

# **ALIGNMENT EVALUATION DRAFT FINAL REPORT**

Augusta Streetcar Feasibility Study  
July 2009

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# 1 INTRODUCTION

Streetcars, or trolleys, are lightweight rail vehicles predominately powered by an overhead catenary system. Vehicles typically operate in mixed-traffic and support pedestrian-friendly development and activity. In recent years, streetcar has reemerged as a high-quality transit alternative to support compact and higher-density development in cities that cannot afford or do not have sufficient demand for larger rail systems.

The Downtown Development Authority of Augusta commissioned this feasibility study to assess the viability of a streetcar system in Downtown Augusta. The study consisted of a review of streetcar experience in other cities, targeted stakeholder involvement process, development of alignment alternatives, selection of preferred conceptual alternative, preparation of preliminary cost estimates, and drafting of an implementation plan. This report documents findings from the cost and feasibility analysis and discusses associated opportunities, obstacles, and constraints.

## 1.1 Project Background

The second largest city in Georgia, Augusta stretches along the Savannah River, immediately south of Interstate 20 and between the capital cities of Atlanta, Georgia and Columbia, South Carolina. The burgeoning four-county greater Augusta region has become a center of medicine, military, and biotechnology. Nearly 1.5 million tourists visit the city annually, generating \$366 million in revenues. Downtown Augusta encompasses the majority of Augusta's tourist attractions, including museums and performing arts centers. Still, the urban area of the City bears the lasting effects of shifting economic conditions from the past half century. The Augusta Streetcar is conceived as a historic line that will complement the fabric of the downtown while bolstering existing and planned revitalization and redevelopment efforts.

## 1.2 Why Streetcar?

At the turn of the 20<sup>th</sup> century, streetcars were a significant fixture in American cities. Over the next 50 years, the rise of the automobile, deindustrialization, and suburbanization would lead to the decline of most systems. In recent years, however, a revived interest in urban life has led to a renaissance of streetcar. New systems are not only serving basic mobility needs but are engineering economic growth and revitalization in formerly challenged downtowns. Recent projects have been completed in Portland, Seattle, Tacoma, San Francisco, Little Rock, Memphis, Kenosha, Tampa, and New Orleans. Several more cities are at various stages of development including, but not limited to, Tucson, Los Angeles, St Louis, Dallas, Birmingham, Grand Rapids, Cincinnati, Columbus, Atlanta, Boise, and Oklahoma City.

While light and heavy rail are designed to carry high volumes of passengers over long distances, streetcar, is most appropriate over shorter distances. Systems average two to three miles in length and operate in mixed-traffic conditions. Vehicles can share bus stops but, unlike buses, have a fixed-guideway and thus do not have to move in and out of traffic. Electrically operated, streetcars do not emit exhaust and are more environmentally-friendly than buses and



automobiles. Systems can be constructed quickly with less disruption and blend more easily with existing business, residences, and traffic. Construction costs are significantly lower costs than heavier rail systems that require extensive infrastructure. Capital costs for recent streetcar systems have ranged from \$3 million per mile in Kenosha, WI to \$8 million per mile in Little Rock, AK, and up to \$20 million per mile in Portland, OR. This is as opposed to the roughly \$30 million to \$50 million per mile for light rail systems.

Perhaps most attractive about streetcars is the associated development potential. The permanence of rail over bus accelerates and organizes development. The frequency of streetcar stops can promote an intensity of uses that fosters more compact, walkable environments. Adjacent properties become more valuable and businesses are stimulated by increased pedestrian activity. Developers are much more willing to participate in the funding of systems because the rails mitigate risk. In addition, the charm and appeal of streetcars can attract more tourists and occasional riders than buses and potentially bolster tourism.



Streetcars, however, are not and should not be regarded as the panacea of downtown revitalization. They alone do not cause development. However, latent development around streetcars tend to occur at an accelerated pace—resulting in higher densities, greater mix of uses, less parking, and increased tax and sales revenues for local governments and local businesses. A review of existing systems reveals a series of conditions that, when met, increase the viability and potential success of a new streetcar network. These conditions include:

- Demand for high-frequency service below that of light or heavy rail;
- Desire to encourage pedestrian and transit friendly development;
- Demand for short trips where local access is more important than speed;
- Business and community financial support;
- Mixed land uses or a variety of markets;
- Tourists or occasional users as well as commuters; and
- Lack of congestion on streetcar streets.

Still, the continued success of streetcars across the country clearly demonstrates its benefits and provide tangible examples of “why streetcar?”. New systems can seamlessly integrate into the built environment at a relatively low cost and with minimal disruption. Operation is dependant on electricity, a domestic energy source. Local, state, and federal resources can be leveraged to stimulate growth and development along streetcar corridors that yield high returns on public and private investment. In Portland, for example, a \$54 million investment yielded \$3 billion; in Little Rock a \$20 million investment yielded \$400 million; and in Tampa a \$48 million investment yielded \$1.2 billion.

Section 2 highlights the streetcar experience of cities similar to Augusta and provide specific examples of the great potential that lies in the development of such systems.

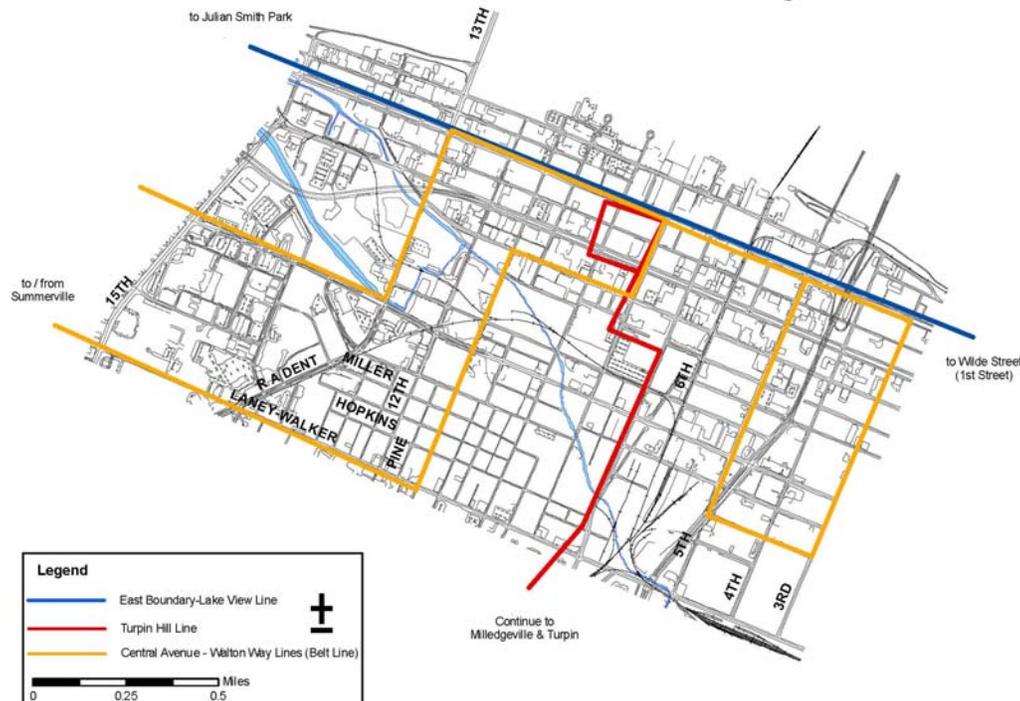
### 1.3 History of Streetcar in Augusta, GA

Augusta has a rich streetcar history that lasted for nearly 70 years. Origins of the streetcar network can be traced back to the Augusta and Summerville horsecar line in 1868. Colonel D.B. Dyer converted the existing horsecar line to an electric trolley service in 1890. Water power was supplied to the trolley via overhead wire. By 1896, Augusta's streetcar network was comprised of 25 miles, 42 trolleys, and 35 trailers and miscellaneous service cars. The system was operated by the Augusta Railway and Electric Company, a consolidated company of three predecessor trolley operators and the local electric company.



The historic streetcar system provided substantial coverage of downtown Augusta, as is illustrated in the map below. Trolley lines included both intra (city) and interurban lines. In 1903, the Augusta-Aiken Railway and Electric Co. consolidated city and interurban operations. By 1920, there were four distinct city lines serving Augusta: Monte Sano, Summerville, Lake View-Turpin Hill, and the Interurban Line. The first two routes implemented in the streetcar network, Central Avenue (Monte Sano) – Walton Way (Summerville) Lines, linked together into a single loop known as the Belt Line. Two double-tracked routes traveled in opposite directions on Broad Street, providing service to Broad Street, Center Street (modern day 5<sup>th</sup> Street), Hale Street, Lincoln Street (modern day 3<sup>rd</sup> St), and Jackson Street (modern day 8<sup>th</sup> St). The Lake View-Turpin Hill Line ran east to west on Broad Street, with an east Boundary at Lake View Line. The majority of the route was double-tracked, with the section crossing Augusta Canal Bridge single-tracked. The single-tracked Turpin Hill Line served South Augusta toward Broad Street along Milledgeville road. In 1902, the 26 mile interurban service, opened in 1902, connected Augusta, North Augusta, Horse Creek Valley, and Aiken.

**Augusta Historic Routes**



**Augusta Historic Routes**

Several factors led to the end of streetcar service in Augusta. The shift in the management of interurban and city lines in 1910 to a northern company, J.G. White Management Corporation, led to severe labor problems. New policies were implemented that forced operators to work in excess of 15 hours per day, clean their own rail cars, evict drunks from vehicles without assistance, and skip lunch to maintain schedules. After two men were fired for allegedly not turning in all of their fares, a labor union and strike ensued in 1911. A brief reconciliation was followed by another strike in 1912. Fight and riots erupted when scabs were brought in and state militia had to be called. Several citizens, some not affiliated, were shot and killed and the incident led to company losing more favor with the public.

