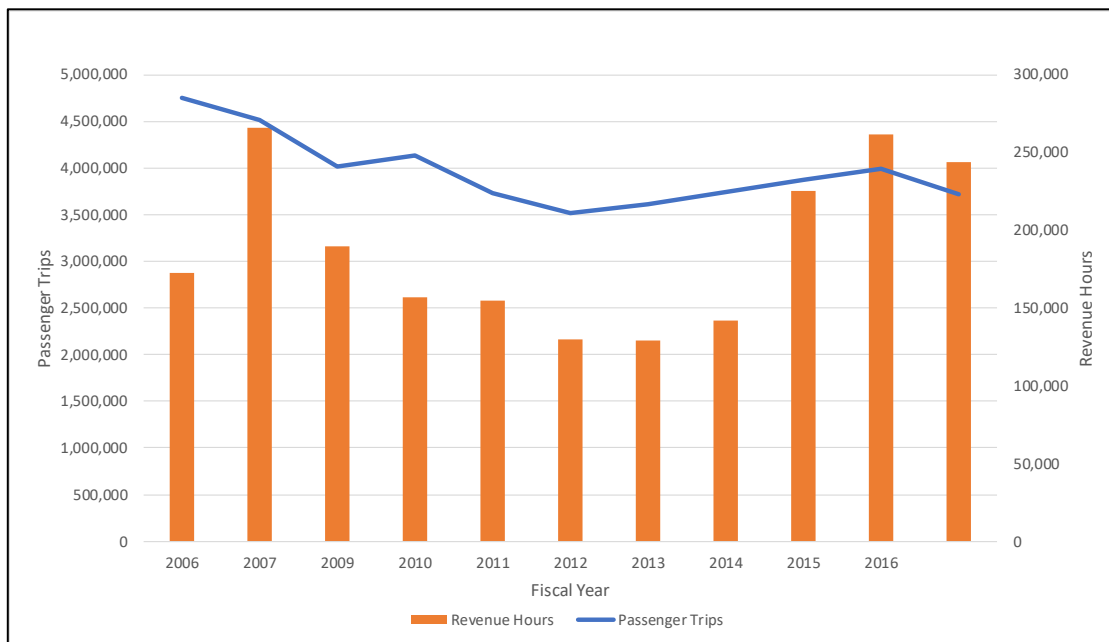


Table 5-4 presents a summary of CATS’ FY 2017 budget (capital and operating) broken down by funding source. The property tax generated nearly 50% of the total CATS budget.

**Table 5-4. CATS FY 2017 Budget Summary**

Funding Source	Amount	Percentage
Farebox	\$2,460,000	7.6%
Advertising	\$425,000	1.3%
Miscellaneous & Interest	\$41,000	0.1%
Federal FTA Funds	\$7,793,254	24.2%
Federal FHWA CMAQ Funds	\$3,616,272	11.2%
Hotel/Motel Tax	\$1,150,000	3.6%
Parish Transportation Fund	\$751,000	2.3%
Property Tax	\$16,000,000	49.6%
<b>Total</b>	<b>\$32,236,526</b>	<b>100.0%</b>

# CHAPTER 6 IMPLEMENTATION PLAN

The goal of the Greenlink Transit Development Plan is to improve the Greenlink network so it is useful to more residents and businesses in City of Greenville and Greenville County. The implementation plan prioritizes how that should be accomplished. The plan includes recommendations on service improvements, capital needs associated with those improvements, and funding levels to achieve an improved Greenlink network. The recommendations are sorted into three time periods that extend beyond the initial five years of this TDP. This is because the service needs of Greenlink are large enough to require extension past FY 2024.

Expansion of the Greenlink network is inherently tied to funding availability. To that end, all improvements are sorted into three funding levels that are linked to how important the project is towards enhancing the Greenlink network. Table 6-1 summarizes the implementation plan.

**Immediate Funding Need** – service and capital improvements that are recommended to occur first. These are the most acute needs in the Greenlink network and are recommended to be implemented between FY 2020 and FY 2024 as funding becomes available.

**Short Term Funding Need** – service and capital improvements that are recommended to occur after immediate need projects are fulfilled. These projects would enhance the immediate enhancements and are recommended to be implemented between FY 2025 and FY 2029 as funding becomes available.

**Long Term Need** – service and capital improvements that are recommended to occur after immediate and short term needs are fulfilled. These projects would continue enhance the Greenlink network and are recommended to be implemented after FY 2029 as funding becomes available.

Figure 6-1 shows proposed operating costs by time period, while Figure 6-2 shows the capital expenditures. It should be noted that, while not reflected in the TDP, Greenlink also should be planning for a capital replacement fund to replace multiple vehicles every year moving forward.

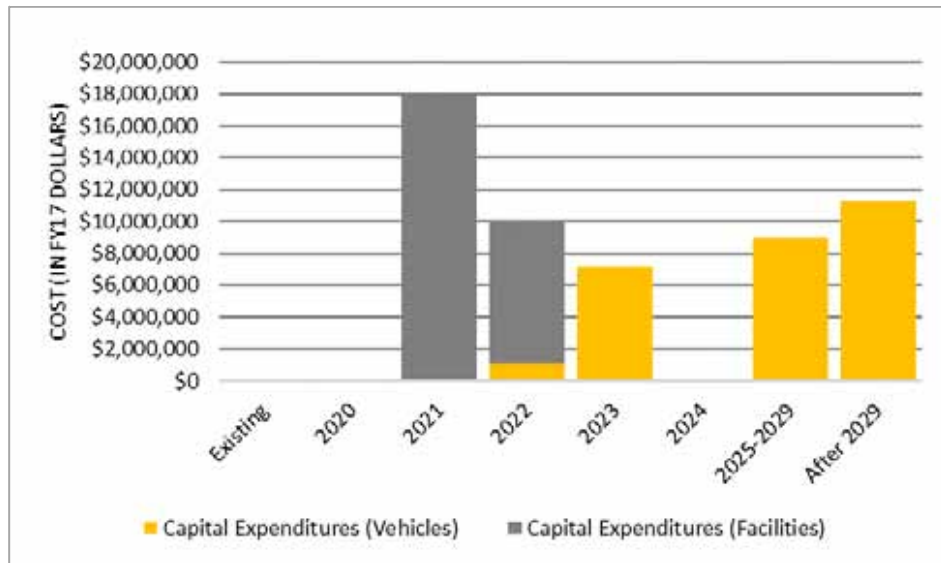
**Figure 6-1. Proposed Operating Costs by Year**



