Connect Cobb

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Northwest Transit Corridor Alternatives Analysis

10 December 2012

Northwest Transit Corridor Alternatives Analysis Study

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Urban Collage, Inc.

Final Report

CONNECT COBB

Northwest Transit Corridor Alternatives Analysis

December 10, 2012

Study Participants:

The citizens of Cobb County and the City of Atlanta
Cobb County, Fulton County and the cities of Atlanta, Acworth, Kennesaw, Marietta, and Smyrna
Atlanta Regional Commission
Federal Transit Administration
Numerous planning partners at state, regional and local agencies and institutions

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1. EXECUTIVE SUMMARY

Cobb County Department of Transportation has conducted an Alternatives Analysis to study transit needs and potential improvement alternatives along the Northwest Atlanta Corridor. The corridor extends roughly 25 miles northwest of Atlanta (Fulton County) from its southern terminus in Midtown Atlanta to its northern terminus in the City of Acworth (Cobb County). Today, the corridor between Cobb and Fulton Counties has some of the highest travel demands in the Atlanta region. It is currently served by Cobb Community Transit's Route 10, which is among the most cost-effective bus routes in the southeastern U.S., boasting a farebox recovery of 47 percent – substantially higher than national averages. Current ridership on this single bus route underscores the strong demand for transportation choices in the corridor. In addition, that demand is driven by a diversity of travel markets throughout the corridor, including commuters destined to employment opportunities in Atlanta, a growing number of reverse commute trips, local trips made by students and seniors, and local trip making for shopping, recreation, medical, and other services.

The goal of the Alternatives Analysis study, referred to as "Connect Cobb," was to evaluate all reasonable modal and multimodal alternatives and general alignment options that can best serve existing and future mobility needs both effectively and efficiently, encourage sustainable land use patterns, complement the local economy and improve the quality of life of citizens, visitors and the business community. Based on extensive public outreach activities combined with technical analysis that focused on the transportation benefits of the alternatives, an innovative hybrid Locally Preferred Alternative (LPA) was identified that is able to address the unique combination of mobility and other needs in the corridor.

A modern, efficient Bus Rapid Transit (BRT), one component of the hybrid LPA, will serve trips throughout the US 41/Cobb Parkway corridor.

This hybrid LPA is comprised of arterial Bus Rapid Transit (BRT) along US 41 and express bus in the I-75 managed lanes. This hybrid service is the only option able to meet the two major trip demands in the corridor. The first type of trip is the long-haul commute trip that is traveling from/through Cobb County to other regional destinations. The express bus service component of the LPA operating along I-75 addresses this trip pattern. This service also leverages other transportation investments being made in I-75, including the planned addition of managed lanes along I-75 by the Georgia DOT. The second trip type is for localized access to and between the major activity centers along the Northwest Atlanta Corridor. The arterial BRT portion of the LPA serves these as well as other trips. Further, BRT on US 41 will help anchor and promote more sustainable development in the future. In total, the LPA is better than any other alternative considered because it successfully achieves the following key objectives:

- Utilizes infrastructure that is existing (I-75 HOV lanes inside I-285) and proposed (managed lanes on I-75 outside I-285) bolstering the system's cost effectiveness

- Supports peak period express commuting trips with a limited number of stops

- Connects major activity centers within the corridor (e.g. Kennesaw State University, Town Center Area, Southern Polytechnic State University, Dobbins ARB, Cumberland Galleria, Georgia Tech, Atlantic Station, Midtown Atlanta)
- Supports City land use plans (e.g. GreenTech Corridor) with accessibility via circulators and feeder routes
- Enhances the efficiency and effectiveness of the demonstrated reverse commute into Cobb County
- Supports demonstrated localized trip opportunities
- Demonstrates sensitivity to the human and natural environmental issues
- Complements economic development and redevelopment opportunities (e.g. Cobb County's Redevelopment Overlay Districts)

Regional Transit Context

The Atlanta metropolitan area is advancing regional transit coordination of the existing service providers and planning for future service through the Regional Transit Committee's Concept 3. Service in the Northwest Atlanta Corridor is identified in this regional plan. Consistent with this regional plan, the LPA provides connectivity at its southern termini to MARTA at the Arts Center Station. In addition, the LPA crosses the City of Atlanta's Beltline Corridor near Northside Drive, allowing for an additional transit connection with the City's planned Beltline streetcar. The LPA also calls for a station in the Cumberland Galleria area that would intersect with the planned BRT corridor along I-285 that is identified in the region's long-range plan and in the *revive285* Environmental Impact Statement (EIS). As each of these transit programs continue through the planning process, the LPA will be refined to ensure regional seamless service for its users.

The remaining sections of this Executive Summary describe the key elements of the AA study, including study purpose and need, the public process, and how the alternatives were evaluated to select the LPA for the corridor.

Purpose and Need

The following five goals were established for the Northwest Atlanta Corridor Alternatives Analysis to best align the needs of the corridor with the best option available.

1. **Goal/Objective: Transportation**
   - Reduce congestion/improve traffic flow
   - Plan for current and future needs
   - Reduce travel delay
   - Improve travel efficiency and reliability
   - Improve safety

2. Goal/Objective: Land Use Considerations

- More efficient use of land
- Increase housing choices
- Promote active, healthy lifestyles

3. Goal/Objective: Economic Development/Redevelopment

- Stimulate local economy
- Leverage public and private investment

4. Goal/Objective: Environment and Air Quality

- Minimize adverse environmental impacts to the built and natural environment
- Consult with local and regional stakeholders
- Promote environmental justice
- Improve air quality

5. Goal/Objective: Financial Considerations

- Maximize cost efficiency and cost effectiveness
- Develop a financially feasible project/leverage available resources

Public Involvement

To complement the technical components of the AA, a robust public involvement program was implemented to ensure community and stakeholder involvement. The public involvement approach was unique in that it combined traditional public involvement techniques and communication methods with more innovative opportunities for the stakeholders and public to be involved and engaged. This included strategies such as stakeholder teams, stakeholder briefings, stakeholder roundtables, kiosk events, interactive meetings, online surveys and social media tools.

Highlights of the public involvement program include:

- Participation and guidance from county, city, state, regional, and federal agency staff, and planning partners through two advisory teams: the Technical Team and the Partners Team;
- Coordination with Regional, State and Federal agencies such as Atlanta Regional Commission, Georgia DOT, and Federal Transit Administration;
- Stakeholder Briefings with elected officials, special interest groups, business community organizations and major stakeholders;
- Stakeholder Roundtables with community members, planning partners, area universities and businesses, special interest groups, city, county and regional agency staff;
- Inclusion of special populations such as low-income, minority, limited or non-English speaking, and the disabled with transit kiosks, project materials in Spanish and Portuguese, and briefings for community advocates;
- Outreach to City of Atlanta with interactive meetings held in conjunction with Atlanta BeltLine and Atlanta city staff;
- Significant online presence with an informative website, Facebook page and online survey tools; and

- Two public surveys resulting in confirmation that the majority of the public places a high priority on improving transit services and facilities in the corridor.

Transit Alternatives Evaluation

The Connect Cobb AA built on previous studies establishing the need for and feasibility of transit improvements in the Northwest Atlanta corridor. A broad range of transit alternatives consisting of numerous alignment and technology options was evaluated, with screening conducted to narrow the list of feasible alternatives. That smaller list was then subjected to more detailed screening to select the Locally Preferred Alternative (LPA) best able to meet the corridor purpose and need.

The screening process involved a series of technical analyses that assessed the transportation, land use/economic development, environmental, and financial impacts of each alternative. The focus of those analyses was on identifying the differences in how well each alternative performed according to the established goals and objectives. Analysis results were summarized and presented for public input that was obtained through approximately 55 public outreach events over a 14-month period.

As the technical analyses were underway, however, it became clear that significant tradeoffs would be made by selecting one alternative over another. Notably, alternatives operating along I-75 were shown to serve well the commute market between Cobb and Fulton Counties. Conversely, alternatives along US 41 would better serve reverse commute trips as well as intra-corridor trip making for school and other trips. Further, other transportation planning ongoing in the corridor identified an opportunity to leverage the managed lane investments being made by the Georgia DOT on I-75. And in addition, analysis suggested that a fixed guideway transit investment along US 41 could support and catalyze economic development plans and initiatives underway by others. For these reasons, consideration shifted from a single alignment LPA to a unique hybrid LPA that would provide service along both US 41 and I-75.

By utilizing some existing infrastructure and strategic new infrastructure, the LPA has a significantly lower overall cost compared with the other build alternatives, yet provides similarly high levels of service to the user. The station locations that would serve both alignments include KSU, Town Center/Big Shanty, Barrett Lakes Parkway, Canton Road (hospital), Allgood Road, White Water, Roswell/Big Chicken Station, University/South Loop, City of Marietta's GreenTech Corridor, Dobbins ARB gate, Windy Hill Road, Cumberland Parkway North, Akers Square/Cumberland Parkway South, Mt. Paran, West Paces Ferry Road, Howell Mill Road, Beltline, Atlantic Station, and MARTA Arts Center Station.

To supplement this new transit service, localized access would be made available via a series of circulator and feeder operations in Cobb County for the following areas:

- Acworth
- Kennesaw State University
- Marietta
- Smyrna
- Kennesaw
- Town Center Area
- GreenTech Corridor
- Cumberland Galleria Area

The hybrid LPA, shown in Figure 1-1, was presented to the technical and partner teams, corridor stakeholders, and the Cobb County Board of Commissions to obtain input and concurrence.

Additional evaluation including further detail of the financial plan strategy, refinement of the ridership forecasting, and detailed environmental of this LPA will be accomplished during the Environmental Assessment phase.

Next Steps

Cobb County has already begun activities to further advance the project through the environmental process with the preparation of an Environmental Assessment. Following the NEPA procedures, over the

next 18 to 24 months, the environmental impacts of the LPA will be further quantified. In addition, extensive public outreach will be continued. Other next steps include: ongoing refinement of ridership and travel time forecasting, further detailing of the financial strategy, and a benefit cost analysis. The results of this analysis will offer necessary information which enables the U.S. Secretary of Transportation to make findings of project justification and local financial commitment, will support the consideration and inclusion of the LPA in the Cobb County Transportation Plan as well as the City of Atlanta Transportation Plan, and will enable the local Metropolitan Planning Organization to include the LPA as part of the regional long-range transportation plan.

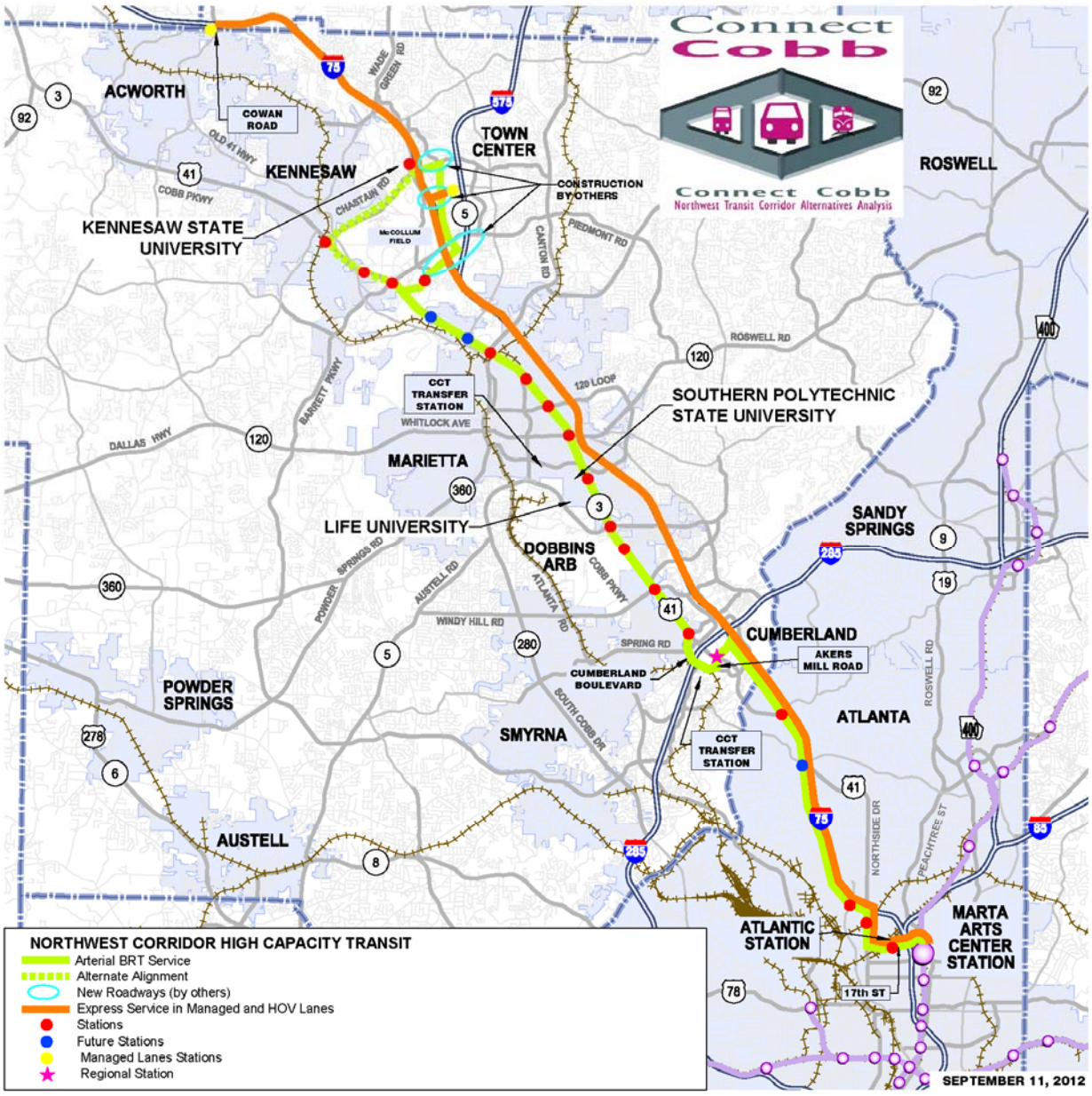

Figure 1-1: Locally Preferred Alternative

2. INTRODUCTION

This Alternatives Analysis (AA) sponsored by the Cobb County Department of Transportation, examines options for transportation improvements in the Northwest Atlanta Corridor that extends roughly 25 miles northwest of Atlanta (Fulton County) from its southern terminus in Midtown Atlanta to its northern terminus in the City of Acworth (Cobb County). Referred to as "Connect Cobb," this AA process helps inform the decisions about how best to address transportation problems and other needs in the corridor. The AA builds on previous studies which have identified opportunities for premium public transportation service in the corridor. These studies provided a starting point for the alternatives examined in this AA.

The Connect Cobb AA process ensures examination of a broad range of alternatives, including transit technologies and alignments, for meeting the needs and addressing the problems that have been identified in the corridor. This AA documents the corridor needs and problems, the alternatives that have been identified to address them, and how well each alternative meets the needs and solves problems. It also describes the public outreach that has been performed to obtain input and guide the study process, and identifies potential sources of funding for project implementation. Based on an evaluation of how well each alternative performs and a tradeoff analysis of benefits and impacts among the alternatives, the AA recommends a LPA and describes the next steps in the process, including preparation of an environmental assessment (EA).

2.1 Corridor Study Area

As shown in Figure 2-1: Northwest Atlanta Corridor, the study area is defined as a 25-mile corridor including the area between and adjacent to I-75 and US 41 from Acworth to Midtown Atlanta. This study area includes Cobb and Fulton Counties as well as the jurisdictions of Acworth, Kennesaw, Marietta, Smyrna, and the City of Atlanta. The Northwest Atlanta corridor not only connects Cobb County communities to the City of Atlanta, but is also home to a diverse range of vibrant activity centers, including two state universities (one of which, Kennesaw State University (KSU), is the third largest university in Georgia with over 24,000 students), an active military base, two national parks, historic and recreational sites, as well as residential enclaves and major commercial centers, such as Cumberland Galleria and Town Center. The Northwest Atlanta corridor connects to that portion of the City of Atlanta known locally as Midtown Atlanta, which contains four transit stations on Metropolitan Atlanta Rapid Transit Authority's (MARTA's) North rail line, the campus of the Georgia Institute of Technology, numerous regionally-significant arts, cultural, and recreational venues, and a dense mix of both jobs and residences.

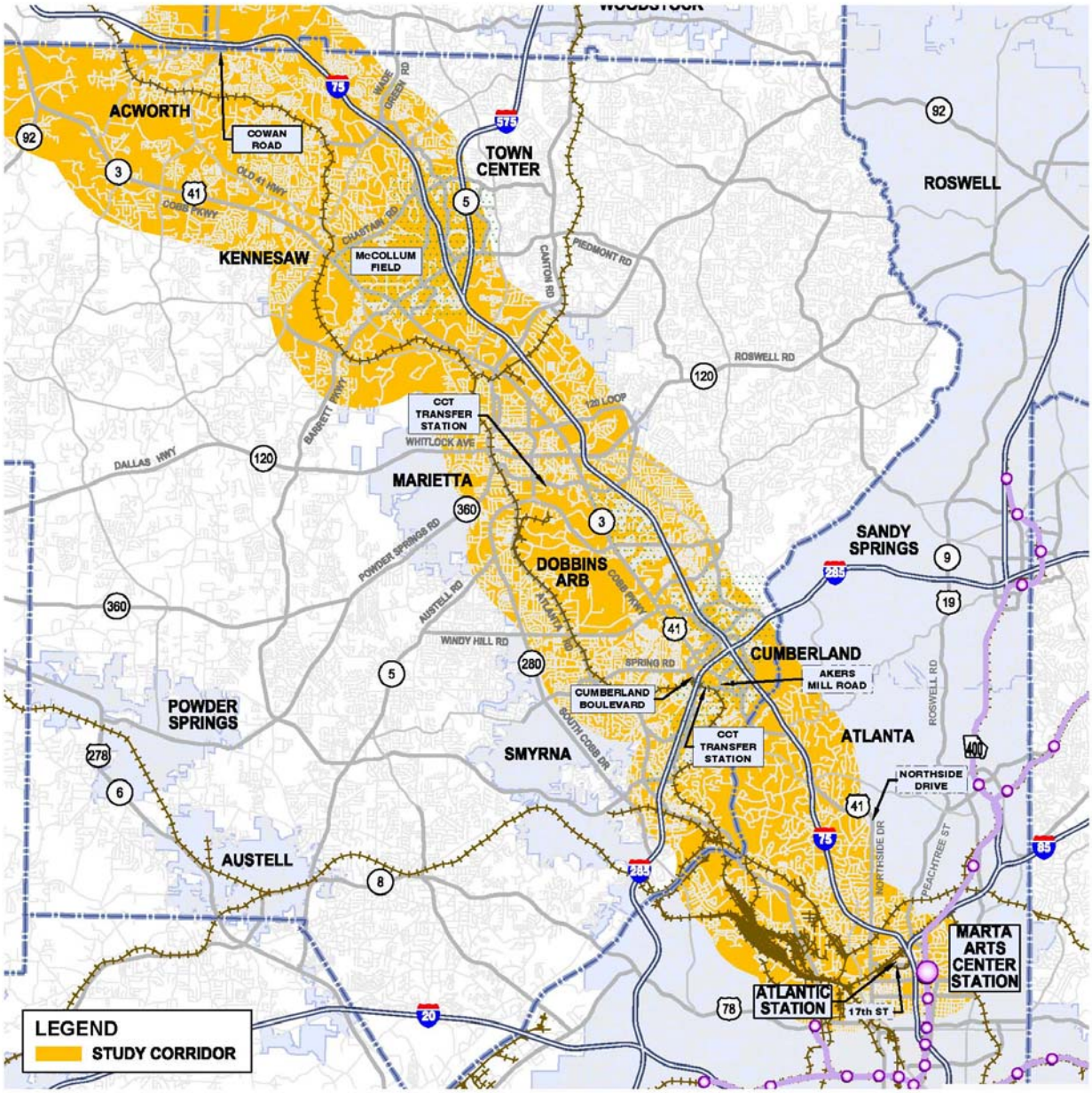

Figure 2-1: Northwest Atlanta Corridor

2.2 Study Background

Several previous studies have identified the demand for and opportunities in the corridor for high capacity public transportation services. Although not a comprehensive listing, the more recent prior studies are summarized as follows.

Northwest Corridor Transit Implementation Study: Completed in 2001, this study looked at connecting the Town Center area with the Cumberland/Galleria area and with Midtown Atlanta via a light rail transit line. A light rail circulator through both Cumberland and the Town Center area was also included as part of the proposed system in the plan as well as an LRT system that branched off the main trunkline and into Marietta. The study was sponsored by the Cumberland and Town Center Area Community Improvement

Districts. The study included system alignment, vehicle technology, station concepts, system operations, construction schedule and funding analysis.

The Northwest Connectivity Study: Prepared jointly in 2004 by the Georgia Regional Transportation Authority (GRTA) and the Georgia Department of Transportation (GDOT), this study examined improving transportation connections between the activity centers within the northwest corridor, including Midtown Atlanta, Cumberland, and Town Center. The study included the planning process and environmental impact analysis work necessary to determine a preferred route and transportation option. The LPA from that study focused on bus rapid transit (BRT) along I-75 operating in high occupancy vehicle (HOV) lanes.

2008 Cobb County Comprehensive Transportation Plan: The CTP was adopted by the County in early 2008 and serves as the blueprint for transportation investment through the year 2030 for the county as well as the cities in the county. It serves as a long range, multi-modal transportation plan that links land use and transportation within the incorporated and unincorporated areas of the county to efficiently and effectively address traffic congestion and safety concerns on the county's transportation network. During preparation of this CTP, citizen opinions were scientifically polled, revealing that citizens preferred increased investments in transit as the preferred means (50.3% of total responses) of improving mobility. (Roadway improvements ranked second with 40.8% of total responses.) Transit project recommendations included high capacity transit along US 41 with both a short term and long term approach to implementing the project, including adequate right of way, implementing ITS improvements along the corridor, and adopting transit supportive land uses.

Long Range Transportation Plan (LRTP): The Atlanta Regional Commission (ARC) adopted PLAN 2040, the region's current long-range transportation plan for the 18-county Atlanta metropolitan planning area in July 2011. The plan addresses current and expected travel demands on the region's transportation system through the year 2040. PLAN 2040 is a direct result of a comprehensive and collaborative effort among ARC, GDOT, local governments and state and federal planning partners to guide regional growth through specific investment strategies and programs for metro Atlanta. Plan 2040 includes a fiscally-unconstrained "Aspirations Plan" for the entire region which borrows from the TPB's "Concept 3" (described below) for its transit element. The Aspirations Plan includes a high speed/high capacity rail system, potentially light rail transit (LRT), from the I-75 KSU/Town Center area to Midtown Atlanta or Downtown Atlanta via Marietta and Cumberland.

Preparation of this AA and environmental studies for the Cobb County transit corridor were included in PLAN 2040's financially constrained transit expansion plan.

Transit Planning Board (TPB)/Atlanta Regional Transit Implementation Board (TIB) Vision: The TPB was a partnership created by the ARC, MARTA, and GRTA that was tasked with creating a regional transit plan for the Atlanta region and subsequently a new regional funding source to implement and operate the system. TPB's future vision for regional transit (now referred to as Concept 3) includes a high speed/high capacity rail system, potentially LRT, from the I-75 KSU/Town Center area to Midtown Atlanta or Downtown Atlanta via Marietta and Cumberland. Concept 3 also includes a LRT system along I-285 North, SR 400, and I-85 North. Concept 3 was adopted by the ARC Board in December 2008 and now serves as the transit component of PLAN 2040's long-range Aspirations Plan.

2.3 Purpose and Need

Based on the previous studies of transit opportunities in the corridor supplemented by data collected about existing and future conditions, the following statements summarize existing transit conditions and needs in the Northwest Atlanta corridor:

Travel patterns in the corridor suggest a very strong market for trips between Cobb County and the neighboring Fulton County and the City of Atlanta. In 2010 and as forecasted by the ARC for 2040, Fulton County is the most common destination for trips leaving Cobb County. Furthermore, more of these trips between the two counties are made on transit than for any other set of destinations within the 10-county ARC region. Although the current transit share is less than four percent of all work trips in this market, the trip pattern indicates the potential for significantly more transit use (especially if more transit alternatives were available).

Current transit service along US 41 is inconvenient and the ability to operate reliably in the future will be compromised by increasing congestion. Currently, transit routes are operated in the corridor by Cobb Community Transit (CCT), GRTA, and MARTA. The busiest of those routes, CCT Route 10, runs along US 41 between Cobb and Fulton Counties, connecting to the MARTA rail system at the Arts Center station in Midtown Atlanta. CCT Route 10 is very well used, returning the highest fare box recovery ratio (47 percent) in the entire CCT system and carrying the highest ridership of all CCT system routes at over 3,800 riders on typical weekdays. This high demand is despite the fact that today a trip made on transit from the Dobbins Air Reserve Base (ARB) to the MARTA Arts Center station takes nearly two hours in congested traffic, while the same trip made by automobile may take only 30-45 minutes. In the future, the transit travel time is forecasted to deteriorate by up to 15 percent, assuming no significant transit improvements in the corridor. The high demand and excessive travel times suggest the need to explore strategies for more viable transit service than presently available.

Traffic growth along the Northwest corridor, primarily U.S 41 and I-75, has caused traffic congestion and travel times to increase over the past decade. The Northwest Atlanta corridor is one of the region's most congested travel corridors. Existing estimates of average annual daily traffic (AADT) exceed 250,000 on I-75 north of I-285 and 30,000 along US 41 northward from I-285 to Kennesaw. Between 2010 and 2040, southbound AM peak travel times along I-75 from Midtown Atlanta to Kennesaw State University are expected to increase from 43 to 68 minutes while northbound PM peak travel times will increase from 51 to 95 minutes. I-75 north of I-285 is ranked in the top 10 percent of most congested freeways in the region and US 41 is ranked in the top 25 percent of most congested arterials in the metro region according to ARC's 2010 Congestion Management Process. By 2040, it is estimated that trip times on US 41 will increase by as much as 95 percent in the peak commuting periods. Northbound PM peak travel times along the US 41 corridor are expected to increase from 62 minutes to 121 minutes within Cobb County and from 55 minutes to 88 minutes southbound during the AM peak. Transportation solutions are needed to address this worsening congestion.

Strong growth is expected to continue along the corridor through the year 2040. Over the next 10 years the population of Cobb County is expected to grow by 9.1 percent, adding 60,000 new residents. Employment is expected to grow at an even faster rate of 17 percent, adding 360,000 new jobs in Cobb County. Both population and employment growth is expected to be focused along the Northwest Atlanta corridor. This demographic growth trend is expected to continue in the County through year 2040, resulting in a total population growth of 21.4 percent and employment growth of 50.4 percent. These significant growth rates and resulting travel demands far exceed the planned roadway capacity expansions. In addition, employment growth in Fulton County and the Midtown Atlanta area is also expected to increase 53.7 percent and 60.9 percent, respectively, between 2010 and 2040. This growth cannot be sustained without supporting improvements to the corridor transportation system.

Based on these conditions and needs, and with substantial public stakeholder input, the following preliminary statement of purpose and need was developed to guide the AA process:

Transit improvements are needed to serve existing and future mobility needs both effectively and efficiently, encourage sustainable land use patterns, complement the local economy, and improve the quality of life of citizens, visitors, and employees. Cobb County workforce and Atlanta commuters will have an attractive and convenient transit option. People traveling within Cobb County and from the City of Atlanta to destinations along Cobb Parkway will have a convenient and competitive transit option as well.

The public input that informed this purpose and need statement was collected through numerous public roundtable meetings, stakeholder interviews, field briefings, surveys, Technical Advisory Committee meetings, Stakeholder Committee meetings, and a countywide telephone survey. These are summarized in Section 6 of this report. The following highlights key input from the public and agencies used to develop the purpose and need statement:

- Traffic congestion will be the most significant transportation issue facing the county in 25 years, followed by inadequate public transit options. Alleviating traffic, providing congestion relief and congestion free commute options should be the primary objectives of this study.
- Cobb County should focus on making it easier to get to local destinations and for people to use public transportation. Cobb County should prioritize improving the public transportation system over building new roads.
- Two of the three top issues that are most important to Cobb County voters, based on a telephone survey completed by The Shapiro Group in October 2011, are decreasing traffic congestion and improving commute times.
- Cost effectiveness is important to consider.
- Accommodations for bicycles and pedestrians are important as it allows better access to potential transit stations.
- Accident and incident management options in the Northwest Atlanta corridor on interstates and major arterials are very limited at the present time.
- Redundant transportation option(s) should be explored which along with ITS improvements might alert Northwest Atlanta corridor travelers to road closures or severe congestion.

To measure how well various alternatives meet the overall purpose and need for the corridor, the following five goals were established for the Northwest Atlanta corridor AA.

1. **Goal/Objective: Transportation**

- Reduce congestion/improve traffic flow
- Plan for current and future needs
- Reduce travel delay
- Improve travel efficiency and reliability
- Improve safety

2. **Goal/Objective: Land Use Considerations**

- More efficient use of land
- Increase housing choices
- Promote active, healthy lifestyles

3. **Goal/Objective: Economic Development/Redevelopment**

- Stimulate local economy
- Leverage public and private investment

4. **Goal/Objective: Environment and Air Quality**

- Minimize adverse environmental impacts to the built and natural environment
- Consult with local and regional stakeholders
- Promote environmental justice
- Improve air quality

5. **Goal/Objective: Financial Considerations**

- Maximize cost efficiency and cost effectiveness
- Develop a financially feasible project/leverage available resources

This AA uses the purpose and need established for the Northwest Atlanta corridor as the basis for first identifying potential alternatives that can address corridor needs, and then evaluating those alternatives to select the LPA. With substantial ongoing input from the public, the LPA is the alternative determined to be the best solution for the corridor.

2.4 Report Organization

The AA is organized to present and evaluate alternatives in a structured format. This format will facilitate understanding of how alternatives were developed, as well as the key benefits and impacts of each. The remaining chapters of the AA are:

- **Section 3 - Existing Conditions**: This section includes an overview of the current road network, existing transit service, and environmental, social, and cultural conditions.
- **Section 4 – Definition of Alternatives**: In this section, alternatives to meet corridor needs are identified in terms of transit mode/technology, alignments, and determination of preliminary station locations. A technology screening is presented as well as a preliminary assessment of feasible alignments. The alternatives advanced for additional screening are provided.
- **Section 5 - Analysis**: This section evaluates the proposed alternatives using a two tier screening process. The Tier I evaluation assesses alternatives based on factors including cost estimates, impact analysis, and ridership forecasting, and identifies a short list for more detailed analysis in the Tier II screening. The Tier II screening includes a series of performance metrics, as well as cost estimates, ridership forecasts, and financial analysis.

- **Section 6 - Public Involvement Summary**: This section documents the public involvement process undertaken by Connect Cobb and includes an overview of stakeholder and public comments as well as results from the two telephone surveys.
- **Section 7 - Funding Options**: Identification of funding to construct and operate the project will be key to the project's successful implementation. This section identifies the range of potential funding options, both for capital and ongoing operations and maintenance.
- **Section 8 - LPA and Recommended Next Steps:** This section describes the recommended LPA for the Northwest Atlanta corridor that has resulted from this AA process, as well as the next steps in project development.

3. EXISTING CONDITIONS

This section describes existing conditions in the Northwest Atlanta corridor. An overview is provided of the existing roadway networks and transit networks in the corridor, traffic and travel patterns, and land use and socioeconomic conditions including future growth in population and employment, travel patterns, and market and economic conditions. Finally, a summary is provided of the environmental and cultural resources located throughout the corridor. This inventory of existing conditions creates a baseline against which the potential benefits of proposed alternatives can be assessed.

3.1 Existing Road Network

The Northwest Corridor contains a network of roads that provide for local and through trips. This network contains two major facilities for radial movement within the Atlanta Region: US 41 and I-75, as well as several cross-radial arterial and collector roads.

US 41 (Cobb Parkway)

US 41 is a principal arterial road with four to six through lanes. It connects the Cumberland Community Improvement District (CID), City of Smyrna, Southern Polytechnic State University, Dobbins Air Reserve Base, City of Marietta, City of Kennesaw, and City of Acworth. The Town Center CID and Kennesaw State University are accessible via Barrett Parkway and McCollum Parkway, connecting roads that also provide access to I-75. Daily traffic volumes along the corridor vary from 29,000 to 40,000 vehicles per day (vpd), with most volumes being in the mid-30,000s per day. This volume is close to the capacity of a four lane divided road.

I-75

I-75 is an Interstate Highway which carries over 280,000 vehicles per day at its busiest point in the study area, just north of Windy Hill Road. The limited number of Chattahoochee River crossings east of I-75 has increased the use of this corridor for north-south regional traffic movements. I-75 has nine exits north of I-285 in Cobb County.

Many of the I-75 interchanges have been improved over time to keep pace with growth in traffic accessing I-75. However, these interchanges remain as potential congestion areas due to their dual use for traffic crossing I-75 as well as traffic accessing the interstate facility.

East-West Connecting Roads

There are several important corridors that provide east-west connectivity between the US 41 and I-75 corridors. The connecting roads with interchanges at I-75 include:

- Windy Hill Road
- Delk Road
- South Marietta Parkway
- North Marietta Parkway
- Canton Road Connector
- Barrett Parkway

- Chastain Road
- Wade Green Road

3.2 Existing Roadway Performance

Areas of potential congestion occur at major intersecting roads. As traffic growth occurs on US 41 and these major crossing roads, additional pressure will be placed on the signalized intersections, resulting in increasing congestion and travel times. The following crossing roads have current ADTs greater than 30,000 vpd:

- US 41 at Barrett Parkway
- US 41 at South Marietta Parkway
- US 41 at Windy Hill Road
- Cumberland Boulevard at Spring Road

Figure 3-1: Corridor Traffic Volumes and Signalized Intersections(Cobb County Line to Kennesaw), Figure 3-2: Corridor Traffic Volumes and Signalized Intersections (South Loop to Acworth), and Figure 3-3: Corridor Traffic Volumes and Signalized Intersections (Cumberland to Delk Road) combined show the Northwest Atlanta corridor from Acworth to the City of Atlanta. Signalized intersections along US 41 and Cumberland Parkway are identified along with the volume of traffic on the crossing roads. This figure shows the relative level of activity at the signalized intersections.