Aside from internal labor issues, fire and natural disasters resulted in costly damages. In 1916, a fire nearly destroyed the entire business section of the trolley routes. Most of the catenary wire was destroyed on Broad Street and the company had to sell its Terminal Building and offices in 1920 to remain solvent. In addition, the Carolina shore of the Savannah River was subject to continual flooding. The rise of the automobile saw new roads coming under construction. In June 1924, the trolley tracks in the center of Broad Street were paved over. In 1928, the South Carolina Power Company took over the interurbans. The last interurban trip occurred on July 8, 1929 and the last of the city lines was terminated in 1937.



#### 1.4 Study Area Description

The study area for the feasibility study is Downtown Augusta. The area is bound by the Savannah River to the north, Walton Way to the south, 5th Street to the east, and the Medical District to the west. It is home to 2,661 people. A total of 895 businesses are located in Downtown Augusta, employing over 17,000 persons. The Medical District includes two of the region's largest employers—the Medical College of Georgia and University Hospital—as well as a host of other hospitals, facilities, and private medical companies. The streetcar is anticipated to facilitate connections between major generators and also ease growing parking constraints in the Downtown and Medical District.

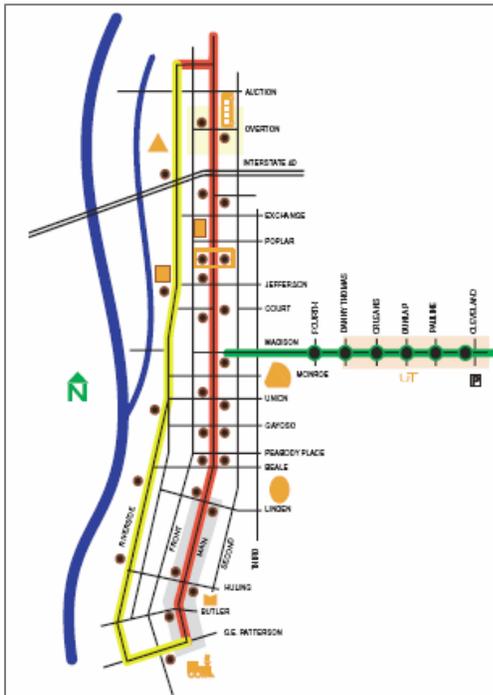
The following five streetcar alternatives were analyzed as part of this assessment:

Street	From	To	Length (miles)
<b>1. Broad Street</b>	Medical District	North Augusta	2.86
<b>2. Reynolds Street</b>	Medical District	North Augusta	3.08
<b>3. Broad /Reynolds Streets</b>	Medical District	North Augusta	3.08
<b>4. Reynolds Street</b>	Downtown Augusta	North Augusta	2.03
<b>5. Broad Street</b>	Downtown Augusta	Medical District	2.86

## 2 STREETCAR EXPERIENCE IN OTHER CITIES

The purpose of the peer analysis is to examine the streetcar experience of other cities comparable to Augusta to learn from their approaches and experiences. Existing historic and vintage streetcar systems in Memphis, TN; Tampa, FL; and Little Rock, AR are discussed based on direct project knowledge and a literature review (which included a review of agency websites). An overview of relevant aspects of each system are provided as well as a summary of key system statistics that can be used as a benchmark when developing cost estimates and the preliminary implementation plan.

### 2.1 Memphis, TN



The Memphis Area Transit Authority (MATA) operates a heritage trolley system that transports nearly 1.1 million passengers annually.<sup>1</sup> The three routes—the Main Street Trolley, Riverfront Trolley Loop, and the Madison Avenue Line—are designed to invoke memories of the city’s former streetcar system that shut down in the 1940s. Service is offered daily with a base fare of \$1.00, lunchtime fare of \$0.50, and a variety of pass options.

The first of the three routes, the Main Street Trolley, was conceived as part of the redevelopment of Memphis’ deteriorating downtown pedestrian mall. Opened in 1993, the 2.5 mile line is mostly double-tracked, running along the same route as the former horse-drawn trolley. The trolley line was extended slightly beyond the limits of the pedestrian mall to serve potential economic development areas. Capital costs for the Main Street Trolley totaled \$34.9 million, \$3 million of which was for procuring restored vehicles. Funding was 77.2 percent Federal, 7.1 percent State,

7.1 percent City, and 8.6 percent private.<sup>2</sup> The Federal portion was comprised of funds diverted from a failed freeway project in midtown Memphis. This initial line proved quite successful, boasting 468,115 passengers in its inaugural year.

In 1997, the first expansion of the system, the Riverfront Trolley Loop, opened. The two-mile alignment connected the two ends of the Main Street line, converting the system to a 4.5 mile loop and adding six stations. The Riverfront Trolley Loop offers scenic views of the Mississippi River, operating as a one-way loop in downtown Memphis, with the Main Street Line as one leg of the circle. The trolley shares its double-tracked right-of-way with Amtrak: one track is dedicated to MATA use and the other to Amtrak. Total cost for the Riverfront Trolley Loop was \$9.4 million, with the majority of financing, nearly 80 percent, from Federal Interstate Substitution Funds. By 2000, the ridership on the entire MATA trolley system rose to 941,011. In 1998, MATA completed its \$5.4 million North End Terminal project, providing parking and transfer facilities between bus and trolley lines.

<sup>1</sup> American Public Transportation Association, 2007

<sup>2</sup> <http://www.railwaypreservation.com/vintagetrolley/memphis.htm>

A significant factor influencing ridership for the Main Street Trolley and the Riverfront Trolley Loop was the intense growth that occurred along their corridors. From 1990 to 2004, the residential population along the corridor increased from less than 1,000 to over 5,000. In addition, the influx of new cultural and entertainment developments helped to revitalize downtown Memphis and transform it into a destination for residents and visitors alike. Main Street experienced significant growth in commercial development construction. Along the Riverfront Trolley Loop, there is new residential development, consisting of converted office buildings along and adjacent to Main Street as well as new mixed-use, high density development along the river to the south of downtown.



The last extension of the system, the Madison Line, opened in 2004. This route provides a rail link between Memphis's largest two employment centers: the existing downtown and the Medical Center complex. The 2.5 mile line operates in mixed traffic along Madison Avenue, primarily on tracks located in the inside travel lanes. The total cost for the new system was \$60 million. Significantly more expensive than the other two segments, the Madison Line capital costs included six new stations, a small park-and-ride facility at its eastern terminus, two major bridge projects, and procurement of one replica and three vintage trolleys. Unlike its predecessor lines, the Madison Avenue Line was built to light rail standards as the city plans to implement a light rail system. Nearly 80 percent of the funding for the Madison Avenue line was provided by the Federal Transit Administration and the remaining 20 percent was split between the City of Memphis and the Tennessee Department of Transportation.

With the opening of the last line in 2004, Memphis continues to see extended growth. By 2012, the CBID is expected to have 31,886 residents, an increase of 77 percent over the 17,976 person in 2000. While employment dropped five percent between 2003 and 2007, employment is expected to increase by seven percent through 2012. Between 2000 and 2006 alone, Memphis experienced an average three percent annual increase in tourism. The hotel market performance has steadily increased over the past six years.

The Memphis trolley system successfully integrates a rich streetcar history with transportation well-designed to meet the needs of both residents and tourists. The vintage look and feel of trolleys combined with the tourist attractions makes it a draw for visitors. And with the continued growth occurring in Memphis, the trolley serves as a convenient and affordable means for short trips by employees and residents.

**MATA Trolley Summary Table**

Memphis, TN Population	674,028 <sup>3</sup>
Year Implemented	1993
Current System Length	7 miles
Stops	34
Annual Ridership	1,079,300 <sup>4</sup>
Major Trip Generators	Stadium, Convention Center, Medical Center, Beal Street

<sup>3</sup> U.S. Census Bureau, 2007 Population Estimates

<sup>4</sup> 2007 ridership, APTA Public Transportation Ridership Report, Light Rail, Fourth Quarter 2007

Total System Cost	\$101 million
Initial System Cost	\$33 million
Initial System Track Miles	2.5 miles
Initial System Cost per Track Mile	\$6.6 million
Peak Headway	10 minutes
Vehicles	20 restored vehicles

## 2.2 Tampa, FL



Opened in 2002, the TECO Line Streetcar was proposed in the mid-1990s to provide mobility and connectivity between the city's waterfront attractions and historic district. Objectives of the system were to stabilize existing and stimulate new economic development and preserve the historic character of the area.<sup>5</sup> The 2.3 mile, historic line is mostly single-tracked with some double-tracked area. It is managed by Tampa Historic Streetcar, Inc., a non-profit corporation created by an interlocal agreement between the City of Tampa and Hillsborough Area Regional Transit Authority (HART) to manage day-to-day operations and maintenance.

Through an agreement with the Tampa Historic District, HART operates the service. The system begins operation at 11 a.m. daily with a one-way base fare of \$2.00 along with a \$4.00 all-day pass option and various discounts. Tourists comprise roughly 2/3 of the ridership, as the streetcar does not directly serve the central business district. It is a third of a mile from the CBD, but not easily accessible by foot. Ridership exceeded projections in the streetcar's inaugural year, reaching 420,000 and remaining over the 400,000 mark in subsequent years.