Table 6-1. Greenlink Implementation Plan

Funding Priority	Project Type	Route Type	Implementation Year	Improvement	Improvement Annual Operating Cost [FY17 dollars]	Cumulative Annual Operating Cost [FY17 dollars]	35-ft vehicles	Cutaway vehicles	Cumulative Total Fleet	Improvement Capital Cost [FY17 dollars]
	Fixed Route			Greenlink COA Fixed Route Network	\$3,982,000		17	3	20	-
	GAP			Existing GAP service	\$500,000	\$4,482,000	-	5	25	-
Immediate	Fixed Route	Systemwide	2020	Extend weekday span to 11:30p	\$859,000	\$5,341,000			25	\$0
Immediate	Fixed Route	Systemwide	2020	Operate Saturdays from 5:30a - 11:30p	\$359,000	\$5,700,000			25	\$0
Immediate	GAP	Systemwide	2020	Extend GAP service until 11:30p M-Sat	\$160,000	\$5,860,000			25	\$0
Immediate	Capital	-	2023	New Maintenance Facility		\$5,860,000			25	\$27,000,000
Immediate	Capital	-	2023	Purchase new vehicles (replace Coach buses)		\$5,860,000	3		28	\$1,650,000
Immediate	Capital	-	2023	Purchase new vehicles for 30 minute service		\$5,860,000	13		41	\$7,150,000
Immediate	Fixed Route	Systemwide	2023	Improve all Weekday routes to 30 minute frequency	\$3,169,000	\$9,029,000			41	\$0
Immediate	Fixed Route	Systemwide	2023	Improve all Saturday routes to 30 minute frequency	\$378,000	\$9,407,000			41	\$0
Immediate	Fixed Route	Systemwide	2024	Add Sunday service (60 minute frequency; 12 hrs)	\$510,000	\$9,917,000			41	\$0
Immediate	GAP	Systemwide	2024	Operate GAP service on Sundays	\$40,000	\$9,957,000			41	\$0
Short Term	Fixed Route	Radial	2025-2029	Cedar Lane	\$268,000	\$10,225,000	1		42	\$550,000
Short Term	Fixed Route	Radial	2025-2029	Old Buncombe	\$261,000	\$10,486,000	1		43	\$550,000
Short Term	Fixed Route	Commuter	2025-2029	US 123 commuter	\$159,000	\$10,645,000	3		46	\$1,650,000
Short Term	Fixed Route	Radial	2025-2029	Cleveland/Haywood	\$289,000	\$10,934,000	1		47	\$550,000
Short Term	Fixed Route	Connector	2025-2029	Gantt	\$249,000	\$11,183,000	1		48	\$550,000
Short Term	Fixed Route	Crosstown	2025-2029	Blue Ridge/Pleasantburg/Halton	\$554,000	\$11,737,000	2		50	\$1,100,000
Short Term	Fixed Route	Crosstown	2025-2029	White Horse	\$291,000	\$12,028,000	1		51	\$550,000
Short Term	Fixed Route	Radial	2025-2029	Laurens/Woodruff	\$475,000	\$12,503,000	2		53	\$1,100,000
Short Term	Fixed Route	Radial	2025-2029	Church/Mills	\$251,000	\$12,754,000	1		54	\$550,000
Short Term	Capital	-	2025-2029	Purchase new vehicles for expanded routes		\$12,754,000	3		57	\$1,650,000
Short Term	GAP	Systemwide	2025-2029	GAP service for route expansion	\$335,000	\$13,089,000		2	59	\$200,000
Long Term	Fixed Route	Connector	After 2029	Mauldin	\$231,000	\$13,320,000	1		60	\$550,000
Long Term	Fixed Route	Commuter	After 2029	US 276 commuter	\$149,000	\$13,469,000	3		63	\$1,650,000
Long Term	Fixed Route	Connector	After 2029	Greer	\$260,000	\$13,729,000	1		64	\$550,000
Long Term	Fixed Route	Commuter	After 2029	I-85 commuter	\$191,000	\$13,920,000	3		67	\$1,650,000
Long Term	Fixed Route	Crosstown	After 2029	Howell	\$267,000	\$14,187,000	1		68	\$550,000
Long Term	Fixed Route	Crosstown	After 2029	Faris/Haywood	\$464,000	\$14,651,000	2		70	\$1,100,000
Long Term	Fixed Route	Commuter	After 2029	I-385 commuter	\$185,000	\$14,836,000	3		73	\$1,650,000
Long Term	Fixed Route	Connector	After 2029	Pelham	\$231,000	\$15,067,000	1		74	\$550,000
Long Term	Fixed Route	Connector	After 2029	Fountain Inn	\$262,000	\$15,329,000	1		75	\$550,000
Long Term	Fixed Route	Connector	After 2029	Travelers Rest	\$238,000	\$15,567,000	1		76	\$550,000
Long Term	Capital	-	After 2029	Purchase new vehicles (for expanded routes)	-	\$15,567,000	3		79	\$1,650,000
Long Term	GAP	Systemwide	After 2029	GAP service for route expansion	\$447,000	\$16,014,000		3	82	\$300,000

Figure 6-2. Proposed Capital Costs by Year



## Immediate Improvement Plan

The Immediate Improvement Plan includes fixed route, GAP paratransit, and capital improvements for the five-year period from the beginning of FY 2019 (July 1, 2019) to the end of FY 2024 (June 30, 2024).