Traffic growth along the Northwest corridor has caused traffic congestion on the corridor's major roadways, primarily US 41 and I-75, to increase over the past decade and travel times to worsen. The Northwest Atlanta Corridor is one of the region's most congested travel corridors. Existing estimates of average annual daily traffic (AADT) exceed 250,000 on I-75 north of I-285 and 30,000 along U.S.41 northward from I-285 to Kennesaw. Between 2010 and 2040, southbound AM peak travel times along I-75 from Midtown Atlanta to Kennesaw State University are expected to increase from 43 to 68 minutes while northbound PM peak travel times will increase from 51 to 95 minutes. I-75 north of I-285 is ranked in the top 10% of most congested freeways in the region and US 41 is ranked in the top 25% of most congested arterials in the metro region according to ARC's 2010 Congestion Management Process.

Congestion in the corridor is the result of growth in population and employment in the corridor over the last several decades as well as strong travel patterns between major destinations. Between 2000 and 2010, the Atlanta metropolitan statistical area (MSA), comprised of 28 counties, increased by about 20% in population. Cobb County's population increased 13.2% during this period, while the City of Atlanta's population grew by less than 1%, demonstrating that significant population growth continues outside of the City of Atlanta. This increase in Cobb County population generated commensurate increases in traffic congestion along the roadway networks in the study corridor.

Strong growth is expected to continue along the corridor through the year 2040. Over the next ten years the population of Cobb County is expected to grow by 9.1%, adding 60,000 new residents. Employment is expected to grow at an even faster rate of 17%, adding 360,000 new jobs in Cobb County. Both population and employment growth is expected to be focused along the Northwest Atlanta corridor. This demographic growth trend is expected to continue in the County through year 2040, resulting in a total population growth of 21.4% and employment growth of 50.4%. These significant growth increases and resulting travel demands far exceed the planned roadway capacity expansions. In addition, employment

growth in Fulton County and the Midtown Atlanta area also are expected to increase 53.7% and 60.9%, respectively, between 2010 and 2040.

Furthermore, much of the planned growth is expected to take the form of transit compatible mixed use development. Land use planning efforts underway focus on new and redevelopment in the corridor with a moderate to high-density mix of uses. The County's 2007 Comprehensive Land Use Plan identifies a strong transit presence and supportive pedestrian infrastructure as pivotal elements in advancing a more intense, dense development pattern within activity centers and development nodes along the corridor. This type of new development will further increase corridor trip making. By 2040, it is estimated that trip times on US 41 will increase by as much as 95% in the peak commuting periods. Northbound PM peak travel times along the US 41 corridor are expected to increase from 62 minutes to 121 minutes within Cobb County and from 55 minutes to 88 minutes southbound during the AM peak.

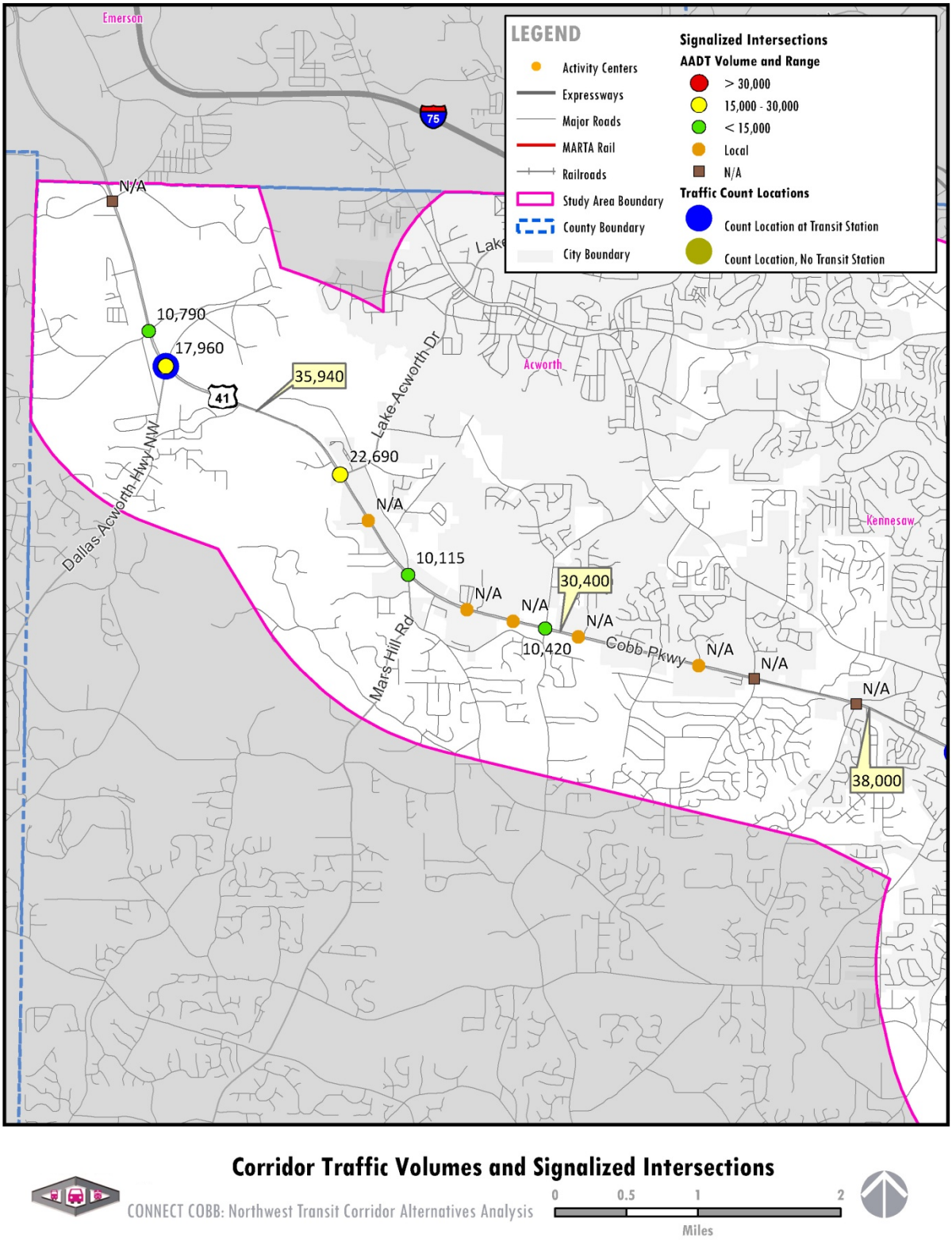

Figure 3-1: Corridor Traffic Volumes and Signalized Intersections(Cobb County Line to Kennesaw)

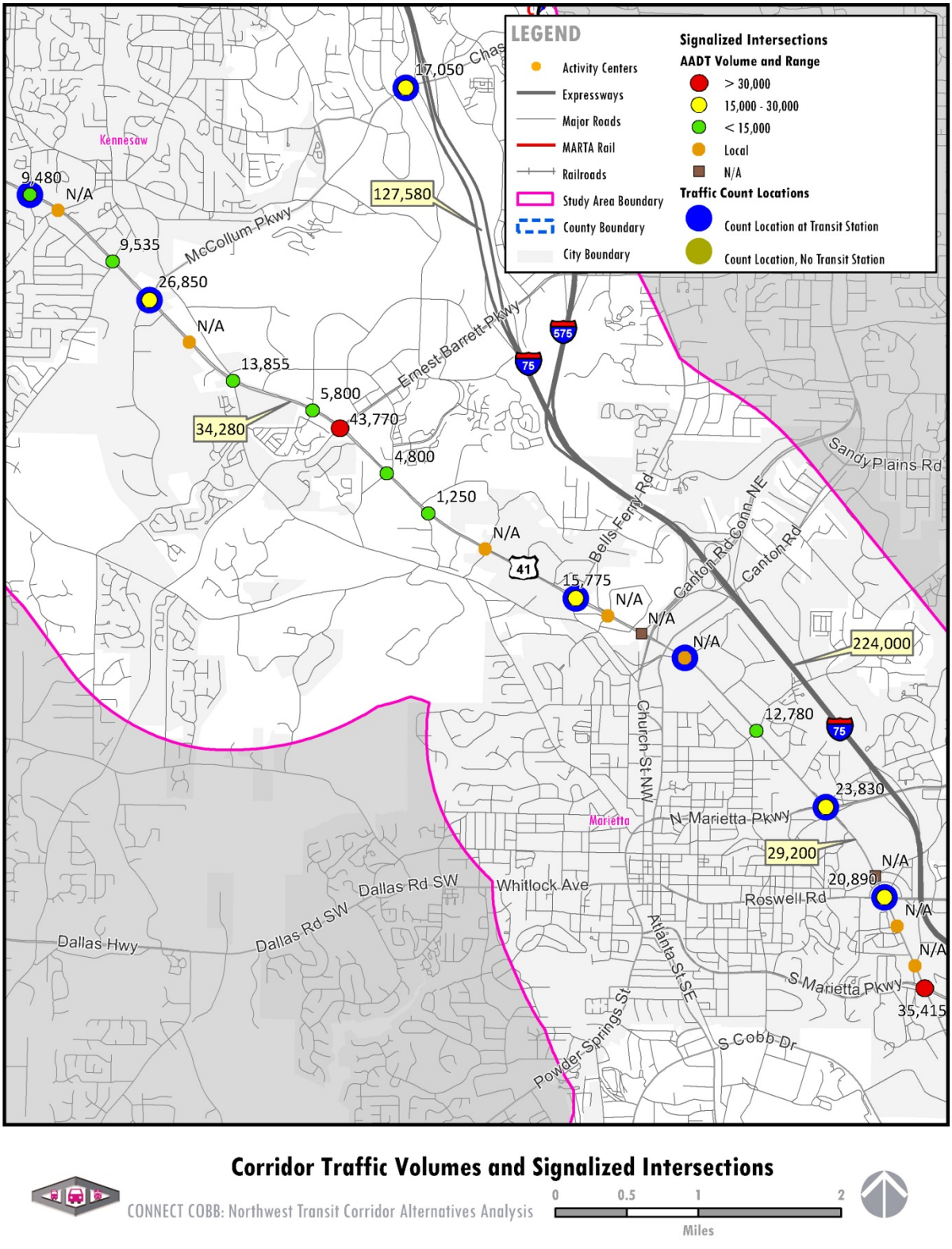

Figure 3-2: Corridor Traffic Volumes and Signalized Intersections (South Loop to Acworth)

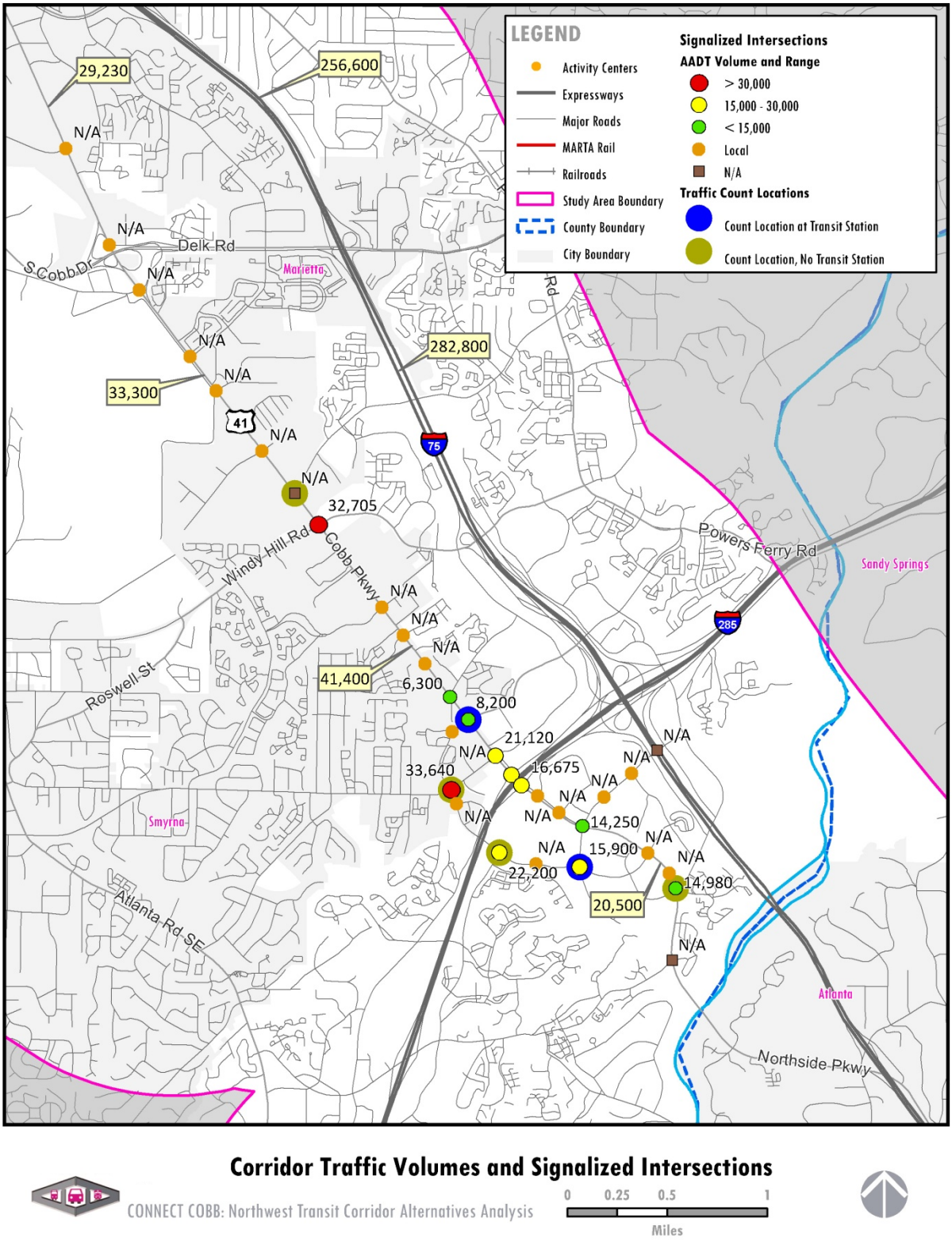

Figure 3-3: Corridor Traffic Volumes and Signalized Intersections (Cumberland to Delk Road)

A preliminary analysis was performed to identify intersections within the study area where traffic congestion is currently present. Based on side street traffic volumes, a total of 18 intersections were identified for analysis within the study area along US 41/Cobb Parkway, Chastain Road, Cumberland Boulevard, and US 41/ Northside Drive. PM peak hour turning movement counts were conducted at each of these intersections. This data was used to perform an existing conditions analysis of the PM peak hour at each intersection. The results of this analysis are shown in Table 3-1: 2012 Existing Conditions PM Peak Hour Analysis. Table 3-1 indicates that nearly every intersection operates at LOS D or below.

Table 3-1: 2012 Existing Conditions PM Peak Hour Analysis

Intersection	LOS	Delay (sec)
Chastain Rd at Frey Rd/Barrett Lakes Blvd	E	58
US 41 at Dallas Acworth Hwy/SR 92	D	37
US 41 at Pine Mountain Rd/Jiles Rd	D	49
US 41 at McCollum Pkwy/Cobb International Blvd	E	78
US 41 at Barrett Pkwy	E	57
US 41 at Bells Ferry Rd	E	59
US 41 at Elisabeth St/Industrial Park Dr	D	41
US 41 at N. Marietta Pkwy/SR 120	E	62
US 41 at Roswell Rd/SR 120	D	50
US 41 at S. Marietta Pkwy/SR 120	D	42
US 41 at Terrell Mill Rd	C	30
US 41 at Windy Hill Rd	E	61
US 41 at Windy Ridge Pkwy/ Cumberland Blvd	D	52
Cumberland Blvd at Spring Rd	E	56
Cumberland Blvd at Cumberland Pkwy/Mall Driveway	E	71
Cumberland Blvd at Akers Mill Rd/ Stillhouse Rd	E	55
US 41 at Cumberland Blvd	F	94
US 41/Northside Dr at 17th St	F	102

3.3 Existing Transit Network

Within the study corridor there are several transit agencies providing service ranging from express bus service to local activity-center-based shuttle services.

3.3.1 Cobb Community Transit (CCT)

CCT began bus transit service in 1989. Currently, CCT operates four routes within the study corridor: Route 10, 100, 101, and 102. CCT runs along US 41, providing transit service between Cobb and Fulton counties and connecting to the MARTA rail system. CCT Route 10 connects to the Arts Center MARTA station. While CCT service in the US 41 service is well used, it is currently hampered by congestion and lacks supporting infrastructure.

3.3.2 Georgia Regional Transportation Authority (GRTA)

GRTA is responsible for planning and operating the Xpress regional bus program. Xpress is a partnership between GRTA and the counties of Clayton, Cherokee, Cobb, Coweta, DeKalb, Douglas, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale; all within metropolitan Atlanta. GRTA has

contracted with McDonald Transit Associates, Inc., MARTA, CCT, and Gwinnett Community Transit (GCT) to operate and maintain the Xpress system. GRTA's Xpress began operation in June 2004 with express routes to downtown Atlanta. GRTA operates four express routes through the project area: GRTA 480, 481, 490, and 491. Although GRTA's express service is well used, it lacks dedicated on/off ramps and lanes to bypass roadway congestion, and the continuation of funding is uncertain at this time.

3.3.3 MARTA

MARTA provides bus and rapid rail service to the most urbanized portions of the Atlanta metropolitan area. The ninth-largest transit system in the United States, MARTA provides transportation for approximately 500,000 passenger boardings each weekday (2010). The transit agency was established in 1971 with the passage of an authorizing referendum by voters in Fulton and DeKalb counties and the City of Atlanta.

There are two MARTA rail lines in the study corridor: Red Line (North Springs to Airport) and Gold (Doraville to Airport). MARTA operates three rail stations within a mile of the study corridor. All stations are on both the Red and Gold Lines: Arts Center Station, Midtown Atlanta Station, and North Avenue Station.

MARTA operates two bus routes that connect to the Arts Center Station (110 and 27), four bus routes that connect with the Midtown Atlanta Station (12, 99, 36, and 27), and three bus routes that connect with the North Avenue Station 26, 2 and 99. MARTA operates Bus Route 12 in the study corridor, traveling from the Cumberland Transfer Center to the Midtown Atlanta Station. Like the current CCT service in the corridor, the MARTA local bus routes are hampered by roadway congestion and lack of supporting infrastructure. MARTA does not currently have any rail extension under design or construction in the study corridor.

CCT Routes 10 and 102 connect with the MARTA rail system at the Arts Center Station. CCT Routes 100 and 101 connect with the MARTA rail system at the Civic Center Station, just south of the study corridor in downtown Atlanta. GRTA Routes 480 and 490 connects also with the MARTA rail system at the Civic Center Station. GRTA Route 481 connects with the MARTA rail system at the Civic Center Station, Arts Center Station, and Midtown Atlanta Station. GRTA Route 491 connects with the Civic Center Station and Arts Center Station.

3.4 Existing Transit Performance

Travel patterns in the corridor suggest a very strong market for trips between Cobb County and the neighboring Fulton County and the City of Atlanta. In 2010 and as forecasted by the Atlanta Regional Commission (ARC) for 2040, Fulton County is the most common destination for trips leaving Cobb County. Furthermore, more of these trips between the two counties are made on transit than for any other set of destinations within the 10-county ARC region. Although the transit share is currently small, with less than four percent of work trips made on transit in this market, the trip pattern indicates the potential for significantly more transit use (especially if more transit alternatives were available).

Current transit service along US 41 is inconvenient and the ability to operate reliably in the future will be compromised by increasing congestion. Currently, transit routes are operated in the corridor by CCT, GRTA, and MARTA. The busiest of those routes, CCT Route 10, runs along US 41 between Cobb and Fulton Counties, connecting to the MARTA rail system at the Arts Center station in Midtown Atlanta. CCT Route 10 is very well used, returning the highest fare box recovery ratio (47 percent) in the entire CCT system and carrying the highest ridership of all CCT system routes at over 3,800 riders on typical weekdays. This high demand is despite the fact that today a trip made on transit from the Dobbins ARB

to the MARTA Arts Center station takes nearly two hours in congested traffic, while the same trip made by automobile may take only 30-45 minutes. In the future, the transit travel time is forecasted to deteriorate by up to 15 percent, assuming no significant transit improvements in the corridor.

3.5 Land Uses and Socioeconomic Conditions

Below is a summary of the land uses, activity centers, population and employment in the study corridor.

3.5.1 Regional Context

The Northwest Atlanta corridor is home to a diverse range of land uses, including state universities, an active military base, two national parks, historic and recreational sites, residential enclaves, and commercial centers.

The southern end of the corridor within the City of Atlanta includes the Midtown Atlanta and Atlantic Station districts which are characterized by predominately medium to high density mixed use development. Moving northwest, the corridor passes through low-density residential areas in the northwestern portion of the City of Atlanta. At the Chattahoochee River, the study corridor transitions from Fulton County to Cobb County. North of the river near the convergence of I-75, I-285, and US 41 includes the Cumberland and Vinings districts, which are characterized by multi-story office buildings, large shopping centers, multi-family housing, and other major activities such as the Cobb Energy Performing Arts Center.

Moving further north, the US 41 portion of the corridor includes a high amount of commercial areas with long stretches of strip retail within the cities of Smyrna, Marietta, and Kennesaw. US 41 also traverses several activity centers in Cobb County, including Dobbins Air Reserve Base, Southern Polytechnic State University, Life University, and Kennesaw State University (KSU). As US 41 continues north into Acworth, the amount of developed land decreases and the corridor's character transitions to semi-rural or exurban (particularly after passing over Lake Acworth).

US 41 was built in the late 1950s as a suburban/rural highway. The US 41 corridor saw its first wave of commercial strip development along with Cobb County's rapid growth from the 1950s through the 1980s, particularly from Cumberland to Marietta. Subsequent development and redevelopment have followed in the 1990s and 2000s, particularly in the northern section near Kennesaw, Town Center, and Acworth. As a result, US 41 in this area has evolved as a continuous 20-mile stretch of commercial strip development with a wide range of 'new' and 'old' retail.

Running parallel to US 41 to the east is I-75. The I-75 portion of the corridor provides interchange access to retail and office destinations in the Town Center and Cumberland areas while also serving as the primary route for commuters and travelers between the most northwest areas of the metropolitan Atlanta area and the central core. The study area encompasses three major activity centers: Midtown Atlanta, Cumberland/Dobbins ARB, and Town Center/KSU.

The development character along I-75 varies greatly as it moves through northwest metro Atlanta. Starting on the southern end within the high-density urban core, I-75 quickly transitions to a low-scale residential character as it moves northward between Howell Mill Road and the Chattahoochee River/Cobb County line. Starting in Cobb County, I-75 is characterized by commercial uses and mid-rise office towers around the Cumberland district. Moving further north, the corridor transitions to low-density commercial, single-family and industrial uses around Dobbins Air Reserve Base and the City of Marietta. Where I-75 meets I-575 around the Town Center and KSU areas, both multi-family and commercial density rise slightly before transitioning again to a character of low-density commercial and residential

moving north. North of Town Center, the development character along I-75 continues to decrease in density as the study area reaches the northern extent of Cobb County.

3.5.2 Existing Land Use and Activity Centers

As a whole, the development pattern along the combined US 41/I-75 study corridor can generally be described as three large "clusters" of land use diversity: Midtown Atlanta/Atlantic Station on the southern end, Cumberland/Marietta/Dobbins in the middle, and Town Center/KSU at the convergence of I-75 and I-575 to the north. As noted above, the US 41 corridor is largely comprised of commercial uses in Cobb County and a mix of residential and non-residential uses in Fulton County. I-75 has a broad diversity of uses, ranging from commercial uses in the northern parts of the study area to industrial and multi-family in the middle, and numerous single family neighborhoods throughout.

Single family is prevalent throughout all parts of the corridor and can be found mostly on the corridor periphery away from the major roadways. There is also a clear linear pattern of strip retail development along US 41, South Cobb Drive, and Atlanta Road. Other retail areas in the study corridor are located along North Marietta Parkway, Roswell Road, Windy Hill Parkway, Delk Road, Spring Road, and Marietta Boulevard in Fulton County.

There are several 'mixed use' activity nodes that contain a diversity of residential, retail, and office space within close proximity. Cumberland, Atlantic Station, and Midtown Atlanta/Midtown West include the large regional centers while Kennesaw, Marietta, and Vinings constitute smaller scale 'downtowns' in the study corridor.

Along with the previously mentioned colleges and universities located in the study corridor, there are also several large institutions that have a sizable impact on existing and future transportation demand. These include large employment nodes at WellStar Kennestone Hospital, Piedmont Hospital, and the Lockheed-Martin/Dobbins Air Reserve complex. Dobbins Air Reserve Base is the largest multi-service reserve training base in the world and covers over 6,000 acres. The WellStar Healthcare system employs over 11,000 employees throughout Cobb County. The Home Depot, with headquarters in the study corridor, employs an estimated 11,784 employees. The Lockheed-Martin/Dobbins Air Reserve complex employees are combined 10,115 full-time part-time and temporary employees, according to the Cobb County Economic Development Department. Kennesaw State University employs an estimated 3,400 employees and Southern Polytechnic Institute employs 596.

Recreational and open space is also prevalent in the study corridor. Three major open space amenities that dominate their respective regions include the Chattahoochee National Recreation Area along the Cobb and Fulton borders, Kennesaw Mountain National Battlefield Park, and Lake Acworth on the north end of the study corridor. In the City of Atlanta, the study corridor crosses the Beltline corridor near Northside Drive. The City is underway developing the Beltline as a greenway connecting neighborhoods which rim the downtown core, including a multi-use path throughout. Long-term plans include the addition of a streetcar or trolley within the Beltline corridor.

Of the approximately 77,000 total acres within the study corridor, the majority of land is currently used for single-family residential (51%). Approximately 26% is used for commercial business use (16% is industrial and about 10% is commercial). Eight percent of the study corridor is currently used for multi-family residential purposes. Office, institutional, mixed-use and "other" make up the remaining 7% of parcel land uses. The single-family residential uses are generally located away from heavily traveled roadways, while commercial and multi-family residential uses are generally concentrated along busy roadways.

3.5.3 EXISTING AND FUTURE POPULATION

ARC projects that the 20-county Atlanta region will reach 8.3 million people by the year 2040, an increase of nearly 3 million people from today. The region's place as a transportation and logistics hub of the southeast positions the region well to remain one of the fasting growing metropolitan areas in the country, according to ARC. In the last eight years alone, the region added 1.1 million people, making it the second fasting growing metro region in the country.

In 2010, Cobb County accounts for about 17% of the larger 10-county region's population, with over 607,000 residents in 260,000 households. Population in Cobb County is mostly dispersed in low-density, single-family residential subdivisions within both the county's incorporated and unincorporated areas. With the population primarily residing outside of the study corridor's four municipalities, the cities of Smyrna, Marietta, Kennesaw, and Acworth represent less than one quarter of the County's population and households. Acworth and Kennesaw both saw their population grow at a more rapid pace over the past decade than Smyrna and Marietta. However, both communities saw a shift towards an increasing share of renter occupied households, particularly in Kennesaw – a trend likely due to the rising student enrollment at KSU.

The City of Atlanta is the largest city in the study corridor with a population of approximately 420,000 and 185,120 households in 2010. As mentioned earlier, while the overall population in the City of Atlanta has not grown substantially over the last decade, smaller, younger households are more predominant now than compared to the last several decades.

Following the trends of the past 10 years, ARC projects Cobb County will continue to grow in both population and households, but at a slower pace than the region overall. Furthermore, household growth is expected to be stronger in the northern portion of Cobb County in the next 20 years (see Figure 3-4: Projected Household Growth Under "No Build" Scenario, 2009 to 2030), although the projections consider opportunities closer to the region's core where land has been made available for redevelopment in Cobb County and the City of Atlanta.

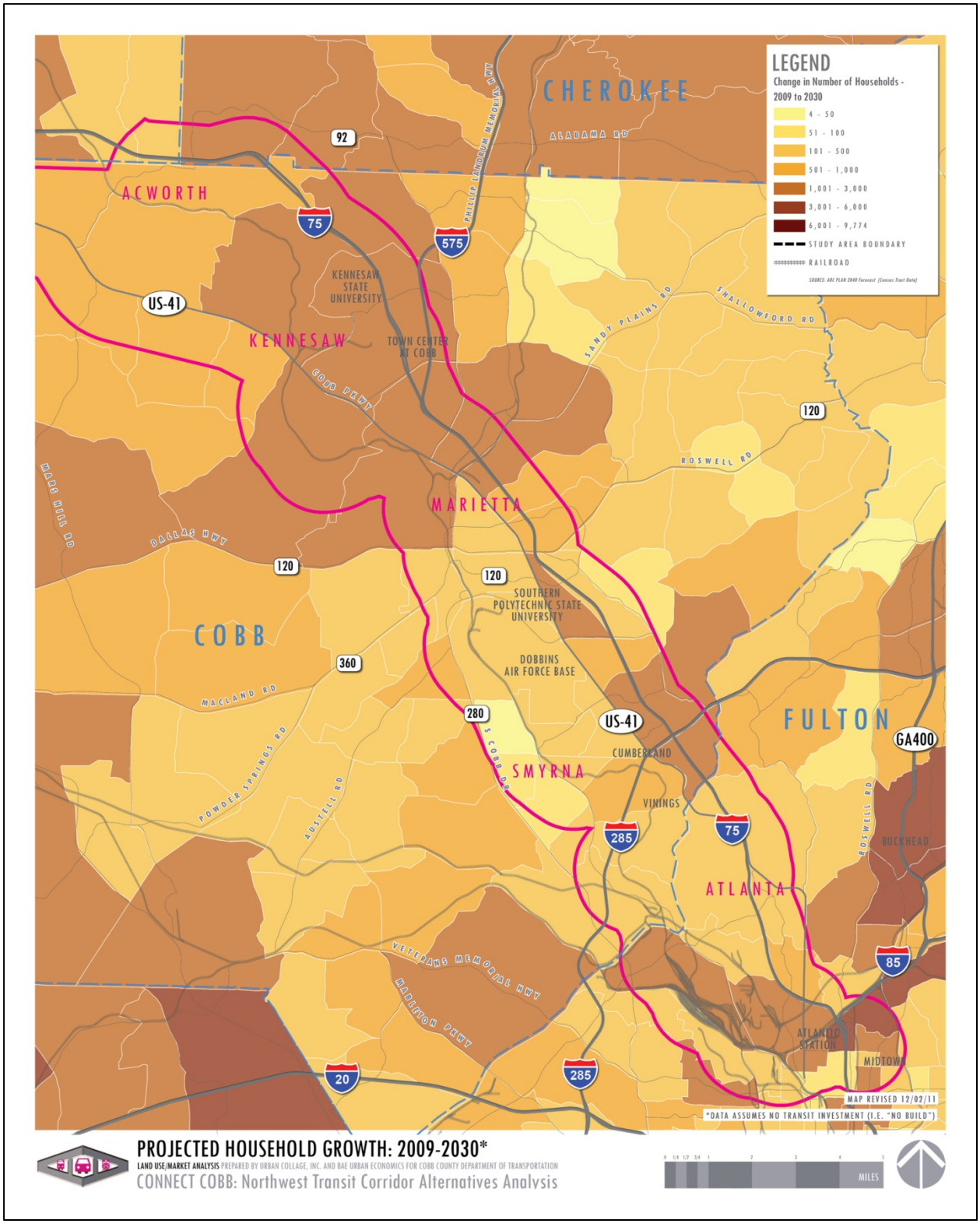

Figure 3-4: Projected Household Growth Under "No Build" Scenario, 2009 to 2030

3.5.4 EXISTING AND FUTURE EMPLOYMENT

ARC forecasts employment in the region to grow by 1.1 million jobs for a total of 3 million jobs in the year 2040. Cobb County's share of this employment is expected to continue to be about 15% of the total regional employment. The majority of Cobb County's employment is located in the I-75 corridor, with the highest densities located in the Cumberland and Town Center activity centers. The County's employment base is a diverse mix of industries typically found in metropolitan areas: a high proportion of professional jobs and technical jobs, and jobs in wholesaling. Also, although small in terms of the number of jobs, the relative share of employment in management or headquartered operations is more concentrated in Cobb County than the rest of the state.

The study corridor runs through urban and suburban office markets that hold an important segment of the region's office space. The Midtown Atlanta office market, located at the southern end of the study area, is one of Atlanta's three submarkets along with Downtown and Buckhead. Cobb County contains a large suburban office market, referred to as Northwest, centered along I-75. The majority of the office space in the Northwest market is found at the convergence of I-75 and I-285 in Cumberland. The Northwest market contains 35 million square feet of office space of which about 27 million is located in Cumberland. An additional 8 million square feet is located further north along the corridor in the cities of Marietta and Kennesaw as well as Cherokee County.

Employment centers found in the study corridor generally coincide with the three large land use "clusters" mentioned earlier: Midtown Atlanta/Atlantic Station; Cumberland/Marietta/Dobbins area; and Town Center/KSU. The Midtown Atlanta employment area currently includes about 21-50 employees per acre. The Cumberland/Marietta/Dobbins area currently includes 6-20 employees per acre; and the Town Center/KSU employment area currently includes 6-10 employees per acre.

Employment growth is anticipated to surpass household growth, particularly in Cobb County. Between 2010 and 2030, ARC projects Cobb County will add over 100,000 jobs and increase its job base by 50%. Although employment is expected to continue to be concentrated in the same job centers, ARC projects employment growth to be more dispersed than the current pattern of job centers (see Figure 3-5: Projected Employment Growth under "No Build" Scenario, 2009 to 2030). Employment growth is generally expected to be stronger in the northern portion of Cobb County in the next 20 years.