Capital construction costs for the project totaled \$63.5 million. Roughly 39 percent, or \$24.5 million, of that cost was for an intermodal center, transportation plaza, one station, and property purchases. The majority of costs were financed through state and federal funding. The city and the Florida DOT also made substantial contributions.

To fund operations for the first 10 years without City or HART subsidies, the business plan proposed an innovative funding package. Revenue is generated from four primary sources: a tax-assessment district comprising the area served by the streetcar; an endowment fund created from private sector contributions for naming rights of the system; advertising; and fares. Annual operating expenses are about \$2.4 million. At the start of operations, the endowment fund had approximately \$5 million, since then earning a return and an additional \$1.5 million in commitments. Tampa Electric Company purchased naming rights for the entire system at a cost

<sup>5</sup> <http://www.heritagetrolley.org/planTampaProjectDesc.htm>

of \$1 million, designating the system “TECO.” Prices for naming rights throughout the system are \$250,000 for vehicles and between \$75,000 and \$150,000 for stations.<sup>6</sup> The plan also provided for Federal Congestion Mitigation and Air Quality (CMAQ) funds for the first three years until the endowment fund generated sufficient revenue to operate the system.

The TECO Line has been quite successful in stimulating economic development. By 2006, the line was credited with helping to catalyze nearly \$1 billion in new development. The corridor has added 2,500 new housing units and significant commercial development. Most of the investment has occurred within 3 blocks of the line, mostly in Channelside, a residential and entertainment district adjacent to the waterfront that was recently converted from commercial uses.

Approximately 89,000 people currently live within a three-mile radius of downtown Tampa. If current development trends continue, in 25 years there will be more than 6,000 residential units and 12 million square feet of commercial space on a 200-acre footprint that is a third of the total area of the central business district.<sup>7</sup> The streetcar has also been instrumental to creating more pedestrian-friendly neighborhoods along the corridor that encourage a park once environment.

The TECO Streetcar line is a paradigm of a thriving, visitor-oriented streetcar system. The system has become integral to the city’s image and has increased the attraction of Tampa’s waterfront and historic district for major conventions and visitors. The original intent of the system was to strategically connect various tourist attractions, but the system goes well beyond connecting the urban core of three neighborhoods. The \$1 billion worth of development investment in the area immediately surrounding the streetcar as well as its strong ridership numbers illustrate influence of the system on the city’s economy.



**TECO Line Streetcar Summary Table**

Tampa, FL Population	336,823 <sup>8</sup>
Year Implemented	2002
Current System Length	2.3 miles
Stops	12
Annual Ridership	431,800 <sup>9</sup>
Major Trip Generators	Stadium, Convention Center, Cruise Port
Total System Cost	\$63.5 million
Initial System Cost	\$48.3 million
Initial System Track Miles	2.3 miles
Initial System Cost per Track Mile	\$21 million
Peak Headway	15 minutes
Vehicles	8 replica vehicles

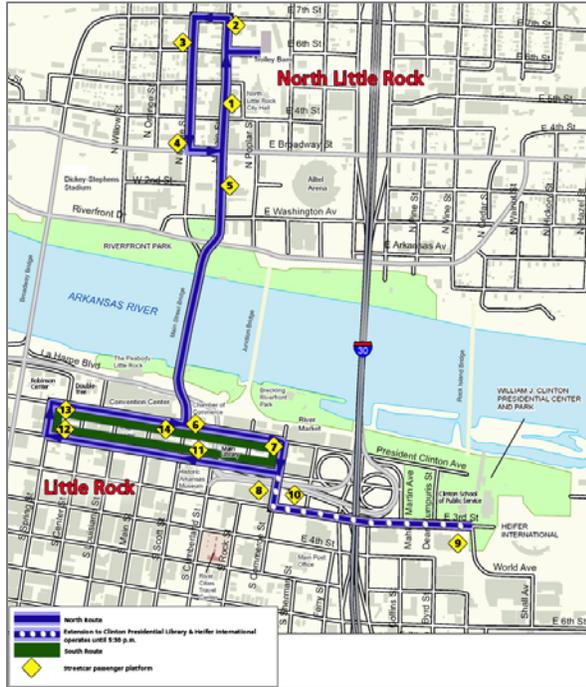
<sup>6</sup> <http://www.railwaypreservation.com/vintagetrolley/tampa.htm>

<sup>7</sup> *Street Smart: Streetcars and Cities in the Twenty-First Century*, p. 48

<sup>8</sup> U.S. Census Bureau, 2007 Population Estimates

<sup>9</sup> 2007 ridership, APTA Public Transportation Ridership Report, Light Rail, Fourth Quarter 2007

## 2.3 Little Rock, AR



The River Rail Streetcar connects the urban cores of Little Rock and North Little Rock, AR, two cities situated on opposite sides of the Arkansas River. The daily streetcar service is operated by the Central Arkansas Transit Authority (CAT) at a base fare of \$1.00. The current 3-mile system has two routes, a blue and green loop, and was constructed in two phases.

Phase 1 was proposed as part of the “The River Project,” a downtown Revitalization effort consisting of a tax to build an 18,000-seat arena with only 300 new parking spaces. Additional plans proposed included expansion of the Statehouse Convention Center, the redeveloped River Market area, a new central library, the Clinton Presidential Library, and, in North Little Rock, the Alltel Arena and a new ballpark.

The four stated goals of the new trolley line were to improve downtown mobility, revive the historic

connection of residents with streetcars, promote economic development and tourism, and provide transportation to the convention center and arena events.<sup>10</sup>

Opened in November 2004, the initial 2.5 mile section is a single-tracked loop. The total cost was \$19.6 million, including design, construction management, three vehicles, and a maintenance building. The Little Rock system was funded with an atypical 80-20 Federal funding split. Over an eight year period, CAT was able to secure six different Federal earmarks, totaling roughly \$16 million, or eighty percent of the total cost of the new system. Sources included New Starts Rail funds, flex STP funds, and High Priority funds from TEA-21. Local funds were provided by Pulaski County, Little Rock, and North Little Rock. Ridership in the first year exceeded the forecasted 140,000 riders and reached nearly 200,000. In 2005, ridership was 180,000. Local share was \$4.2 million.

By 2006, the development investment surrounding the system was valued at \$140 million. Two commercial and residential mixed-use developments costing more than \$80 million have been announced since that time and existing buildings are undergoing renovations to accommodate new and intensive uses. In keeping with the goal to provide a connection to the area’s historic past was the restoration of the 118-year-old Argenta Drug Store in North Little Rock, one of the oldest continuously operating pharmacies in the nation. Economic development efforts extended to many food vendors in River Market Hall and to the restaurants and bars in the River Market District.

Phase 2 opened in February 2007 and added a half-mile extension to the Clinton Presidential Library and two more trolleys. Longer range plans include a possible 3-mile extension to Little Rock National Airport. The total cost of Phase 2 was \$7.6 million. The Federal share of Phase 2

<sup>10</sup> <http://www.heritagetrolley.org/planLittleRock.htm>

is \$7.1 million, with the remainder contributed by the cities of Little Rock, North Little Rock, and Pulaski County.<sup>11</sup> CAT is also offering to sell naming rights for the system, cars, and stations.

The streetcar continues to promote economic development. As of 2008, new real estate investments around the system exceeded \$400 million. A summary of new developments is provided in the table below. In addition to the developments summarized in the table below, four additional restaurants and two office buildings were announced in 2008.

<b>Development</b>	<b>Investment</b>
18 Floor Condominium Tower (opened 2007)	\$75 million
Condominium tower (20 floors – opened 2009)	\$80 million
Hampton Inn Hotel (8 floors – opened 2009)	\$20 million
Doubletree Condominium Project (7 floors)	\$35 million
Enclave Development (260 units)	\$25 million
Arkansas History Center	\$22 million
Creghan Irish Pub/Offices	\$20 million
Arkansas Travelers Ballpark	\$35 million
Capital Hotel Renovation	\$24 million

The River Rail Streetcar is a shining example of how heritage streetcars can effectively be used as a catalyst for revitalization and economic development. In addition, it can be used as a model for extending Augusta streetcar service into North Augusta.

**River Rail Streetcar Summary Table**

Little Rock, AR Population	187,452 <sup>12</sup>
Year Implemented	2004
Current System Length	3 miles
Stops	11
Annual Ridership	180,000 <sup>13</sup>
Major Trip Generators	Stadium, Convention Center, Clinton Library
Total System Cost	\$27.2 million
Initial System Cost	\$19.6 million
Initial System Track Miles	2.5 miles
Initial System Cost per Track Mile	\$7.84 million
Peak Headway	19 minutes
Vehicles	5 replica vehicles

<sup>11</sup> <http://www.heritagetrolley.org/planLittleRockRTOL24.htm#LRNov2005>

<sup>12</sup> U.S. Census Bureau, 2007 Population Estimates

<sup>13</sup> 2007 ridership, APTA Public Transportation Ridership Report, Light Rail, Fourth Quarter 2007

### 3 SUMMARY OF STAKEHOLDER INVOLVEMENT

The stakeholder involvement process for the Augusta Streetcar Feasibility Study was designed to engage key private and public sector representatives in the development of goals and objectives and the development of a conceptual alignment alternative. The process also focused on informing stakeholders of the potential benefits and risks inherent in streetcar development, through presentations and a tour of the River Rail Streetcar in Little Rock, AR. This section summarizes findings from the Stakeholder Workshop that kicked off the project and the field visit to Little Rock.