### Service Improvements

Service improvements recommended in the Immediate Improvement Plan focus on improving the core network. Specific improvements include:

#### FY 2020

- Extend weekday network to operate until 11:30 p.m. (4 additional hours of service).  
Operating Cost: \$859,000 (FY 2017 dollars)
- Extend Saturday network to operate from 5:30 a.m. to 11:30 p.m. (8 additional hours of service).  
Operating Cost: \$359,000 (FY 2017 dollars)
- Expand GAP paratransit service to cover new fixed route hours.  
Operating Cost: \$160,000 (FY 2017 dollars)

#### FY 2023

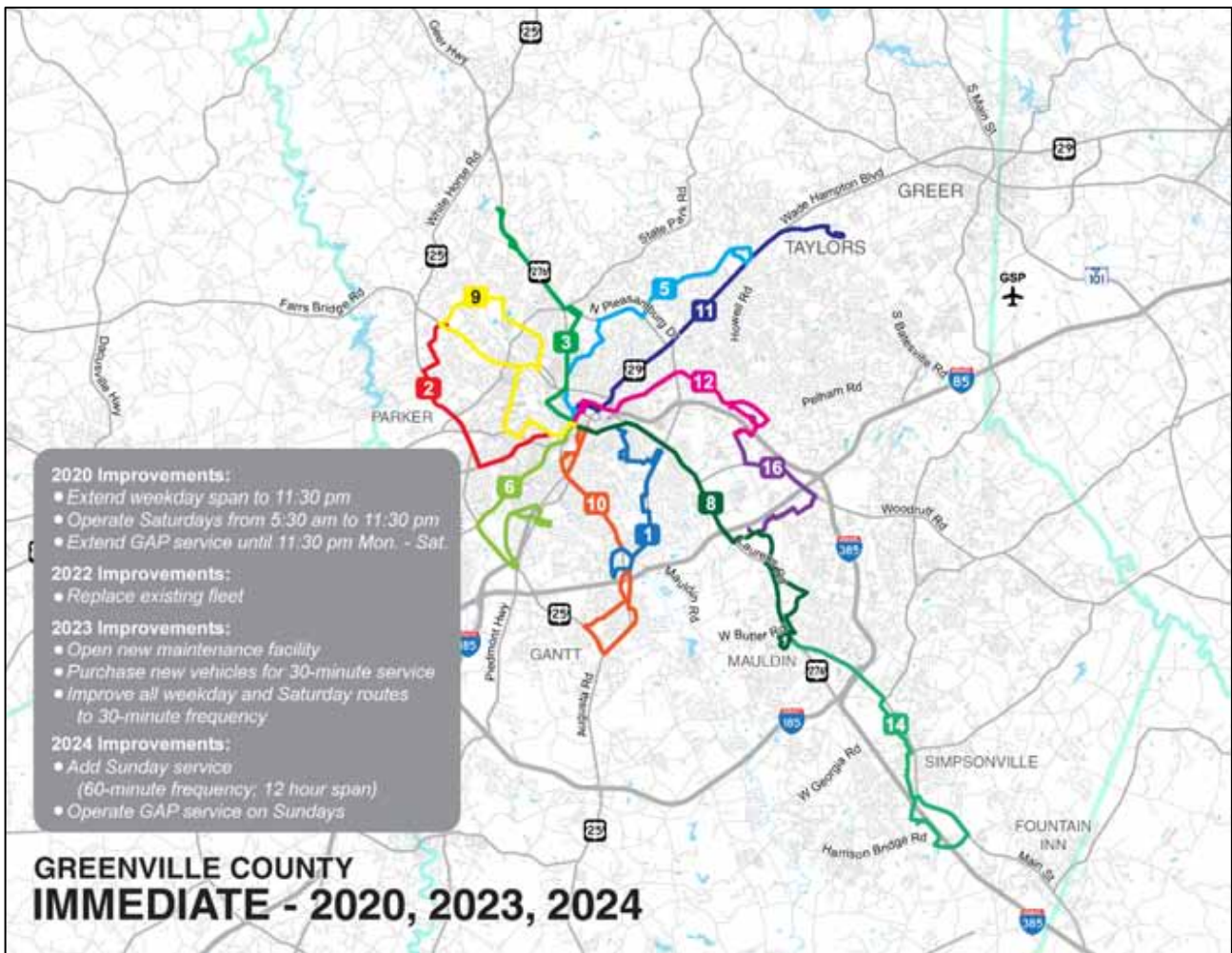
- Increase frequency on all weekday routes to every 30 minutes.  
Operating Cost: \$3,169,000 (FY 2017 dollars)
- Increase frequency on all Saturday routes to every 30 minutes.  
Operating Cost: \$378,000 (FY 2017 dollars)

#### FY 2024

- Add Sunday service (12 hours of service each day).  
Operating Cost: \$510,000 (FY 2017 dollars)
- Expand GAP paratransit service to cover Sunday service.  
Operating Cost: \$40,000 (FY 2017 dollars)

The total operating cost over the time period is \$5,475,000 (FY 2017 dollars). Figure 6-3 shows the proposed improvements in the immediate service plan.