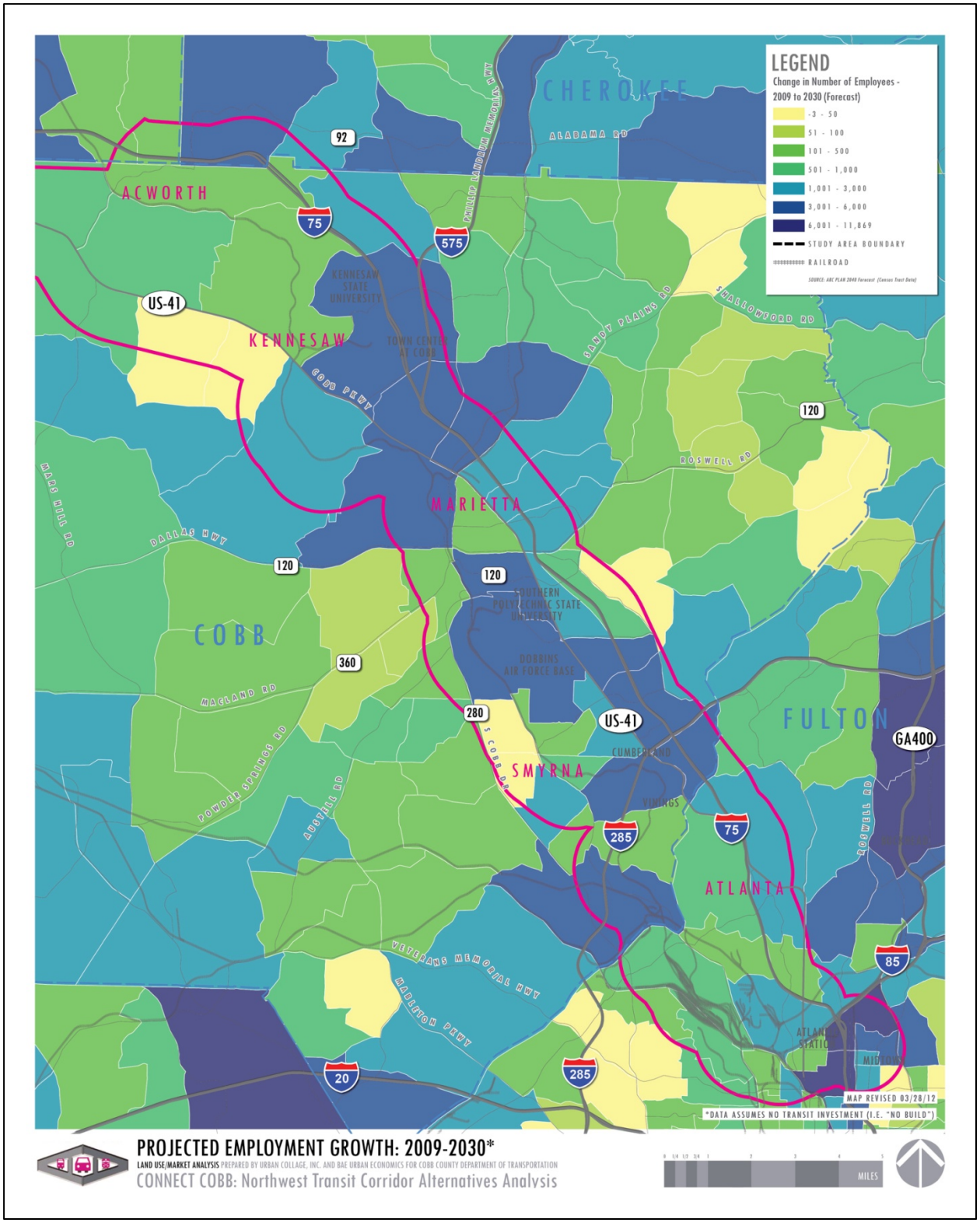

Figure 3-5: Projected Employment Growth under "No Build" Scenario, 2009 to 2030

The region's extensive transportation network fosters growth of specialized economic activity and high paying employment opportunities. As part of the regional economy, Cobb County residents and employers have access to a large base of highly skilled jobs and workers from throughout the metropolitan area due to the connectivity of the transportation network. Over two-thirds of Cobb County's workforce is employed either in Cobb County (41%) or Fulton County (29%). About 40% of Cobb County's jobs are held by Cobb County residents. The remaining 60% of jobs are held by workers who live around the region.

3.5.5 Market and Economic Opportunities

Cobb County and the region overall are expected to continue to grow significantly over the next 20 years, providing a need for new residential and business opportunities within the study area. The study corridor offers both development and redevelopment opportunities, given the current road network and potential public transportation investments.

While current economic conditions have diminished development opportunities in the short term, the outlook for future development is expected to support a diversified set of land uses due to improved transit options in close proximity. In addition, several large sites may be candidates for transit ready or transit oriented redevelopment in the Northwest Atlanta Corridor.

Stronger transit linkages will enhance and strengthen the commercial real estate market. For example, within the Cumberland area, introduction of high quality transit could enhance its competitiveness in capturing new office demand by increasing accessibility to the region's core and to the northwest suburbs, as well as Hartsfield-Jackson Atlanta International Airport.

Retail and mixed use development opportunities will likely emerge with new residential and office developments. It is likely that new development in many parts of the study area will contain a mix of uses including retail as it provides essential amenities and convenience to nearby workers and residents. There may also be opportunities for redevelopment of aging retail centers into more pedestrian oriented, mixed-use destinations designed around transit stops.

3.6 Environmental Conditions

This section identifies key community, cultural, and environmental resources that exist in the Northwest Atlanta corridor. Because environmental screening for purposes of this AA will focus on assessing key differences among alternatives, the most sensitive categories of resources are described below. A more comprehensive assessment of environmental impacts will occur in later phases of project development.

3.6.1 Community Resources

The Northwest Atlanta corridor possesses a rich range of resources that serve corridor communities, including schools, libraries, churches, and parks. Some of the more significant resources include both institutions of higher education, such as Kennesaw State University, the second largest university in Georgia, as well as recreational areas, notably the nearly 100-acre Chattahoochee National Recreational Area and the nearly 200-acre Lake Acworth Park. Another important resource given its proximity to US 41 in Kennesaw is the 26-acre Pineridge Memorial Cemetery. Figure 3-6: Community Resources identifies the range of community resources located throughout the corridor. Under the National Environmental Policy Act (NEPA), efforts must be taken or avoid or minimize impact to these resources. Further, Georgia law provides additional protections to cemeteries and burial grounds.

3.6.2 CULTURAL RESOURCES

Figure 3-7: Cultural Resources shows the location of cultural resources listed on the National Register of Historic Places; these include historic districts and individually listed sites that are protected by federal law. Key historic resources that reflect the Civil War history of the corridor include the Kennesaw Mountain National Battlefield Park, Camp McDonald off US 41 in Kennesaw, and the Marietta National Cemetery. Federal laws including NEPA, Section 106, the National Historic Preservation Act, and Section 4(f), the Department of Transportation Act provide protection for these important cultural resources.

3.6.3 WATER RESOURCES

Water resources in the corridor include rivers, lakes, ponds, wetlands, and floodplains. Figure 3-9: Water Resources for Initial Assessment shows the location of these resources, the most significant of which are the Chattahoochee River and Lake Acworth. The Chattahoochee River and its national recreational area (noted above) are protected by federal law, specifically NEPA, Section 4(f), Section 404, the Clean Water Act and amendments, and Section 10, the Rivers and Harbors Act.

3.6.4 ENVIRONMENTAL JUSTICE POPULATIONS

Executive Order (EO) 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations), dated February 11, 1994, calls on federal agencies to identify and address any disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low income populations. As an initial step in assessing any impacts to these protected populations as a result of transit improvements made in the Northwest Atlanta corridor, the populations are first identified.

Figure 3-10: Low-Income Populations for Initial Assessment shows the low income populations in the Northwest Atlanta corridor. Approximately 9 percent of the population is low income. Figure 3-11: Minority Populations for Initial Assessment identifies the locations of minority populations. Nearly 47 percent of the corridor population is minority.

3.6.5 HAZARDOUS MATERIALS

The final category of potential environmental concern relates to hazardous materials. These include sites that are known to have released hazardous materials, as well as industrial areas where the potential for impact exist. Figure 3-12: Hazardous Sites for Initial Assessment shows the sites in the corridor that may contain hazardous materials.

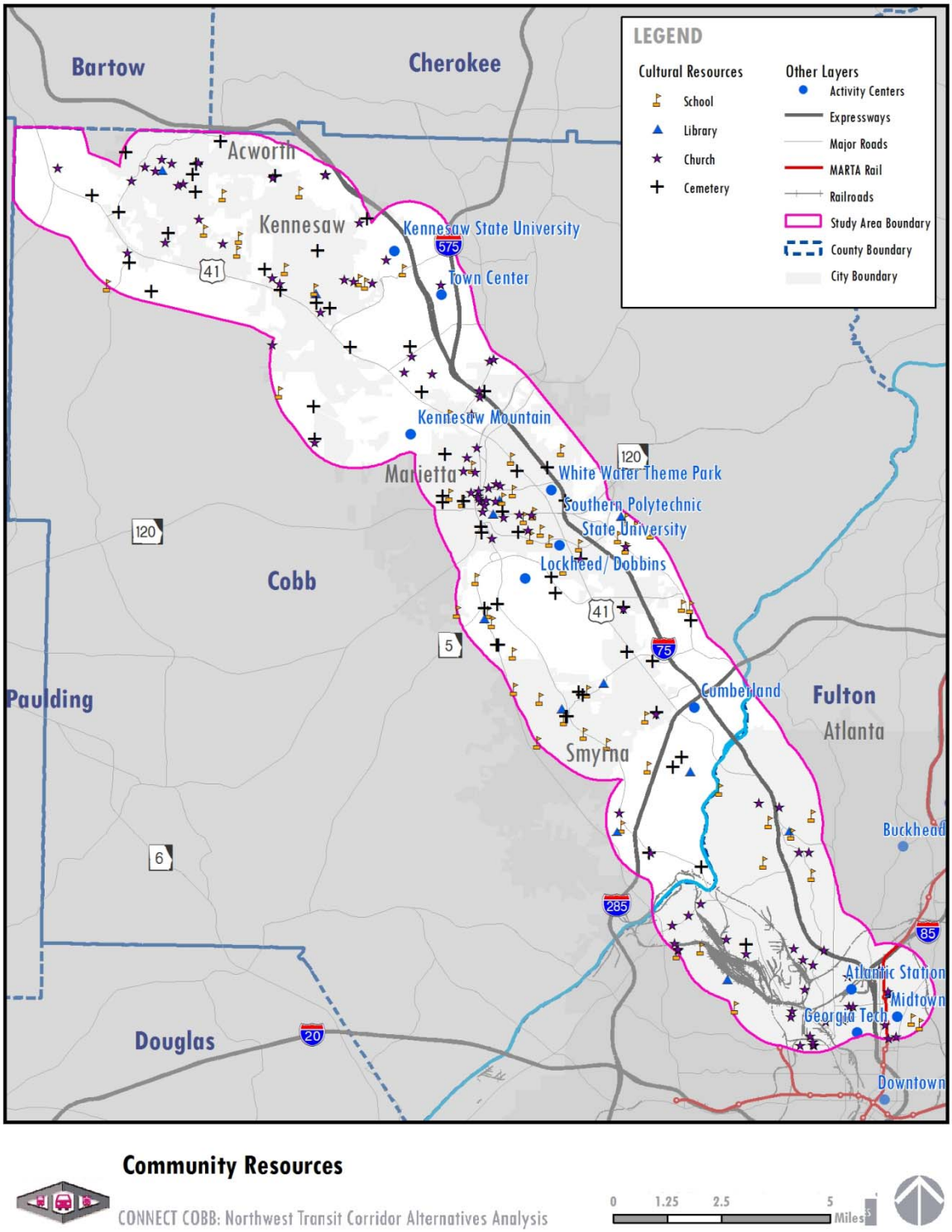

Figure 3-6: Community Resources

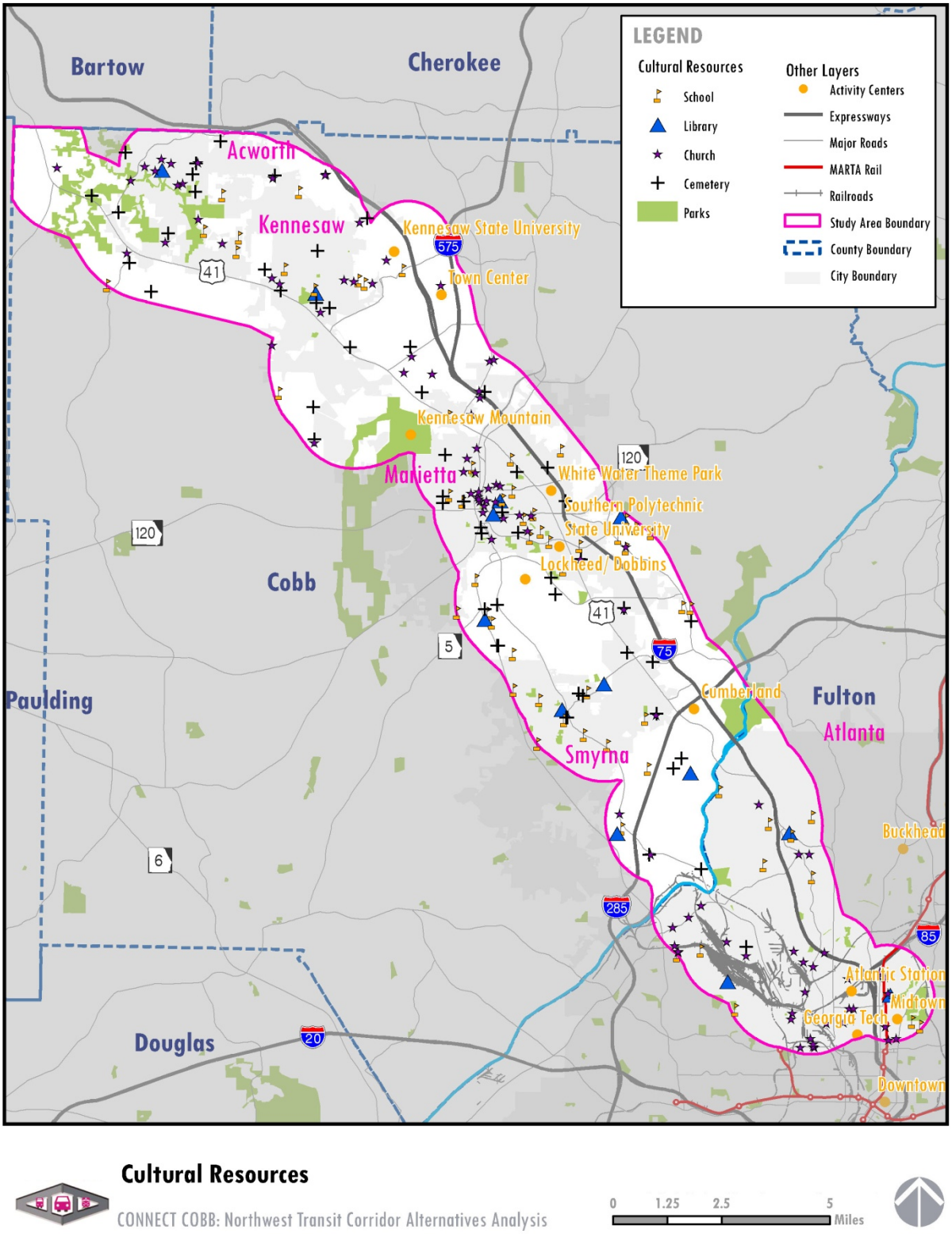

Figure 3-7: Cultural Resources

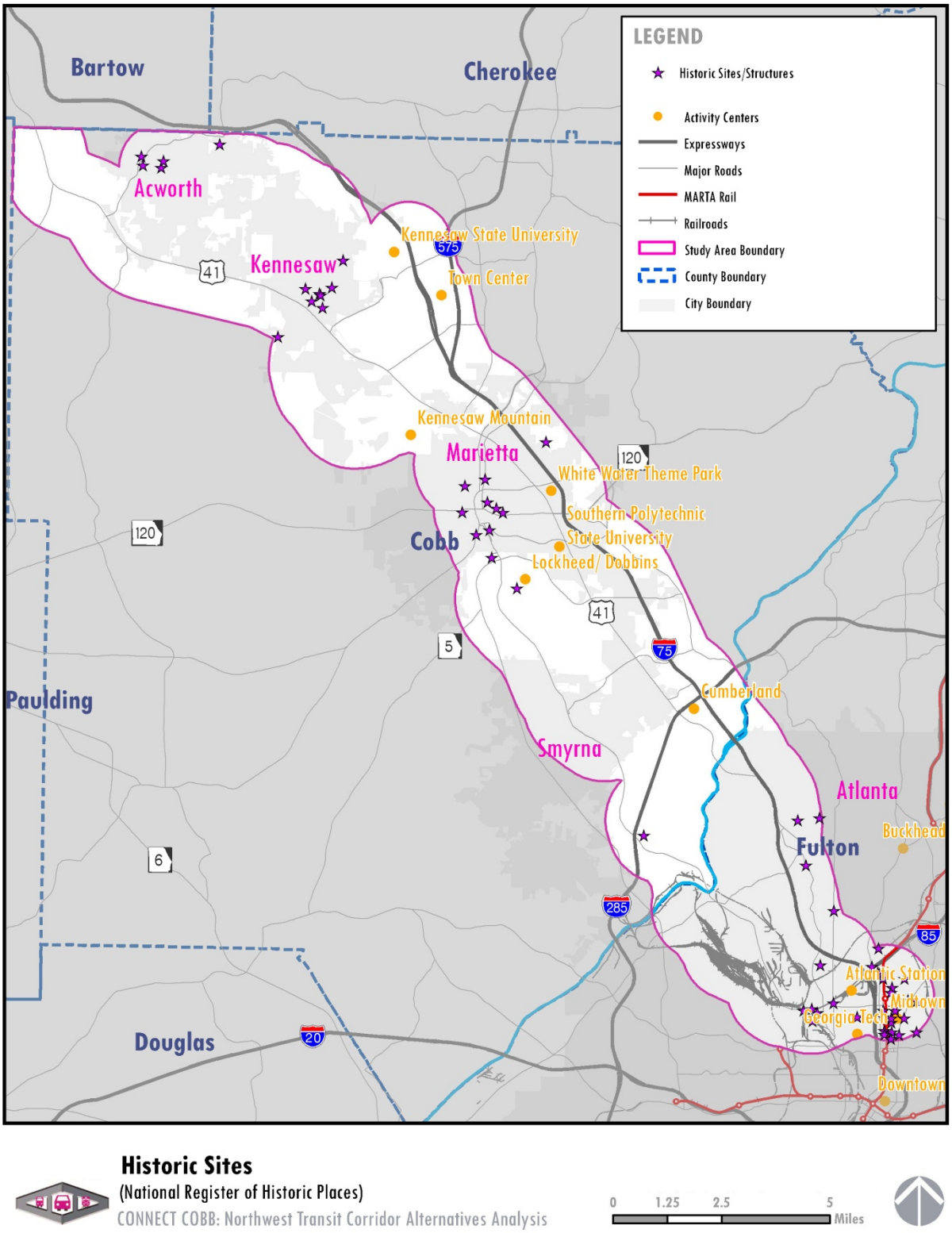

Figure 3-8: Historic Sites for Initial Assessment

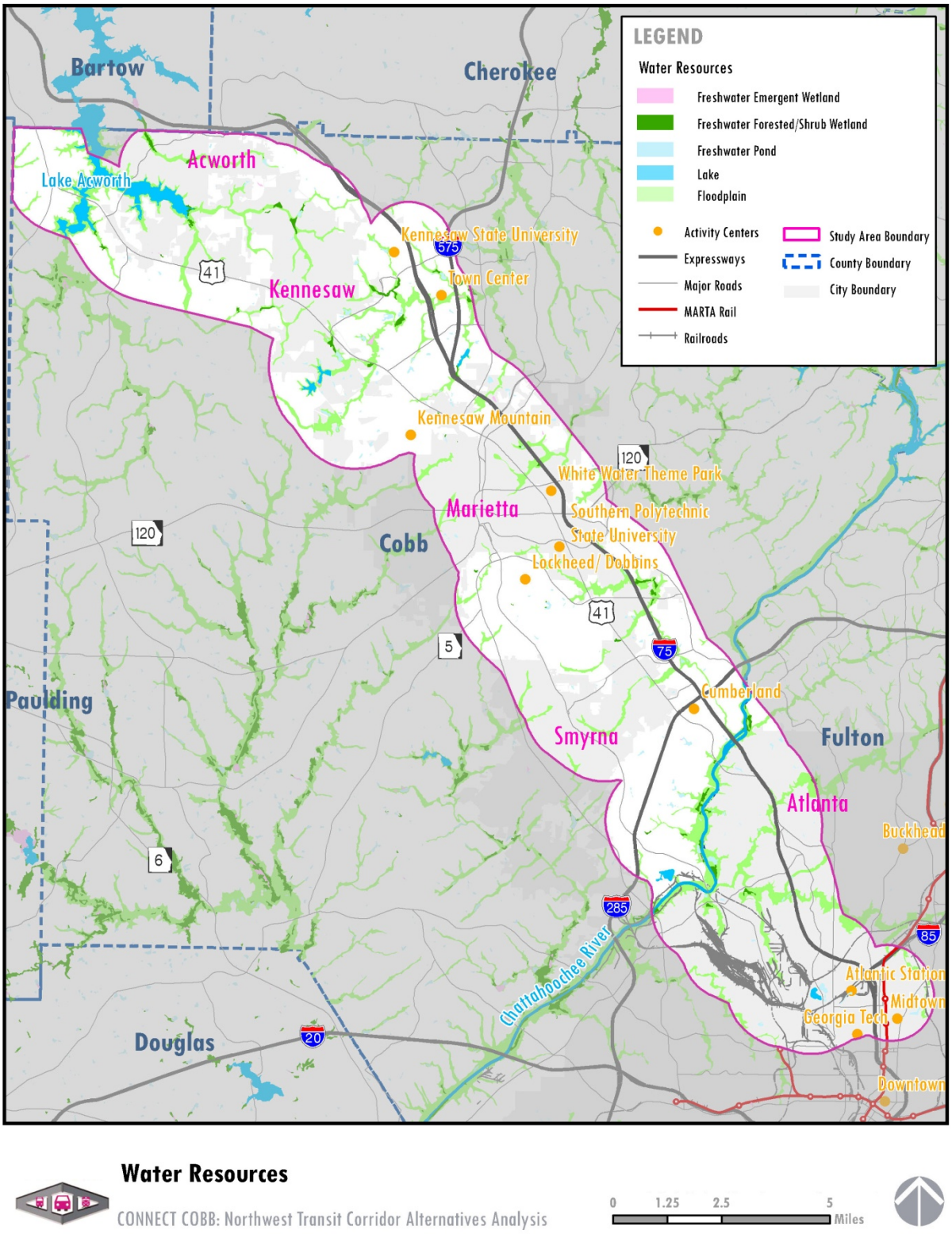

Figure 3-9: Water Resources for Initial Assessment

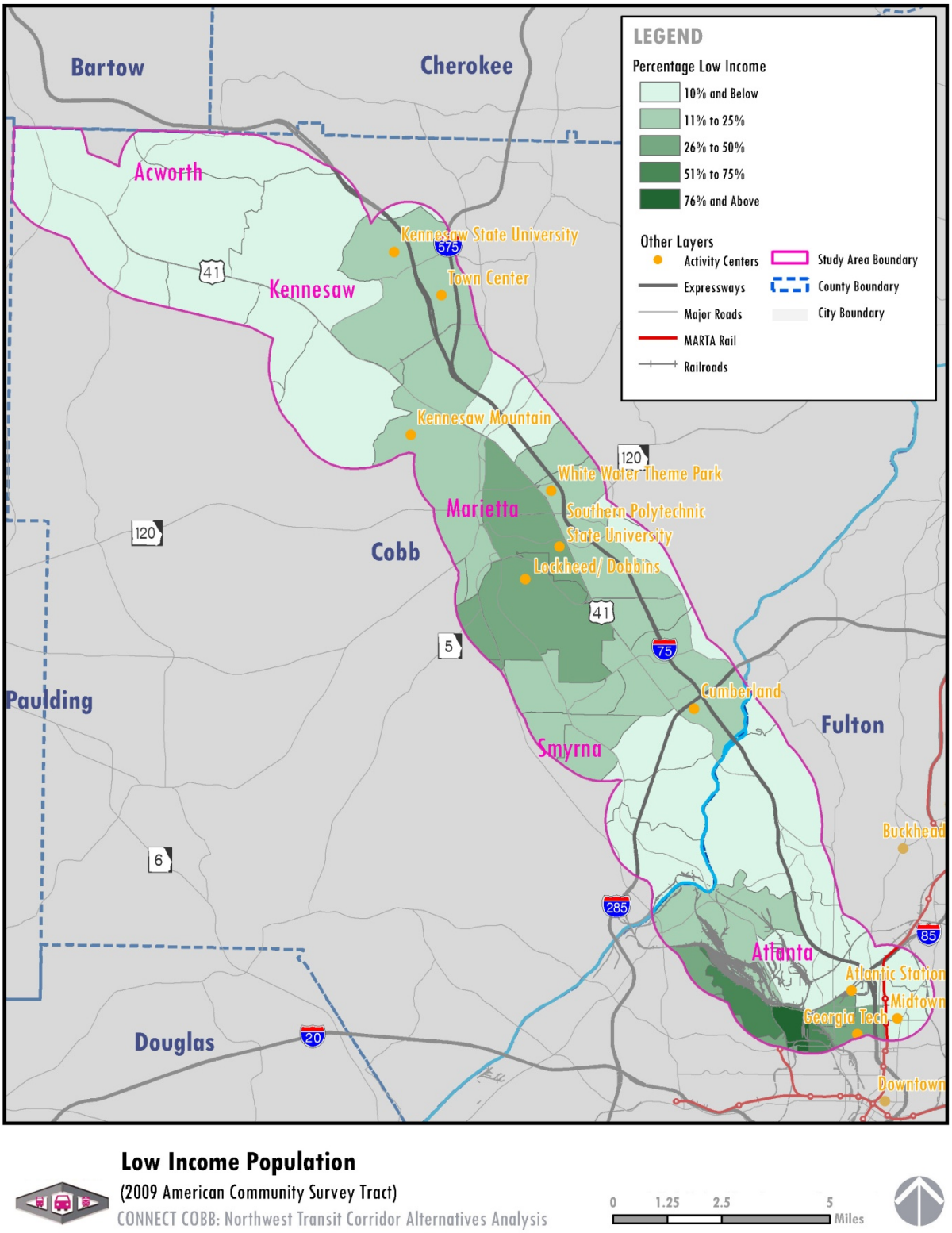

Figure 3-10: Low-Income Populations for Initial Assessment

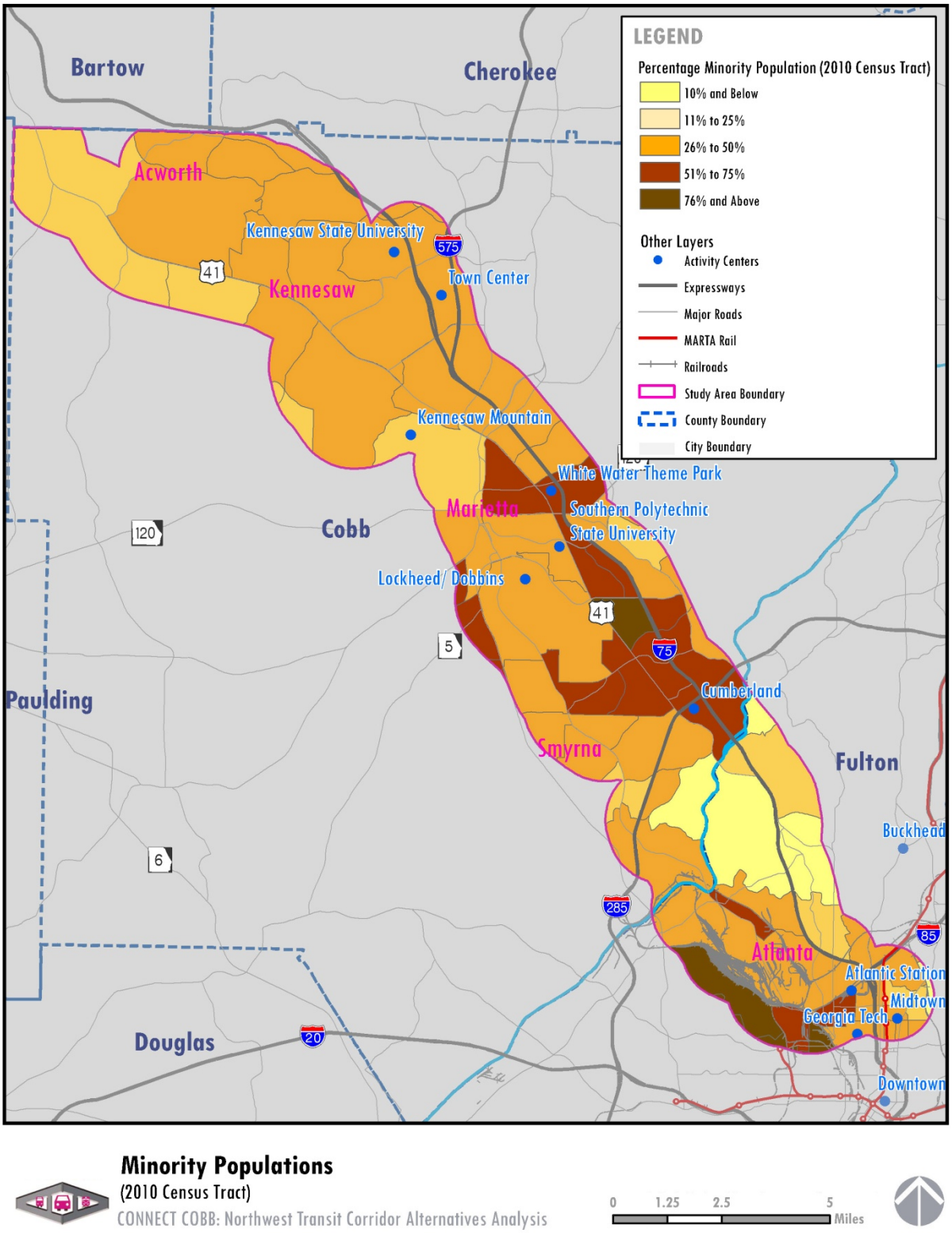

Figure 3-11: Minority Populations for Initial Assessment

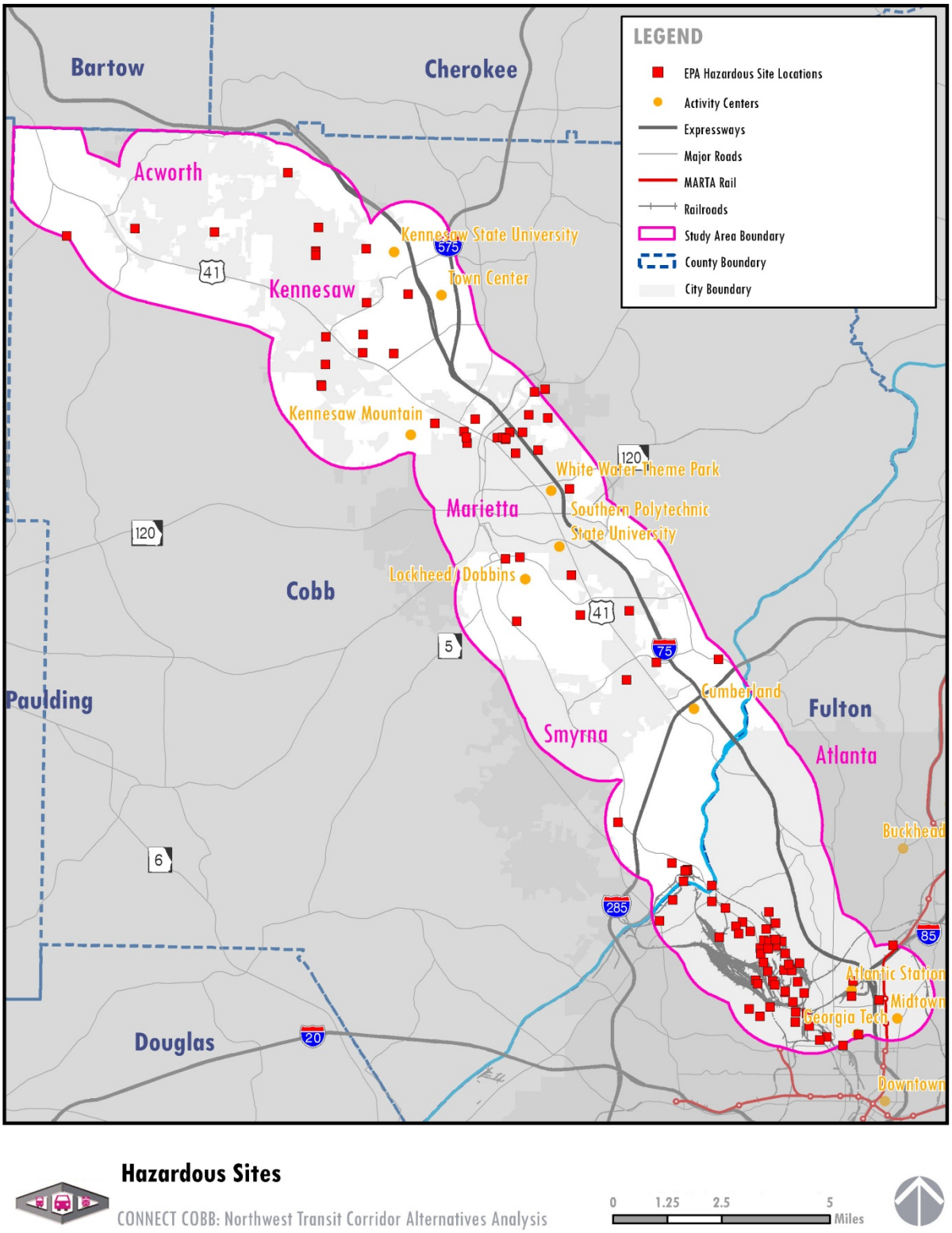

Figure 3-12: Hazardous Sites for Initial Assessment

4. DEFINITION OF ALTERNATIVES

This section describes the alternatives that are considered to address the transportation and other needs in the Northwest Atlanta corridor. A broad range of alternatives have been considered, to ensure a comprehensive assessment of potential solutions. A narrowing of alternatives through a tiered screening process then results in a smaller and more focused set of alternatives that are subjected to more extensive evaluation.

There are four phases of analysis associated with identifying and evaluating alternatives within the AA:

- Identification of Technology/Transit Mode (Section 4.2) – to identify a shortlist of technologies appropriate for the conditions in the Northwest Atlanta corridor;
- Identification of Alignments (Section 4.3) – to conduct a high level analysis of a universe of alignments identifying those advancing into Tier I;
- Tier I Analysis (Section 5.3) – to assess alternatives against data-driven Measures Of Effectiveness (MOEs) and evaluate their viability for advancement into Tier II analysis; and
- Tier II Analysis (Section **Error! Reference source not found.**) – to develop a LPA to be carried forward into the next phase of project development.

This process began with identifying candidate transit modes (i.e. technology), general alignments and key destinations (station locations), as described in the subsequent sections.

4.1 Technology/Transit Mode

A transit mode is defined by the type of right-of-way required to operate the mode, the type of service, and the system technology. Right-of-way is further broken down into three categories:

- Fully controlled or separated right-of-way.
- Longitudinally physically separated from at grade crossings.
- In street interacting among mixed traffic.