#### 3.1 Steering Committee Workshop

In September 2008, a Steering Committee workshop was held to accomplish the following: educate steering committee members on “what is streetcar?”; present examples of other successful streetcar projects in the United States; explain to the committee the criteria that will be used to evaluate the selection of a streetcar alignment in Augusta; participate in open discussion with steering committee to assess possible route alignments; and suggest areas of interest the streetcar should serve. Steering Committee members were selected in consultation with the Downtown Development Authority.

##### 3.1.1 Augusta Streetcar Objectives

The committee cited the following objectives for streetcar in downtown Augusta:

**Address Rising Cost of Gasoline Prices** Committee members expressed interest in providing Augusta resident with alternative transportation options due to rising gasoline prices.

**Contend with Parking Issues in Downtown Augusta** The streetcar alignment should be designed such that people are able to park at designated locations and utilize the streetcar to reach their end destinations. Committee members emphasized the need for Medical College of Georgia employees and tourists who visit Augusta. A survey conducted at the Medical College of Georgia found that staff and students do not travel into downtown during lunch because there is limited parking. If properly designed, the streetcar will allow staff / students to utilize the streetcar during lunch to travel to and from downtown.

**Encourage Economic Development along the Streetcar Alignment** The streetcar should promote existing and future economic development adjacent to its corridors.

**Maintain Nostalgia in Augusta** The streetcar should complement the historic character in and around the downtown area.

**Develop a System that Serves as a Tourist Attraction** The streetcar and its stops should be designed to attract tourists to the City of Augusta.

### 3.1.2 Locations to be Served by the Streetcar

Committee members explained that the streetcar must serve the downtown district on either one or both Reynolds and Broad Streets. The focus of the first alignment implemented should be the downtown. Future iterations could extend to North Augusta. Steering Committee members identified the following facilities to be served by the streetcar:

- Augusta Commons
- Augusta Public Transit Transfer Facility
- Augusta Tomorrow Plan (Re-development plans and list of areas of interest)
- Bell Auditorium
- Botanical Gardens
- Canal St. / St. Sebastian
- East Boundary
- Greenjackets
- James Brown Arena (eliminates parking during events)
- Judicial Center
- KROC Center
- Laney Walker Street
- Marriott Hotel
- Municipal Building
- Olde Town
- Paine College / Medical College of Georgia
- Riverfront (between 5th St. & 12th St.)
- Riverwatch Parkway / I-20 Development
- Public Library Main Branch (New location)
- Summerville
- TEAC Center (Trade Exhibit)
- Turpin Hill

### 3.1.3 Additional Questions and Answers

The following questions were addressed during the workshop.

1. What type of technology will be used for the streetcar? Consultant responded that other streetcar systems in the United States used replica vintage streetcars or restored original vehicles that are powered by overhead catenary. Photo examples were shown for streetcars in Kenosha, WI; Little Rock, AR; Dallas, TX; Memphis, TN; and Tampa, FL. Selection of the streetcar vehicle occurs later in the process.
2. How can Augusta mirror other systems, in particular, Denver's 16th Street Line? Consultant addressed this question by providing a review of peer systems, describing how the system was funded, vehicles used, popular service destinations, and plans for expansion. Staff described that in the case of Denver, the 16th Street Line works as a people mover that travels along the mall, stopping at designated locations.
3. Are vehicles environmentally sensitive? For example, are there solar power streetcars? Are streetcars emission-free? Is the power source able to run underground? The consultant explained that streetcars are powered by electricity through overhead catenary. Technology is not available for solar power streetcars, and since the streetcars are operated electrically they provide no negative air quality impacts. Staff explained that operating the

power source underground would be the most costly option because extra construction would be incurred to dig and house the source underground.

4. Will an Augusta Streetcar system have the most current technology? The team does not want to invest in technology that would be obsolete in ten years. The consultant responded that if committee members invested in the technology today, it would not become obsolete in the future.
5. How have previously built streetcar systems been funded? In particular how did the Tax Increment Financing (TIF) help fund the Portland streetcar system? Additionally, committee members suggested imposing a tax on Augusta citizens to help finance the streetcar. The consultant explained that the Community / Business Improvement District (C/BID) helped fund the Portland streetcar, and that there are several federal funding options available to help fund Augusta's streetcar project. Staff explained that the most sources include Congestion Mitigation and Air Quality (CMAQ) funds and New Starts. Committee members said that the City of Augusta had recently become eligible for CMAQ funding. Although monies from New Starts are generally awarded to large scale heavy rail and light rail projects, the committee was still encouraged to apply.

If federal funding could not cover the total cost of the streetcar project, committee members proposed funding the project privately. There was discussion that local stakeholders and businesses could possibly join forces to raise the monies to cover the difference in cost. Staff pointed out that the Dallas M-Line was partially privately funded.

6. What would be the revenue source for the streetcar? What percentage of revenue should be expected from federal and local sources, and what percentage should be expected from the farebox recovery? The consultant explained that the majority of streetcar systems are free to the public, and federal monies are normally reserved for larger scale projects. However, the committee should still pursue federal and local funding to keep the system in operation.
7. Can the streetcar extend to North Augusta to connect the two cities? The consultant explained that this option would be explored, however, this alignment would be considered for a later phase of the project. An inherent challenge would be crossing the river.

In addition to the above questions, committee members stressed the importance of streetcar bus stops being "glorified." They pointed out that the bus stops should be attractive to passengers and, in particular, attract tourists. In addition to the enhanced bus stops, members expressed that there is a strong ADA presence in the community and that all the bus stops should be ADA accessible.

### **3.2 Stakeholder Trip to Little Rock, AR**

In June 2009, two representatives from the City of Augusta, one representative from the Downtown Development Authority, and a consultant representative traveled to Little Rock to tour the trolley system. The group met with individuals who spearheaded its

implementation as well as members of the development community to discuss the trolley's benefits and to gain insight into its development.

On the surface, there were a number of similarities between Little Rock and Augusta beyond the fact that the urbanized areas are similar in size. Both regions have a river that separates the central business district (CBD) from an area of development on the other side—North Little Rock is comparable to North Augusta. Both communities are considering ways to support substantial convention centers and trolley implementation in Little Rock was designed to support a series of event driven facilities and attractions, including the Clinton Library, an arena, and a minor league ballpark. These types of facilities are being considered in Augusta.

Key findings from the trip included:

- The three chief executives, Pulaski County (County Judge) and the mayors of the two cities, were instrumental in developing the project. The transit authority and developers all stressed that these individuals were necessary to champion the project.
- Buddy Villines (County Judge) emphasized the need to build the streetcar on a “least” cost basis. They structured a temporary sales tax to finance the trolley along with other improvements. The tax was extended via referendum to fund the extension to the Clinton Library and was also packaged with other infrastructure improvements. The County is considering another extension of the sales tax to fund a trolley extension to the airport.
- Developers saw the trolley as an element of infrastructure but also as an attraction to enhance one's visit or experience in the area. The trolley ridership is anchored by the Clinton Library, River Market, museums, and the hotels and augmented by residents and those who work near the alignment. The trolley also helps developers create activity in and around their developments which supports business and tourism.
- From the Transit Authority's perspective, the trolley has become the centerpiece of the system. A case in point is a recent effort to reduce the local budget. The City Council considered cutting its funding of transit operations. When it was determined that the trolley service would also be reduced, the Council removed the cut from consideration. The trolley system has been integrated into the transit system and serves as a distributor for regional bus routes coming into the CBD.

By taking the trip, City of Augusta and Downtown Development Authority representatives were able to identify some critical elements of trolley development:

- The system needs a ridership anchor(s).
- Trolleys can be implemented into narrow streets with existing traffic and on-street parking.
- Least cost approach centered on avoiding utilities and eliminating non-essential amenities should be sought. Trolley stops were basically the same

as a bus stop with shelters. The maintenance facility was constructed on the line and is Spartan in design.

- Trolley systems do not cause the growth and development around their alignment, but they focus and can enhance development. The growth around the trolley in Little Rock has exceeded expectations and each of those who were interviewed attributed that to the streetcar.
- Trolley projects need a politically focused champion.

## 4 ALIGNMENT ALTERNATIVES

This section describes the various alignment options for the Augusta Streetcar. The alternatives were defined based on findings from a workshop held with key stakeholders in August 2008 and in consideration of major generators and tourist attractions to be served by the streetcar. The purpose of this evaluation is to define the recommended corridor for the streetcar.

### 4.1 Description of Alternatives

#### **Alternative 1: Downtown – Medical District – N. Augusta via Broad St**

The proposed Downtown – Medical District – N. Augusta via Broad St Line extends from near the intersection of RA Dent Blvd and Laney Walker Blvd at the southern terminus to the James Brown Arena at the western terminus, via Broad St. This alignment operates on single-track between Laney Walker Blvd and Broad St on Thirteenth St (western thru lane), and again between the James Brown Arena and Broad St on Seventh St (eastern thru lane). This requires a minimum of 0.94 and 0.42 miles of track on Thirteenth St and Seventh St, respectively. On Broad St the alignment would consist of double-tracks operating in both the northern and southern thru lanes. Traveling eastbound, the streetcar would operate in the southern thru lane, and traveling westbound the streetcar would operate in the northern thru lane. This requires a minimum of 1.50 miles of track for the Broad Street segment. Collectively, a minimum of 2.86 miles of track required for Alternative 1.

Broad St is a main thoroughfare in downtown Augusta, consisting of mixed-use retail, commercial, and office spaces. According to the 2009 Augusta Tomorrow Master Plan, numerous redevelopment initiatives are proposed on Broad St and within a ¼ mile of the proposed alignment. With the current and proposed development opportunities and the addition of the streetcar there is the potential to revitalize the downtown Augusta area. There are 15 proposed stop locations along Alternative 1 that provide access to the following locations:

- Augusta Civic Center (James Brown Arena),
- Augusta Commons,
- Augusta Public Library (Main Branch),
- Cultural & Civic Facilities District,
- Financial District & Office District,
- Medical District, and
- Municipal District.