**Figure 6-3. Proposed Immediate Improvements**



**Capital Improvements**

Capital improvements recommended in the Immediate Improvement Plan are centered on constructing a new maintenance facility and upgrading the Greenlink fleet to a state of good repair. Additional information on the state of Greenlink’s fleet is provided in Chapter 3 of the COA Final Report. Specific capital improvements include:

FY 2021-22

- Construct new maintenance facility.  
Capital Cost: \$27,000,000 (FY 2017 dollars)

FY 2022

- Purchase two new vehicles for fleet replacement.  
Capital Cost: \$1,100,000 (FY 2017 dollars)

FY 2023

- Purchase thirteen new vehicles<sup>5</sup> to expand service to every 30 minutes on the Greenlink network. Capital Cost: \$7,150,000 (FY 2017 dollars)

## Short Term Improvement Plan

The Short Term Improvement Plan includes fixed route, GAP paratransit, and capital improvements for the five-year period from the beginning of FY 2025 (July 1, 2024) to the end of FY 2029 (June 30, 2029).

### Service Improvements

Service improvements recommended in the Short Term Improvement Plan add new routes to the Greenlink network. Specific improvements include:

FY 2025-29

- Add new fixed route services
  - Cedar Lane
  - Old Buncombe
  - US 123 commuter
  - Cleveland/Haywood
  - Gantt
  - Blue Ridge/Pleasantburg/Halton
  - White Horse
  - Laurens/Woodruff
  - Church/Mills
 Operating Cost: \$2,797,000 (FY 2017 dollars)
- Expand GAP paratransit service to cover new routes. Operating Cost: \$335,000 (FY 2017 dollars)

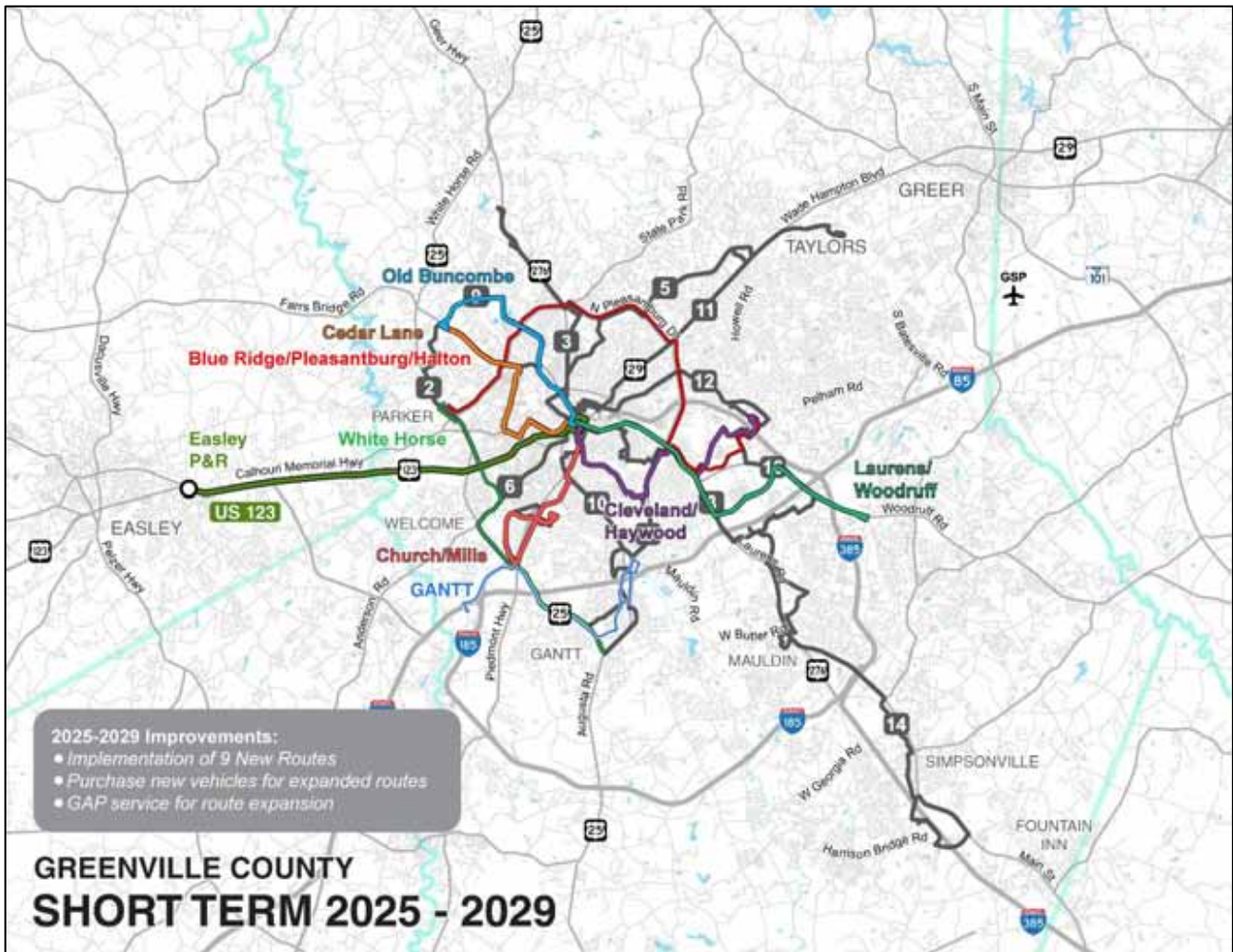
The total operating cost over the time period is \$3,132,000 (FY 2017 dollars). Figure 6-4 shows the proposed improvements in the Short Term service plan.

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<sup>5</sup> Assumed to be 35-ft CNG vehicles at a cost of \$550,000 per vehicle.