Types of service are defined by the region served, service schedule, frequency of service, and time of operation. System technology refers to the mechanical features such as power source, vehicle type and method of travel. The method of travel is the difference between “non-fixed guideway” or “fixed guideway” systems, the most common being rubber tires on concrete/asphalt or steel wheels on rail.

A technology review was conducted to determine reasonable potential options in the Northwest Atlanta corridor. Specific transit modes are most appropriate to serve specific markets or conditions. Some are best suited to dense, urban environments; others are designed to serve longer distance, commuter-based needs. The technology review evaluates the characteristics and factors (per above) of the following transit modes:

- Express Bus
- Bus Rapid Transit
- Commuter Rail

- Light Rail
- Streetcar
- Heavy Rail
- Monorail
- Maglev

Each of these modes is described below in terms of operating characteristics and information on the implementation and ongoing operating and maintenance (O&M) costs of each. The capacity of existing facilities to store and maintain the vehicle fleets associated with each mode is also assessed. As noted above, not all technologies/modes are likely appropriate for the needs and conditions of the Northwest Atlanta corridor.

4.1.1 Express Bus

Express bus services use diesel or diesel/hybrid buses that operate in existing roadways with mixed traffic, making limited stops along normal bus routes to accelerate service. This type of system is referred to as an urban or regional circulator and can easily be adaptable to community and corridor needs. Express bus alignments can vary between 5 to 30 miles depending on the service provider and service area. Market demands help determine whether express bus service will be operated during peak commuter periods only, or if it should be operated as high-frequency service throughout the day with headways ranging from 10 to 20 minutes. Average travel speeds range from 10 to 20 miles per hour, depending on the spacing of stops, traffic conditions, and other considerations.

Typical right-of-way needs average between 8 to 14 feet. Additional right-of-way could be required for park and ride lots and minimal roadway improvements (signal improvements, queue-jumps). An express bus fleet could potentially share the existing Cobb County Transit bus maintenance facility.

Because express bus typically operates in a mixed-use right-of-way environment, implementation costs are relatively low ranging from $1 to $2 million per mile. Average annual O&M costs range from $4 to $10 million. Phoenix, Miami, Los Angeles and Seattle use express bus systems.

4.1.2 Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT) system uses high-tech diesel or diesel/hybrid buses that operate on dedicated transitways within their own right-of-way, High Occupancy Vehicle (HOV) lanes, or existing roadways. This permanent integrated system uses signal priority, queue jumpers, improved stations along corridors, and other techniques to increase the operational efficiency and reliability of bus service. This type of system is referred to as an urban or regional circulator and can be easily adaptable to community and corridor needs. BRT alignments can vary between 5 to 30 miles depending on the service area. Frequent service is provided, with headways ranging from 3 to 20 minutes. Travel speeds range from 20 to 40 miles per hour.

Typical right-of-way needs average between 12 and 32 feet, depending on whether the BRT is in mixed traffic or is operated along a dedicated transit corridor, respectively. Additional right-of-way could be required for the dedicated transitway, station platforms, park and ride lots, and roadway improvements (e.g. grade separations, intersection improvements, widening of roadways). Stations are typically spaced a quarter-mile to 2 miles apart and incorporate platform stations with amenities and possible park and ride lots. A BRT vehicle fleet can potentially share the Cobb County Transit bus maintenance facility. However, depending on the type of BRT vehicles procured, some minor modifications to the facility may be needed.

Implementation costs vary widely, from $4 to $50 million per mile and average annual O&M costs from $4 to $29 million. The wide variation in costs is attributable to the vast spectrum of infrastructure elements that can be incorporated into a BRT project. Boston, Cleveland, Eugene and Pittsburgh are examples of cities that have BRT systems.

4.1.3 STREETCAR

Streetcars are electrically-powered rail transit systems that operate within mixed traffic usually along the curb lane. They are powered by electrified overhead catenary lines. This type of system is referred to as an urban circulator and offers service to local areas connecting multiple trip destinations. They handle a smaller volume of riders than other modes and stop more frequently. The average operating length of a streetcar system is between 5 and 15 miles, non-linear. Service runs on intervals ranging from 8 to 15 minutes with average travel speeds from 8 to 12 miles per hour.

Typical right-of-way needs average between 5 and 20 feet. Stations are generally located approximately one-quarter mile apart and are simple stops or platforms. A streetcar would require its own maintenance facility; however, there could be a potential to share a maintenance facility with the Beltline streetcar project or MARTA's Peachtree Streetcar.

Streetcar implementation costs range from $2 to $25 million per mile and average annual O&M costs from $4 to $6 million. Memphis, Tampa, New Orleans, Portland, and San Francisco are examples of cities with streetcar systems in place.

4.1.4 MONORAIL

Monorail systems operate on a dedicated single beam guide structure with service provided through rubber tire, electrically-powered vehicles. Power is delivered to the vehicles through an electrified third rail. This type of system is referred to as an urban circulator and is typically used at airports and theme parks. Alignments can range between 2.5 to 15 miles with a typical operating frequency of 5 to 10 minutes. Average travel speeds range from 10 to 35 miles per hour.

Typical right-of-way needs average between 10 and 24 feet. Additional right-of-way would be required for the dedicated transitway, station platforms, park and ride lots, and roadway improvements (e.g. grade separations, intersection improvements, widening of roadways). Stations are typically a quarter-mile to 1 mile apart and incorporate platform stations with passenger amenities and possible park and ride lots. A monorail would require a new maintenance facility.

Monorail implementation costs vary from $30 to $100 million per mile and average annual O&M costs range from $4 to $15 million. Las Vegas, Orlando, Newark and Seattle are examples of cities that operate monorail systems.

4.1.5 Light Rail Transit (LRT)

Light rail systems are powered by overhead electric catenary lines and typically operate on separated rights-of-way within urban areas. When necessary, light rail systems can operate in close proximity to mixed traffic, and alignments can also exist within shared space on a city street, even in mixed traffic on a limited basis. This type of system is referred to as an urban or regional service. Alignments can range between 10 to 30 miles with a typical operating frequency of 5 to 30 minutes. Average travel speeds range from 20 to 60 miles per hour.

Typical right-of-way needs average between 10 and 32 feet. Additional right-of-way would be required for the dedicated transitway, station platforms, park and ride lots, and roadway improvements (e.g. grade separations, intersection improvements, widening of roadways). Stations are typically a quarter-mile to 2 miles apart and incorporate platform stations with passenger amenities and possible park and ride lots. LRT would require its own maintenance facility; however, there could be a potential shared facility with the other LRT corridor projects proposed within the greater Atlanta region.

Light rail implementation costs vary from $40 to $120 million per mile and average annual O&M costs range from $13 to $33 million. Denver, Minneapolis, Dallas, and Houston are examples of cities that operate light rail systems.

4.1.6 Commuter Rail

Commuter rail systems are electric or diesel propelled urban passenger trains which operate solely within a railroad corridor. Trains powered by a locomotive can operate in “push-pull” mode, allowing the train to be operated from either end. The trains operating in “push-pull” mode have a locomotive at one end of the train and a second control cab at the other end. Commuter rail vehicles are larger and provide more seating and less standing room than LRT vehicles due to the typically longer commute time involved. The service also has the ability to coexist with freight rail providers on track owned by a freight railroad; however, capacity and liability concerns often make shared track agreements difficult to negotiate.

Commuter rail systems provide service between a center city and outer surrounding suburbs and mainly operate only during the peak periods. Alignments typically range between 30 to 125 miles in length with service intervals of 20 to 30 minutes. Stations are generally spaced at two to five miles apart and incorporate platform stations with passenger amenities and possible park and ride lots. Average travel speeds range from 30 to 60 miles per hour.

Typical right-of-way needs average between 24 and 48 feet. Additional right-of-way would be required for dedicated rail corridors, station platforms, park and ride lots, and roadway improvements (e.g. grade separations). Commuter rail would require its own maintenance facility. Implementation costs vary from $3 to $20 million per mile and average annual O&M costs from $3 to $30 million. Costs vary depending largely on the need to build new infrastructure. Boston (MBTA), Albuquerque, New York (Long Island RR), Dallas/Fort Worth (TRE), and Nashville are examples of cities with commuter rail systems.

4.1.7 HEAVY RAIL TRANSIT

Heavy rail systems, commonly referred to as subways or metros, have dedicated railway with the capacity and frequency to handle a heavy traffic volume. Service is provided by steel-wheel, electrically-powered vehicles operating two or more (most between six and ten) cars on a fully grade-separated right-of-way, in underground or elevated structures providing service to regional and urban areas. Power is delivered to the vehicle through an electrified third rail. Outside urban areas, heavy rail systems may run grade separated at ground level. Alignments stretch anywhere from 10 to 125 miles, typically operating at intervals of 5 to 10 minutes. Travel speeds range from 30 to 80 miles per hour.

Typical right-of-way needs average between 24 and 48 feet. Additional right-of-way would be required for dedicated rail corridors, station platforms, park and ride lots, and roadway improvements (such as grade separations, since at-grade crossings are prohibited). Stations are usually spaced at a distance of approximately one mile apart in high density urban areas and up to five miles apart in surrounding suburban areas. Large, elaborate stations with passenger amenities and possible park and ride lots are typically used. A heavy rail vehicle fleet could potentially share MARTA's existing maintenance facilities.

Implementation costs vary from $100 to $250 million per mile or more and average annual O&M costs range from $15 to $28 million. American cities with heavy rail systems in place have high population and employment densities, and long histories of public transportation. Atlanta (MARTA), Washington DC (Metro), San Francisco (BART), New York (MTA), and Boston (MBTA) are examples of cities with heavy rail systems.

4.1.8 MAGLEV

Maglev uses high powered electrically charged magnets to suspend, guide and propel trains. It operates on a grade separated aerial structure and usually connects two urban cores. The system is designed around alignment lengths ranging between 150 to 500 miles with long distances between station spacing. Average travel speeds range from 200 to 300 miles per hour.

Typical right-of-way needs average between 10 and 24 feet. Additional right-of-way would be required for the dedicated aerial structure, station platforms, and park and ride lots. Stations are generally spaced at a distance of approximately 15 to 20 miles apart. Maglev would require its own maintenance facility. Since there is limited information available on construction and O&M costs for this type of system, typical cost data is not available. However, recent studies show that preliminary implementation costs could range from $75 to $200 million per mile or more. There are currently no American cities that have an operational maglev system.

4.2 Technology Screening

Given the broad range of potential transit technologies/modes described above, an initial screening was performed to eliminate those modes that do not meet key evaluation criteria. This screening is intended to help narrow the set of initial alternatives considered, to focus only on those modes that are best suited for the needs and characteristics of the Northwest Atlanta corridor.

Broadly characterized, among the spectrum of transit technologies currently available in North America, heavy rail transit and light rail transit afford the greatest operating speeds and capacity. However, as displayed in Figure 4-1: Characteristics of Transit Modes, rail-based technologies typically have a significantly greater cost than other modes of transit such as bus rapid transit, express bus, and local bus.

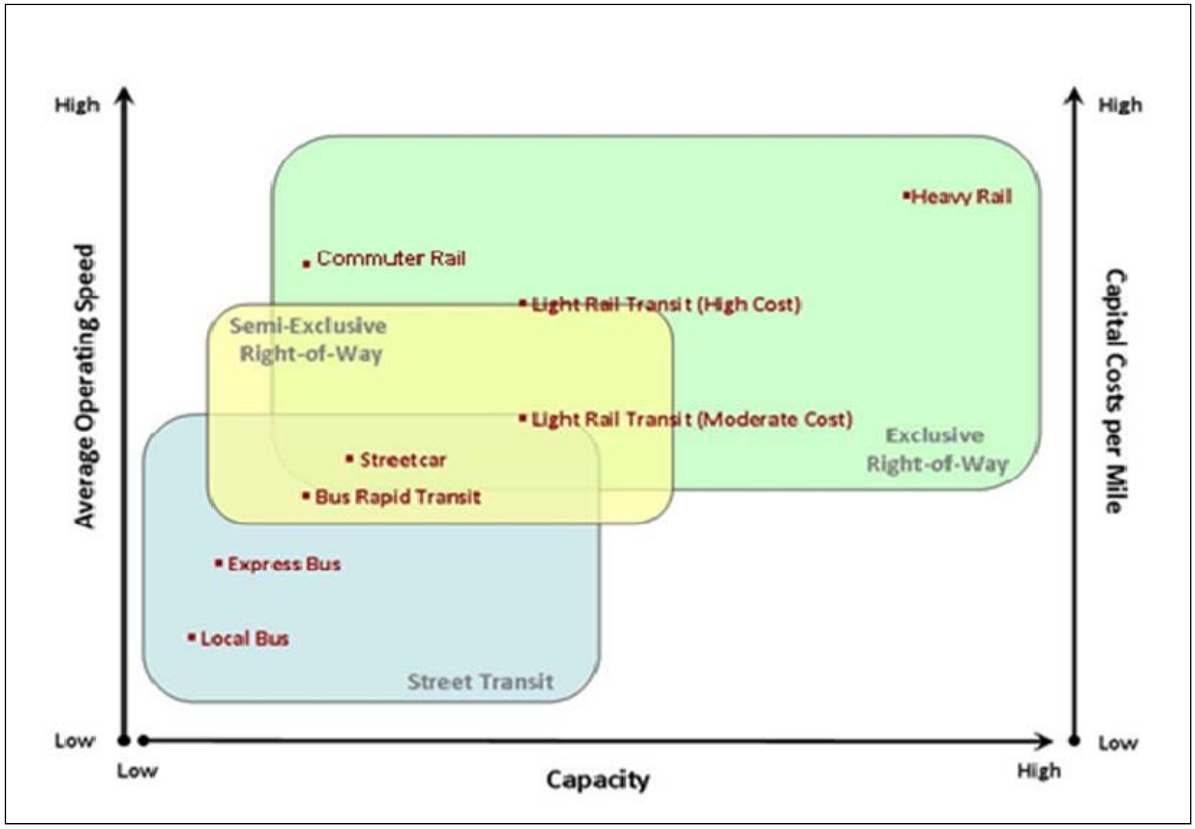

Figure 4-1: Characteristics of Transit Modes

Specific criteria used to screen the technologies/modes include technology service type, vehicle operations, technology design standards and regulations, order-of-magnitude operating and maintenance costs and order-of-magnitude construction costs. Each of these criteria is defined below.

Technology service type is based on the implementation and utilization of the technology in other transit systems and includes the following factors:

- Average right-of-way needs / typical footprint
- Typical spacing between stations
- Typical length of service

This criterion gauges the "fit" between the technology and the physical environment in the Northwest Atlanta corridor

Vehicle operations addresses the following factors:

- Proven technology
- Ability to operate within existing travel lanes
- Typical power source to operate the technology

- Service type
- Typical peak service frequency
- Average operating speed

Technology design standards and regulations refer to compatibility with the standard design criteria established for each transit technology, as well as regulations set forth by the federal governing agency, most notably Federal Transit Administration (FTA).

Order-of-magnitude operating and maintenance costs are based on current and past annual operations and maintenance costs derived from FTA's database.

Order-of-magnitude construction costs examine the average cost per mile to construct the mode, based on current and past costs for the specific transit technology.

Table 4-1: Results of the Technology Screening displays the results of the technology screening against the five criteria identified above. As shown, four modes – monorail, commuter rail, heavy rail and maglev (both urban and regional) – are eliminated from further consideration because of their inability to operate in existing travel lanes; the lack of existing US experience was another factor that weighed against Maglev. Streetcar is also eliminated because, in comparison to other modes, it does not effectively serve the travel distances in the corridor. Three technologies – Express Bus, BRT, and LRT – are advanced for further in consideration in the definition of alternatives.

Table 4-1: Results of the Technology Screening

Technology	Service Needs			Operations						Design Standards / Regulations	Capital Costs per Mile	Annual Operating & Maintenance Costs	Tier II Further Review
	Average ROW / Typical Footprint Needs	Station Spacing	Average Length of Service	Proven Technology	Ability to Operate in Travel Lanes	Power Source	Peak Service	Service Type	Average Operating Speed				
Express Bus	8 – 14 ft	Limited Stops Along Normal Bus Routes	5 – 30 miles	Yes – Phoenix, Miami, Los Angeles, Seattle	Yes – mixed traffic with signal improvements / queue jump lanes	Diesel / Diesel/hybrid	10 – 20 min	Urban / Regional Circulator	20 – 40 mph	Adheres to FTA regulations	$1 - $2 million	$4 - $10 million	Yes
BRT	12 – 32 ft	.25 – 2 miles	5 – 30 miles	Yes – Boston, Cleveland, Eugene, Pittsburgh	Yes – dedicated ROW, HOV or mixed traffic	Diesel / Diesel/hybrid	3 – 20 min	Urban / Regional Circulator	20 – 40 mph	Adheres to FTA regulations	$4 - $50 million	$4 - $29 million	Yes
Streetcar	5 – 20 ft	.25 miles	5 – 15 miles	Yes – Memphis, Tampa, New Orleans, Portland, San Francisco	Yes – mixed traffic	Overhead Electric Source (Catenary)	8 – 15 min	Urban Circulator	8 – 12 mph	Adheres to FTA regulations	$2- $25 million	$4 - $6 million	No
Monorail	10 – 24 ft	.25 – 1 mile	2.5 – 15 miles	Yes – Las Vegas, Orlando, Newark, Seattle	No – grade separated fixed guideway	Electric Third Rail	5 – 10 min	Urban Circulator	10 – 35 mph	Adheres to FTA regulations	$30- $100 million	$4- $15 million	No
LRT	10 -32 ft	.25 – 2 miles	10 – 30 miles	Yes – Denver, Minneapolis, Dallas, Houston	Yes – along side of travel lanes & in-street running	Overhead Electric Source (Catenary)	5 – 30 min	Urban / Regional	20 -60 mph	Adheres to FTA regulations	$40- $120 million	$13- $33 million	Yes
Commuter Rail	24 -48 ft	2 – 5 miles	30 – 125 miles	Yes – New York, Albuquerque, Dallas/Fort Worth, Nashville	No – operates within railroad ROW	Electric or Diesel	20 -30 min	Regional / Interurban	30 -60 mph	Adheres to FTA regulations	$3- $125 million	$3- $30 million	No
Heavy Rail	24 – 48 ft	1 – 5 miles	10 – 125 miles	Yes – Washington, San Francisco, New York, Atlanta, Boston	No – operates within railroad ROW	Electric Third Rail	5 – 10 min	Urban / Regional	30 -80 mph	Adheres to FTA regulations	$100- $250 million	$15- $28million	No
Urban Maglev	10 – 24 ft	1 – 10 miles	150 – 500 miles	No – no US Cities currently operate a system	No – grade separated fixed guideway	Electrically Charged Magnets	N/A	Regional	30 -80 mph	Adheres to FRA regulations	$75- $200 million (based on manufactures costs)	N/A	No
Regional Maglev	10 – 24 ft	15 – 20 miles	150 – 500	No – no US Cities currently operate a system	No – grade separated fixed guideway	Electrically Charged Magnets	N/A	Regional	200 -300 mph	Adheres to FRA regulations	$75- $200 million (based on manufactures costs)	N/A	No

4.3 Identification of Alignments

The second key component of an alternative is the alignment – the route that the transit mode will follow to serve markets throughout the Northwest Atlanta corridor. As described in Section 2.2, previous studies in the corridor served as the basis for identifying the initial set of potential alignments. The initial alignment options as shown in Figure 4-2: Alignments for Initial Assessment are as follows:

- I-75 – I-75 is an Interstate Highway which carries over 280,000 vehicles per day at its busiest point in the study area, just north of Windy Hill Road. The limited number of Chattahoochee River crossings east of I-75 has increased the use of this corridor for north-south regional traffic movements. I-75 has nine exits north of I-285 in Cobb County.

- US 41 – US 41 is a principal arterial road with four to six through lanes. It connects the Cumberland Community Improvement District (CID), City of Smyrna, Southern Polytechnic University, Dobbins Air Reserve Base, City of Marietta, City of Kennesaw, and City of Acworth. The Town Center CID and Kennesaw State University are accessible via Barrett Parkway and McCollum Parkway, connecting roads that also provide access to I-75. Daily traffic volumes along the corridor vary from 29,000 to 40,000 vehicles per day (vpd), with most volumes being in the mid 30,000s per day.

- I-285, Atlanta Road, and Chattahoochee Avenue – As part of the City of Atlanta's "Connect Atlanta" Comprehensive Transportation Plan, this alignment was defined as a potential connection between Atlanta's Central Business District and Cobb County. Although a feasibility study has yet to be performed, the conceptual alignment (described north to south) envisioned utilizing existing I-285 rights-of-way, connecting the Cumberland area to Atlanta Road. The alignment south of this area has a number of potential routes including Chattahoochee Avenue, Marietta Boulevard, Marietta Street, West Marietta Street, Howell Mill Road, Northside Drive, 17th Street or North Avenue. This area within the City of Atlanta is characterized primarily by industrial and commercial land uses with generally low daily vehicular volumes.

- CSX railroad corridor – The CSX railroad corridor is approximately a 31 mile corridor that weaves through Acworth, Kennesaw, and Marietta as it heads south into Fulton County and the City of Atlanta. The corridor is mostly a two-track alignment, with a small section of single track. In the future, CSX is likely to double track the single track portions of the line between the Chattahoochee River and Smyrna through Vinings. Spur tracks that serve Dobbins Air Reserve Base and various local industries are located along the rail way, as well as siding tracks. The corridor also traverses through a Norfolk Southern yard (Inman Yard) and a CSX rail yard (Tilford Yard), as well as through Howell Junction which is a major freight rail bottleneck. On average, 70 trains operate along the CSX corridor per day.

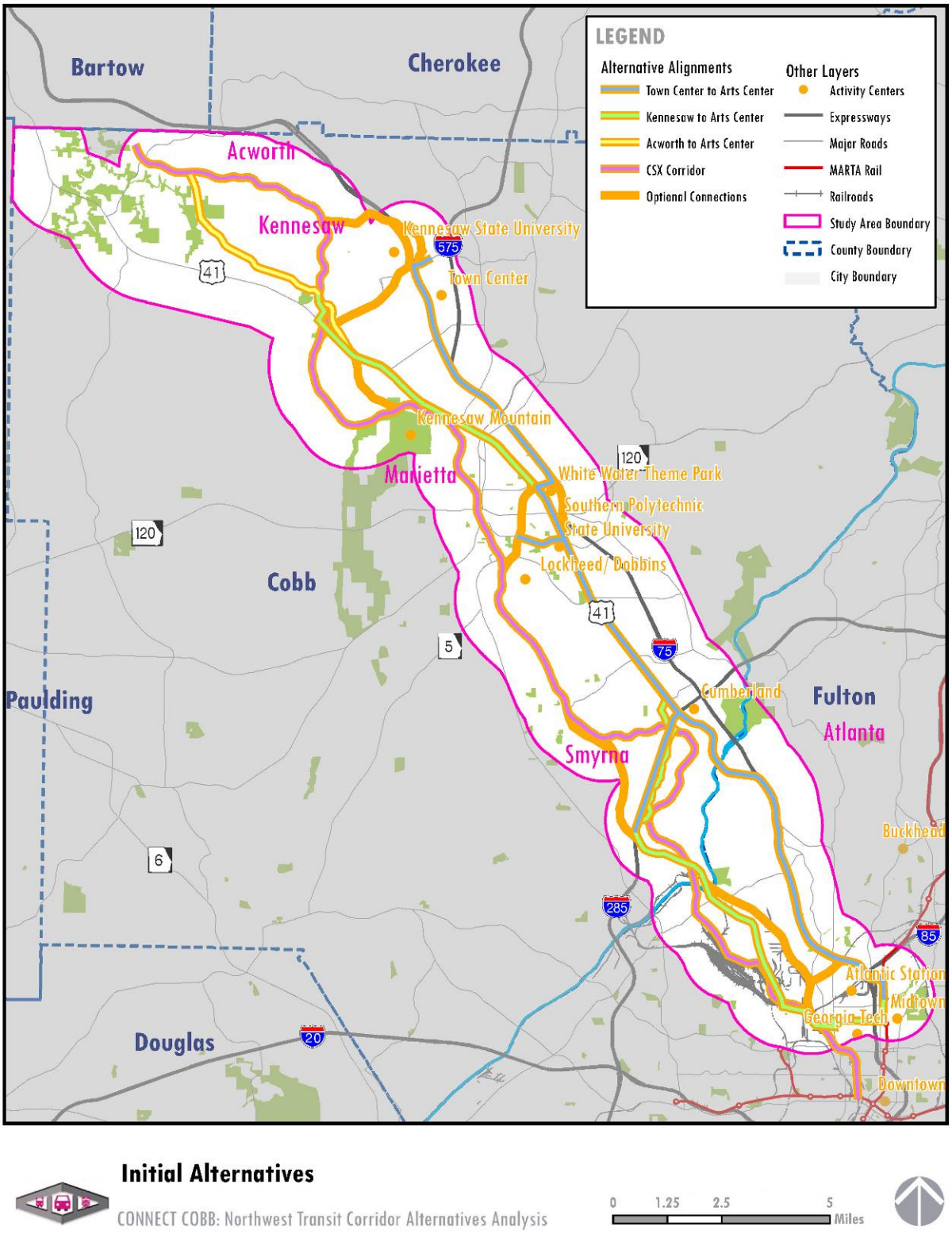

Figure 4-2: Alignments for Initial Assessment

4.4 Initial Alignment Screening

The four alignments are screened in terms of five major factors and subfactors:

1. CSX Railroad Operations – This factor is important because the existing CSX facility is an active freight corridor and any proposed passenger service will be sharing the tracks with freight trains. It should be noted that this factor only applies to the CSX alignment; no other alignment under consideration will impact CSX railroad operations. Operational issues include the following:
    - Existing number of freight trains per day/ trip reliability
    - Number of tracks/ spur lines/ sidings
    - FRA safety procedures/ design standards
2. Operations and speeds – This factor considers any operational constraints as well as the average speed of operations that could be achieved:
    - Speed operation/ constraints/ opportunities
    - Required operations and insurance agreements
3. Right-of-way – This factor estimates the amount of right-of-way required to implement fixed guideway transit along each corridor.
4. Environmental factors – This set of environmental subfactors considers the likely impact on each. The focus is on the following sensitive corridor resources, that are protected by both state and federal regulations:
    - Cultural resources
    - Historic sites
    - Water resources
    - Low income populations
    - Hazardous sites
5. Development and redevelopment opportunities – One of the key goals of a fixed guideway transit investment in the corridor is to help support continued economic development For the initial alignment screening, this assessment includes:
    - Service to activity centers
    - Support of future zoning/land use policies
    - Potential for catalyzing economic development

Each alignment was assessed according to these five factors. Results are presented below.

4.4.1 CSX Railroad Operations

As noted above, this evaluation factor applies only to the CSX alignment. Key findings relative to this factor include the following:

- The CSX rail corridor does not serve the MARTA Arts Center directly. This would require another means of providing connections to MARTA service.

CSX typically has reservations regarding sharing tracks with both freight rail and passenger rail service, especially if the technology is not commuter rail. Due to Federal Railroad Administration safety regulations, vehicles sharing the freight tracks must be FRA vehicle compliant. Technologies other than commuter rail vehicles are typically not FRA compliant. However, as described in Section 4.2, commuter rail is not an appropriate transit mode to serve the markets in the Northwest Atlanta corridor. Otherwise, FRA requires a minimum of 25 feet between freight tracks and a separate transit vehicle, and CSX has historically preferred a 25 foot separation as well. The requirement of off-setting a transit technology from the freight tracks would require additional right-of-way along the corridor, and where the rail corridor traverses through Marietta with a 66 foot right-of-way, extensive right-of-way acquisition, relocations and displacements would more than likely be required.

It is also unclear from a legal perspective whether the state would in fact have any leverage in negotiating with CSX to allow passenger service in the corridor. If negotiations were successful, CSX also requires the transit operator to enter into an operations agreement, which would specify detailed operations procedures, operating speeds for passenger trains (CSX maximum speeds in Cobb County are slower than desirable for passenger rail service), financial operations contributions, design requirements, and safety measures. Operations of a passenger rail service would be required through the local transit provider or regional transit provider, not through Amtrak. Amtrak is solely an intra-urban passenger rail service.

Based on this qualitative assessment, the CSX corridor would appear to present operations constraints and require successful negotiations with CSX. This is mainly due to the requirement of freight trains and other transit technology vehicles operating on the existing freight tracks, especially due to the high number of daily trains.

4.4.2 Operations and Speeds

Normal operations for transit technologies within a median dedicated alignment, dedicated curb-running alignment, or in-street running require the transit technology to operate at the same speed restrictions that the general purpose vehicles operate at and that are posted for those roadways. The dedicated alignments would provide some form of barrier, such as a fence (not a Jersey barrier or crash walls) separating transit and general purpose vehicles. Key findings by alignment option are as follows:

- I-75 Corridor – This corridor would operate within I-75 on separate dedicated transit lanes and operate at the existing posted speed of 55 mph within Fulton County and 65 mph within Cobb County.

- US 41 Corridor – This corridor would operate within US 41 on separate dedicated transit lanes and operate within the existing posted speeds. Posted speeds along US 41 vary from 45 mph (Fulton County line to Bells Ferry Rd) to 55 mph (Bells Ferry to Barrett Parkway), back to 45 mph (Barrett Parkway to Jiles Road/Pine Mountain Road) and then to 55 mph (Jiles Road to Bartow County line).

- I-285/Atlanta Road/Chattahoochee Ave – This corridor would operate within Atlanta Road, Chattahoochee Avenue, and Howell Mill Road on separate dedicated transit lanes and operate within the existing posted speeds. Posted speeds along Atlanta Road are 45 mph, Chattahoochee Avenue is posted 40 mph (Atlanta Road to Defoor Circle Way) and 25mph

(Defoor Circle Way to Howell Mill Road), and Howell Mill Road is posted 25mph (Chattahoochee Avenue to Atone Street) and 35mph (Atone Street to 14th Street).

- CSX Rail Corridor – Since this alignment does not operate in an existing roadway, the transit operations would occur independently of the roadway, except at at-grade crossings. CSX would require an operations agreement to cross over any existing freight railroad tracks at-grade or grade separated. Those types of agreements typically cost millions of dollars.

Based on the qualitative assessment, the CSX corridor could potentially be a costly corridor due to the required agreements with CSX. The I-285/Atlanta Road/Chattahoochee Ave corridor would potentially increase the travel time of the transit system due to the limited travel speeds the system could operate. The I-285/Atlanta Road/Chattahoochee Avenue corridor could also be problematic since the existing roadway speeds are less than what is posted along I-75 and US 41. I-75 and US 41 would provide a higher operating speed for the transit technology, thus reducing the travel times for the rider.

4.4.3 RIGHT-OF-WAY

This factor considers how much right of way would be required, if any, to construct the premium transit service along each of the four alignment options.

- I-75 Corridor – The I-75 Corridor is a highly urbanized corridor that centers around the highway facility. As such, the existing right-of-way is extremely wide, ranging from 250 feet in Fulton County up to 865 feet near Woodstock Road in Cobb County. The factors in the different widths are due to the number of travel lanes and ramp configurations.

- US 41 Corridor – As a parallel facility to I-75, this corridor is also a highly urbanized corridor that is characterized by mixed use development, commercial development, retail development, and other auto-oriented development. The right-of-way varies from 300 feet near Loring Road to 155 feet near Roswell Road. The range of different widths is due to the number of travel lanes, utilities, and development patterns.

- I-285/Atlanta Road/Chattahoochee Ave - As a western parallel facility to I-75, this corridor is a highly urbanized corridor that is characterized by industrial, residential, commercial, and small scale retail development. Right-of-way widths along I-285 are approximately 300 feet. The right-of-way along Atlanta Road averages 90 feet between I-285 and the CSX Rail corridor. Between CSX and Bolton Road, the right-of-way ranges from 125 feet to 200 feet. South of Bolton Road to Chattahoochee Avenue, the right-of-way ranges from 130 feet to 100 feet. Along Chattahoochee Avenue, the right-of-way ranges from 60 feet to 100 feet. Howell Mill Road has limited right-of-way, especially between the railroad corridor and 17th Street, where the roadway splits the Atlanta City Water Works Reservoirs. In addition, there are specific intersections that prevent wide curve radii for transit vehicles to traverse through, such as Howell Mill Road/ 17th Street and Chattahoochee Avenue/Howell Mill Road. Throughout this corridor, development is located right up to the right-of-way limits. In addition, the factors in the different widths are due to the number of travel lanes, utilities, and development patterns. This corridor, outside of I-285, provides limited existing travel lanes and a lack of ability to widen or increase the travel lanes for future improvements.

- CSX Rail Corridor – Unlike the other corridors, the CSX corridor was built on a ridge line in order to accommodate the grade and turn characteristics necessary for rail to operate. The existing right-of-way varies along the 31 mile corridor between Acworth and the MARTA CNN/Georgia

Dome Station. At its most narrow the width is 50 feet wide and at its maximum width it is 135 feet. Where the right-of-way is the widest, double tracks are prevalent. The tracks are normally centered within the right-of-way. Development has continued to build up to the edge of the railroad right-of-way, prohibiting the ability to widen the existing right-of-way limits without severe displacements and acquisitions. Given the fact that the use of this corridor for transportation purposes is much more freight related, there are numerous siding tracks and spur tracks leading to industrial sites, thus requiring additional switches and crossovers for both freight and transit vehicles to navigate through.

Based on the qualitative assessment, the I-285/Atlanta Road/Chattahoochee Ave corridor and CSX corridors would appear to present right-of-way constraints and design constraints, along with the requirement for new right-of-way for whichever transit technology is chosen. US 41 could present some minor right-of-way impacts at intersections in order to account for potential widening for dedicated transit lanes. The existing right-of-way along I-75 is sufficient enough to accommodate a dedicated transit lane; however, there might be the need for minimal right-of-way depending on the alignment location for both the I-75 managed lanes project and dedicated transit lanes.

4.4.4 ENVIRONMENTAL

Major findings related to sensitive environmental resources are summarized for each alignment option:

- I-75 Corridor – Given the highly urbanized character of the I-75 corridor, the potential to impact community facilities including churches, parks, and cemeteries is limited. The Chattahoochee River and associated tributaries are the primary water features along this corridor. Minority populations in this corridor are generally located between Marietta and the Cumberland area. Known contamination hazard sites are localized in the northern portion of Marietta, and are much less numerous along the remainder of the corridor.

- US 41 Corridor – US 41 closely parallels I-75 and is therefore similar in its potential to impact natural features. This is particularly true for water resources, as both corridors cross the same water bodies. Unlike I-75, US 41 is not an access controlled facility, and therefore exhibits a higher number of community facilities, such as churches and cemeteries, along its length. This is particularly true in the Kennesaw area, where US 41 traverses the older portion of the city. The corridor has similar concentrations of environmental justice populations and hazardous sites as the I-75 corridor.