An illustration of Alternative 1 is shown in Figure 1.

#### **Alternative 2: Downtown – Medical District – N. Augusta via Reynolds St**

The proposed Downtown – Medical District – N. Augusta via Reynolds St Line extends from near the intersection of RA Dent Blvd and Laney Walker Blvd at the southern terminus to the James Brown Arena at the western terminus, via Reynolds St. The alignment operates on single-track between Laney Walker Blvd and Reynolds St on Thirteenth St (western thru lane), and again between the James Brown Arena and Reynolds St on Seventh St (eastern thru lane). This requires a minimum of 1.05 and 0.53 miles of track on Thirteenth St and Seventh St, respectively. As in the case of Alternative 1, this alternative consists of double-tracking on Reynolds St operating in both, the northern and southern thru lanes. Traveling eastbound, the

streetcar operates in the southern thru lane and, traveling westbound, the streetcar operates in the northern thru lane. This requires a minimum of 1.50 miles of track for the Reynolds St segment. Collectively, a minimum of 3.08 miles of track required for Alternative 2.

There are also an abundance of mixed-uses and proposed redevelopment efforts occurring on Reynolds St or within a ¼ mile of the alignment. In addition to the proposed development, the Augusta GreenJackets is building their new stadium along the Riverwalk, in which the proposed alignment will provide direct access to the Riverside Ball Park. This has the potential to attract streetcar passengers in addition to revitalizing downtown Augusta. There are 12 proposed stop locations along this alternative providing access to the following locations:

- Augusta Civic Center (James Brown Arena),
- Augusta Commons,
- Augusta Public Library (Main Branch),
- Cultural & Civic Facilities District,
- Financial District & Office District,
- Medical District,
- Municipal District,
- Riverwalk, and
- TEA Center.

An illustration of Alternative 2 is shown in Figure 2.

### **Alternative 3: Medical District – N. Augusta via Broad & Reynolds Streets**

The proposed Medical District – N. Augusta via Downtown Line extends from near the intersection of Ra Dent Blvd and Laney Walker Blvd at the southern terminus to the James Brown Arena at the western terminus, via Broad and Reynolds St. The alignment operates on single-tracking between Laney Walker Blvd and Reynolds St on Thirteenth St (western thru lane), and again between the James Brown Arena and Reynolds St on Seventh St (eastern thru lane). This requires a minimum of 1.05 and 0.53 miles of track on Thirteenth St and Seventh St, respectively. Traveling westbound the streetcar operates in the northern thru lane on Reynolds St, and in the southern thru lane while traveling eastbound on Broad St. This portion of the alignment requires 0.75 miles of track on both, Broad and Reynolds St. Collectively, a minimum of 3.08 miles of track required for Alternative 3.

Alternative 3 provides a connection between downtown Augusta and the Medical District providing access to all the major destinations in the surrounding area. There are 15 proposed stop locations along this alternative providing direct access to the following locations:

- Augusta Civic Center (James Brown Arena),
- Augusta Commons,
- Cultural & Civic Facilities District,
- Financial District & Office District,
- Medical District
- Municipal District,
- Augusta Public Library (Main Branch),
- Riverwalk, and
- TEA Center.

An illustration of Alternative 3 is shown in Figure 3.

#### **Alternative 4: Downtown – N. Augusta via Reynolds St**

The proposed Downtown – N. Augusta via Reynolds St Line extends from the James Brown Arena at the southern terminus to near the intersection of Thirteenth St and Reynolds St at the northern terminus. As previously discussed, the alignment is single-track and operates in the eastern thru lane on Seventh St between the James Brown Arena and Reynolds St. On Reynolds St, the train operates in the northern thru lane traveling westbound to the northern terminus, and in the southern thru lane while traveling southbound to the James Brown Arena. This alternative requires a minimum of 2.03 miles of track.

There are seven proposed stop locations along this alternative providing direct access to the following locations:

- Augusta Civic Center (James Brown Arena),
- Augusta Commons,
- Augusta Public Library (Main Branch),
- Cultural & Civic Facilities District,
- Financial District & Office District,
- Medical District
- Municipal District,
- Riverwalk, and
- TEA Center.

An illustration of Alternative 4 is shown in Figure 4.

#### **Alternative 5: Downtown – Medical District via Broad St**

The proposed Downtown – Medical District via Broad St Line extends near from the intersection of Ra Dent Blvd and Laney Walker Blvd at the western terminus to the James Brown Arena at the eastern terminus. The alignment utilizes single-tracking between Laney Walker Blvd and Broad St on Thirteenth St (western thru lane), and again between the James Brown Arena and Broad St on Seventh St (eastern thru lane). This requires a minimum of 0.94 and 0.42 miles of track on Thirteenth St and Seventh St, respectively. On Broad St the alignment would consist of double-tracking utilizing both, the northern and southern thru lanes. Traveling eastbound the streetcar operates in the southern thru lane and traveling westbound the streetcar operates in the northern thru lane. This requires a minimum of 1.50 miles of track on the Broad Street segment. Collectively, there are a minimum of 2.86 miles of track required for Alternative 5. There are 11 proposed stop locations along this alternative providing direct access to the following locations:

- Augusta Civic Center (James Brown Arena),
- Augusta Commons,
- Augusta Public Library (Main Branch),
- Cultural & Civic Facilities District,
- Financial District & Office District,
- Medical District
- Municipal District, and
- TEA Center.

An illustration of Alternative 5 is shown in Figure 5.

Alternatives 4 and 5 were developed to determine the best potential alignments to implement based on the alternative selected. The two alternatives are thus excluded from the evaluation of alternatives and should be regarded as informational.

Figure 1. Alternative 1: Downtown – Medical District – N. Augusta via Broad St

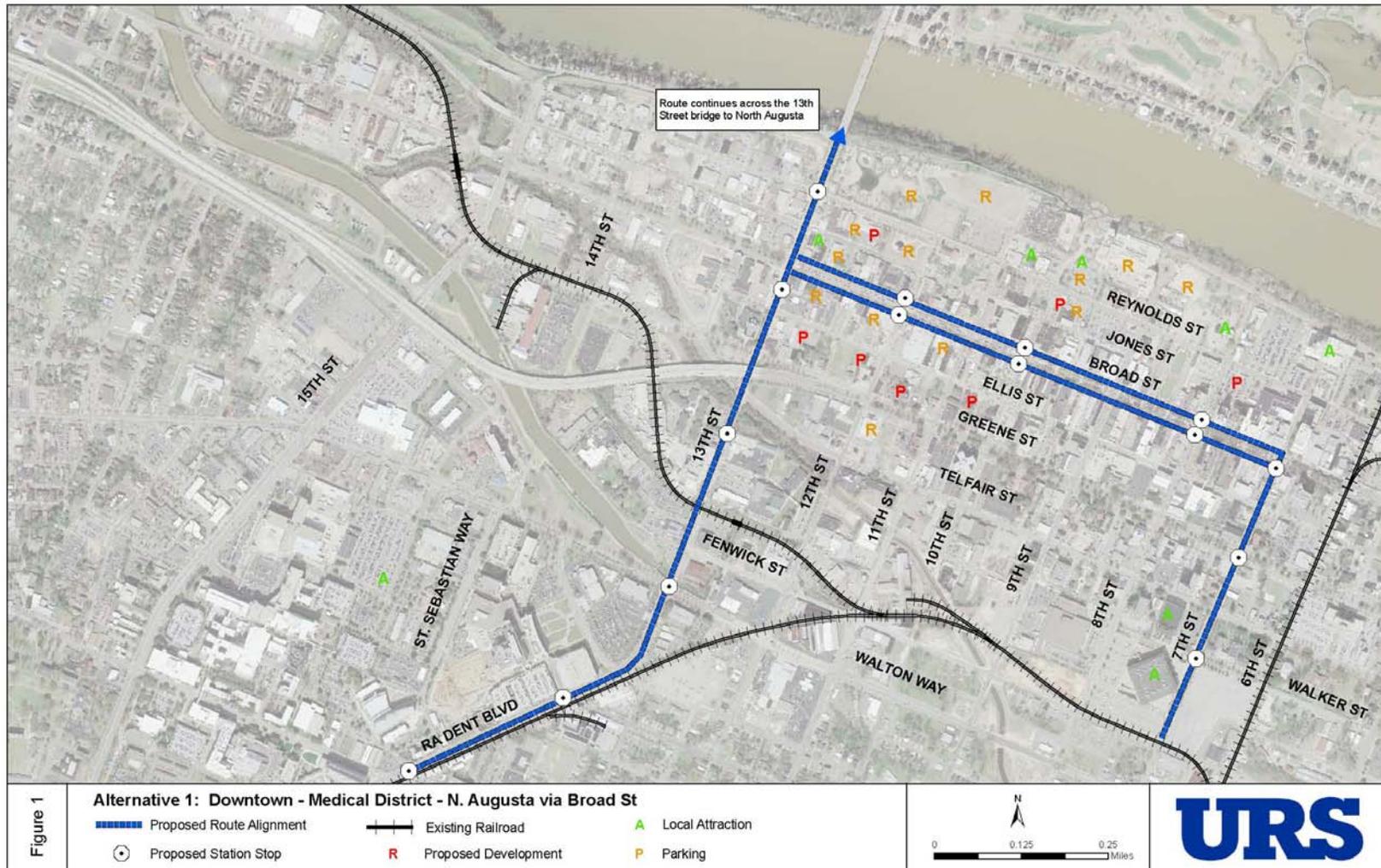


Figure 2. Alternative 2: Downtown – Medical District – N. Augusta via Reynolds St