Figure 6-4. Proposed Short Term Improvements



**Capital Improvements**

The capital improvements recommended in the Short Term Improvement Plan is fleet expansion for each of the proposed fixed route and GAP paratransit expansion projects. Specific capital improvements include:

FY 2025-29

- Purchase 16 new vehicles<sup>6</sup> for fixed route service expansion.  
Capital Cost: \$8,800,000 (FY 2017 dollars)
- Purchase two new cutaway vehicles for GAP paratransit expansion.  
Capital Cost: \$200,000 (FY 2017 dollars)

<sup>6</sup> Assumed to be 35-ft CNG vehicles at a cost of \$550,000 per vehicle.

## Long Term Improvement Plan

The Long Term Improvement Plan includes fixed route, GAP paratransit, and capital improvements slated for implementation on or after FY 2030 (July 1, 2029).

### Service Improvements

Service improvements recommended in the Long Term Improvement Plan add new routes to the Greenlink network. Specific improvements include:

After FY 2029

- Add new fixed routes services
  - Mauldin
  - US 276 commuter
  - Greer
  - I-85 commuter
  - Howell
  - Faris/Haywood
  - I-385 commuter
  - Pelham
  - Fountain Inn
  - Travelers Rest

Operating Cost: \$2,478,000 (FY 2017 dollars)
- Expand GAP paratransit service to cover new routes.  
Operating Cost: \$447,000 (FY 2017 dollars)

The total operating cost over the time period is \$2,925,000 (FY 2017 dollars). shows the proposed improvements in the Long Term service plan.

### Capital Improvements

The capital improvements recommended in the Long Term Improvement Plan is fleet expansion for each of the proposed fixed route and GAP paratransit expansion projects. Specific capital improvements include:

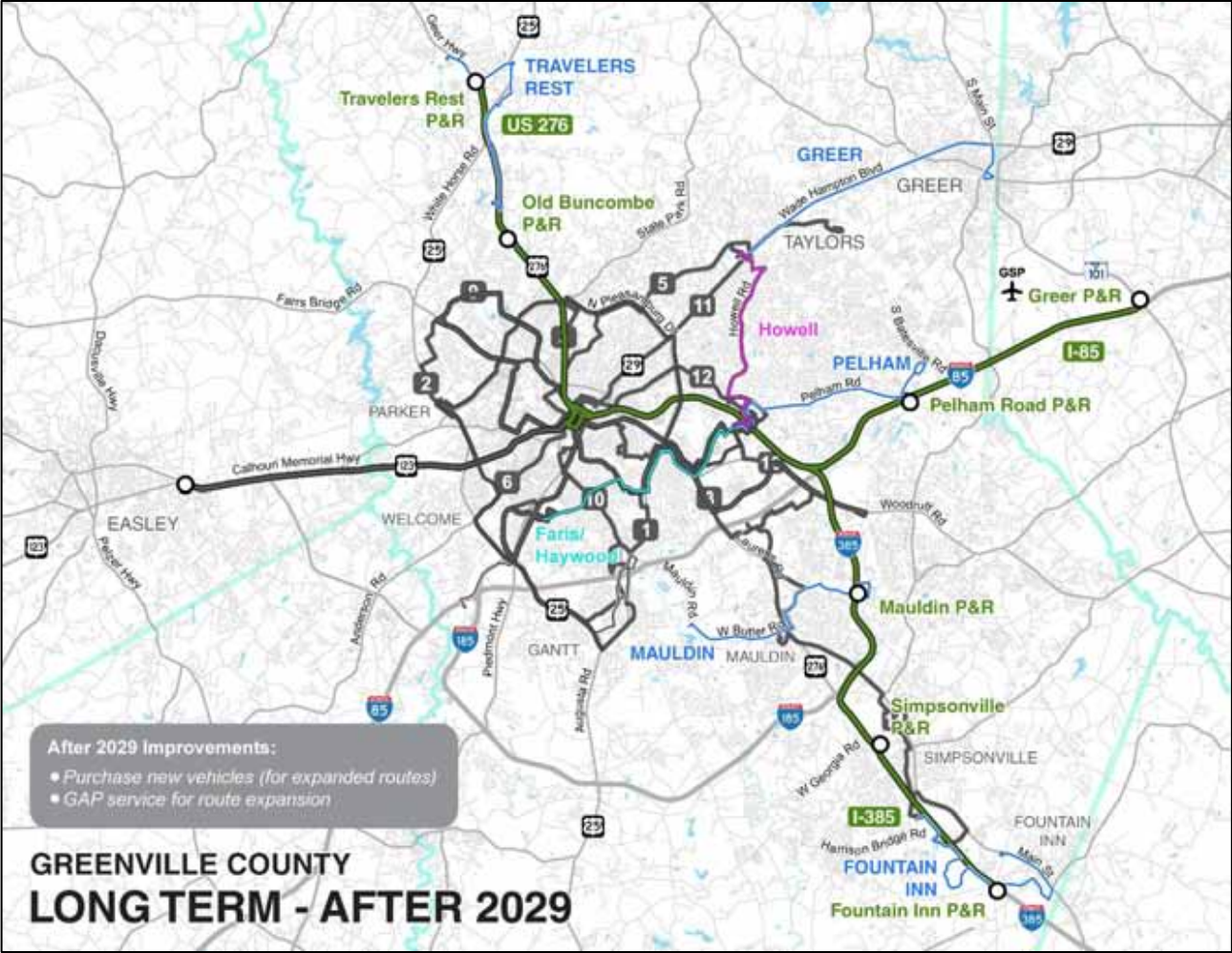
After FY 2029

- Purchase 20 new vehicles<sup>7</sup> for fixed route service expansion.  
Capital Cost: \$11,000,000 (FY 2017 dollars)
- Purchase three new cutaway vehicles for GAP paratransit expansion.  
Capital Cost: \$300,000 (FY 2017 dollars)

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<sup>7</sup> Assumed to be 35-ft CNG vehicles at a cost of \$550,000 per vehicle.