- I-285/Atlanta Road/Chattahoochee Avenue - This corridor follows an interstate facility and then traverses an area characterized by a high number of industrial uses along Atlanta Road and Chattahoochee Avenue into Midtown Atlanta. As such, the potential to impact natural and community resources is somewhat less than for the I-75 corridor, which traverses primarily residential areas through Fulton County into Atlanta. Similar to the I-75 corridor, this connection requires a crossing over the Chattahoochee River. The most significant environmental consideration is the proliferation of hazardous material sites along the Chattahoochee Avenue portion of the corridor that could require significant mitigation. In addition, there are higher concentrations of minority and low-income populations in comparison to the I-75 corridor.

- CSX Rail Corridor – Unlike the I-75 and US 41 corridors, the CSX corridor was built on a ridge line in order to accommodate the grade and turn characteristics necessary for freight rail to operate. As a historic transportation corridor, it also connects town centers within the study area. Many of these early communities were first developed along the rail line. Given this early

development pattern, there are many more community facilities and historic sites – particularly in Marietta – along the rail line than there are in the other three corridors. Having been built generally along a ridge line, there are fewer water features along the corridor than either the I-75 or US 41 corridors. The Fulton County portions of this corridor are highly industrial, and contain a concentration of known hazardous materials sites. The Fulton County portion of the corridor is also characterized by higher concentrations of both minority and low-income populations than other parts of the study area.

Based on the qualitative assessment, the CSX corridor would appear to present the most significant obstacles of the four corridors from an environmental perspective. This corridor exhibits higher potential impacts to historic sites, community facilities, industrialized sites, and low income and minority populations than the other three corridors. In respect to natural features, avoidance of natural features may be easiest along the CSX Corridor. However, avoidance and mitigation techniques along the US 41 and I-75 corridors appear manageable at this stage of analysis.

There is a slightly higher potential for cultural impacts along US 41 than I-75 due largely to the access and land uses around the facility. In addition, the US 41 and I-75 corridors have similar natural features constraints and potential impacts. The I-285/Atlanta Road/Chattahoochee Avenue alignment would rate less favorably than the I-75 or US 41 alignments due to the presence of a high number of hazardous material sites along Chattahoochee Avenue.

4.4.5 Development and Redevelopment Opportunities

This factor considers how transit investment along each alignment supports existing development and future redevelopment opportunities in the corridor.

- I-75 – A transit investment along the I-75 corridor would provide direct connections between both existing and future destinations, integrating directly with Atlantic Station, Midtown Atlanta, and the Arts Center MARTA Station - all of which include existing mid to high-density development. I-75 passes immediately beside destinations such as high-density offices near Cumberland Mall, the Cobb Energy Center, Town Center Mall, and Kennesaw State University. Transit could also serve to spark redevelopment of aging commercial uses around Roswell Road, Canton Road, Barrett Parkway, and Chastain Road. I-75 between Cumberland Mall and Midtown Atlanta is challenged from an economic development point of view due to small amounts of developable land and high property costs.

- US 41 Corridor – Transit along US 41 would serve to connect existing destinations as well as spur future transit-oriented development. The corridor runs directly adjacent to existing centers such as Cumberland Galleria, Cumberland Mall, Windy Hill Shopping Center, Southern Polytechnic State University, White Water Theme Park, and WellStar Kennestone Hospital as well as several smaller retail destinations in Acworth and Kennesaw. Transit in this corridor could be a catalyst for redevelopment of aging commercial greyfield sites, including areas between I-285 and Delk Road around the intersection of Roswell Road and aging industrial parcels around Canton Road in Kennesaw.

- I-285/Atlanta Road/Chattahoochee Ave– The character of this alignment is predominantly industrial (including Georgia Power's Plant Atkinson, the Cobb Water Reclamation Facility, and the Bolton Road Landfill) and commercial warehousing that are mostly auto-oriented with few pedestrian amenities such as sidewalks and ADA facilities. From a land use point of view, the major disadvantage to this alignment is that it passes only a small number of major existing

destinations in the approximately 7-8 miles between Cumberland and Howell Mill Road (one exception being the Home Depot headquarters at I-285/Paces Ferry). A slight advantage to a transit investment along this alignment could be to spur new economic development and destinations around new station locations. Another slight advantage to this alignment could be that right-of-way acquisition would be less expensive (compared to US 41 and I-75) due to lower property values and lower market demand.

- CSX Rail Corridor – Although the transit alignment along the existing CSX corridor would have the advantage of connecting through the historic downtowns of Acworth and Marietta, its alignment as a whole misses the majority of the key employment, retail and educational destinations in northwest Atlanta. It would not connect to the Arts Center MARTA Station, misses the heart of Cumberland, and is well over a mile from both Kennesaw State and Southern Polytechnic State Universities. The CSX corridor is also constrained from a future economic development point of view because it abuts single-family land uses for the majority of its length and has very little adjacent land available to support new transit-oriented development and/or large-scale commuter parking lots/structures.

Based on this assessment, the CSX Rail alignment is the most challenged of the four initial alignment options from a future land use and economic development point of view. In addition, the I-285/Atlanta Road/Chattahoochee Ave alignment provides a challenging constraint for future economic development and revising the land use patterns due to the heavy emphasis on industrial uses.

Although the I-285/Atlanta Road alignment does exhibit minor potential economic advantages, the large amount of industrial land existing today suggests that the character of this alignment is not likely to change in the coming decades and that market demand for such change is very limited, even with the addition of a transit investment.

As noted above, these two alignments within both Cobb and Fulton counties are less desirable than the other two options. They present significant obstacles in terms of access to existing destinations and they offer only a limited amount of land available for future transit-oriented development.

The CSX corridor contains obstacles and challenges for implementing a transit service due to the various factors that were analyzed. With demanding rail operation regulations and agreement requirements, limited right-of-way, numerous environmental constraints, and limited potential for redevelopment and transit-oriented development opportunities, this corridor would be the most complicated of the corridors under consideration to implement transit service.

The corridor along I-285/Atlanta Road/Chattahoochee Avenue also contains obstacles and challenges from a right-of-way perspective due to the land uses along these roadway corridors and design constraints. In addition, utilizing the existing roadway network could hamper traffic operations due to the limited travel lanes to accommodate a fixed guideway transit service and lower posted travel speeds. Development constraints and the lack of destinations also present challenges.

4.4.6 Summary of Initial Alignment Screening

Table 4-2: Results of Initial Alignment Screening summarizes the results of the initial alignment screening. Based on that screening, the I-285/Atlanta Road/Chattahoochee Avenue and CSX corridor alignments are eliminated from further consideration, and the US 41 and I-75 alignments are advanced for more detailed screening.

Table 4-2: Results of Initial Alignment Screening

Alignment	CSX Railroad Operations			Operations and Speed		Right-of-Way	Environmental Factors					Development & Redevelopment Opportunities			Recommended for Study
	Existing Number of Freight trains per Day	Number of Tacks / Spur Lines / Sidings	FRA Safety Procedures / Design Standards	Speed Operation / Constraints / Opportunities	Required Operations & Insurance Agreements		Cultural Resources	Historic Sites	Water Resources	Low Income / Minority Population	Hazardous Material Sites	Service to Existing Activity Centers	Supports Future Zoning / Land Use Polices	Potential for Catalyzing Economic Development	
CSX	70	2 / 4 /4	25 ft Offset for non FRA Compliant Vehicle. Must Reach Operating Agreement	Speed is alignment-driven. Must comply with posted speed limits when crossing at-grade roadways	Requires Operating agreement for crossing freight tracks	50 to 135 ft	High	High	Low	High	High	Low – Doesn't serve universities and CID areas	Low – abuts single-family for majority of area which is not likely to change	Low – limited land availability and topo constraints	No
US-41	N/A	N/A	N/A	45 to 55 mph	N/A	300 to 155 ft	Medium	Medium	Low	Medium	Medium	Medium - serves many existing activity centers	High - Supports future land use per Cobb Comp. Plan	High - large amount of aging strip retail	Yes
I-75	N/A	N/A	N/A	55 to 65 mph	N/A	250 to 865 ft	Medium	Low	Low	Low	Low	Medium - serves many existing activity centers	High - Supports future land use per Cobb Comp. Plan	Medium - large amount of greenfield areas, but not always in ideal locations	Yes
I-285 / Atlanta Rd / Chattahoochee Ave	N/A	N/A	N/A	25 to 40 mph	N/A	60 to 300 ft	Low	Low	High	High	High	Low - Doesn't serve many existing activity centers	Medium - supports some adopted City of Atlanta and Cobb plans	Medium - large industrial uses are constraints, but land inexpensive	No

4.5 Identification of Station Locations

The third key component of the alternatives is the location of stations. With heavy stakeholder and public input, the planning team identified a total of 34 potential station locations for consideration within the 22-mile study area (e.g., from Acworth to Midtown Atlanta).

Twenty of these stations are located along US 41, including: SR 92, Mars Hill Road, Acworth-Due West, Jim Owens/Blue Springs Road, Pine Mountain/Jiles Road, Chastain Road, Roberts Road, Barrett Parkway/Ridenour, White Circle, Bells Ferry Road, Canton Road, Allgood Road, N. Loop/White Water, Roswell Road/Big Chicken, Life College/S. Loop, Delk Rd./Dobbins, Dobbins Gate, Windy Hill Road, Cumberland North (Windy Ridge), and Cumberland South (Akers Mill).

Fourteen of these stations are located along I-75, including: Cowan Road, KSU/Town Center, Bells Ferry Road Area, Roswell Road/Big Chicken, Franklin Road, Cumberland North (Windy Hill), Cumberland South (Akers Mill), Mt. Paran Road (High School), Northside/West Paces Ferry Road, Howell Mill Road, BeltLine, Atlantic Station and Arts Center MARTA.

These stations are reflected on Figure 4-3: Initial Transit Station Locations.

Potential station locations were determined based on balancing a number of factors including:

Existing Roadway Network: Stations should be located in places that provide relatively easy vehicular access, ideally from multiple locations. This is especially important for locations along the interstate that are likely to have a focus on commuters (e.g., riders will be driving to the station). Locations with major cross roads/intersections present the most obvious opportunities.

Ability to Incent Redevelopment: Locations that are near aging and/or underutilized properties, especially with respect to real estate market strengths. These locations present a unique opportunity to create economic development and new mixed-use developments.

Existing Destinations: There are numerous existing destinations that are highly likely to generate large volumes of ridership. This can include large employment centers (e.g., Cumberland, Atlantic Station, and Dobbins Air Reserve Base), institutions (e.g., Life College, KSU, etc.), shopping districts (e.g., Howell Mill, Barrett Parkway) and connections to other forms of transit (e.g., the BeltLine, CCT, etc).

Spacing: The spacing of potential stations is important in that it has a very large impact on the times of trips and, therefore, the desirability to potential riders. Closer spacing means more stations and access to more riders, but also means longer trip times for trips involving longer distances. In general, identified potential stations are spaced no closer than a half-mile and in several cases further apart (particularly along the I-75 alignment which is more likely targeted to commuters).

4.5.1 Station Timing/Phasing

There are multiple variations possible of the ultimate number and spacing of stations for the enhanced transit system. The final number and location of stations will be established following more detailed analysis. At this phase of alternatives definition, 34 potential stations was divided into three categories based on their perceived need and likelihood for coming to fruition.

Primary Stations: These potential station locations are highly likely in that they serve major destinations and/or have a high potential for ridership. This should be considered the minimum recommended amount of stations utilized and/or would be in the first phase of system development. This would represent a system of 11 (I-75 alignment) or 12 (US 41 alignment) stations.

Secondary Stations: These potential station locations generally provide access to secondary destinations with a moderate to high potential for ridership. While these station locations are desirable to create a fuller system, they are not absolutely required (at least from a land use and economic development standpoint). These locations could be included in the first phase of system development but could also be added at a later date as ridership matures. Using both Primary and Secondary stations would represent a system of 13 (I-75 alignment) to 20 (US 41 alignment) stations.

Tertiary Stations: These potential station locations provide good access and visibility but most likely do not have immediate needs from a ridership perspective. On the other hand, these station locations may have a high potential for longer term redevelopment (e.g., more available land) and eventual ridership and present an opportunity to someday build-out the system (e.g., adding in stations at a later date when warranted). Using Primary, Secondary and Tertiary stations would represent a robust system build-out of 14 (I-75 alignment) to 26 (US 41 alignment) stations.

4.5.2 Station Types

The needs of future riders will vary greatly depending upon station location and rider points of origination and destination. Some riders will use transit as a means of commuting long distances to employment centers throughout the region (i.e., along this corridor and throughout the MARTA rail footprint) and will be seeking transit stations with accommodations for commuter parking or new housing within walking distance. Other riders will be using transit to go very short distances for shopping, entertainment and/or commuting.

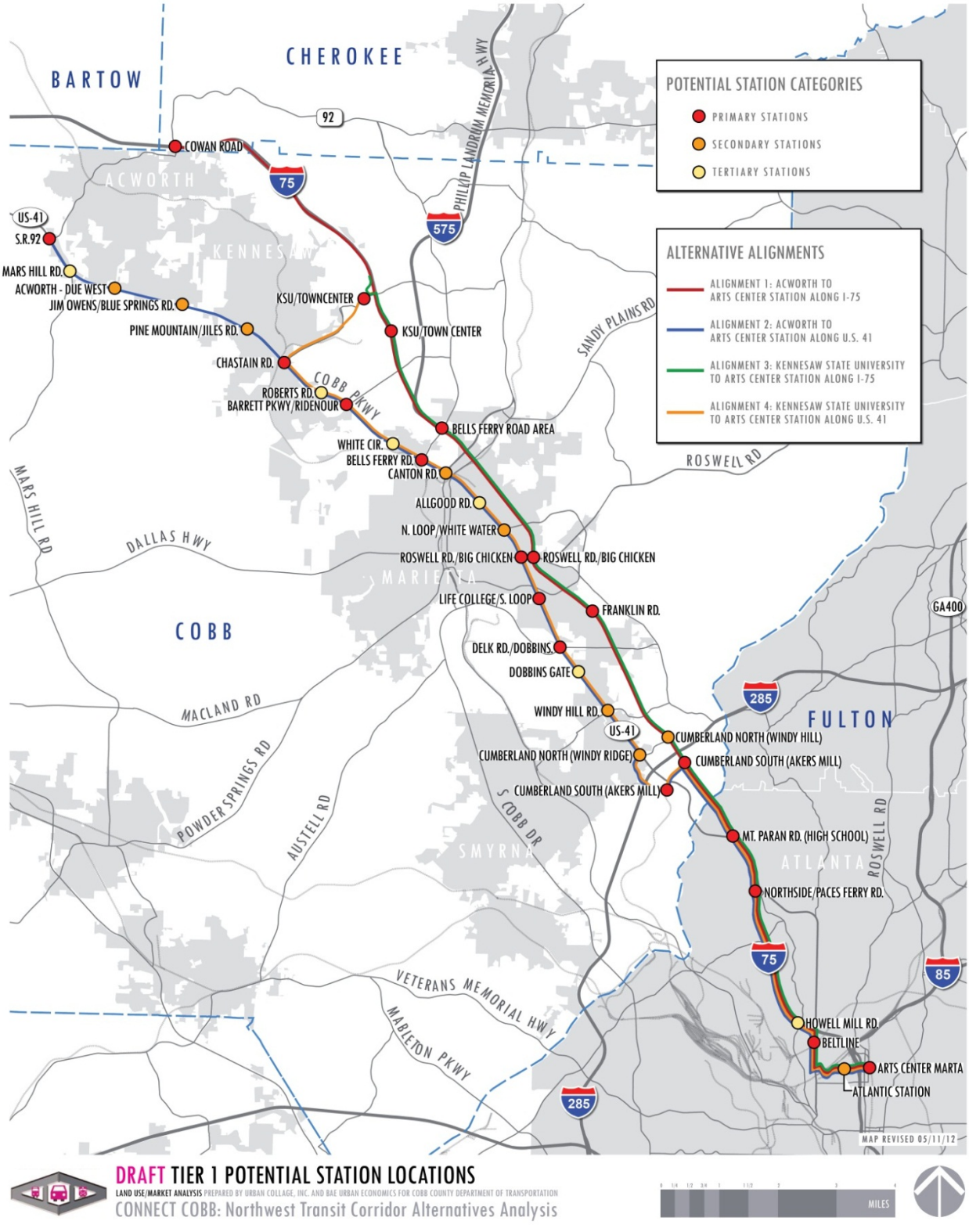

Figure 4-3: Initial Transit Station Locations

While each station should and could provide a level of "transit-oriented development" (e.g., walkable, a mix of uses, etc.) stations will vary depending upon context by levels of intensity, density of development, walkability and the number of anticipated parking spaces needed for commuters. In that light, it should be noted that no two stations will be exactly alike. Rather, they will fall within a continuum of typologies. To help understand this, Figure 4-4 depicts four types of stations (although there are variations in between).

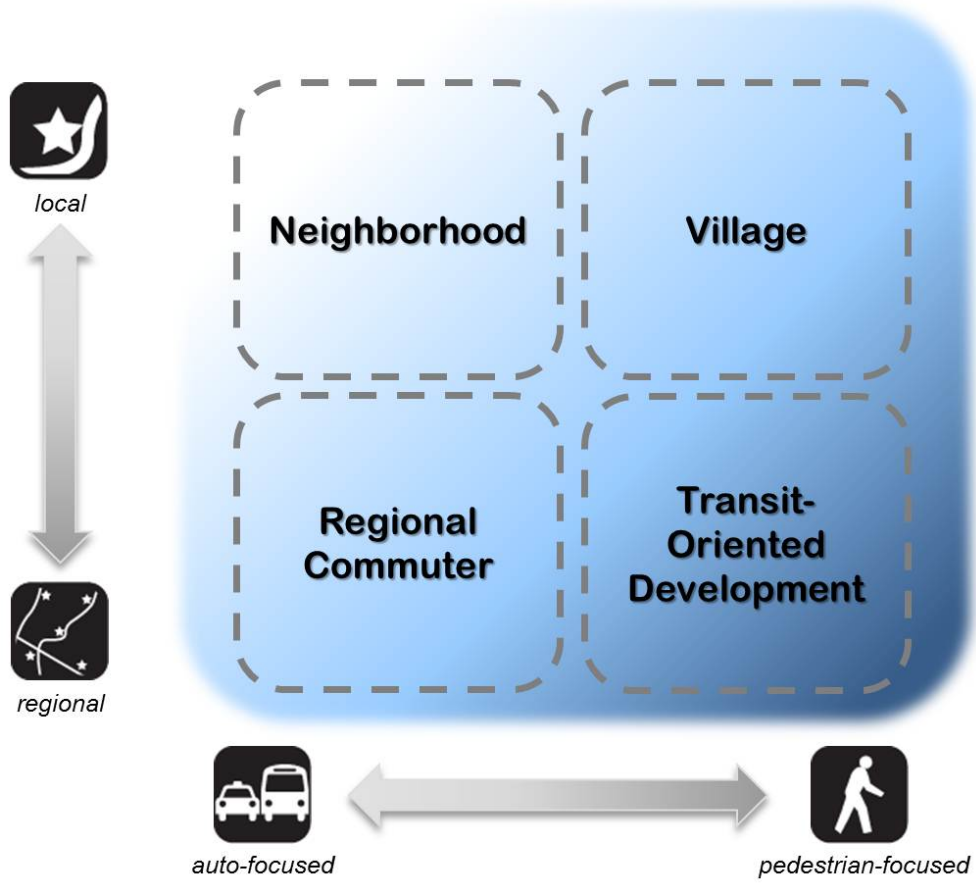

Figure 4-4: Transit Station Characteristics

Neighborhood Stations: These stations will be more local in nature and will tend to serve nearby lower density neighborhoods. In most cases they will not be a destination themselves but rather a portal for nearby residents to access the greater system. In this regard, the actual station design is likely to be simple and may be more focused on commuters and parking needs, albeit at a small scale. These stations would more likely be located on the US 41 corridor than along I-75. Examples of similar stations within the existing MARTA rail network include Inman Park/Reynoldstown and Oakland City.

Village Stations: These stations are also more "local" in nature and will tend to serve nearby neighborhoods and commercial districts. However, they will typically include a modest amount of mixed-

use development and will function as small to medium walkable activity nodes. The actual station design is likely to be simple and while there may be a small amount of parking for commuters, it will cater more towards pedestrian access. These stations would more likely be located on the US 41 corridor than along I-75. Examples of similar stations within the existing MARTA rail network include Decatur and Ashby.

Regional Commuter Stations: These stations will be more "regional" in nature and will tend to serve a broad audience of commuters (i.e., people who will drive to the station to be dropped off or park for the day). In this regard, the actual station design will be fairly large with a heavy focus on parking either in surface lots or decks. Typically, they will include very little associated mixed-use development and they will generally not be activity nodes. These stations would more likely be located on the I-75 corridor than along US 41. Examples of similar stations within the existing MARTA rail network include North Springs and Doraville.

Transit Oriented Development (TOD) Stations: These stations will be regional in nature and will serve high density destinations. TOD stations are very walkable and typically contain a diverse mix of uses including residential, retail, office and institutions. In this regard, the actual station design will be fairly complex and in some instances appear iconic. These stations would more likely be located on the US 41 corridor than along I-75, particularly in higher density environs such as Cumberland and Atlantic Station. Examples of similar stations within the existing MARTA rail network include Lindbergh Center and Buckhead.

In order to provide a measure for evaluating parking needs and impacts, all of the potential stations within the Northwest Corridor were assigned an estimated range of commuter parking spaces that may be required. These ranges are not intended to be a specific recommendation on a station-by-station basis (which would require a much greater level of study). Rather they are intended as an order of magnitude to compare across stations and ascertain which stations are more or less likely to serve commuter needs. See Appendix C for more information on commuter parking assumptions.

4.6 Preliminary Alternatives

The short list of technology/modes, alignment options, and station locations identified in the preceding sections were then assembled into conceptual alternatives. As will be discussed later, build alternatives will be compared to both a "No Build" option and to a "Transportation System Management" option in the Tier II evaluation. Those will be introduced later in this document. The preliminary build alternatives identified for study included the following:

1. Alternative 1-LRT: I-75 Corridor from Acworth to Midtown Atlanta
2. Alternative 1-BRT: I-75 Corridor from Acworth to Midtown Atlanta
3. Alternative 2A-LRT: US 41 Corridor from Acworth to Midtown Atlanta with more stations
4. Alternative 2A-BRT: US 41 Corridor from Acworth to Midtown Atlanta with more stations
5. Alternative 2B-LRT: US 41 Corridor from Acworth to Midtown Atlanta with fewer stations

6. Alternative 2B-BRT: US 41 Corridor from Acworth to Midtown Atlanta with fewer stations
7. Alternative 3-LRT: I-75 Corridor from KSU to Midtown Atlanta
8. Alternative 3-BRT: I-75 Corridor from KSU to Midtown Atlanta
9. Alternative 4A-LRT: US 41 Corridor from KSU to Midtown Atlanta with more stations
10. Alternative 4A-BRT: US 41 Corridor from KSU to Midtown Atlanta with more stations
11. Alternative 4B-LRT: US 41 Corridor from KSU to Midtown Atlanta with fewer stations
12. Alternative 4B-BRT: US 41 Corridor from KSU to Midtown Atlanta with fewer stations

Each of these Preliminary Alternatives is illustrated on Figure 4-5: Tier 1 Alternatives and described below.

4.6.1 Alternative 1-LRT and 1-BRT: I-75 Corridor from Acworth to Midtown Atlanta

This alternative will provide for LRT or BRT transit along the I-75 corridor from Acworth to Midtown Atlanta. This alignment would begin at I-75 and Cowan Road in Acworth and follow I-75 to Northside Drive in the City of Atlanta. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station.

Location along the I-75 corridor will allow operation that is separate from automobile traffic. The wider spacing between stations and location along I-75 will favor longer distance trips between major activity centers in Cobb County and Midtown Atlanta.

4.6.2 Alternative 2A-LRT and 2A-BRT: US 41 Corridor from Acworth to Midtown Atlanta (with more station locations)

This alternative will provide for LRT or BRT transit along the US 41 corridor from Acworth to Midtown Atlanta. The alignment of this alternative would begin at the northern intersection of SR 92 and US 41 in Acworth and extend south along US 41 to Cumberland Boulevard, and would then follow Cumberland Boulevard to the existing CCT transfer station. This alignment would continue along Cumberland Boulevard to Akers Mill Road, and would then follow Akers Mill Road to I-75. The alignment would continue south along I-75 to Northside Drive. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station.

Location along the US 41 corridor will include operation in the median that is separate from automobile traffic. Operation will be at-grade with grade separation of major intersections. The shorter spacing between stations will provide more frequent access. The location along US 41 will favor trips between activity centers and local destinations within Cobb County, as well as providing connection with few stops for travel between Cumberland CID and Midtown Atlanta. The at-grade transit system operations will use a signal priority option for extending main street green time while the transit vehicle passes. This will have minor impacts on the traffic signal system along US 41 and will require the transit vehicle to slow or stop in some instances when arriving at an intersection in the middle of the signal cycle.

4.6.3 Alternative 2B-LRT and 2B-BRT: US 41 Corridor from Acworth to Midtown Atlanta (with fewer station locations)

Like Alternative 2a, this alternative will provide for LRT or BRT transit along the US 41 corridor from Acworth to Midtown Atlanta but with fewer stations. The transit travel times will be reduced along with the level of local access.

4.6.4 Alternative 3-LRT and 3-BRT: I-75 Corridor from KSU to Midtown Atlanta

This alternative will provide for LRT or BRT transit along the I-75 corridor from KSU to Midtown Atlanta. This will operate the same as Alignment 1. The alignment would begin at I-75 and Frey Road near Kennesaw State University and follow I-75 to Northside Drive. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station.

4.6.5 Alternative 4A-LRT and 4B-BRT: US 41 Corridor from KSU to Midtown Atlanta (with more station locations)

This alternative will provide for LRT or BRT transit along the McCollum Parkway and US 41 corridors from KSU to Midtown Atlanta. It will operate the same as Alternative 2a.

The alignment would begin at Kennesaw State University and follow Chastain Road/McCollum Parkway to US 41 and extend south along US 41 to Cumberland Boulevard and then follow Cumberland Boulevard to the existing CCT transfer station. This alignment would continue along Cumberland Boulevard to Akers Mill Road, and would then follow Akers Mill Road to I-75. From I-75, it would continue to Northside Drive. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station.

4.6.6 Alternative 4B-LRT and 4B-BRT: US 41 Corridor from KSU to Midtown Atlanta (with fewer station locations)

This alternative will provide for LRT or BRT transit along the McCollum Parkway and US 41 corridors from KSU to Midtown Atlanta. It will operate the same as Alternative 2b.

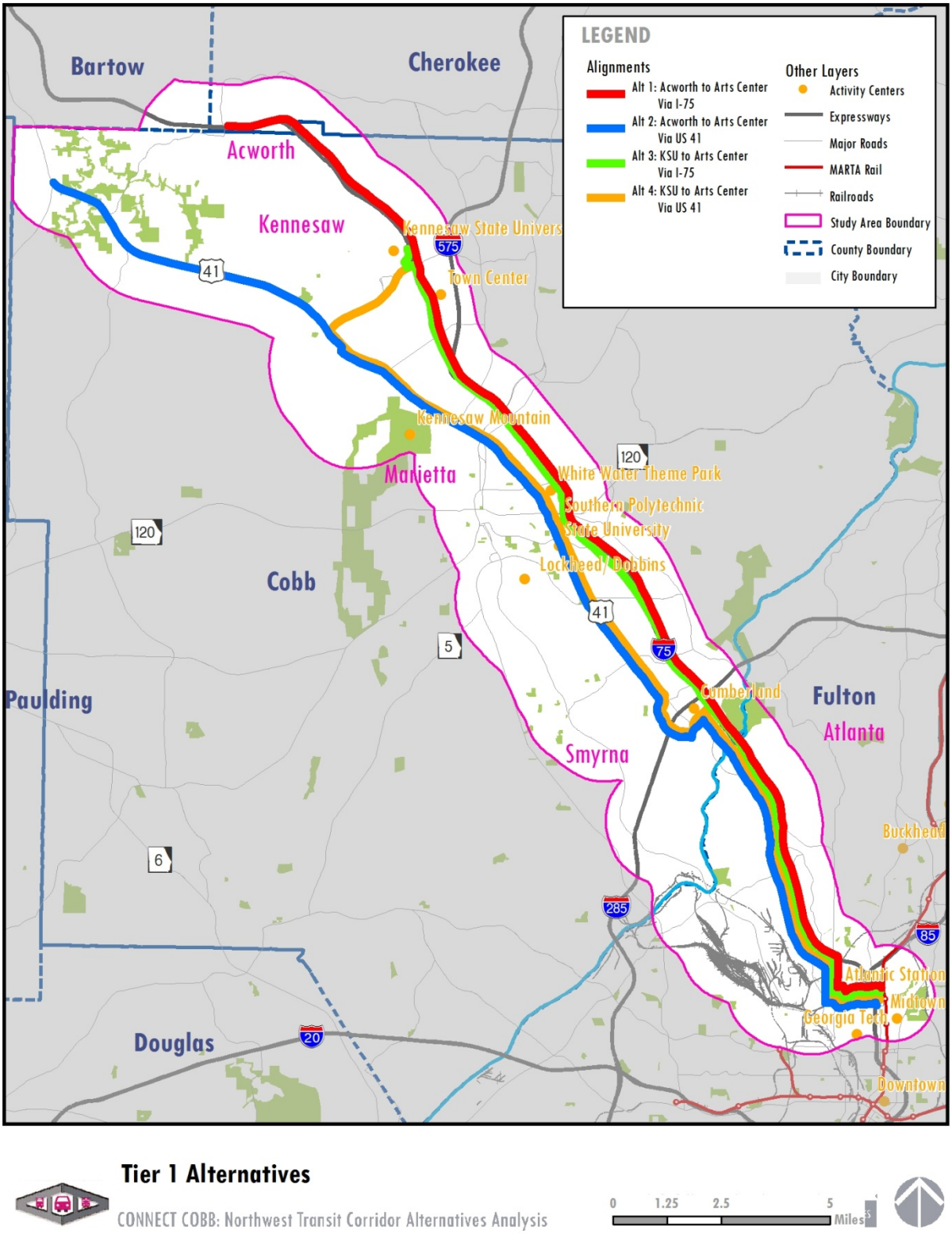

Figure 4-5: Tier 1 Alternatives

5. ANALYSIS

This section provides a comparative evaluation of the potential benefits, costs and impacts of the preliminary alternatives identified in Section 4. The alternatives are analyzed and then evaluated according to a two-tiered screening approach. As explained below, this approach evaluates all preliminary alternatives (Tier I), and then advances the most promising alternatives for more detailed analysis (Tier II). The alternative that then best satisfies the criteria of the goals and objectives was identified as the Locally Preferred Alternative.

Figure 5-1: Alternatives Analysis Two-Tiered Evaluation Process illustrates this two-tiered screening approach. As shown, the public was engaged throughout this screening process and was provided ample opportunities to review and provide input on how the alternatives were evaluated. Section 6 of this AA describes the public involvement process in more detail.

The following sections describe the results of each tier of analysis and screening, and how these alternatives were gradually narrowed based on their performance against key screening factors and metrics.

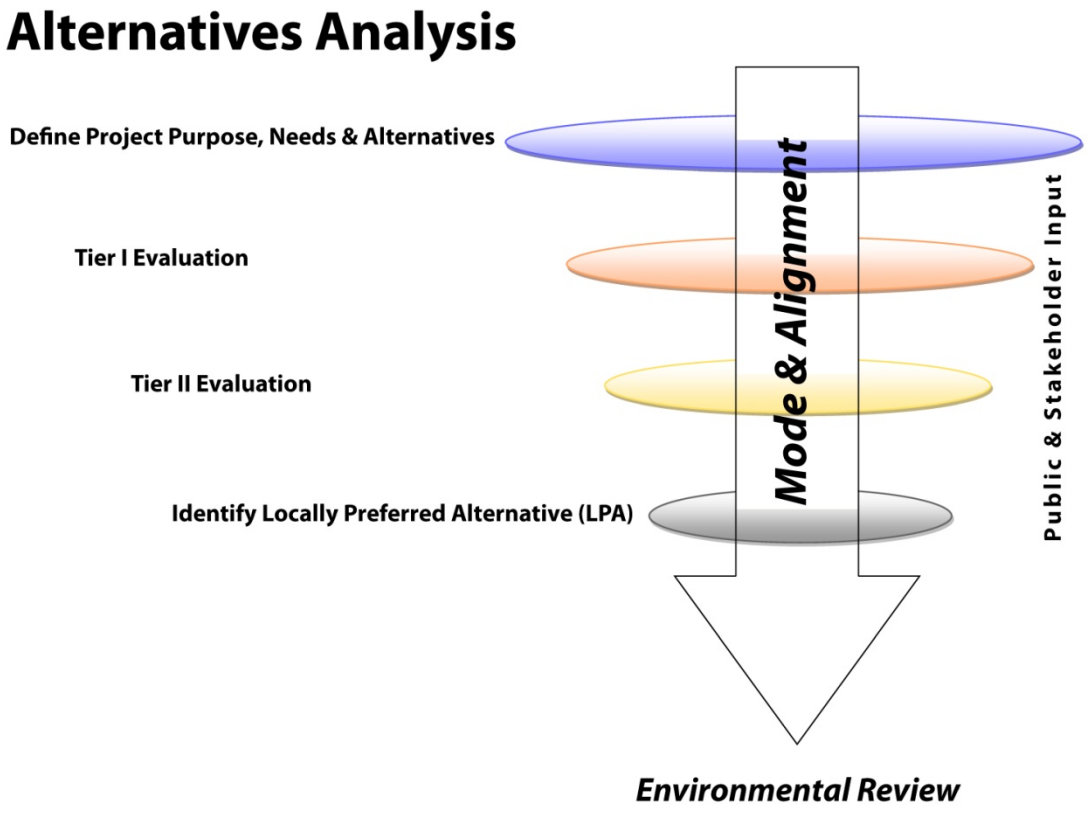

Figure 5-1: Alternatives Analysis Two-Tiered Evaluation Process

5.1 Evaluation Framework and Methodologies

The evaluation framework for this study was developed consistent with Federal Transit Administration (FTA) accepted practices. This Framework is generally consistent with similar studies conducted throughout the region, and relies on the use of existing, available data resources. The tools and techniques used in the analyses are described in the following sections.