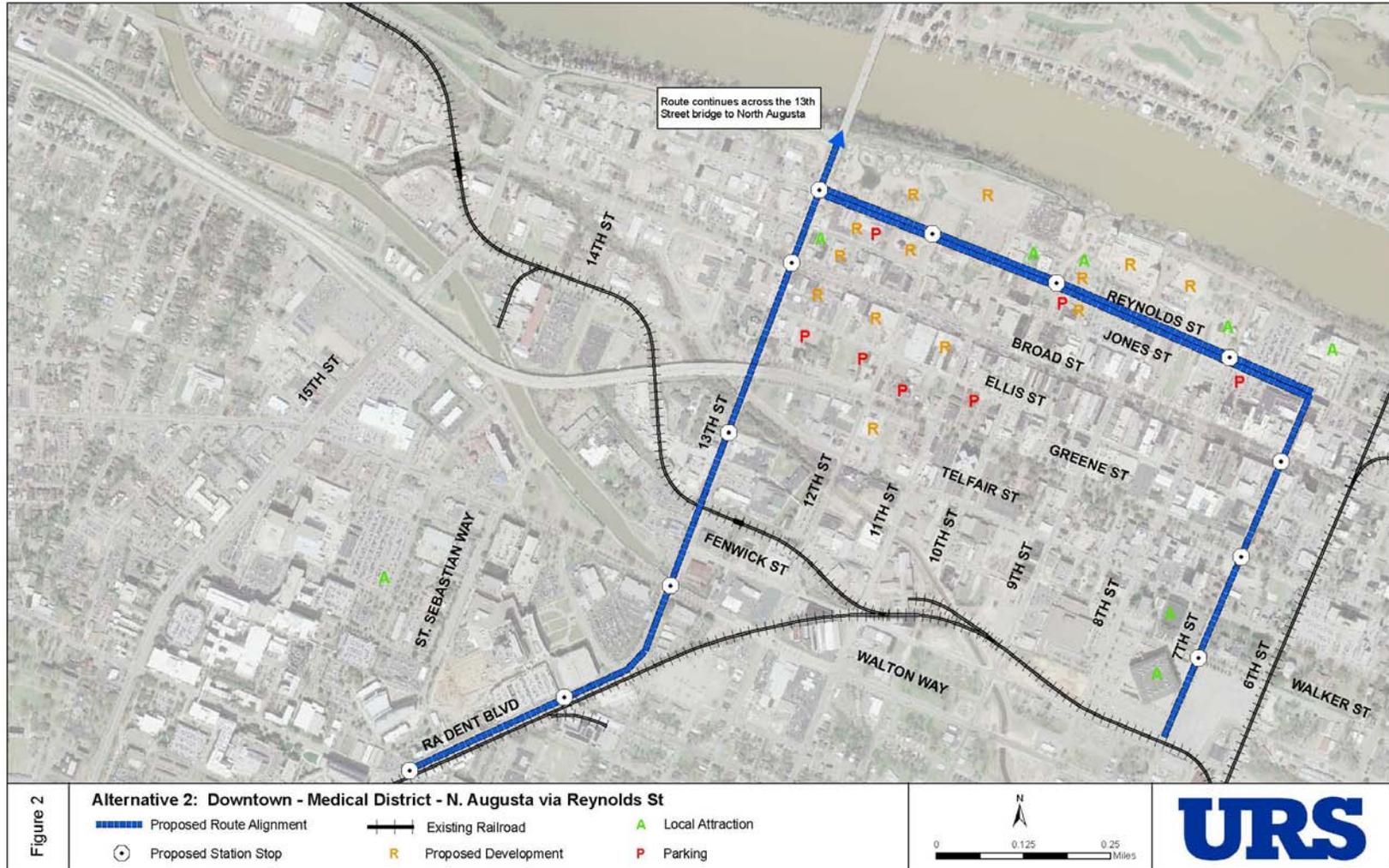


Figure 3. Medical District – N. Augusta via Downtown

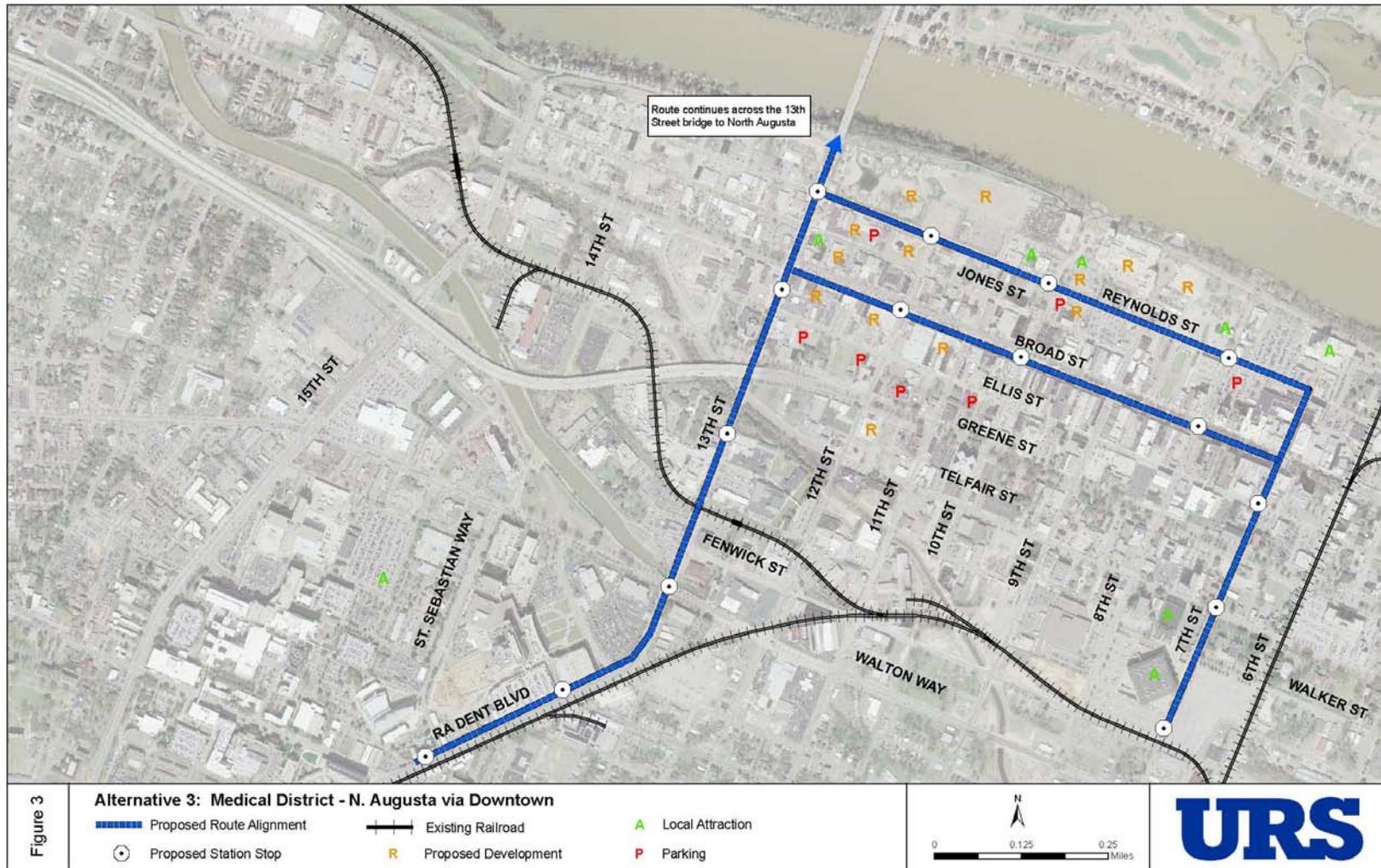


Figure 4. Downtown – N. Augusta via Reynolds St

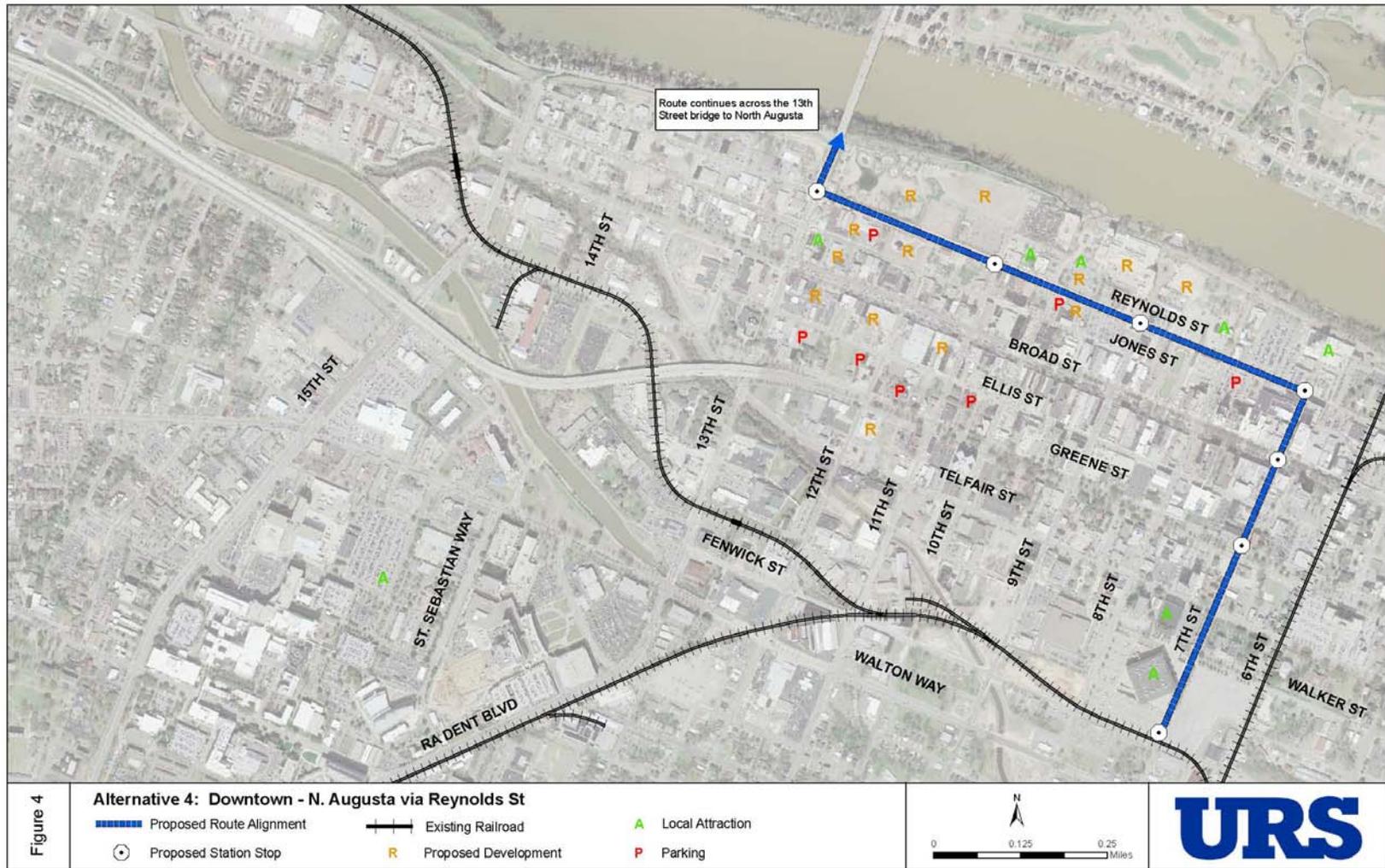
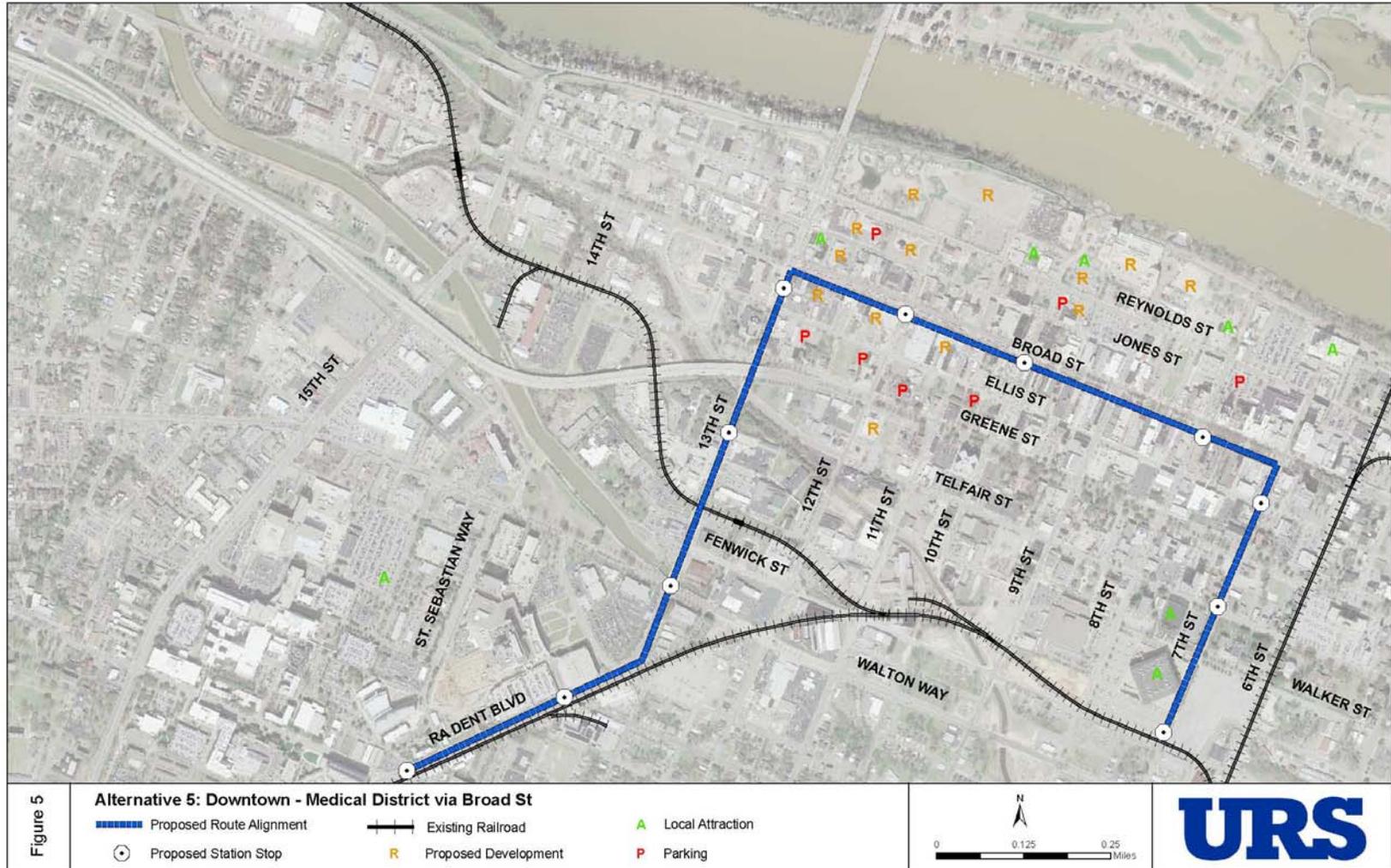


Figure 5. Downtown – Medical District via Broad St



## 5 ALTERNATIVES EVALUATION

The evaluation of alternatives was designed to identify the alternative with the highest propensity to support the streetcar given this preliminary stage of analysis. The evaluation process is designed to ensure the streetcar network will operate efficiently and that impacts to downtown Augusta and transportation operations are minimized. The recommended alignment will:

- Be the most beneficial to surrounding land uses and development;
- Minimize negative transportation/environmental impacts; and
- Present the fewest issues in terms of constructability.

The evaluation is intended to raise issues that would need to be considered more closely in future planning efforts. The assessment of alternatives will be useful in identifying opportunities, potential issues, and concerns that may impact the viability of streetcar service in Augusta. This section outlines the evaluation methodology and presents the evaluation criteria.

### 5.1 Methodology

Three evaluation criteria were developed based on findings from the Stakeholder Workshop, input from the Downtown Development Authority of Augusta, and set objectives for determining the preferred alignment. These criteria are Parking and Traffic Impacts; Potential Demand; and Capital Cost. A series of performance measures were defined to evaluate the alternatives under each criterion.

For each performance measure, the alternatives were assigned a relative ranking of “high”, “medium”, and “low” based on relative thresholds. Points were then assigned across each criterion. The ranking system assigned a zero (0) to each low rating, a one (1) to each medium rating, and a two (2) to each high rating. A weighted sum was then calculated for all five alternatives, with a higher number of points indicative of an alternative that more effectively meets the established performance criteria. The sums are weighted as follows: 20 percent Parking and Traffic Impacts; 40 percent Potential Demand; and 40 percent Capital Costs.