Figure 6-5. Proposed Long Term Improvements



# APPENDIX 1 FOCUS GROUP DOCUMENTATION

This appendix presents notes and other documentation of focus group meetings that were conducted on December 18-19, 2017.

## Meeting Notes

### Meeting 1: Monday, December 18, 2017, 1:00pm

#### *Service Expansion*

- The order of Analysis 1 makes sense because the high capital costs of increasing frequency should come after smaller wins are achieved.
- The Gantt Connector is logical because it restores service to an area (Grove Station Apartments) that previously had service. There are some students that live in the area that may take transit.
- There are several employers in the Greenville metro that have twelve-hour shifts. Currently it is very difficult to use the transit system if you work a twelve-hour work day, and many return trips may not be possible. Running the transit service until 11:30 PM may not be late enough to solve this issue. Certified Nursing Assistants are an example.
- The Donaldson Center needs to have access to the transit system. This may be accomplished with an internal circulator service that connects to the rest of the system.
- The service industry is growing in Greenville, especially downtown with restaurants, and transportation for these workers should be addressed with later service.
- There is a need for express service that serves multiple job centers. It should run late enough for employees to take it home. The existing service does not run late enough.
- Transit expansion needs to be linked to workforce development. Connecting the employees to the employers should be the message Greenlink sends to the community in order to gain support. Show the return on investment to make the case for transit. Greenville is a business first community.
- A route to SCTAC would be a good idea to serve the people working there.
- Service to students is important, such as the Air Craft maintenance program at Greenville Tech. Some students have had to drop out of the local schools because they can't get to and from classes.
- Access to healthcare is critical because when patients can't get access, their medical conditions worsen, and they end up needing more invasive, more expensive procedures.
- There is not enough density in Greenville to have high frequency (every 15 minutes or better) transit service. Without increased density high frequency bus or rail transit doesn't make sense.

#### *Funding Options*

- Currently the transit network operates 2/3<sup>rd</sup> of its service in the county, and 1/3<sup>rd</sup> in the city. Greenville County would be open to expanding service but wants (needs) more service to the outer part of the county. The county only puts in \$400,000 annually, which is a fraction of the overall expenses.
- The Upstate is conservative and anti-tax increase. Unlikely to see that change, so funding for transit needs to come in a different way than a dedicated tax.

- Public-private partnership would be of interest (especially to conservative politicians) but needs to be attractive to have a chance. Farebox recovery of 20% isn't going to sell a public-private partnership.
- The private sector needs to become involved in financing the transit system because the public sector doesn't have the ability. A penny sales tax involving transportation was voted down in 2012. The political climate in this area is very conservative, and sales tax increases likely won't pass. A property tax is even less likely to pass.

## **Meeting 2: Monday, December 18, 2017, 3:00pm**

### *Service Expansion*

- The existing system needs to be upgraded before expansion can occur. There needs to be more covered bus stops and handicapped access.
- The priority order of Analysis 1 is open to a bit of debate. Some agree the hours should be extended before the frequency is improved. Others prefer that improved frequency during the week occur prior to the Saturday service expansion.
- Attendees ask about increasing the frequency during peak times only.
- There are five hotels under construction in downtown Greenville. Downtown is booming and there will be increased demand for workers to access this area.
- Cedar Lane and White Horse Rd is a dangerous area for pedestrians, where there have been instances where they have been hit by vehicles when they cross the road.
- There are not enough connections to other routes in the existing system. If there were more connections then riders wouldn't be forced to transfer downtown. Riders have multiple destinations to go to during the day and being able to access those destinations easily is critical.
- There is a stigma about using transit in our culture that needs to be overcome. Some grocery stores do not even want the buses using their parking lots, and they don't like transit riders waiting in front of their stores. Most people don't want to give up their cars.

### *Funding Options*

- Funding for a new route could come in the form of a transportation student fee imposed on all Greenville Tech students.
- In order to overcome funding challenges, we need to find an example city that has excellent transit that we can emulate. We need to ask what they are doing better than us.
- The messaging for the transit expansion needs to include the goals of transit. Greenlink needs to spread that message and make it as clear as possible by educating the community. Transit improves the quality of life for the people in the community, as well as serves as transportation for those who cannot buy or operate a personal vehicle.
- Increasing taxes is not an option for Greenville, and people take note any time raising taxes is suggested because it is so unfavorable.
- South Carolina is a very conservative state, but they are willing to pay for really great services. No one has made a compelling case for transit though.
- Transit alone is not enough to convince people to support change. There needs to be a campaign that includes bike, pedestrian, and other mobility options to support transit. There needs to be a

greater, more comprehensive plan to convince people we need change. The conservative political environment makes it especially difficult to make any changes.

- There is not enough communication with the right people in the room to encourage real change. We need a round table discussion with elected officials to talk about the planning in Greenville. Experts in the field need to be a part of the discussion to educate the elected officials.
- The return on investment for spending money on transit is great for Greenville. There are economic benefits seen across the city when money is spent on transit services. There are about 500,000 residents in Greenville County, so if we spend \$17 million on transit, it's only about \$35.00 per person annually.
- Conservatives need a business case for transit, so we need to form a workforce development argument.
- The Greenlink expansion needs to be a big part of the comprehensive plan that the city is undergoing. Development is occurring in many places all at once. But there appears to be no connection between transportation improvement and land use fees.
- There needs to be a clear message that unifies the many different groups that are interested in transit expansion. Community engagement with this message would help gain support and could continue with grass roots. Beer and Napkins meetings and "Yes in my backyard" messaging could all be platforms to help move forward.

#### **Meeting 3: Monday, December 18, 2017, 5:30pm**

- Public private partnerships would be a good strategy for funding transit expansion. Greenville has several large businesses/employers that could come together to fund a transit route.
- Connections between nearby areas such as Clemson could increase ridership by bringing students into the area.