The evaluation of transit alternatives included input from stakeholders and the general public as well as detailed technical analysis. Taken together, the input and the technical analysis were used to compare each alternative back to the Goals and Objectives identified early in the study process. This included creating measures that addressed each objective within the primary goals of transportation, land use, economic development/redevelopment, environment and air quality, and financial considerations.

During the development of the evaluation framework, there were several meetings in which the public and project stakeholders were given the opportunity to provide input into the goals, objectives, and performance measures:

- Stakeholder Kickoff Meeting held on November 15, 2011
- Stakeholder Transportation and Air Quality Roundtable plus Stakeholder Land Roundtable held on December 6, 2011
- Stakeholder Economic Development Roundtable plus Environmental Roundtable held on December 8, 2011,
- Stakeholder Financial Roundtable held on December 13, 2011

5.2 Performance Measures

As identified above, a significant effort was made through a series of meetings with the public and stakeholders to solicit their ideas, views, and input on defining the objectives within each of the primary goals for the alternatives analysis. During these meetings the citizen input was further solicited to assist in developing performances measures for each of the objectives. The following sections describe those performance measures that were used to analyze each of the alternatives as they progressed through the tiered evaluation.

5.2.1 Transportation Performance Measures

Travel and transportation performance measures were developed from detailed travel modeling. The latest available travel demand model for the Atlanta region as obtained from ARC was used to forecast ridership. For each build alternative, the transit concept was coded on top of the currently adopted long-range plan network and forecasts were developed for the 2040 planning horizon year. Travel performance measures were then calculated from the travel demand model for the corridor, study area, and region. A detailed description of the travel and ridership forecasting methodology and analysis is provided in Appendix B.

The metrics used for evaluating the alternatives are indicated below for each goal.

GOAL 1: Reduce Congestion/Improve Traffic Flow

Reducing corridor-wide traffic congestion throughout the Northwest Corridor will have a positive impact on both transit and non-transit users. The following measures are used for this goal:

- **Metric 1.1: Changes in Travel Patterns**: This is based on the transit mode split as determined by the travel demand model.

- **Metric 1.2: Increased Pedestrian and Bicycle Connectivity**: Alternatives with higher station frequency result in the potential to provide greater pedestrian and bicycle connectivity.

- **Metric 1.3: Reduction in Vehicle Miles of Travel**: The total distance traveled by vehicles using the Northwest Corridor. Reduction in this metric indicates less roadway use.

GOAL 2: PLAN FOR CURRENT AND FUTURE TRAVEL NEEDS

Providing systems to address future travel needs as well as current deficiencies will provide lasting value to the community. Future travel needs include the need to serve more people due to anticipated population growth. It also means providing transportation for a growing senior population and for those without the option for automobile travel. The following measures are used for this goal:

- **Metric 2.1: Increased Transit Capacity**: This measures the ability of the system to provide increased transit capacity.

- **Metric 2.2: Transit Walk Access Frequency**: This metric is considers the frequency of stops along with the density of land use near the stops locations.

- **Metric 2.3: Transit Access for Low-Income and Traditionally Underserved Users**: This metric is based on the location of the alignment and number of stops in relation to area identified as having concentrations of lower income and minority populations in the environmental analysis.

- **Metric 2.4: Flexibility**: This indicates the ability of the system to expand service and capacity in a cost effective manner. Systems with greater degrees of grade separation allow more flexibility to expand through reduced headways and longer vehicles.

GOAL 3: REDUCE TRAVEL DELAY

Reducing delay along the Northwest Corridor is a key improvement that is important for overall transportation objectives regardless of travel mode. The following measures are used for this goal:

- **Metric 3.1: Reduction in Vehicle Hours of Travel**: The total amount of travel time needed to satisfy trips along the Northwest Corridor. Reduction in this metric indicates less delay.

- **Metric 3.2: Reduction in Peak Period Corridor Travel Times**: This metric indicates the reduction in travel times during the peak travel periods as a composite of roadway and transit users.

GOAL 4: IMPROVE TRAVEL EFFICIENCY

Providing for efficient travel is a key to an effective transportation system. The Northwest Corridor's travel efficiency will be measured in terms of moving people, versus moving vehicles, as well as providing connections to major activity centers. This will reflect the ability of transit to promote efficient movement through use of higher occupancy vehicles. The following measures are used for this goal:

- **Metric 4.1: Increased Transit Ridership**: This measures the use of the proposed transit system.

- **Metric 4.2: Improved Transit Connectivity**: This indicates the level of improvement in connection to major activity centers, including Kennesaw State University, Town Center Mall, Downtown Marietta, Dobbins Air Reserve Base, and Cumberland/Galleria.

GOAL 5: IMPROVE SAFETY

Improving safety is one of the primary reasons for enhancement of the transportation system. Transit facilitates can improve safety by reducing vehicular crash exposure due to a decrease in vehicle miles traveled. They can also reduce the number of daily trips using automobile. The following measures are used for this goal:

- **Metric 5.1: Reduced Annual Vehicular Crash Exposure**: This metric indicates a reduction in potential crash exposure. It is related to the reduction in VMT along the Northwest Corridor compared to the GDOT Statewide Crash Average per 100 Million VMT. The reduction in VMT due to the transit alternatives is correlated to an expected decrease in crashes per mile along the corridor.

- **Metric 5.2: Reduced Daily Trips Using Automobile**: This metric indicates a reduction in trips using the automobile due to increased use of transit. This represents a shifting of travel to a travel mode with lower crash rates.

5.2.2 LAND USE AND ECONOMIC DEVELOPMENT PERFORMANCE MEASURES

For Tier I each corridor was evaluated with respect to the following specific land use and economic development goals and objectives, each having their own respective performance measures. A broader set of performance measures were evaluated for the Tier II analysis.

- Land Use Goal: **More Efficient Use of land**. Measures include Reduced Parking Needs and Improved Bicycle & Pedestrian Infrastructure.

- Land Use Goal: **Increased Housing Choices**. Measures include Increased Transit-Oriented Development.

- Economic Development/Redevelopment Goal: **Stimulate Local Economy**. Measures include Increased Commercial/Retail Spaces and Creation of More Mixed-Use Complexes within Walking Distance of Transit.

In order to effectively evaluate these goals and their associated measures a variety of subjective and objective land use and economic development factors were looked at including:

Potential Transit Stations: The opportunity to develop transit stations associated with a new high-capacity transit line is fundamental in the effort to change and enhance land use and development patterns in the corridor commensurate with the overall stated Need and Purpose of this project. Once developed, Transit Stations will forever impact their immediate environs including land use and development but also nearby vehicular, pedestrian and bicycle circulation patterns. In addition, the location, spacing and design of transit stations will have a large impact on ridership patterns. Transit stations, therefore, were carefully considered both within their impact on the immediate context as well as within the broader context of the system as a whole.

Susceptibility to Change: As embodied within the overall Statement of Purpose and Need, the ability to incentivize economic development is one of several fundamental drivers of this Alternatives Analysis. As demonstrated successfully in numerous locations across the United States, public investment in transit and associated infrastructure often leads to private investment in new construction, new housing, and new jobs. In order to help understand the impacts and possibilities for new transit-oriented development, a conceptual analysis was conducted of existing development patterns relative to their susceptibility to change or underutilization. This assessment is intended to show locations where future development/redevelopment is most likely to occur over time.

Availability of Commercially Zoned Land: In addition to surveying lands that are susceptible to change, another way of ascertaining the likelihood of future commercial and mixed-use development is to understand existing zoning. Although zoning can and sometimes is changed in response to specific development proposals, it can often be difficult, particularly adjacent to or within existing stable residential areas. Therefore, areas currently zoned for commercial purposes (e.g., Retail, Office, Mixed-Use) typically represent a path of least resistance for new mixed-use, transit supportive development. Over 150 individual zoning categories were analyzed from each of the nine municipalities within the overall study area (counties of Cobb, Bartow and Cherokee; cities of Acworth, Atlanta, Kennesaw, Marietta, Smyrna and Sandy Springs). For ease of comparison, zoning was generalized and collapsed into 7 categories. Of the almost 77,000 acres of property in the study area, just over 13,600 acres were zoned in some form of commercial category (Commercial, Office–Institutional, Mixed-Use, or Office). Not surprisingly, the majority of commercial properties are located within or very near the US 41 corridor, along Barrett Parkway, in the Cumberland Area and in Midtown Atlanta.

Pedestrian and Bike Facilities: In spring of 2011, Cobb County completed a 15-month planning effort to create the Cobb County Bicycle and Pedestrian Improvement Plan, which includes a street-by-street assessment of level of service or LOS for both bicycle and pedestrian facilities. The LOS assessment provides an A-F letter grading system with A being the highest/best grade and F being the worst. Equally important to the location and efficacy of existing facilities is the opportunity to create new and enhanced facilities associated with a new transit system. Using the above methodology, existing data and new data were compiled in order to evaluate measures for improved bicycle and pedestrian infrastructure.

Market Preferences: While many of the above factors rely on an assessment of existing and future quantifiable ***physical*** features (e.g., potential station locations, susceptibility, etc.), another important factor in determining the effectiveness of transit alternatives is the degree to which various alignments will be more or less receptive to the private development market (e.g., a ***non-physical*** assessment). From a Tier I perspective, this assessment is somewhat more subjective. Given that all transit alternatives considered in Tier I involved fixed-guideway systems (e.g. regardless of BRT or LRT), real estate preferences focused on the comparative strengths and weaknesses of the two primary alignments (e.g., US 41 versus I-75) in terms of delivering new mixed-use, transit-oriented development in and around potential transit stations.

For the detailed methodology, assessment and data associated with the land use and economic development goals refer to Appendix C.

Based on the analyses described previously, several specific metrics have been developed in order to assess the performance of several land use and economic development measures.

The **MEASURES** being screened are:

- Reduced Parking Needs
- Improved Bicycle & Pedestrian Infrastructure
- Increased Transit-Oriented Development
- Increased Commercial/Retail Spaces
- Creation of More Mixed-Use Complexes within Walking Distance of Transit

The **METRICS** being utilized to assess the Measures are:

Metric: Number of New Transit Stations: The relative number of potential new transit stations (and therefore the number of new Transit-Oriented Development nodes) has a direct correlation to increasing pedestrian and bicycle infrastructure, increasing housing choices, increasing commercial /retail spaces and creating more mixed-use development.

Metric: Anticipated Number of New Commuter Parking Spaces: The relative anticipated quantity of commuter parking spaces needed has a direct correlation to reducing parking needs in the corridor as a whole – fewer stations focused on commuters will lead to a greater degree of walkable, transit-oriented development.

Metric: Acres of Land Susceptible to Change Within ¼ Mile of Station Locations: The overall quantity of Greenfield Sites and High Susceptibility Sites within walking distance of Station Locations will be directly proportional to the ability to create transit-oriented development, increase commercial / retail spaces, and develop more mixed-use complexes. For the purposes of this preliminary analysis (and given that precise station locations have yet to be studied) Station Locations include a +/-500' radius buffer zone within which stations are likely to occur.

Metric: Acres of Land Zoned for Commercial Use Within ¼ Mile of Station Locations: While land can be rezoned to support new TOD development, existing commercial zoning will be the easiest and least controversial to develop. Furthermore, existing commercial property in new TOD locations will result in reduced parking needs (more workers taking transit) and will increase opportunities for new commercial/ retail spaces.

Metric: Proximity / Ability to Connect to and/or Improve Existing Ped/Bike Facilities: Potential TOD locations near existing pedestrian and bicycle facilities and/or closer to the local street network will provide the greatest opportunities for improving and expanding the overall ped/bike network.

Metric: Attractiveness to Private Development Market: Locations that are more attractive to the private development market will result in more commercial/retail spaces and more mixed-use complexes.

5.2.3 Environmental Performance Measures

Table 5-1: Environmental Issues Related to Transit Projects provides an overview of the environmental issues typically assessed in the AA process. As shown, these issues are often either impact or benefit

related. Impact-related factors are those that typically are addressed through avoidance and mitigation strategies. Benefit-related factors are those that typically result in favorable outcomes after implementation of a transportation improvement. All of the factors are considered and utilized in project approval and funding decisions under NEPA reviews and the FTA New Starts funding program.

Table 5-1: Environmental Issues Related to Transit Projects

Impact-Related	Benefit-Related
• Natural – Wetlands, streams, floodplains, endangered species • Cultural – Parks, churches, schools, cemeteries, etc. • Historical – Historic sites, archaeological sites • Physical – Hazardous sites, noise/vibration sensitive sites • Social – Low-income and minority populations, elderly and disabled	• Air Quality - Reduction in emissions, Greenhouse gases • Sustainability – Promoting compact urban form, higher occupancy trips • Livability – Promoting economic development, healthier lifestyles • Economic – Opportunities for the transit dependent

The following factors influenced the development of performance measures for environmental analysis in the AA:

- Impact related measures typically involve physical features of the built and natural environment. Therefore, they are used to develop project constraints, and to identify areas that should be avoided if possible. If avoidance is not possible, then project alternatives within the constrained areas could result in mitigation requirements. Data exists to measure these potential impact-related issues and consists of environmental resource data files and reports produced by local, regional, and national resource agencies socio-economic statistics and Census data.

- Benefit-related measures relate to the favorable factors associated with build alternatives. As such, they do not lend themselves to constraint mapping and avoidance analysis. These factors are typically evaluated in later analysis and therefore are not included in this Tier I analysis.

As noted above, the Tier I analysis was oriented towards identification of possible impacts to the built and natural environment consistent with NEPA procedures. Most of the natural, social, and economic environment related issues can be incorporated into the following objectives:

- Objective 1: Avoid and minimize potential impacts to environmentally sensitive resources and promote sustainable transportation solutions

- Objective 2: Avoid and minimize impacts to low income, minority, and historically underrepresented populations consistent with Environmental Justice (EJ) criteria.

These objectives are also consistent with the AA Purpose and Need Statement. Based on these objectives, MOEs were developed based on two primary evaluation criteria – environmental preservation and EJ – as reflected in Table 5-2: Environmental Measures of Effectiveness.

Table 5-2: Environmental Measures of Effectiveness

Evaluation Criteria	Measure of Effectiveness	Tier I	Tier II
Environmental Preservation	Estimated community impacts/disruptions for (residential, business, community, facilities, churches)	X	X
	Noise sensitive land uses within proximity to alignments	X	X
	Environmentally sensitive resources within ½-mile of alignment (wetlands, water bodies, parks, historic structures)	X	X
Environmental Justice	Minority, low-income, elderly and disabled populations within ½-mile of alignments	X	X

The MOEs developed for the Tier I and Tier II analysis are more detailed, and more quantitative, than those used in the Initial Screening Analysis. Since the alignment alternatives are better defined in Tier I and II, analysis of their potential interactions with environmental resources can be more discreetly quantified. The evaluation factors utilized for this analysis are summarized and are more fully described in the Appendix A.

5.2.4 FINANCIAL PERFORMANCE MEASURES

Through the development of the goals and objectives for the alternatives analysis study, those related to the financial considerations were in two areas: maximizing cost efficiency and cost effectiveness plus developing financially feasible project/leverage available resources. At this stage of the overall study, specific local resources were not readily identifiable for the local match to be leveraged to capture Federal funding. Consequently, the performance measures used particularly for the Tier I analysis were related to the alternatives' cost per mile and total capital, operating, and maintenance costs.

5.3 Tier I Analysis

As described in Section 4, a transit alternative is comprised of technology/transit mode, alignment, station locations, and operating plan. A broad set of technologies and alignments was considered, to ensure that the full range of potential solutions was considered.

In Section 4.2, a technology assessment was performed of a wide range of transit technologies to identify the most appropriate modes for the conditions and characteristics of the Northwest Atlanta Corridor. The result of that assessment indicated that express bus/BRT and LRT are feasible modes for the corridor (see Section 4.6). In addition, an assessment was conducted of the four alignment options that were identified. This assessment, detailed in Section 4.4, advanced the US 41 and I-75 alignments for more detailed analysis.

In the Tier I analysis, the preliminary alternatives identified in Section 4 were evaluated using the framework and methodologies discussed in Section 5.2. In the sections that follow, each of these factors is described, and an assessment is provided of how well each alignment performs. The alignments selected for more detailed analysis in Tier II are summarized in Section 5.4.

5.3.1 TIER I TRANSPORTATION ANALYSIS RESULTS

As described earlier, the Tier I transportation analysis included conducting travel demand modeling for the preliminary (i.e. Tier I) build alternatives and reporting resulting travel performance measures. In addition, the Tier I transportation analysis also examined the need for grade separation of various intersections along the US 41 corridor. The consideration of grade separations is important to the analysis as it affects the travel speeds, travel times, safety and total project costs.

Results of Transportation Performance Measure Evaluation

Travel demand modeling was then conducted for each of the Tier I alternatives to measure the predicted transportation performance of each alternative. This analysis produced forecasts of transit ridership and measures of travel times, delays and overall mobility. The results of the Tier I transportation performance measure evaluation are shown in Table 5-3: Summary of Transportation Results for Tier I Alternatives. Analyzing the performance using the metrics described in Section 5.1.1 leads to the following preliminary conclusions:

- Alignments along the I-75 corridor and the US 41 alignment from Acworth to Midtown Atlanta (more stations) provide significant reductions in both vehicle hours of travel and vehicle miles of travel per day.
- Alignments along US 41 with more frequent stations have the greatest walk access frequency. These alignments also provide greater transit access to low income and traditionally underserved populations
- Alignments along the I-75 corridor and the US 41 alignment from Acworth to Midtown Atlanta (more stations) provide the largest increase in people served along the corridor with the same levels of roadway operation as experienced in the no-build condition. These alignments also have the greatest reduction in peak period corridor travel times.

Table 5-3: Summary of Transportation Results for Tier I Alternatives

Summary of Transportation Results for Tier I Alternatives

	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3	Alternative 4A	Alternative 4B
CORRIDOR	I-75	US 41	US 41	I-75	US 41	US 41
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown	KSU to Midtown
# of STATIONS	13	26	15	12	22	15
GOAL 1: Reduce Congestion/Improve Traffic Flow						
METRIC 1.1: Reduction in Vehicle Hours of Travel (Daily)*	27,000	36,000	2,000	24,000	4,000	1,000
METRIC 1.2: Reduction in Vehicle Miles of Travel (Daily)*	167,000	43,000	-2,000	143,000	37,000	-12,000
Alternative Ranking 1.1	4	5	1	3	2	1
Alternative Ranking 1.2	5	3	1	4	2	1
GOAL 2: Plan for Current and Future Travel Needs						
METRIC 2.1: Transit Walk Access Frequency	Low	High	Medium	Low	High	Medium
METRIC 2.2: Increased Transit Ridership (Daily)*	22,000	15,000	9,000	20,000	13,000	8,000
METRIC 2.3: Transit Access for Low-Income/Traditionally Underserved	Medium	High	High	Medium	High	High
Alternative Ranking 2.1	1	5	3	1	5	3
Alternative Ranking 2.2	5	3	2	5	3	2
Alternative Ranking 2.3	3	5	5	3	5	5
GOAL 3: Improve Travel Efficiency						
METRIC 3.1: Reduction in Peak Period Corridor Travel Time (min.)*	7.8	6.7	6.7	7.4	7.0	6.1
METRIC 3.2: Increase in People Served by Northwest Corridor in the Peak Periods*	Work In Progress					
Alternative Ranking 3.	5	3	3	5	4	2
Alternative Ranking 3.2						
Composite Ranking	3.8	4.0	2.5	3.5	3.5	2.3

* Metric is provided for anticipated year 2040 conditions in comparison to no-build scenario (current system)

Ranking - 1 (Least supportive) to 5 (most supportive)

Potential Grade Separation

As mentioned earlier, grade separation of transit will be needed at some intersections to provide premium transit service along US 41 and maintain adequate traffic operations at critical signalized intersections. A preliminary analysis was performed to identify locations for potential grade separation of intersections within the study area. The details of the analysis are in Appendix B.

These intersections include the following:

Locations for Potential Grade-Separation of Premium Transit

- US 41 at McCollum Parkway/Cobb International Boulevard
- US 41 at Ernest Barrett Parkway
- US 41 at N. Marietta Parkway/SR 120
- US 41 at Roswell Rd/SR 120
- US 41 at S. Marietta Parkway/SR 120
- US 41 at Windy Hill Road
- Cumberland Boulevard at Spring Road
- Cumberland Boulevard at Cumberland Parkway/Mall Driveway

- US 41 at Cumberland Boulevard
- US 41/Northside Drive at 17th Street

5.3.2 TIER I LAND USE/ECONOMIC DEVELOPMENT ANALYSIS RESULTS

Table 5-4: Summary of Land Use and Economic Development/Redevelopment Results for Tier I Alternatives provides an assessment of how well each Tier I alternative performs against the goals and objectives related to land use and economic development. Based on this assessment, the following conclusions can be drawn:

- On the whole, alignments that include more potential transit stations, and therefore contain more potential TODs, generally provide a greater opportunity for more efficient use of land, increased housing choices and stimulating the local economy.
- Alignments 2a and 4a (both in the US 41 corridor) include the greatest number of stations and the largest cumulative physical inventory of land likely to redevelop (by a significant margin). Therefore, these alignments have the greatest potential for increasing housing choices and creation of new TODs/mixed-use complexes.
- Alignments utilizing the I-75 corridor (1 and 3) are more amenable to commuter parking given their interstate access. Therefore, these two alignments have the greatest adverse impact on the ability to reduce parking needs.
- Two US 41 alignments have a large number of stations (2a and 4a) and therefore also generate high commuter parking counts. However, these stations also have high quantities of commercially zoned land near stations that equates to potential parking reductions (existing drivers becoming transit riders).
- Alignments utilizing the US 41 corridor (2a, 2b, 4a and 4b) generally have significantly more opportunity to improve and expand walking and biking facilities due to their greater level of connectivity with existing roadways. I-75 alignments can create internalized bike/ped options but will be more limited in terms of connecting to and/or expanding existing facilities.
- Overall, Alignment 2a appears to perform best across all measures.

Table 5-4: Summary of Land Use and Economic Development/Redevelopment Results for Tier I Alternatives

Summary of Land Use Results for Tier I Alternatives

	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3	Alternative 4A	Alternative 4B
CORRIDOR	I-75	US 41	US 41	I-75	US 41	US 41
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown	KSU to Midtown
# STATIONS	13	26	15	12	22	15
GOAL / OBJECTIVE: More Efficient Use of Land						
MEASURE: Reduced Parking Needs						
METRIC 1: Anticipated Number of New Commuter Parking Spaces	6600	4900	3750	6300	5700	4700
METRIC 2: Acres of Land Zoned for Commercial Use within 1/4 mile of Station Locations	1440	2580	1840	1250	2380	1810
Overall Measure Grade	2	4	3	2	3	3
Alternative Ranking	Fifth	First	Second	Sixth	Third	Fourth
MEASURE: Improved Bicycle and Pedestrian Infrastructure						
METRIC 1: Proximity / Ability to Connect to and/or Improve Existing Facilities	Medium	High	Medium High	Low	High	Medium High
METRIC 2: Number of New Stations to Bike/Walk to	13	26	15	12	22	15
Overall Measure Grade	2	5	3	1	4	3
Alternative Ranking	Fifth	First	Fourth	Sixth	Second	Third
GOAL / OBJECTIVE: Increase Housing Choices						
MEASURE: Increased Transit-Oriented Development						
METRIC 1: Acres of Land Susceptible to Change within 1/4 mile of Station Locations	580	1530	850	540	1290	800
METRIC 2: Number of New Transit Stations	13	26	15	12	22	15
Overall Measure Grade	1	5	2	1	4	2
Alternative Ranking	Fifth	First	Third	Sixth	Second	Fourth

Summary of Economic Development / Redevelopment Results for Tier 1 Alternatives

	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3	Alternative 4A	Alternative 4B
CORRIDOR	I-75	US 41	US 41	I-75	US 41	US 41
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown	KSU to Midtown
# STATIONS	13	26	15	12	22	15
GOAL / OBJECTIVE: Stimulate Local Economy						
MEASURE: Increased Commercial / Retail Spaces						
METRIC 1: Acres of Land Susceptible to Change within 1/4 mile of Station Locations	580	1530	850	540	1290	800
METRIC 2: Number of New Stations	13	26	15	12	22	15
METRIC 3: Acres of Land Zoned for Commercial Use within 1/4 mile of Station Locations	1440	2580	1840	1250	2380	1810
METRIC 4: Attractiveness to Private Development Market	Medium Low	High	Medium High	Low	High	Medium High
Overall Measure Grade	2	5	3	1	4	3
Alternative Ranking	Fifth	First	Third	Sixth	Second	Fourth
MEASURE: Creation of More Mixed-Use Complexes Within Walking Distance of Transit						
METRIC 1: Acres of Land Susceptible to Change within 1/4 mile of Station Locations	580	1530	850	540	1290	800
METRIC 2: Number of New Stations	13	26	15	12	22	15
METRIC 3: Attractiveness to Private Development Market	Medium Low	High	Medium High	Low	High	Medium High
Overall Measure Grade	2	5	3	1	4	3
Alternative Ranking	5	First	Third	Sixth	Second	Fourth
Average Grade Across All Land Use and Economic Development Measures	2	5	3	1	4	3
Alternative Ranking	Fifth	First	Third	Sixth	Second	Fourth

NOTES:

1. Exact station locations are yet to be determined. Therefore, 500 foot radii buffers have been established to determine a "zone" in which the station is likely to occur.
2. Measure Grading System:
   - 5 = Measure fully supports the overall goal
   - 4 = Measure largely supports the overall goal
   - 3 = Measure partially supports the overall goal
   - 2 = Measure largely does not support the overall goal
   - 1 = Measure does no support the overall goal
3. "Commercially Zoned Property" includes: Mixed-Use, Office, O&I and Commercial/Retail

5.3.3 TIER I ENVIRONMENTAL ANALYSIS RESULTS

The Tier I alternatives were ranked based upon the proximity of environmentally sensitive resources, with higher ratings going to those alternatives with fewer resources along their Tier I alignments. The alternatives were evaluated based on their potential involvement with these resources. The environmental review did not make a distinction between the modes. The measures that were evaluated were tied to the alternatives' physical alignment and station/facility locations and not the transit technology. The results of this assessment are presented in Table 5-5: Summary of Environmental Results for Tier I Alternatives. After the individual measures scoring, each mode was ranked ordinally, first through fourth, as shown, the potential impacts to environmental resources of the Tier I alternatives are somewhat similar in scale. A discussion of each individual performance measure is available in Appendix A: Detailed Environmental and Cultural Analysis.

Table 5-5: Summary of Environmental Results for Tier I Alternatives

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Alternative Length (Miles)	27.4	29.4	21.4	25.3
Environmentally Sensitive Resources				
Total Wetland Acreage	97.84	150.86	92.83	137.76
Total Park Acreage	110.21	346.44	110.21	151.10
Total Floodplain Acreage	585.81	620.92	539.29	530.75
Total Historic Resources	31	48	26	32
Total Community Resources	8	18	8	14
Total Hazardous Material Sites	5	6	5	9
Potential Impact Alternative Rating	**Low**	**High**	**Low**	**Medium**
Alternative Ranking	**2**	**4**	**1**	**3**
Number of Potentially Impacted Parcels	1,697	2,123	1,545	1,820
Potential Impact Alternative Rating	**Low**	**Medium**	**Medium**	**Medium**
Alternative Ranking	**1**	**T-2**	**T-2**	**T-2**
% Potential Noise Sensitive Land Uses	38%	68%	41%	63%
Potential Impact Alternative Rating	**Low**	**High**	**Low**	**High**
Alternative Ranking	**1**	**4**	**2**	**3**
Environmental Justice				
Minority Population Percentage	48.9%	47.5%	51.2%	49.2%
Low-Income Population Percentage	15.0%	13.8%	16.3%	15.3%
Elderly Population Percentage	6.2%	6.7%	6.0%	6.5%
Potential Impact Alternative Rating	**Medium**	**Medium**	**Medium**	**Medium**
Alternative Ranking	**NA**	**NA**	**NA**	**NA**
CUMULATIVE IMPACT ALTERNATIVE RATING	**Low**	**High-Medium**	**Low-Medium**	**Medium**
CUMULATIVE ALTERNATIVE RANKING	**1st**	**4th**	**2nd**	**3rd**

The following conclusions are made as a result of this analysis:

- All of the Tier I alternatives cross the Chattahoochee River National Recreation Area. Given its national significance, impacts to this resource will need to be carefully avoided if possible. If avoidance is not possible, then special mitigation measures may be needed. Since all alternatives cross the river at the same location, there is no differentiation between them in terms of potential impacts to this resource.

- All of the Tier I alternatives have similar concentrations of traditionally underserved populations.
- There is a slightly higher concentration of wetlands within the buffer along US 41 than I-75.
- The major difference in the alternatives along US 41 is the potential for Alternatives 2 A/B to impact wetlands and parklands in the vicinity of Lake Acworth.
- There is a slightly higher concentration of parklands within the buffer along US 41 than I-75 particularly along Alternatives 2 A/B. However, as previously noted, all of the alternatives will have the same level of involvement with the Chattahoochee National Recreation Area.
- As would be expected due to the access characteristics of the two corridors, the US 41 corridor also has a higher number of community resources along it than does the I-75 corridor, which extends into the areas of mature development within Kennesaw, has the highest number of potential historic sites within the proximity buffer to the alignment. The other Tier I alternatives all have similar numbers of potential historic sites nearby.
- The number of potential hazardous material sites along all of the alternatives is similar, and is primarily concentrated in the area near Allgood Road in northeast Marietta.

In summary, the potential involvement with environmental resources are proportional to the length of the alternative, and are slightly higher along US 41 than along I-75.

5.3.4 Tier I Financial Analysis Results

Tier I financial analysis evaluated average costs per mile per technology. The costs per mile took into account the operating characteristics of such technology, the operations costs, right-of-way needs, and construction costs. As referenced in Section 4.1, each technology defines the average cost per mile and operating costs. The results of the Tier I financial analysis advanced both light rail and bus rapid transit for further consideration in Tier II.

5.3.5 Tier I evaluation Results

The Tier I analysis is summarized in Table 5-6: Tier I Evaluation Results. As shown, each build alternative is evaluated against the goals and objectives, and the quantitative analysis discussed in the previous sections is summarized using a “Best, Average, Worst” scale – identified using green, yellow and red respectively. The process for selecting the Tier I alternatives to advance into the Tier II evaluation was based on the higher number of “Best” scores while having the least “Worst” scores. Below the matrix, a simple “Yes” or “No” identifies those alternatives which advanced for further consideration in Tier II.

As shown, none of the BRT alternatives along I-75 were advanced to Tier II. The BRT alternatives along I-75 did not sufficiently improve travel performance as compared to existing express bus service to warrant the high costs of building a dedicated BRT facility. Conversely, the BRT alternatives along US 41 showed significant improvements in travel mobility to warrant further consideration. Similarly, LRT along US 41 and along I-75 showed promising results, and were advanced to Tier II analysis. It should also be noted that the evaluation of Tier I results also provided lessons learned for improving certain alternatives as they are advance for further study in Tier II. For example, it was concluded that the 2a-BRT and 2a-LRT alternatives would be significantly improved by truncating each corridor slightly on the north end to avoid significant potential environmental impacts without sacrificing significant connectivity or ridership.

Table 5-6: Tier I Evaluation Results

Tier 1 Evaluation Results

Connect Cobb: Northwest Transit Corridor Alternatives Analysis

Goals/Objectives	Measure	1-LRT	1-BRT	2a-LRT	2a-BRT	2b-LRT	2b-BRT	3-LRT	3-BRT	4a-LRT	4a-BRT	4b-LRT	4b-BRT
		Build Alternatives											
		Acworth to Midtown I-75		Acworth to Midtown US 41,		Acworth to Midtown US 41,		KSU to Midtown I-75		KSU to Midtown US 41, more stations		KSU to Midtown US 41, fewer stations	
Transportation													
Reduce congestion/improve traffic flow	Changes in travel patterns (Transit mode split)												
	Increased transit ridership (unlinked transit boardings)												
	Reduction in Vehicle Hours of Travel (Daily)												
	Reduction in Vehicle Miles of Travel (Daily)												
	Reduced single occupancy vehicle trips (SOV trips)												
Plan for current and future needs	Increased transit capacity												
	Transit Walk Access Frequency												
	Increased Transit Ridership (Daily)												
	Transit Access for Low-Income/Traditionally Underserved												
	Reduced walk times for transit												
	Reduced wait times for transit												
	Increased travel destinations												
	Flexibility (ability to expand service and capacity cost effectively)												
Reduce travel delay	General travel time savings in minutes (U.S. 41 TTS NB PM Peak)												
	General travel time savings in minutes (I-75 NB TTS PM Peak)												
	Reduce number of transfers required												
Improve travel efficiency	Increased riders per hour												
	Improved connectivity												
Land Use													
More efficient use of land	Reduced parking needs												
	Improved bicycle and pedestrian infrastructure												
Increase housing choices	Increased transit-oriented development												
Economic Development/Redevelopment													
Stimulate local economy	Increased commercial/retail spaces Creation of more mixed use complexes within walking distance of transit												
Environment and Air Quality													
Minimize adverse environmental impacts to the built and natural environment.	Estimated community impacts/disruptions for (residential, business, community, facilities, churches)												
	Noise sensitive land uses within proximity to alignments												
	Environmentally sensitive resources within ½-mile of alignment (wetlands, water bodies, parks, historic structures)												
Improve air quality	Use the cleanest possible transit technology												
Promote environmental justice	Minority, low-income, elderly and disabled populations within 1/2 mile of stations; Minority, low-income, elderly and disabled populations within 1,000 feet of alignments												
Financial													
Maximize cost efficiency and cost effectiveness	Cost per mile												
	Total capital, operating and maintenance costs												
	Advancing to Tier II Evaluation*:	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No

Evaluation scores above:
- Best (as compared to the other Build Alternatives)
- Average (as compared to the other Build Alternatives)
- Worst (as compared to the other Build Alternatives)

* Alternatives advancing to Tier II may be further refined and improved during Tier II analysis.

5.4 Tier II Analysis

This section describes the Tier II alternatives that were carried forward from the Tier I screening process. Each of the Tier II alternatives is then analyzed and evaluated against the study goals and objectives.