The alternative that receives the highest weighted score across the five alternatives is considered to represent the most appropriate corridor for future streetcar service.

### 5.2 Evaluation Criteria

This section presents the three evaluation criteria and corresponding performance measures. Data sources for each performance measure are also provided.

#### 5.2.1 Parking and Traffic Impacts

The implementation of streetcar services is not expected to have a significant negative impact on traffic operations. However, segments with lower traffic volumes are more conducive to streetcar operations and construction. This criterion was used to evaluate the impact of automobile traffic on streetcar operations by using four performance measures. The measures and the corresponding data sources are provided below.

Thru Lanes: The number of thru lanes was calculated per segment for each alternative. Streetcar would have the least impact on segments that have a higher number of thru lanes. The average number of thru lanes that occurs across the entire alignment was determined for each alignment. Alignments with higher average numbers of thru lanes were scored more favorably. Data was collected by physically counting the number of lanes in each segment.

Traffic Volumes: Average Daily Traffic volumes for individual segments of the alignments were collected from the City of Augusta. Alternatives with lower average number of traffic volumes across the entire alignment were scored more favorably.

On-Street Parking Spaces: An important consideration for streetcar is the potential displacement of on-street parking spaces. As a part of the analysis, parking spaces were counted for each segment to determine the total number of spaces that would potentially need to be displaced for streetcar station stops. Alignments with fewer parking spaces eliminated were scored favorably.

### 5.2.2 Potential Demand

At this level of analysis, it is not possible to conduct a detailed ridership estimate for each alternative. Therefore, the potential demand criteria were developed as a proxy for potential ridership. The following performance measures are indicators of potential ridership.