#### **Meeting 4: Tuesday, December 19, 2017, 1:00pm**

##### *Service Expansion*

- Analysis 1 could be rearranged to include Sunday service before adding weekday frequency. This could be another opportunity to increase service without incurring the large capital expense of additional buses. The public perception of this move would be positive. Asheville has had success in adding Sunday service.
- Service that runs later is a great idea, but is 11:30 PM the right time? Service that runs earlier or later than 11:30 may work better for the community, particularly 2<sup>nd</sup> shift workers.
- The downtown travel market could be a target for service span extension. Currently the service doesn't operate late enough for the community to take the return trip after having dinner downtown. The employees of the restaurants could also use the later service.
- A route along Woodruff Rd would do well because of all the activity in the area. There is serious congestion and people don't like to sit in traffic on Woodruff Rd.
- Increasing the frequency of all the routes may be too ambitious. Increasing half of the routes to 30-minute headways may be a good compromise.

- Crosstown routes are favorable because they connect riders to other areas of the area without be forced to go downtown. Connections between routes is important for access to other areas.
- There are areas such as Fountain Inn that need access to medical care in Greenville. Getting folks from these areas to their medical appointments is important.

#### *Funding Options*

- We're behind other cities like Charleston and Columbia in terms of funding the transit system, but those cities each have large universities downtown, as well as higher ridership, so they might not be the best cities to compare ourselves with.
- In order to gain support to expand the system, the education, awareness, and outreach need to be done really well. Otherwise a penny sales tax won't be successful in the conservative political climate. There needs to be a significant cultural shift for transit expansion to be successful. The stigma associated with transit is strong in South Carolina and we need to overcome that with education and awareness.
- We need the business community to step forward to make the case for transit to the city council. Businesses with low-wage employees should be advocating for the service expansion. Restaurants need employees to be able to get to work. Some restaurants have suffered and even closed because they can't find staff. Private sector companies, such as Michelin and BMW, need to be a part of transit expansion discussion.
- A business case for transit needs to be constructed and presented. We could reduce the need for expensive parking decks with transit expansion. Transit also takes cars off the road.
- Adding weekday frequency is very expensive, so it may be a better idea to add other, less capital-intensive service, before adding weekday frequency. We need small wins before we can pursue a sales tax increase because the last sales tax failed miserably.
- The Latino community hasn't been responsive in surveying efforts, potentially because of the hostile political environment. Greenlink should reach out to see what they would like in transit expansion.
- Ultimately, a dedicated funding source needs to be put in place so that Greenlink is funded properly.

#### **Meeting 5: Tuesday, December 19, 2017, 3:00pm**

##### *Service Expansion*

- Increasing the frequency to 30 minutes is essential because it would bring a great benefit to the riders.
- Some disagreement on whether frequency or service span expansion should come first. Frequency increase would provide a benefit to more riders than operating later at night and would make the system more useful.
- Extending the hours later in the evening is also critical though because it would offer workers to get home from their jobs. There are a lot of 2<sup>nd</sup> and 3<sup>rd</sup> shift employees that may need the span of service to continue later than 11:30 PM.

- Folks with disabilities can't get to their jobs without the bus, so increasing the hours of operation should be prioritized. Furman students would also ride Greenlink if the service ran late, especially on Fridays and Saturdays.
- In January 2018 Clemson will start running 35' buses and will therefore have excess capacity, enabling them to open the doors to public. Currently Clemson operates service for students, faculty, and staff only.
- It may be beneficial to route buses through the downtown transfer center to another route instead of using the transfer center as an end-of-line. This would enable riders to stay on the bus rather than transfer to another bus.
- Greenlink should customize their transit services to their riders, so that areas with higher ridership get better frequency. A one size fits all solution does not work as well as giving more service to the areas that warrant it.
- Service expansion should improve the number of places that low-income riders can reach.

#### *Funding Options*

- Greenlink should look to how other successful transit agencies are funded and use the same approach to funding that they do.
- The large employers in the region should be at the table when deciding how to expand transit. If these companies get behind the transit system, then it will be a success. Greenville will do anything for economic development, so businesses need to be a big part of these decisions.
- Expansion needs to occur in each of the city council members regions so that everyone feels like they get something in the expansion plan. This will help create support for the transit plans. Isochrone analysis could be done for each of the council members regions, showing the increased area riders could reach from each location.
- Transit needs to be addressed with a larger discussion around mobility, including pedestrian access to places from the bus stops. Some areas in Greenville are very dangerous for pedestrians, and these places should be improved by installing crosswalk and sidewalk infrastructure.
- The lack of local funding for transit makes expansion really difficult. Greenlink needs to change the minds of business leaders and city council members' minds so that a dedicated funding source is created.
- There is a lack of vision for Greenlink and what it wants to be to the community. Need to set the vision first before a specific service and funding plan can be promoted.
- The driver for transit expansion is employment, and an economic case for transit needs to be made in order to convince enough people that funding more transit is a good idea. Greenville is pro-business so the message for transit needs to be in familiar business terms.