5.4.1 Tier II Transportation Alternatives

Based on the Tier I analysis and screening, the initial list of build alternatives was reduced from 12 to five. In addition to the five build alternatives, No-Build and Transportation System Management (TSM) alternatives are defined in this section. Those alternatives advancing to the Tier II analysis and evaluation and defined below include:

- No Build (or "no action alternative')
- Transportation System Management (TSM)
- Alternative 1-LRT: I-75 corridor from Acworth to Midtown Atlanta (Light Rail)
- Alternative 2a-LRT: US 41 corridor from Acworth to Midtown Atlanta (Light Rail)
- Alternative 2b-BRT: US 41 corridor from Acworth to Midtown Atlanta (Bus Rapid Transit)
- Alternative 4a-LRT: US 41 corridor from KSU to Midtown Atlanta (Light Rail)
- Alternative 4b-BRT: US 41 corridor from KSU to Midtown Atlanta (Bus Rapid Transit)

5.4.1.1 TRANSPORTATION SYSTEM MANAGEMENT

This alternative is defined as the best that can be done short of a major capital investment. As a low-cost alternative, it focuses on enhancements to the existing bus service along the US 41 corridor. This improved service will make use of transit priority signal timing and queue jumper lanes to enhance travel times for transit vehicles along the US 41 corridor. This will require implementation of signal priority systems and extension/modification of right turn lanes to facilitate queue jumping. The operation of the systems will provide an advance green for the buses in some areas and will extend green times to facilitate bus movements. These changes will have minor impacts on the traffic signal system along US 41.

5.4.1.2 ALTERNATIVE 1-LRT: I-75 CORRIDOR FROM ACWORTH TO MIDTOWN ATLANTA

LRT service would operate along the I-75 corridor from Acworth to Midtown Atlanta. The alternative begins at I-75 and Cowan Road in Acworth and follows I-75 south to Northside Drive. It would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station. There are a total of 11 stations proposed along this alternative.

This alignment along the I-75 corridor will allow operation that is separate from automobile traffic. The wider spacing between LRT stations and location along I-75 will favor longer distance trips between major activity centers in Cobb County and Midtown Atlanta.

5.4.1.3 ALTERNATIVES 2A-LRT AND 2B-BRT: US 41 CORRIDOR FROM ACWORTH TO MIDTOWN ATLANTA

This alternative will provide for LRT or BRT transit along the US 41 corridor from Acworth to Midtown Atlanta. Service would begin at the southern intersection of SR 92 (Lower 92) and US 41 in Acworth and extend south along US 41 to Cumberland Boulevard and would then follow Cumberland Boulevard to the existing CCT transfer station. This alignment would continue along Cumberland Boulevard to Akers Mill Road, and would then follow Akers Mill Road to I-75. The alignment would continue south along I-75 to Northside Drive. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station. There are a total of 19 stations proposed along this alternative

Location along the US 41 corridor will include operation in the median that is separate from automobile traffic. Operation will be at-grade with grade separation of major intersections. The shorter spacing between stations will provide more frequent access. The location along US 41 will favor trips between activity centers and local destinations within Cobb County, as well as providing connection with few stops for travel between Cumberland CID and Midtown Atlanta. The at-grade transit system operations will use a signal priority option for extending main street green time while the transit vehicle passes. This will have minor impacts on the traffic signal system along US 41 and will require the transit vehicle to slow or stop in some instances when arriving at an intersection in the middle of the signal cycle.

5.4.1.4 ALTERNATIVES 4A-LRT AND 4B-BRT: US 41 CORRIDOR FROM KSU TO MIDTOWN ATLANTA

This alternative will provide for LRT or BRT transit along the McCollum Parkway and US 41 corridors from KSU to Midtown Atlanta. Service would begin at KSU and follow Chastain Road/McCollum Parkway to US 41, and extend south along US 41 to Cumberland Boulevard and then follow Cumberland Boulevard to the existing CCT transfer station. This alignment would continue along Cumberland Boulevard to Akers Mill Road, and would then follow Akers Mill Road to I-75. The alignment would continue along I-75 to Northside Drive. The alignment would then follow Northside Drive to 17th Street and would connect to the MARTA Arts Center Station. There are a total of 22 stations proposed along this alternative.

Operation will be at-grade with grade separation of major intersections. This system will operate along US 41 in the same manner as Alternatives 2A-LRT and 2A-BRT 2, however, this alignment will connect to KSU via McCollum Parkway or the new roadway parallel to Barrett Parkway.

5.4.2 TIER II TRANSPORTATION ANALYSIS RESULTS

The Tier II Transportation analysis focused on the movement of people within the Northwest Corridor via both transit and automobile travel modes, and evaluated generally the same performance measures in Tier I but in more detail. Again, the transportation goals included:

- Reduce Congestion/Improve Traffic Flow
- Plan for Current and Future Travel Needs
- Reduce Travel Delay
- Improve Travel Efficiency
- Improve Travel Safety

Table 5-7: Summary of Transportation Results for Tier II Alternatives shows the results of the Tier II transportation analysis.

Table 5-7: Summary of Transportation Results for Tier II Alternatives

Summary of Transportation Results for Tier II Alternatives

	TSM	Alternative 1	Alternative 2A	Alternative 2A	Alternative 4A	Alternative 4A
CORRIDOR	US 41/I-75	I-75	US 41	US 41	US 41	US 41
TECHNOLOGY	Exp. Bus / Queue Jump	Light Rail	Light Rail	Bus Rapid Transit	Light Rail	Bus Rapid Transit
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown
# of STATIONS	18	13	26	26	22	22
OBJECTIVE 1: Reduce Congestion/Improve Traffic Flow						
METRIC 1.1: Changes in Travel Patterns (Transit Mode Split)*	Baseline	0.4%	0.4%	0.4%	0.3%	0.3%
METRIC 1.2: Increased Pedestrian and Bicycle Connectivity	Baseline	Lower	Higher	Higher	Higher	Higher
METRIC 1.3: Reduction in Vehicle Miles of Travel (Daily)*	N/A	36,900	25,400	35,900	44,600	20,300
Alternative Ranking 1.1	N/A	4	4	4	3	3
Alternative Ranking 1.2	N/A	2	4	4	4	4
Alternative Ranking 1.3	N/A	4	3	4	5	3
OBJECTIVE 2: Plan for Current and Future Travel Needs						
METRIC 2.1: Increased Transit Capacity	Baseline	Highest	Highest	Moderate	Highest	Moderate
METRIC 2.2: Transit Walk Access Frequency	Baseline	Lower	Higher	Higher	Higher	Higher
METRIC 2.3: Transit Access for Low-Income/Traditionally Underserved	Baseline	Lower	Highest	Highest	Higher	Higher
METRIC 2.4: Flexibility (ability to expand service and capacity cost effectively)	Baseline	Highest	High	Moderate	High	Moderate
Alternative Ranking 2.1	N/A	4	4	3	4	3
Alternative Ranking 2.2	N/A	2	5	5	4	4
Alternative Ranking 2.3	N/A	2	5	5	4	4
Alternative Ranking 2.4	N/A	5	4	3	4	3
OBJECTIVE 3: Reduce Travel Delay						
METRIC 3.1: Reduction in Daily Vehicle Hours of Travel (VHT)*	Baseline	4,000	900	1,900	2,700	200
METRIC 3.2: Reduction in Peak Period Corridor Travel Times (min.)*	Baseline	3.6	2.4	2.4	2.4	2.4
Alternative Ranking 3.1	N/A	5	2	3	4	2
Alternative Ranking 3.2	N/A	4	3	3	3	3
OBJECTIVE 4: Improve Travel Efficiency						
METRIC 4.1: Increased Transit Ridership (Total of CCT, GRTA, and MARTA)*	Baseline	20,000	13,600	13,600	18,500	6,500
METRIC 4.2: Improved Transit Connectivity	Baseline	Lower	Higher	Higher	Highest	Highest
Alternative Ranking 4.1	N/A	5	4	4	5	3
Alternative Ranking 4.2	N/A	2	3	3	5	5
OBJECTIVE 5: Improve Safety						
METRIC 5.1: Reduced Annual Vehicular Crash Exposure (One Mile Section)	Baseline	72	50	70	87	40
METRIC 5.2: Reduced Daily Trips Using Automobile (using safer transit alternative)*	Baseline	5,900	4,400	6,500	7,900	4,200
Alternative Ranking 5.1	N/A	4	3	4	5	3
Alternative Ranking 5.2	N/A	4	3	4	5	3
Composite Ranking	N/A	3.6	3.6	3.8	4.2	3.3

* Metric is provided for anticipated year 2040 conditions based on travel demand model results in comparison to TSM Alternative
Ranking - 1 (Least supportive) to 5 (most supportive)

5.4.3 TIER II LAND USE/ECONOMIC DEVELOPMENT ANALYSIS RESULTS

Each Tier II alternative was evaluated with respect to five land use/economic development Goals / Objectives. It is important to note that although many of the measures associated with these goals were carried forward from Tier I, the data and analyses for these and a broader set of measures were analyzed for Tier II - both quantitatively and qualitatively - with respect to land use and economic development / redevelopment impacts:

- Land Use Goal: **More Efficient Use of land**. Measures include Reduced Parking Needs and Improved Bicycle & Pedestrian Infrastructure.

- Land Use Goal: **Increased Housing Choices**. Measures include Diversity of Housing & Income Levels, Better Jobs / Housing Balance, Increased Station Area Development and Increased Location Efficient Housing.

- Land Use Goal: **Promote Active, Healthy Lifestyles**. Measures include Increased Public Facilities Such as Parks, Green Space, Health & Education.

- Economic Development / Redevelopment Goal: **Stimulate Local Economy**. Measures include Increased Employment & Income Levels, Net Economic Growth, Increased Commercial / Retail Spaces and Creation of More Mixed-Use Complexes within Walking Distance of Transit.

- Economic Development / Redevelopment Goal: **Leverage Public & Private Investment**. Measures include Revenue Generated from Land Development and Encourage Public Private Partnerships at Stations.

In order to effectively evaluate these Goals, three overarching and driving elements were taken into account as the basis for making detailed and informed projections on the impact of potential transit investment.

Transit Geometry / Alignment: Transportation analyses as part of Tiers I and II outlined specific physical horizontal and vertical positions for dedicated transit lines along each of the US 41 and I-75 alignments. The positioning of these lines was based on various topographical, vehicular level of service, right-of-way and other constraints as well as the ability of each corridor to accommodate light rail or bus rapid transit vehicle operations such as turning radii and max/min. slopes. The resulting configurations of transit operations and station locations have a direct result on the viability and scale of associated new development.

Refined Station Areas: The opportunity to develop transit stations associated with a new high-capacity transit line is fundamental in the effort to change and enhance land use and development patterns in the corridor commensurate with the overall stated Need and Purpose of this alternatives analysis study. Once developed, Transit Stations will forever impact their immediate environs including land use and development but also nearby vehicular, pedestrian and bicycle circulation patterns. In addition, the location, spacing and design of transit stations will have a large impact on ridership patterns. Transit stations, therefore, were carefully considered both in their impact on the immediate context as well as within the broader context of the system as a whole. Following on the more generalized work during Tier I, station locations were cross-referenced with engineering constraints and development opportunities in order to suggest more specific physical station locations and arrangements for Tier II.

Future Development & Land Value: As part of the Tier II analysis, differences between transit alternatives were projected and compared in terms of the amount of new development catalyzed, number of new jobs created, increases in land value and potential property tax revenue impacts associated with the station areas. The analysis considers in more detail the build out potential in areas within a quarter mile of stations along each of the three alternative alignments. The Tier II analysis employs market-based development programs envisioned for each station area's build-out, applying generalized, transit-appropriate development typologies to land likely to redevelop at each of the station areas.

For the detailed methodology, analyses and data associated with the Tier II factors described above refer to Appendix C.

Building on those in Tier I, specific **metrics** were developed and expanded for Tier II. These metrics assessed performance of land use and economic development **measures** across the Tier II alternatives.

The **MEASURES** being screened are:

- Reduced Parking Needs
- Improved Bicycle and Pedestrian Infrastructure
- Diversity of Housing & Income Levels
- Better Jobs / Housing Balance
- Increased Development Associated with Transit
- Increased Location Efficient Housing
- Increased Public Facilities Such As Parks, Green Space, Health & Education
- Increased Employment & Income Levels
- Net Economic Growth
- Increased Commercial / Retail Spaces
- Creation of More Mixed-Use Complexes Within Walking Distance of Transit
- Revenue Generated From Land Development
- Encourage Public / Private Partnerships At Stations

The **METRICS** being utilized to assess the Measures can be described as follows:

Metric: Commuter Parking Spaces: The relative anticipated quantity of commuter parking spaces needed has a direct correlation to assessing ***reduced parking needs*** in the corridor as a whole.

Metric: Changing Land Use: Each Station Area was given a relative score based on their projected quantity of single-use land changing to mixed-use development over time.

Metric: Changing Commuting Patterns: Each Station Area was scored based on the quantity and type of existing land uses that will still be present at build out and their compatibility with transit.

Metric: Quantity of New Bicycle/Pedestrian Infrastructure: Without doing detailed station area plans, this metric is based on the assumption that new bike / ped enhancements in Station Areas are likely to be directly proportional to the amount of new development. Each Station Area was scored based on the relative quantity of land susceptible to redevelopment in order to provide a measure for ***improved bicycle and pedestrian infrastructure.***

Metric: Bike Connectivity Score: While the metric above assessed the possibility for constructing new infrastructure, this metric assesses the opportunity for ***improved bicycle infrastructure*** by looking at existing bike facilities and understanding the opportunity for new / expanded connections. Each Station Area was scored based on the availability of existing nearby bike facilities and the potential to expand their scope and connectivity.

Metric: Pedestrian Connectivity Score: Similar to the bike connectivity metric above, this metric assessed the opportunity for ***improved pedestrian infrastructure*** by looking at existing pedestrian facilities and understanding the opportunity for new / expanded connections. Each Station Area was

scored based on the availability of existing nearby pedestrian facilities and the potential to expand their scope and connectivity:

Metric: Number of New Housing Units Created: Using the previously-described methodology to project new development, the quantity of new housing developed within each Station Area was documented and compared across transit options. Each Station Area was scored on the ability to create new housing units across a diversity of income levels.

Metric: Jobs to Housing Ratio in New Development Related to Transit: Understanding the ratio of jobs to housing units in a region is fundamental in understanding commuting patterns. Each Station Area was scored based on projected jobs-to-housing ratios within new development.

Metric: Total Square Footage of New Development Associated with Transit: This metric has a direct correlation to the Measure of ***increased development associated with transit*** and an indirect correlation to ***revenue generated from land development.*** The total square footage of new retail, office and housing development was projected for each Station Area and scored per alternative.

Metric: Number of New (NET) Jobs Created within Walking Distance of Transit: The number of new jobs created (both gross and net) by development around Station Areas was projected and scored per alternative.

Metric: Acres of New Open Space Developed in Station Areas: Using applicable case studies and research, each station area was allocated an open space percentage based on projected density, quantity of likely new development and projected mix of new housing to commercial uses. Each Station Area's percentage was applied to the land susceptible to change to arrive at an overall estimated acreage for new open space, which was scored for each alternative.

Metric: Estimated Increase in Average Salaries Due to Redistribution of Job Types: One key factor in evaluating ***increased employment & income levels*** is to understand what types of new jobs are created within each Station Area. Based on research, each generalized job type (e.g. retail, industrial, office) was assigned an income factor multiplier to represent an approximate value of average salary per job. The results were scored across all alternatives.

Metric: Percent of 2040 Projected Household/Employment Growth: Estimating the amount of growth that will be captured within Station Areas was determined to be a good measure of gauging and comparing ***net economic growth*** across the transit alternatives. Each option was scored accordingly.

Metrics: New (NET) Square Feet of Office/Retail Development in Station Areas: Understanding the projected amounts of new office and retail development is fundamental in assessing the performance of ***increased commercial / retail spaces***. The total square footage of new retail and office development was projected for each Station Area and scored accordingly.

Metric: Number of New Transit Station Areas: The number of new Station Areas is directly proportional to the opportunity for the ***creation of more mixed-use complexes within walking distance of transit***. Transit options / alignments with more station areas yielded more new mixed-use complexes, and therefore a higher score.

Metric: Increase in Residual Land Values: Understanding the impact on residual land value (e.g., not including the value associated with new development) created through investment in transit is one way to determine which alternatives will ***encourage public / private partnerships at stations***. Areas with increases in land values will generally translate to increased interest in investment from the private sector particularly in early stages of redevelopment (e.g., when land speculation is still cost effective). Each option was scored based on this assumption.

Metric: Station Area Attractiveness to Private Development: In addition to increasing residual land values, another way to ***encourage public / private partnerships at stations*** is to understand the natural real estate advantages and disadvantages that are already present in and around Station Areas. Each Station Area was scored based on the apparent level of recent investment coming from the private sector.

Metrics described above focused on all areas within a ¼ mile radius of each potential station location. The results of each were aggregated for each transit alternative in order to provide scores accordingly.

The results of Tier II screening for Land Use and Economic / Redevelopment are presented in Table 5-8: Summary of Land Use Results for Tier II Alternatives and Table 5-9: Summary of Economic Development/Redevelopment Results for Tier II Alternatives. Based on the results, the overall following conclusions were made:

- On the whole, alternatives that include more potential transit stations, and therefore contain more potential land available for redevelopment, generally provide a greater opportunity for more efficient use of land, increased housing choices and stimulating the local economy.
- Alternatives 2a and 4a (both in the US 41 corridor) include the greatest number of stations and the largest cumulative physical inventory of land likely to redevelop (by a significant margin). Therefore, these alternatives have the greatest potential for increasing housing choices, creating new jobs and creating new mixed-use complexes.
- Alternative 1 utilizing the I-75 corridor results in the best overall balance of new jobs to new housing ratio.
- Alternatives utilizing new high-capacity transit could result in anywhere from 47,800 (Alternative 1) to 71,900 (Alignment 2a) net new jobs in the study area.
- Overall, Alternatives 2a and 4a appear to perform best across all measures.

Table 5-8: Summary of Land Use Results for Tier II Alternatives

Summary of Land Use Results for Tier II Alternatives

	TSM	Alternative 1	Alternative 2A	Alternative 2B	Alternative 4A	Alternative 4B
CORRIDOR	na	I-75	US 41	US 41	US 41	US 41
MODE	na	LRT	LRT	BRT	LRT	BRT
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown
# STATIONS	0	13	25	25	23	23
GOAL / OBJECTIVE: More Efficient Use of Land						
MEASURE: Reduced Parking Needs						
METRIC 1: Commuter Parking Spaces	200	6600	6300	6300	7200	7200
METRIC 2: Changing Land Use Score (potential redevelopment areas)	0	17	30	30	29	29
METRIC 2: Changing Commuting Patterns Score (non-redevelopment areas)	6	6	11	11	13	13
Overall Measure Grade	3	2	4	4	4	4
MEASURE: Improved Bicycle and Pedestrian Infrastructure						
METRIC 1: Quantity of New Bicycle/Ped Infrastructure - Score	0	6	16	16	15	15
METRIC 2: Bicycle Connectivity - Score	0	9	14	14	15	15
METRIC 3: Pedestrian Connectivty - Score	0	7	11	11	12	12
Overall Measure Grade	1	3	4	4	5	5
GOAL / OBJECTIVE: Increase Housing Choices						
MEASURE: Diversity of Housing & Income Levels						
METRIC 1: Number of New (Net) Housing Units Created	-	15,100	17,700	17,700	16,200	16,200
Overall Measure Grade	1	3	5	5	4	4
MEASURE: Better Jobs / Housing Balance						
METRIC 1: Jobs / Housing ratio in new TOD development (Gross/Gross)	na	3.5	4.8	4.8	5.1	5.1
Overall Measure Grade	1	5	3	3	3	3
MEASURE: Increased Transit-Oriented Development						
METRIC 1: Total Square Footage of New TOD Development (Gross New Development)	-	31,536,600	43,829,900	43,829,900	41,397,400	41,397,400
Overall Measure Grade	1	3	5	5	5	5
MEASURE: Increased Location Efficient Housing						
METRIC 1: Number of New (Net) Housing Units Created Within Walking Distance of Transi	-	15,100	17,700	17,700	16,200	16,200
METRIC 2: Number of New (Net) Jobs Created Within Walking Distance of Transit	-	47,900	72,000	72,000	68,900	68,900
Overall Measure Grade	1	3	5	5	5	5
GOAL / OBJECTIVE: Promote Active, Healthy Lifestyles						
MEASURE: Increased Public Facilities Such As Parks, Green Space, Health & Education						
METRIC 1: Acres of New Open Space Developed in New TODs	-	34	79	79	71	71
METRIC 2: Number of New (Net) Housing Units Created	-	15,100	17,700	17,700	16,200	16,200
Overall Measure Grade	1	3	5	5	4	4

Table 5-9: Summary of Economic Development/Redevelopment Results for Tier II Alternatives

Summary of Economic Development / Redevelopment Results for Tier II Alternatives

	TSM	Alternative 1	Alternative 2A	Alternative 2A	Alternative 4A	Alternative 4A
CORRIDOR	na	I-75	US 41	US 41	US 41	US 41
MODE	na	LRT	LRT	BRT	LRT	BRT
EXTENT	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	Acworth to Midtown	KSU to Midtown	KSU to Midtown
# STATIONS	0	13	25	25	23	23
GOAL / OBJECTIVE: Stimulate Local Economy						
MEASURE: Increased Employment & Income Levels						
METRIC 1: Number of New (Net) Jobs Created	-	47,900	72,000	72,000	68,900	68,900
METRIC 2: Estimated Increase in Average Salaries Due to Redistribution of Job Types	0%	13-17%	21-25%	21-25%	21-25%	21-25%
Overall Measure Grade	1	3	5	5	5	5
MEASURE: Net Economic Growth						
METRIC 1: Percent of 2040 Projected Household Growth (Cobb County)		15%	18%	18%	16%	16%
METRIC 2: Percent of 2040 Projectect Employment Growth (Cobb County)		20%	36%	36%	35%	35%
METRIC 3: Percent of 2040 Projected Household Growth (NW Atlanta)		6%	6%	6%	6%	6%
METRIC 4: Percent of 2040 Projectect Employment Growth (NW Atlanta)		14%	14%	14%	14%	14%
Overall Measure Grade	1	4	5	5	5	5
MEASURE: Increased Commercial / Retail Spaces						
METRIC 1: New (Net) Square Feet of Office Development in New TODs	0	9,415,500	14,882,100	14,882,100	14,548,100	14,548,100
METRIC 1: New (Net) New Square Feet of Retail Development in New TODs	0	2,118,100	2,796,700	2,796,700	1,984,900	1,984,900
Overall Measure Grade	1	3	5	5	4	4
MEASURE: Creation of More Mixed-Use Complexes Within Walking Distance of Transit						
METRIC 1: Number of New TOD Station Areas	0	13	25	25	23	23
Overall Measure Grade	1	2	5	5	4	4
GOAL / OBJECTIVE: Leverage Public & Private Investment						
MEASURE: Revenue Generated From Land Development						
METRIC 1: Total Square Footage of New TOD Development (Gross New Development)	0	31,536,600	43,829,900	43,829,900	41,397,400	41,397,400
Overall Measure Grade	1	3	5	5	5	5
MEASURE: Encourage Public / Private Partnerships At Stations						
METRIC 1: Increase in Residual Land Values (pre TOD development)[in millions]	$ -	$ 313.6	$ 382.4	$ 382.4	$ 371.5	$ 371.5
METRIC 2: Station Area Attractiveness to Private Development - Score	0	20	29	29	31	31
Overall Measure Grade	1	3	5	5	5	5
Average Grade Across All Land Use and Economic Development Measures	1.1	3.0	4.7	4.7	4.4	4.4
Alternative Preference	Sixth	Fifth	T-First	T-First	T-Third	T-Third

NOTES:

1. Quantitative metrics are based on presumed station locations. Station Areas include 1/4-mile radius from station location.
2. Station locations were determined based on a variety of factors including: ability to incent redevelopment, potential ridership/destinations, and engineering limitations (e.g., topography, conflicts with traffi
3. See accompanying memo/report for a more detailed definition of each metric and how they were arrived at. See memo appendix for detailed charts and station by station analyses.

5.4.4 TIER II ENVIRONMENTAL ANALYSIS RESULTS

The Tier II environmental analysis represented a refinement of the work performed in the Tier I screening. A GIS-based assessment was conducted to identify potential environmental fatal flaws and hot spots within the Tier II alternative alignments. For the purposes of this analysis:

- **Fatal flaws** are defined as substantial impacts to key environmental features, either natural or human, that would
    - Preclude the use of the alignment (a true fatal flaw);
    - Require cost-prohibitive mitigation; and/or
    - Create significant public controversy.
- **Hot spots** are areas that may not fail a 'fatal flaw' analysis, but still have a high concentration of environmental resources, and would therefore require careful considerations in a more detailed alternatives development and may involve substantial mitigation or potential for controversy.

Based on these findings, potential actions to minimize, mitigate, or off-set potential adverse effects will be identified for consideration in the selection of a LPA and for consideration as the study proceeds into the EIS phase of project development. The following conclusions were made regarding environmental impacts and benefits:

- Alternatives along US 41 have a greater potential to impact environmental resources than that along I-75 (Alt 1-LRT). This is primarily due to the surrounding land uses and access characteristics of US 41. As an established north-south thoroughfare through Cobb County, the potential to impact historic and community resources along US 41 is greater than along I-75. It should also be noted that the US 41 alignment presents grade challenges that would require earthwork in order to accommodate a fixed guideway transit technology. This, in turn, would create visual and aesthetic impacts as well as increase the potential to impact community cohesion.
- The only true 'fatal flaw' associated with the Tier II alternatives would be any disturbance to the mitigation resources (monitoring wells and slag cap) at Atlantic Station as prescribed in the EPA mitigation plan. These resources will need to be avoided.
- While the Chattahoochee River crossing is certainly a 'hot spot,' mitigating potential impacts to the resource does not appear to be problematic. The proposed use of the existing I-75 bridge structure strengthens this assumption.
- Should either of the Alternative II technologies be selected as the LPA, special attention will be needed to avoid the Pineridge Cemetery in Kennesaw given its proximity to US 41. While the alternatives along this alignment are proposed within the centerline of the roadway, avoidance of the resource would need to occur during construction.
- Given the distribution of environmental justice populations throughout the study area, the potential for disproportional impacts to these populations appear to be minimal.

5.4.5 TIER II FINANCIAL ANALYSIS RESULTS

The Tier II financial analysis focused on the magnitude of capital costs needed to implement each alternative. Capital cost estimates were derived for the five alternatives considered and were based on conceptual engineering efforts. FTA requires the development of capital costs to follow their standardized format per Section 5309 New Starts (49 USC § 5309). Cost estimates are developed and continually refined throughout the planning, design, and construction phases. The standard format is FTA's Standard Cost Categories (SCC) which is composed of a series of standard design items that can be evaluated between the various New Starts candidate projects. Each project has to establish a unit cost, through the use of FTA's unit cost database, previous projects by the client, and/or evaluation of a combination of the database and current transit projects in the construction phase.

The unit costs used in the Cobb County Northwest Corridor AA were established through the use of previous efforts by MARTA (Clifton Corridor) and Georgia Regional Transit Authority (GRTA) to use standard unit costs for all of the transit projects considered for Georgia's Transportation Investment Act of 2010 (TIA 2010). Specific engineering item unit costs were also developed in order to be consistent between the two different technologies. Station designs were developed to be consistent with all technologies under consideration. The BRT design concept and cost estimate is consistent with LRT with the only major difference being the unit cost per vehicle. The intent behind designing and developing costs for BRT as LRT was that if BRT was selected as the preferred technology, future conversion to LRT could be done with minimal cost.

For each of the alternatives, the conceptual engineering plans identified the type of construction needed (e.g., fill, retained fill, structure, etc.) based on the design concept guidelines. The costs were broken down into seven main categories, per SCC format:

- **Guideway and Track Elements**: Includes guideway and track costs for all transit modes (heavy rail, light rail, commuter rail, bus rapid transit, bus, monorail, cable car, etc.). The unit of measure is route miles of guideway, regardless of width. As associated with the guideway, costs for rough grading, excavation, and concrete base for guideway where applicable are included as well as all construction materials and labor regardless of who is performing the work.

- **Stations, Stops, Terminals, Intermodal**: As associated with stations, this includes costs for rough grading, excavation, station structures, enclosures, finishes, equipment; mechanical and electrical components including HVAC, ventilation shafts and equipment, station power, lighting, public address/customer information system, safety systems such as fire detection and prevention, security surveillance, access control, life safety systems, etc. as well as construction materials and labor regardless of whom is performing the work.

- **Support Facilities, Yards, Shops, Administration Buildings**: As associated with support facilities, this includes costs for rough grading, excavation, support structures, enclosures, finishes, equipment; mechanical and electrical components including HVAC, ventilation shafts and equipment, facility power, lighting, public address system, safety systems such as fire detection and prevention, security surveillance, access control, life safety systems, etc., and fueling stations as well as all construction materials and labor regardless of whom is performing the work.

- **Site Work and Special Conditions**: These costs include all site utilities, environmental mitigations, hazardous material removal and mitigation, site structures, pedestrian and bicycle

access and accommodations, landscaping at stations, and station parking facilities as well as all construction materials and labor regardless of whom is performing the work.

- **Systems**: These costs include all train controls and signals, traffic signals and crossing protections, traction power supply and distribution, communications, central control, and fare collection system as well as all construction materials and labor regardless of whom is performing the work.

- **Right-of-Way**: These costs include acquisition and professional services associated with the real estate component of the project. These costs may include agency staff oversight and administration, real estate and relocation consultants, legal counsel, court expenses, insurance, etc.

- **Vehicles**: These costs include procurement and professional services associated with the vehicle component of the project. These costs may include agency staff oversight and administration, vehicle consultants, design and manufacturing contractors, legal counsel, warranty and insurance costs, etc.

Capital cost estimates also include two additional categories - Professional Design Services and Unallocated Contingencies. Tier II capital costs were developed utilizing the methodology described above and the horizontal and vertical alignments from the conceptual engineering efforts.

5.4.6 Engineering Design Criteria

Conceptual engineering efforts involved a level of engineering that would be considered at 5% effort for the five Tier II build alternatives. This level of conceptual engineering effort consists of utilizing existing topographic data and developing a conceptual profile to determine acceptable operating levels of a transit technology grade. The effort also provides a conceptual design for grade separations and tunnels, and identifying the approximate length of bridge structures and tunnels in order to develop relative cost estimates. This level of design effort would not include utilizing ground or aerial survey data. The following describes the methodology for the conceptual engineering work performed for each Tier II alternative.

Each transit technology has its own set of design standards. Those standards are developed in conjunction with the vehicle dimension and operating characteristics. Design criteria were established utilizing technology standards for LRT and BRT. In addition, a peer review of other transit systems was conducted to evaluate the design criteria utilized for those systems. The criteria included: LRT design standards that were implemented for the Charlotte Area Transit System (CATS) Northeast LRT Extension, MARTA Clifton Corridor, and the Omnitrans E Street BRT project, in San Bernardino County, California. It is important to note that BRT was designed to LRT standards for future potential conversion to LRT.

In addition to the design criteria, the conceptual engineering plans incorporated the use of typical sections. By determining the offsets of the tracks, platforms and other design features from the existing right-of-way, the conceptual engineering plans established a general area of potential impacts. The ability to identify the typical section and design constraints (such as the maximum curve radii) assisted in developing the generalized horizontal alignments for the Tier II alternatives.

For median running sections, LRT and BRT would be located in the center of the existing I-75 or US 41 roadway network. A safety barrier would be located to separate the transitway from the general purpose

vehicle travel lanes. The travel lanes could be reduced to 11 feet, plus provide for sidewalks along the curb lane for pedestrian access to stations.

The conceptual engineering plans also evaluated the vertical alignments for the Tier II alternatives. Existing ground profiles were developed so that when designing for the vertical alignments, the transit technology maximum grade could be taken into account when designing the vertical alignments. Profiles were then developed for the Tier II alternatives to assist in developing unit costs for aerial structure lengths, tunnel lengths, at-grade lengths, and platform locations.

Aerial structures were identified through the conceptual engineering effort. Utilizing the profile, aerial structure locations and the lengths of those structures were calculated. Figure 5-2 provides two views of an example of a dedicated transit aerial structure within the median of an existing roadway. This aerial structure spans across a major intersection to allow the intersection to continue to operate without introducing a new conflict.

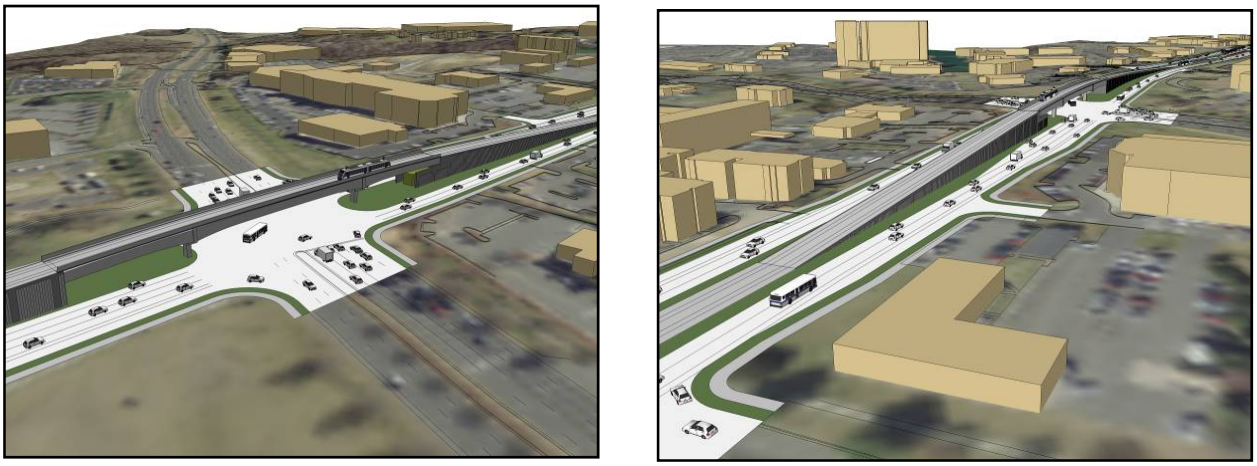

Figure 5-2: Aerial Structures

5.4.7 Capital Costs

To estimate the capital costs, a qualitative and quantitative analysis was conducted utilizing the conceptual engineering designs. Quantities were developed for bridge lengths, dedicated transitway, systems and communications, and site work utilizing the profiles developed along each alternative. Costs were developed for the five build alternatives. The breakdown of these capital costs along with the above mentioned engineering design and the below mentioned operations and maintenance costs are detailed in Appendix D: Concept Designs and Costs. Table 5-10: Capital Costs by Alternative presents the capital costs for each alternative.

5.4.8 Operations and Maintenance Costs

To estimate the annual operations and maintenance (O&M) costs for the Tier II alternatives, a fully-allocated operating and maintenance (O&M) cost model was developed. A fully allocated cost model assumes that all O&M expenses are proportional to the amount of service provided and will increase or decrease as service levels change. The methodology used to develop O&M costs and the operating parameters are described separately in the Operating and Maintenance Cost Report contained in Appendix D.