Projected Employment/Commercial Square Footage with access to alignment: Downtown employees are a potential source of ridership for the streetcar. As a proxy for the projected number of employees in Downtown Augusta, the commercial square footage within the corridor was determined. Data was provided by the Augusta Downtown Development Authority. Streetcar alignments adjacent to greater amounts of commercial square footage were assigned higher scores.

Major/Minor Trip Generators Served: Key objectives of the streetcar are to support tourism and provide an alternative means of transport among major Downtown destinations. The number of major and minor trip generators served was calculated by segment for each of the alignments based on discussion with the client and stakeholders and information from *Augusta Tomorrow*. Alignments serving higher number of trip generators were scored favorably.

Proposed Developments Served: The number of major proposed developments that could be served by each alignment was also calculated. Proposed development sites were determined based on *Augusta Tomorrow*. Alignments with higher numbers of proposed developments were scored more favorably.

Potential Redevelopment Sites Served: Streetcar service can boost redevelopment activities. An assessment of potential redevelopment sites was conducted through a field inventory. Vacant land and properties were noted as potential redevelopment sites. Alternatives enabling streetcar access to a higher number of redevelopment sites received a higher ranking. Greater access to

redevelopment sites results in higher potential ridership to and from these locations.

### 5.2.3 Capital Costs

At this level of analysis, it is not possible to conduct detailed cost modeling evaluations on each alternative. The Capital Costs criterion is comprised of a series of performance measures that serve as proxies for cost estimates.

**Utility Avoidance:** The presence of utilities in segments can increase the expense of construction of the streetcar. The Utility Avoidance measures took into account the number of utility conflicts and the type of utility conflicts that may need to be addressed in order to construct the streetcar. The data is the result of a visual survey and does not consider the type of utility nor its specific underground location. Manholes, overhead utilities, and traffic signals were considered for each alignment.

**Manholes:** The total number of manholes was counted for each block per segment through a visual inventory. The total number of manholes across each alignment was calculated. Alignments with lower numbers of manholes were assigned higher ratings.

**Percent Segments with Overhead Utility Conflicts:** The number of overhead utilities was determined for each alignment segment through a field inventory. To determine the percentage of segments with overhead utility conflicts for each alternative, the total number of segments was divided by the total number of overhead utility conflicts. Segments with a lower number of overhead utility conflicts received higher rating.

**Traffic Signals:** The number of traffic signals was counted for each alternative through a visual field inventory. The average number of traffic signals for each alternative was then calculated. Segments with a lower number of traffic signals were scored more favorably.

**Track Miles:** The number of track miles that need to be constructed for each alternative will impact capital costs for the project. More track miles require a higher level of investment. The length of track to be constructed for each alignment was determined for each alignment based on the length of the alignment and whether or not the individual segments were single or double tracked.

**Rail Crossing / Bridge Crossing / Overpass:** Construction costs rise considerably when streetcars navigate rail crossings, bridge crossings, or overpasses. For each alternative, the total number of times each alignment crosses railroad tracks or a bridge, or has to travel over an overpass was counted through a visual inventory of the alignments. Alignments with lower numbers of crossings were scored more favorably.

Bridge clearances typically must be at least 18 feet for the streetcar to share a lane with automobile, as traffic, due to proximity to the streetcar's overhead catenary system and other traffic using the same lane. For bridge clearances less than 18 feet, a streetcar using a pantograph will require unique solutions to

ensure safety. These solutions may require additional construction costs. Where applicable, bridge clearances were assessed. It is not anticipated that any of the proposed alignments will have bridge clearance issues.

### **5.3 Evaluation Results**

As discussed previously, only alternatives 1, 2, and 3 were included in the evaluation of alternatives. Alternatives 4 and 5 are presented as interim alignments that could be constructed before completion of the selected alignment and are thus excluded from the evaluation. The evaluation results of the first three alternatives are presented below.

#### **5.3.1 Alternative 1**

With a total score of 3.4, Alternative 1 was the lowest ranked of the alternatives considered in the evaluation. The proposed Downtown – Medical District – N. Augusta via Broad St Line extends from the Medical College near the intersection of Ra Dent and Laney Walker Boulevards to the James Brown Arena via Broad Street. The alternative would likely have the greatest impact on parking and traffic operations. The alignment would run in the outer thru lanes on both the northern and southern sides of Broad Street, yielding the highest number of displaced parking spaces of all alternatives (55). Along with Alternative 5, the proposed alignment extends along corridors with the highest traffic volumes among the three alternatives evaluated. The average number of thru lanes available for streetcar traffic is three lanes.

The alignment is expected to have strong potential demand, as it provides direct access to Broad Street. Despite serving the lowest number of existing trip generators, the line would serve the largest number of proposed development, a fair number of potential redevelopment sites, and a substantial amount of projected employment and commercial square footage.

Capital costs for the alternative, however, are anticipated to be among the highest of the three evaluated. The corridor presents a substantial density of potential utility conflicts, including the highest percent of segments with overhead utility conflicts as well as the largest number of traffic signals per route segment. The required 2.9 miles of track that would need to be constructed, however, are the lowest of the proposed options.

#### **5.3.2 Alternative 2**

Alternative 2 ranked second among the three alignments considered. The proposed Downtown – Medical District – N. Augusta extends from the Medical District near the intersection of Ra Dent and Laney Walker Boulevards to the James Brown Arena via Reynolds Street. Relative to Alternatives 1 and 2, parking and traffic impacts for Alternative 2 were minimal. The alignment has the highest average number of thru lanes available for streetcar operation and the lowest number of potential displaced parking spaces (5). Traffic volumes potentially affected are the lowest among the three alternatives.

Potential demand for the proposed alignment is expected to be weak, relative to the other alignments. Alternative 2 would serve the highest number of existing major and minor trip generators. However, it has the least potential for increased demand moving forward because it serves few proposed development and redevelopment sites and has limited projected employment and commercial square footage.

Despite its poor overall rating, capital costs for the alignment are expected to be among the lowest. The alignment exhibits the least magnitude of density conflicts per segment or block. However, the 3.1 miles of track required is among the highest of the alternatives.

### **5.3.3 Alternative 3**

With an overall score of 5.0, Alternative 3 was rated the highest of the three alternatives. The alignment extends from the Medical College at the intersection of Ra Dent and Laney Walker Boulevards to the James Brown Arena via Broad and Reynolds Street. In terms of parking and traffic impacts, Alternative 3 received an average rating of “medium” across the board. The number of thru lanes throughout the alignment and the current traffic volumes are similar to the Alternatives 1 and 2. Relative to the other alternatives, the 25 displaced parking spaces was neither significantly high nor low. In terms of capital costs, Alternative 3 received the same score as Alternative 1. The magnitude of density conflicts per segment/block measured in terms of percent segments with overhead utilities and traffic signals would be “medium” relative to other alternatives. Alternative 3 does, however, have the highest number of manholes across the entire alignment.

While Alternative 3 did not vary widely from the other alternatives in terms of parking and traffic impacts and capital costs, the alignment has the greatest potential demand. It serves the most existing and proposed trip generators and has the highest number of potential redevelopment sites. The highest projected employment and commercial square footage exist along the corridors. The magnitude of the potential demand of this alternative makes sense intuitively as the alignment provides direct access to the two main downtown thoroughfares.

Overall, alignments traversing Broad Street received the highest scores. Alternative 3 was the most favorable, primarily because it encompasses the strengths of both Broad and Reynolds Streets. The evaluation matrix is presented in the table on the next page.

**Table 1 Evaluation Matrix**

<b>Evaluation Criteria</b>	<b>Performance Measure</b>		<b>Alt-1</b>	<b>Alt-2</b>	<b>Alt-3</b>
<b>Parking and Traffic Impacts</b>	Number of thru lanes	Value	3	4	3
		Rating	Med	High	Med
	Traffic Volumes	Value	5,179	4,658	4,751
		Rating	Low	Med	Med
	Displaced Parking Spaces	Value	55	5	25
		Rating	Low	High	Med
	<b>Parking and Traffic Impacts Score</b>		20%	0.2	1.0
<b>Potential Demand</b>	Projected Employment/Commercial sq footage within corridor	Value			
		Rating	High	Med	High
	Number of major/minor trip generators served	Value	12	18	18
		Rating	Low	High	High
	Proposed developments along alignment	Value	10	9	12
		Rating	High	Med	High
	Number of potential redevelopment sites along the alignment	Value	4	3	6
		Rating	Med	Low	High
<b>Potential Demand Score</b>		40%	2	1.6	3.2
<b>Capital Costs</b>	Magnitude of density conflicts per segment/block				
	Manholes	Value	46	33	52
		Rating	Med	Med	Low
	Percent Segments with Overhead Utility Conflicts	Value	15.0%	12.5%	13.3%
		Rating	Low	High	Med
	Traffic Signals (per segment)	Value	5.3	4.7	4.5
		Rating	Low	Med	Med
	Track Miles	Value	2.9	3.1	3.1
		Rating	Med	Low	Low
	Rail crossing/Bridge Crossing/Overpass	Value	2	2	2
		Rating	Med	Med	Med
<b>Capital Costs Score</b>		40%	1.2	2	1.2
<b>Total Score</b>			<b>3.4</b>	<b>4.6</b>	<b>5.0</b>

## **6 IMPLEMENTATION CONSIDERATIONS**

### **6.1 Opportunities, Obstacles, and Constraints to Streetcar in Augusta**

#### **6.1.1 Opportunities**

#### **6.1.2 Obstacles**

#### **6.1.3 Constraints**

### **6.2 Cost Feasibility**

#### **6.2.1 Preliminary Cost Estimates**

#### **6.2.2 Potential Funding Sources**

### **6.3 Next Steps**