## Sign-in Sheets

Sign-In Sheet		
<b>Greenlink Transit Development Plan</b> <b>Focus Group Meeting</b> <b>City Hall 3<sup>rd</sup> Floor Conference Room</b> <b>December 18, 2017 at 1:00 PM</b>		
Name	Organization	Email Address or Phone Number
Doug Davis	GCRA/GAL	ddavis@GCRA-SC.ORG
Adrea Turner	Greenville Chamber	aturner@greenvillechamber.org
Bill West	GCPSIS	WWest13@gmail.com
Henk Hyatt	Gov Chamber	hhayt@greenvillechamber.org
Amanda Lanson	ChartSpan	amanda@chartspan.com
Jon Hammond	ChartSpan	jon.hammond@chartspan.com
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Wendy Walden	Greenville Tech	walden@walden@gvtc.edu
Katy Smith	PHF	kathy.smith@pudmonthealthland.com
Mary West	Hampton Inn & Suites Riverplace	m.west@hospitalityamerica.com
Cessa Owens	Michelle	cessa.owens@michelin.com

December 18, 2017 – 1 p.m. Focus Group Sign In Sheet

**Sign-In Sheet**

**Greenlink Transit Development Plan**

**Focus Group Meeting**

**City Hall 3<sup>rd</sup> Floor Conference Room**

**December 18, 2017 at 3:00 PM ~~1:00~~**

Name	Email Address	Phone Number
Walker Smith	Walker.Smith@bshs.org	241-5136
Elise Romano	e.romano@hospitalityamerica.com	915-0244

December 18, 2017 – 1 p.m. Focus Group Sign In Sheet



### Sign-In Sheet

**Greenlink Transit Development Plan  
 Focus Group Meeting  
 City Hall 3<sup>rd</sup> Floor Conference Room  
 December 18, 2017 at 3:00 PM**

Name	Email Address	Phone Number
Kelli McCormick	kmcormick@cityofgreen.org	864-968-7027
Caroline Aneskiewicz	caroline-aneskiewicz@bmdme.com	864-63-1457
Shawn Bell	shawn.bell@fountaininn.org	864-423-2506
Danielle Gibbs	danielle-gibbs@scott.senate.gov	864 233 5366

December 18, 2017 - 3 p.m. Focus Group Sign In Sheet

Sign-In Sheet

Greenlink Transit Development Plan

Focus Group Meeting

City Hall 3<sup>rd</sup> Floor Conference Room

December 18, 2017 at ~~1:00 PM~~ 3:00

Name	Organization	Email Address or Phone Number
Jennifer Harnill	United Way Greenville County	Jharnill@unitedwaygc.org
Rashida Campbell	GCRRA	rjeffers@gcra-sc.org
Chuck Morton	Greenville Tech	Chuck.Morton@gvt-ec.edu
Glen Williams	Embassy Suites	g.williams@hospitalityamerica.com
Adam James	School District	ADJAMES@greenville.k12.sc.us
Phillip Davie	Greenville School District	pdavie@greenville.k12.sc.us
Susan McLarty	Westminster Pres.	smclarty@wpc-online.org
Isa Hall	Update Forever	hall@updateforever.org

December 18, 2017 - 3 p.m. Focus Group Sign In Sheet

**Sign-In Sheet**

**Greenlink Transit Development Plan  
Focus Group Meeting  
Greenlink Large Conference Room  
December 18, 2017 at 5:30 PM**

Name	Organization	Email Address or Phone Number
Keith Moody	CLEMSON AREA TRANSIT	kmoody@cityofclemson.org

December 18, 2017 - 5:30 p.m. Focus Group Sign In Sheet

**Sign-In Sheet**

**Greenlink Transit Development Plan  
Focus Group Meeting  
City Hall 1<sup>st</sup> Floor Conference Room  
December 19, 2017 at 1:00 PM**

Name	Organization	Email Address or Phone Number
Erin Fletcher	GCEMS/ Access Health	efletcher@ghs.org
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Jenifer Snow	GHS	jsnow@ghs.org
Deborah Johnson	NHCmauklin	dejohnson@nrcmauklin.com
1000 STEEN	JACKSON	1000_STEEN@JACKSON.MG.CORP
Gaye Weeks	Hollingsworth LLC	gweeks@hollingsworthllc.org

December 19, 2017 - 1 p.m. Focus Group Sign In Sheet

Sign-In Sheet

Greenlink Transit Development Plan  
Focus Group Meeting  
City Hall 1<sup>st</sup> Floor Conference Room  
December 19, 2017 at 1:00 PM

Name	Organization	Email Address or Phone Number
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Gene Vaughn	Harvest Hope	G.Vaughn@harvesthope.org
Kathy Vass	Jackson Marketing	Kathy.vass@jacksonmg.com

December 19, 2017 - 1 p.m. Focus Group Sign In Sheet

**Sign-In Sheet**

**Greenlink Transit Development Plan  
Focus Group Meeting  
City Hall 1<sup>st</sup> Floor Conference Room  
December 19, 2017 at 3:00 PM**

Name	Organization	Email Address or Phone Number
Ben Hyde	Simpsonville	bhyde@simpsonville.com
Mike Teachey	Greenville CAP	mike.teachey@greenvillecap.org
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Sally Wills	Innewell Greenville	swills@innewellgreenville.org
Asanyika Ikein	CPATS/Greenville County	Aikein@greenvillecounty.org
MATT COTTEN	FURMAN UNIV.	MATTHEW.COTTEN@FURMAN.EDU
Deb Long	Bon Secours St Francis	deborah-long@bshsi.org
Kim Williams	GADC	235-2028
Jill Littlejohn	City of Greer	
C.L. Cohen	RGV Village Foundation	350.9071

December 19, 2017 - 3 p.m. Focus Group Sign In Sheet



### Sign-In Sheet

**Greenlink Transit Development Plan  
 Focus Group Meeting  
 City Hall 1<sup>st</sup> Floor Conference Room  
 December 19, 2017 at 3:00 PM**

Name	Organization	Email Address or Phone Number
Jason Knudsen	City of Simpsonville	jknudsen@simpsonville.com
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Katie Micoland	Clemson University	KATIEB@Clemson.edu
WES DRIPPS	FURMAN UNIVERSITY	weston.drripps@furman.edu

December 19, 2017 - 3 p.m. Focus Group Sign In Sheet