A service plan defining the operation of the each of the project alternatives was created and used in the calculation of units of service which were input into the O&M cost models. Two Build Alternatives with

sub-options by mode (LRT and BRT) and a TSM Alternative were evaluated. Table 5-11: Operating Parameters by Alternative presents operating parameters developed for each alternative.

A summary of the annual O&M cost by alternative is presented in Table 5-12: Annual O&M Cost Summary by Alternative. Based on the service plans defined for the TSM Alternative, the annual O&M costs are $4.8 million. For BRT Alternatives, the annual O&M costs range between $5.2 and $5.7 million dollars, depending on the alternative. For LRT Alternatives, the annual O&M costs range between $26.3 million dollars to $29.9 million dollars, depending on the alternative. All costs are in 2012 dollars.

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Table 5-10: Capital Costs by Alternative

Cobb County AA
Connect Cobb Transit
Capital Cost Estimate
(2011 Dollars in Millions)

CAT No.	Description	Alternative 1-LRT	Alternative 2a-LRT	Alternative 2b-BRT	Alternative 4a-LRT	Alternative 4b-BRT
	Length (Mile):	27.89	28.53	28.29	24.96	24.70
	Number of Stations:	13	26	26	25	25
	Number of Revenue Vehicles:	26	33	17	30	15
10	GUIDEWAY & TRACK ELEMENTS	$1,057.5	$787.5	$719.8	$723.0	$662.4
20	STATIONS, STOPS, TERMINALS, INTERMODAL	$569.5	$381.7	$381.7	$379.8	$379.8
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	$27.6	$34.7	$16.6	$31.7	$14.8
40	SITEWORK & SPECIAL CONDITIONS	$94.4	$108.4	$107.6	$95.0	$94.1
50	SYSTEMS	$194.9	$207.3	$38.1	$180.3	$33.9
	Construction Subtotal (Sum Categories 10 - 50)	$1,943.9	$1,519.6	$1,263.8	$1,409.8	$1,185.0
60	ROW, LAND, EXISTING IMPROVEMENTS	$29.7	$5.9	$5.9	$8.1	$8.1
70	VEHICLES	$97.2	$123.4	$63.6	$112.2	$56.1
80	PROFESSIONAL SERVICES	$786.5	$614.8	$511.3	$570.4	$479.5
90	UNALLOCATED CONTINGENCY	$857.2	$679.1	$553.4	$630.2	$518.6
Art in Transit		$19.4	$15.2	$12.6	$14.1	$11.9
	Total Project Cost	$3,734.0	$2,958.0	$2,410.6	$2,744.8	$2,259.2
	Cost per mile	133.88	103.67	85.20	109.96	91.48

Note: (costs are in millions)

Table 5-11: Operating Parameters by Alternative

	Alternative 1 - Light Rail Transit	Alternative 2a - Light Rail Transit	Alternative 2b - Bus Rapid Transit	Alternative 4a - Light Rail Transit	Alternative 4b - Bus Rapid Transit
	Acworth to Arts Center Station along I-75	Acworth to Arts Center Station along US 41	Acworth to Arts Center Station along US 41	KSU to Arts Center Station along US 41	KSU to Arts Center Station along US 41
Alignment Length (route miles)	27.4 miles	27.9 miles	27.9 miles	25.3 miles	25.3 miles
Average Operating Speed (mph)	45 mph	35 mph	35 mph	35 mph	35 mph
End-to-End One-Way Run Time (minutes)	37.0 min	48.0 min	48.0 min	44.0 min	44.0 min
Min Layover Time at Terminals (each end)	5.0 min	5.0 min	5.0 min	5.0 min	5.0 min
Round Trip Cycle time (minutes)	88.0 min	112.0 min	112.0 min	104.0 min	104.0 min
Actual Layover Time at Terminals (each end)	7.0 min	8.0 min	8.0 min	8.0 min	8.0 min
Peak Headways (weekdays) - minutes	8.0 min	8.0 min	8.0 min	8.0 min	8.0 min
Peak Trains / Buses in Service	11	14	14	13	13
Peak Consist Size	2	2	1	2	1
Peak Vehicles in Service	22	28	14	26	13
Spare Ratio (15% of peak vehicle requirement)	4	5	3	4	2
Total Fleet Size	26	33	17	30	15

Table 5-12: Annual O&M Cost Summary by Alternative

Alternative	**Alternative 1 - Light Rapid Transit**	**Alternative 2a - Light Rapid Transit**	**Alternative 2b - Bus Rapid Transit**	**Alternative 4a - Light Rail Transit**	**Alternative 4b - Bus Rapid Transit**
Description	**Acworth to Arts Center Station along I-75**	**Acworth to Arts Center Station along US 41**	**Acworth to Arts Center Station along US 41**	**KSU to Arts Center Station along US 41**	**KSU to Arts Center Station along US 41**
Alignment Length (route miles)	27.4 miles	27.9 miles	27.9 miles	25.3 miles	25.3 miles
Peak Headways (weekdays) - minutes	8.0 min	8.0 min	8.0 min	8.0 min	8.0 min
Peak Vehicles in Service	22	28	14	26	13
Total Fleet Size	26	33	17	30	15
Annual Train Miles	1,574,404	1,603,134		1,453,738	
Annual Vehicle Miles	2,790,142	2,841,057	1,603,134	2,576,299	1,453,738
Annual Train Hours	42,503	55,420		51,468	
Annual Vehicle Hours	75,143	97,750	55,420	89,845	51,468
Vehicle Operations	$ 7,845,957.90	$ 9,448,788.18	$ 3,354,858.98	$ 8,713,968.73	$ 3,096,084.67
Vehicle Maintenance	$ 7,636,513.70	$ 7,775,866.14	$ 954,766.92	$ 7,051,233.45	$ 865,792.22
Non-Vehicle Maintenance	$ 4,240,590.63	$ 4,317,973.67	$ 685,080.12	$ 3,915,581.86	$ 622,667.26
General Administration	$ 6,585,564.26	$ 8,381,627.24	$ 705,285.33	$ 7,782,939.58	$ 654,907.81
Totals	**$ 26,308,626.49**	**$ 29,924,255.22**	**$ 5,699,991.35**	**$ 27,463,723.62**	**$ 5,239,451.95**

5.5 Evaluation of Tier II Alternatives

The analyses described in the preceding sections allowed for a comparison of each build alternative to the identified study goals and objectives, as well as a comparison to the No Build and TSM Alternatives. These comparisons are summarized in Table 5-13: Evaluation of Tier II Alternatives shown below. From the evaluation, the two highest scoring alternatives were Alternative 2a-BRT Acworth to Midtown via US 41 in Cobb, I-75 in Fulton and Alternative 4a-BRT Kennesaw to Midtown via US 41 in Cobb, I-75 in Fulton. These findings were reviewed in conjunction with the public input regarding the five goals and objectives to arrive at recommending an LPA. The specifics regarding this evaluation and the LPA are presented in Section 8.

Table 5-13: Evaluation of Tier II Alternatives

Goals/Objectives	Measure	No Build	TSM (Express bus and increased service)	Build Alternatives: 1-LRT Acworth to Midtown I-75	2a-LRT Acworth to Midtown via US 41 in Cobb, I-75 in Fulton	2a-BRT Acworth to Midtown via US 41 in Cobb, I-75 in Fulton	4a-LRT KSU to Midtown US 41 in Cobb, I-75 in Fulton	4a-BRT KSU to Midtown US 41 in Cobb, I-75 in Fulton
Transportation		1.0	1.2	3.6	3.4	3.9	3.4	3.5
Reduce congestion/improve traffic flow	Changes in travel patterns	1	1	4	4	4	3	3
	Increased pedestrian and bicycle connectivity	1	1	4	5	4	5	4
	Reduction in VMT (daily)	1	1	2	5	5	4	4
Plan for current and future needs	Increased transit capacity	1	2	2	5	5	4	4
	Reduced walk times for transit	1	1	5	4	3	4	3
	Transit Access for low income/traditionally underserved	1	1	5	4	4	4	4
	Flexibility (ability to expand service and capacity cost effectively)	1	1	5	3	3	5	2
Reduce travel delay	Reduction in VHT (daily)	1	1	2	3	3	5	5
	Reduction in Peak Period Corridor Travel Times	1	1	5	2	3	1	3
Improve travel efficiency	Increased transit ridership	1	2	1	4	4	3	5
	Improved connectivity	1	1	2	3	3	5	5
Improve safety	Reduced vehicular crashes	1	1	5	1	4	2	3
	Reduced Trips using automobile	1	1	3	2	5	1	3
Land Use		1.1	1.3	3.1	4.1	4.1	4.3	4.3
More efficient use of land	Reduced parking needs	2	3	2	4	4	4	4
	Improved bicycle and pedestrian infrastructure	1	1	3	4	4	5	5
Increase housing choices	Diversity of housing and income levels	1	1	3	4	4	4	4
	Better housing/jobs balance	1	1	5	3	3	3	3
	Increased transit-oriented development	1	1	3	5	5	5	5
	Increased location efficient housing	1	1	3	4	4	5	5
Promote active, healthy lifestyles	Increased public facilities, such as parks, green space, health and education	1	1	3	5	5	4	4
Economic Development/Redevelopment		1.0	1.0	3.0	5.0	5.0	4.7	4.7
Stimulate local economy	Increased employment and income levels	1	1	3	5	5	5	5
	Net economic growth	1	1	4	5	5	5	5
	Increased commercial/retail spaces	1	1	3	5	5	4	4
	Decreased/stabilization of foreclosure rates							
	Creation of more mixed use complexes within walking distance of transit	1	1	2	5	5	4	4
Leverage public and private investment	Revenue generated from land development	1	1	3	5	5	5	5
	Encourage public/private partnerships at stations	1	1	3	5	5	5	5
Environment and Air Quality		3.0	3.5	3.5	3.1	2.8	3.2	3.1
Minimize adverse environmental impacts to the built and natural environment.	Estimated community impacts/disruptions for (residential, business, community, facilities, churches)	5	5	4	2	2	3	3
	Noise sensitive land uses within proximity to alignments	5	5	3	2	2	2	2
	Environmentally sensitive resources within ½-mile of alignment (wetlands, water bodies, parks, historic structures)	5	5	4	2	2	3	3
Improve air quality	Change in daily emissions of VOC and NOx	1	2	5	5	3	5	3
	Use the cleanest possible transit technology	1	4	5	5	4	4	5
Consult with local and regional stakeholders	Coordinate with neighboring jurisdictions	3	3	3	3	3	3	3
	Seek input from all benefitted and burdened communities	3	3	3	3	3	3	3
	Provide equitable access to educational and informational project material	3	3	3	3	3	3	3
	Provide multiple avenues for public comment to ensure participation from all interested parties	3	3	3	3	3	3	3
	Educate public on the viability of transit options	3	3	3	3	3	3	3
Promote environmental justice	Minority, low-income, elderly and disabled populations within 1/2 mile of stations; Minority, low-income, elderly and disabled populations within 1,000 feet of alignments	1	2	3	3	3	3	3
Financial		3.7	4.7	1.7	1.3	2.0	1.7	2.0
Maximize cost efficiency and cost effectiveness	Cost per mile	5	5	1	1	2	1	2
	Total capital, operating and maintenance costs	5	5	1	1	2	1	2
	Cost per trip	1	4	3	2	2	3	2

Project Goals	No Build	TSM	1-LRT Acworth to Midtown I-	2a-LRT Acworth to Midtown US 41, more stations	2a-BRT Acworth to Midtown US 41, more stations	4a-LRT KSU to Midtown US 41, more stations	4a-BRT KSU to Midtown US 41, more stations
Transportation	1.0	1.2	3.6	3.4	3.9	3.4	3.5
Land Use	1.1	1.3	3.1	4.1	4.1	4.3	4.3
Economic Development/ Redevelopment	1.0	1.0	3.0	5.0	5.0	4.7	4.7
Environment and Air Quality	3.0	3.5	3.5	3.1	2.8	3.2	3.1
Financial	3.7	4.7	1.7	1.3	2.0	1.7	2.0
Grand Total:	9.8	11.6	14.9	16.9	17.8	17.2	17.5

Ratings:

5	Best
4	Above Average
3	Average
2	Below Average
1	Worst

6. PUBLIC INVOLVEMENT SUMMARY

To complement the technical components of the AA, a robust public involvement program was implemented to ensure community and stakeholder involvement. Effective two-way communication with planning partners, elected officials and their constituencies, stakeholders, the business community, neighborhoods, and the general public was essential in creating strong community relationships and generating useful project input. Input from these groups was critical in identifying transportation issues and needs in the corridor, and developing and analyzing the alternatives.

This section provides an overview of the public involvement process and efforts undertaken as part of Connect Cobb AA.

Public Outreach involved over 1,500 participants, through 55 outreach events over a 14-month period.

6.1 Public Involvement Goals and Objectives

The core goals of the approach for public involvement for the Connect Cobb AA were three fold: inform, invite and communicate. First, it was important to inform stakeholders and the public of the purpose and progress of the AA study including local issues, alternatives to be considered and potential impacts. Second, inviting participation in the planning process was critical for collecting input in the development and selection of alternatives and building consensus for the conclusions and recommendations of the study. Third, it was essential that study participants, the general public, affected agencies and elected officials be offered mechanisms to communicate their perceptions, opinions and ideas throughout the entire course of the planning process. In meeting these goals, the following objectives were pursued:

- **To consult with local officials, agency representatives and staff to gather their ideas for transportation solutions.** This process relied upon the knowledge and experience of local officials, agency representatives and staff. Those individuals who interact with the current transportation system and community on a regular basis were a key source of information and insight.

- **To collaborate with community stakeholders and gather their ideas for issue identification and the creation of solutions.** This process was an opportunity for the community to voice their concerns and opinions about the current state of transportation in the study area and their vision for future improvements. Coordination with primary users and residents provided invaluable insight to the process.

- **To inform and involve the public throughout the process.** Public involvement tools were utilized to: 1) educate, 2) listen to, and 3) learn from the public early and often throughout the project schedule. The success of the planning process depended on the cooperation and support of the public. It was our goal to ensure that anyone affected by the alternatives in the study area had an opportunity to provide input at key technical milestones during the AA's development.

6.2 Public Involvement Activities

The public involvement approach for the Connect Cobb AA combined traditional public involvement techniques and communication methods with innovative opportunities for the stakeholders and the public to be involved and engaged. This included strategies to successfully meet the public on their own terms, including interactive meetings, stakeholder roundtables, kiosk events, online surveys and social media tools. Various groups have been engaged throughout the AA, as described below.

6.2.1 PROJECT TEAMS

Two teams, the Technical Team and the Partners Team were formed to address the informational and participation needs of elected officials, agency leadership and staff, and significant institutional partners. The purpose of the teams was to provide these groups with in-depth project information and allow them oppourtunities to advise and guide the AA process from their individual team perspectives.

The Technical Team was comprised of County, City, State, Regional, and Federal agency staff and others. The team met four times, including August 31, 2011 (project kick-off), November 15, 2011, January 25, 2012 and May 29, 2012 (joint meeting with Stakeholder Roundtables) to discuss and advise on the purpose and need, evaluation criteria, study process, details of the alternatives, and analysis components of the AA. The members of the team included:

- Cobb County
- City of Acworth
- City of Atlanta
- City of Austell
- City of Kennesaw
- City of Smyrna
- City of Marietta
- City of Powder Springs
- Georgia Department of Transportation (GDOT)
- Georgia Regional Transportation Authority (GRTA)
- Federal Transit Administration (FTA)
- Federal Highway Administration (FHWA)
- Kennesaw State University (KSU)
- Chattahoochee Technical College
- Life University
- Cumberland Community Improvement District
- Town Center Area Community Improvement District
- Southern Polytechnic State University
- Cobb Chamber of Commerce
- Metropolitan Atlanta Rapid Transit Authority (MARTA)

- Atlanta Regional Commission (ARC)
- Dobbins Air Reserve Base (ARB)
- Cobb-Marietta Coliseum & Exhibit Hall Authority
- CSX
- Atlanta BeltLine
- Midtown Alliance
- Governor's Office
- State Road and Tollway Authority

The Partners Team was comprised of the elected officials as well as leaders and executive staff of the above agencies and organizations. The purpose of the Partners Team was to keep leaders up to speed on the study's progress providing them with the necessary knowledge to serve as information conduits to their staff and constituents. This team was invited to meet jointly with the Technical Team at the four dates listed. In addition, the Partners and the Technical Teams were invited to the September 2012 Cobb County Board of Commissioners meetings on September 11th and 25th to hear a presentation on the recommended LPA for the corridor.

6.2.2 Regional, State and Federal Agency Coordination

Throughout the AA study, very close coordination was conducted with various regional, state and federal agencies with an interest in the project. The intent of these coordination meetings was to ensure agency partners were kept abreast of the latest study developments and align the technical work of the AA and resulting LPA with existing and future planning objectives, efforts and initiatives. Below is listing of the coordination meetings:

Federal Transit Administration (FTA)

- October 5, 2011
- February 16, 2012
- April 11, 2012
- June 14, 2012

Georgia Department of Transportation(GDOT)

- June 8, 2012
- July 13, 2012
- August 31, 2012

Atlanta Regional Commission (ARC)

- April 12, 2012 (Regional Transportation Committee)
- April 25,2012 (Board Meeting)
- May 22, 2012 (Transportation Coordinating Committee)

6.2.3 STAKEHOLDER ROUNDTABLES

Stakeholder Roundtables were held to solicit input from the many diverse interests involved in the AA study. Roundtable topics focused on the need and purpose for the project, evaluation criteria, the AA process, and details of the alternatives. Participants included community members, planning partners, key stakeholders, special interest groups, membersof the business community, elected and appointed officials, and agency staff.

Invitees to the roundtables were asked to attend a general kick-off meeting on November 15, 2011. At that meeting, an overview of the roundtable process, with a description of all criteria, goals and objectives was presented. A survey. comment card, and an "idea wall" was provided to the participants to record their initial thoughts on important issues and considerations for the study. A schedule was posted of separate meetings held December 6-13, 2011 for each of the following criteria categories: transportation and air quality, land use, economic development/redevelopment, environment, and financial. Based on their interests, attendees signed-up for desired roundtables, with no limit on the number they could attend. Over 50 participants attended the meeting.

Each of the individual roundtables held in December 2011 included a short presentation on the subject category. Participants then broke up into small groups with a facilitator to discuss refinements of the purpose and need statement and suggest any edits or additions to the evaluation criteria. All input was recorded in individual summaries and distributed to the participants and posted on the Cobb Connect website. Over 80 attendees participated in the December roundtables, many attending more than one or even all five. Below is a listing of the individual roundtables with dates.

- Transportation and Air Quality — December 6, 2011
- Land Use — December 6, 2011
- Economic Development — December 8, 2011
- Environment — December 8, 2011
- Financial — December 13, 2011

The Roundtable participants then met again in a single meeting on February 7, 2012 to hear a presentation on the status of the study and provide input on the alternative alignments and station locations. Interactive exercises allowed attendees to examine maps showing each of the alternatives and directly place their comments concerning preferred station locations, areas of concern, and thoughts on specifics of the alignments. A comment form was also available. Over 30 individuals attended the meeting.

A second joint meeting with the Partners and Technical teams took place on May 29, 2012 to present the results of the Tier I evaluation. The meeting was held in an open-house format. Display boards were set up around the room in stations depicting graphics with the following topics: Purpose and Need and Alternatives Analysis Process, Transit Technology and Corridor Assessment, Tier I Evaluation Results, Alternatives for Tier II Analysis, and Next Steps. To guide them through the displays, attendees were provided a handout explaining the display boards. Staff were on hand to answer questions and take iput either verbally or written, a comment form was provided. In total, 72 attendees signed in at the meeting.

The Roundtable participants also were invited to attend the September 2012 Cobb County Board of Commissioners meetings on September 11th and 25th. At these meetings, the LPA was presented.

6.2.4 Stakeholder Briefings

One-on-one briefings with key stakeholders were conducted to frame issues, set goals, gather data, and collect insight on development of the alternatives. Briefings were conducted with elected officials, city and agency staff, special interest groups, business community organizations and major stakeholders. These briefings and their dates are listed below:

- Midtown Alliance, City of Atlanta & Atlanta BeltLine — Jan. 31 and Aug. 13, 2012
- Dobbins Air Reserve Base (Includes Base Tenants) — February 7, 2012
- Cobb County Board of Commissioners (TV23) — February 28, 2012
- Town Center Area Community Improvement District (CID) — March 27, 2012
- Cumberland CID — March 29, 2012
- Upper Chattahoochee Riverkeeper & National Park Service — June 14, 2012
- City of Kennesaw — August 3, 2012
- Kennesaw State University — August 3, 2012
- City of Acworth — August 4, 2012
- City of Marietta — August 8, 2012
- Cobb Marietta Coliseum & Exhibit Hall Authority — August 24, 2012
- Southern Polytechnic State — September 1, 2012
- City of Smyrna — September 12, 2012

6.2.5 Outreach to Environmental Justice Populations

Federal directives concerning Environmental Justice are intended to increase access for low-income, and minority populations in the decision-making process. To further the goals of these directives, specific outreach techniques geared toward the education and involvement of these populations were implemented as a key part of the public involvement strategy for the Connect Cobb AA. Specific outreach efforts included:

6.2.5.1 COBB COMMUNITY TRANSIT KIOSKS

Informational displays were set up at the Cumberland Transfer Center and Marietta Transfer Center on March 6 and 8, 2012 to distribute project material and collect input and surveys from transit users. Materials were available in English, Spanish and Portuguese, and an interpreter was present for non-English speaking visitors to the kiosks. Project staff talked to 50 transit users, with a total of 45 survey responses collected, three of which were in Spanish.

6.2.5.2 COMMUNITY LEADERSHIP BRIEFING

A briefing was held on March 19, 2012 to reach out to leaders of study area churches and social organizations providing them information on the study and offering them an opportunity to provide their input. Of the over 40 individuals or organizations that were invited to participate, 11 attended the event. The briefing included a presentation on the study and a discussion session. During the discussion, attendees were invited to leave comments and ask questions. Materials were available in English, Spanish and Portuguese for attendees to collect and bring back to other members of their organizations.

6.2.5.3 COBB TRANSIT ADVISORY BOARD

Two presentations were made to the Cobb Transit Advisory Board on February 7, 2012 and June 25, 2012 to present information on the study. Representation on the board is broad and includes advocates for low-income, minority, and the disabled community. Opportunity for discussion followed each of the presentations.

6.2.6 UNIVERSITY STUDENT OUTREACH

Students are typically categorized among low-income populations. However, considering the large population of students in the study corridor, it was believed that a special survey to that sector of the population was appropriate. An online survey was distributed to colleges and universities located in the study corridor from February 6, 2012 through March 9, 2012 to collect feedback regarding how students in the corridor use I-75 and US 41 and their thoughts on transportation needs. A total of 480 responses were received. The following institutions participated in the survey:

- Chattahoochee Tech
- Savannah College of Art and Design (Atlanta campus)
- Georgia Institute of Technology
- Georgia State University
- Kennesaw State University
- Southern Polytechnic State University
- Life University

6.2.7 CITY OF ATLANTA OUTREACH

To ensure the AA study captured the perspective of stakeholders in the southern end of the corridor, outreach coordinated with staff of City of Atlanta and Atlanta BeltLine Inc. planned and hosted several public meetings within the City of Atlanta limits. Four meetings in total were held on the following dates.

- Citywide Conversation — April 30, 2012
- Study Group – Northside — May 7, 2012
- Study Group – Westside — May 21, 2012
- Citywide Conversation — September 27, 2012

The meetings were advertised through the Connect Cobb Facebook and website, the Atlanta BeltLine Inc. website, and email blasts to over 14,000 Atlanta BeltLine Inc. subscribers. The meetings consisted of a presentation by City of Atlanta and Atlanta BeltLine Inc. staff followed by Connect Cobb staff. A discussion session followed the presentations. Display boards were set up around the meeting room and attendees were invited to visit the boards and speak one-on-one with staff. In total, over 50 persons attended these meetings.

6.2.8 COLLATERAL MATERIALS

A variety of materials were prepared to help communicate the study process and results Two project fact sheets were developed to educate and inform stakeholders on the study's initiation and progress. The fact sheets were available at all study meetings, available electronically via e-mail and on the study website, and distributed at activity centers in the study corridor. Fact sheets and newsletters were available in English, Spanish and Portuguese.

6.2.9 WEB PRESENCE

A webpage was developed and maintained for the Connect Cobb AA. Major elements of the webpage included study background, details on study process and alternatives, meeting summaries and presentations, study documents, and contact information. In addition, in recognition of increased use of social media tools, a Facebook page was created and maintained to disperse study information such as notification of events and milestones.

6.2.10 COMMENT COLLECTION AND DOCUMENTATION

All comments received throughout the public involvement process were collected and documented. Wherever possible, comments were recorded through written mechanisms such as comment forms and surveys. Verbal comments received during discussions at meetings or roundtable events, at kiosk events, or stakeholder briefings were recorded. All comments were carefully analyzed and considered as an integral component of the study's process, from development of the purpose and need to the refinement of alternatives, and ultimately the recommendation of the LPA. The following is a summary of the comment themes most commonly heard throughout the process:

- **Alternatives:** Suggestions were made on combinations of preferred modes and alignments.
- **Alignments:** Preferences were expressed for routes felt most beneficial for such factors as congestion relief; development and redevelopment; connectivity; right-of-way and costs constraints; neighborhood impacts; and others.
- **Modes:** Preferences were expressed for technologies to be included for consideration including BRT; Light Rail; Maglev; and Express Bus.
- **Stations:** Stakeholders indicated preferences for station aspects including the number (more vs. less); locations; scale; context; design; safety; convenience; potential for public-private partnerships; need to support universities, existing cities, and neighborhoods; and fostering of local and regional connectivity.
- **Purpose and Need:** Suggestions were heard for inclusion of goals and objectives in the purpose and need statement including cost effectiveness; alleviation of traffic congestion; minimization of environmental and community impacts; and support of economic development and redevelopment opportunities.
- **Environmental Concerns:** Sensitive environmental features were noted including water resources; low-income and minority populations; elevations; air quality; storm water runoff; clean fuel technology; hazardous material sites; historical resources; airspace restrictions; railroad interface; noise impacts; and view shed degradation.

- **Evaluation Criteria:** Input was heard on criteria that should be utilized. Among those heard most frequently were financial feasibility; congestion relief; environmental impacts; and economic development and redevelopment.

- **AA Process and Analysis:** Suggestions were heard for components that should be included in the AA including consideration of all reasonable alternatives and inclusion of all stakeholders both from socio-economic and geographic perspectives. The point was also made that the analysis should consider the net effects of any alternatives (benefits minus any associated costs) and not just the benefits.

- **Important Considerations:** Several other concerns were raised by stakeholders including the needs of transit-dependent, elderly, and students; connections to other systems like MARTA, BeltLine and Xpress; long term financial feasibility of any proposed system; safety; accessibility; parking; security; bicycle and pedestrian connections; and circulator systems.

6.2.11 Public Opinion Polling

Two public opinion surveys were conducted as part of this AA. A detailed description of the survey techniques and results are provided in Appendix E. These surveys were an important component of the overall outreach strategy, because unlike all other activities, the surveys allowed for control over the sample. These surveys included residents along the Northwest Corridor and are adjusted to a representative sample of the demographics of the study area.

The input received from these surveys clearly demonstrates that a majority of residents strongly support improvements in transit services and facilities in the corridor. Opinions are split concerning the specific transit technology and design elements. But, the need for high capacity transit is clearly indicated. Roughly 41% feel that traffic congestion will be the most pressing transportation challenge in the corridor, while 43% feel that inadequate transit will be the most significant issue. Approximately 44% feel that improvements should be made exclusively to transit in the corridor, 13% support improvements to roads, 10% support improvements to walking, while 33% feel that it is important to improve all three modes. Furthermore, responses clearly indicate the importance of transit connections that are well coordinated with the MARTA system.

7. Funding Options

Identifying sources of funds to pay for both the construction and ongoing operating and maintenance (O&M) costs of the project selected for the Northwest Atlanta corridor is a critical step in advancing the project's implementation. While no funding plan has yet been developed for the project, an analysis of potential funding sources has been completed. This section presents the results of that analysis which was intended to identify and describe realistic potential capital and operating funding sources that could support implementation and long-term operation of the project selected for implementation. The potential funding sources include a variety of federal, state and local programs and are consistent with sources and strategies for similar high capacity fixed guideway projects currently proceeding through the Federal Transit Administration's (FTA) project development process.

For this analysis, an estimate of total project costs – capital and O&M – was made, to provide order of magnitude amounts that would need to be generated by potential sources. The section first describes capital needs, sources, and potential partnerships for obtaining funds. O&M costs and sources are then described. The section concludes with next steps needed to develop a financial plan for the project.

7.1 Potential Capital Funding Sources

Based on work performed in the development of corridor alternatives, a total capital cost of approximately $1.2 billion (2012 dollars) is assumed to be needed to implement a project that meets the needs in the Northwest Atlanta corridor. The following sections provide an overview of potential federal, state, and local capital funding sources that could be targeted in the future to implement the project. Additional details about these sources are provided in Appendix F.

7.1.1 Federal Sources

The primary federal funding source to support implementation of the project will likely be the FTA's Section 5309 New Starts program. This program could provide funding on the order of 50 to 60 percent of the total capital costs; this program does not provide O&M funding. In addition to the New Starts program, there are other federal transit and highway programs Cobb County DOT could pursue to provide funding for specific elements of the project. It is important to note that the maximum level of federal funding that could be used to implement the project, i.e. the combination of FTA New Starts funds with other federal transportation funding programs, is 80 percent.

The range of potential federal funding sources provided by the recently passed Moving Ahead for Progress in the 21st Century (MAP-21) federal surface transportation legislation for fiscal year (FY) 2013 and 2014 are identified below. As the project is further developed, it will be necessary to track and evaluate future surface transportation legislation for any changes to the MAP-21 funding programs described below as well as to evaluate potential opportunities for any new programs.

- **FTA Section 5309 Fixed Guideway Capital Investment Grant Program (New Starts):** The FTA Section 5309 New Starts Program is the federal government's primary financial resource for supporting locally planned, implemented, and operated transit fixed guideway capital investments. Projects pursuing New Starts funding must follow the discretionary grant program's rules and requirements. This includes FTA's evaluation of the sponsor agency's local financial capacity and level of funding commitment at each phase of the project development process eventually leading to a Full Funding Grant Agreement (FFGA) which commits FTA capital investment funds to the project. This evaluation considers the following:

- **Share of non-FTA Section 5309 New Starts Sources.** This refers to the percentage share of capital costs that will be provided by sources other than New Starts. Roughly 40 to 50 percent of the project's capital costs will need to be provided by non-New Starts funding sources.

- **The stability and reliability of cost and revenue assumptions in the proposed system-wide capital plan.** The FTA wants to ensure that the implementation of the fixed guideway project will not negatively affect the planned capital improvement projects for the existing transit system, including investments aimed at maintaining the existing system in a state of good repair. As such, the financial plan will include Cobb County Transit' s (CCT) planned fleet replacement schedule as well as other background transit capital projects which may include but not be limited to: facility improvements, passenger amenities, IT improvements, equipment, and planning studies.

- **Ability of the sponsoring agency to fund long-term operations of the New Starts project and entire transit system (including existing service)**. Similar to the capital program, the FTA wants to ensure that with the implementation of the fixed guideway project, funding sources are stable and reliable to maintain long term operation (20 years) of the existing transit system and that there are no severe service cuts planned in order to accommodate the fixed guideway project.

Appendix F summarizes 23 high-capacity fixed guideway projects that were included in the FTA's Federal Fiscal Year (FFY) 2013 Annual Report on Funding Recommendations: New Starts and Small Starts Project Profiles issued in January 2012.

Other Federal Funding Sources

There may be opportunities to leverage additional federal funding for specific elements of the project. The sources described below provide a brief overview of these federal funding programs.

- **FTA Section 5307 Urbanized Area Funds:** These funds are apportioned to urban areas based on a formula. For areas with populations of 200,000 and more, the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles as well as population and population density.

  Section 5307 funds can be used for capital costs as well as preventive maintenance of capital infrastructure. Eligible activities include planning, engineering design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software.

  Appendix F describes other New Starts projects that have included the use of Section 5307 funds to support planning and engineering activities and/or to support project construction.

  Relatively few projects use this funding source, which is more traditionally used for funding state of good repair improvement projects of existing capital infrastructure and/or to purchase replacement/expansion buses. Most likely Cobb DOT will continue to use Section 5307 funds to support eligible capital expenses for the existing background transit. However, as the Northwest

Atlanta corridor project becomes more defined in the future, there may be an opportunity for a specific project element(s) to be funded in part with Section 5307 funds.

- **FTA Section 5312 Research, Development, Demonstration and Deployment Program:** MAP-21 authorizes $70 million annually for FY 2013 and FY 2014 subject to appropriations by Congress for the FTA Section 5312 Program. This program supports public transportation research; innovation and development; and demonstration, deployment, and evaluation and specifically creates a new low- or no-emissions vehicle deployment program. Through a competitive grant process, funding will be made available for the acquisition of low- or no-emission vehicles and related equipment, the construction of facilities for low- or no-emission vehicles, and the rehabilitation of existing facilities to accommodate the use of low- or no-emission vehicles. As the project implementation process continues, Cobb DOT will evaluate the potential to incorporate low- or no-emission buses into the project's definition and determine if the Section 5312 funds could be used to fund a portion of the vehicle acquisition costs and/or maintenance facility costs. Alternatively, Cobb DOT could evaluate this program to fund replacement of the background system buses and potentially free up Section 5307 funding for the Northwest Atlanta corridor project.

- **Flexible FHWA Funds**: Some Federal Highway Administration (FHWA) funding sources are eligible to be "flexed" (transferred) to the FTA for use on transit projects. The primary FHWA flexed funds include the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Surface Transportation Program (STP). See Appendix F for a list of New Starts projects in the FY 2013 Budget that included CMAQ and/or STP funds as a component of their respective financial plans.

    - **Congestion Mitigation and Air Quality (CMAQ) Improvement Program.** These funds are available for transportation projects likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and be included in the Metropolitan Planning Organization's (MPO's) current transportation plan and transportation improvement program (TIP). Under MAP-21, eligible capital expenditures related to the Northwest Atlanta corridor project definition could include:

        - Projects that improve traffic flow that could include: improved signalization, construction of HOV lanes; intersection improvements, implementing turning lanes; and ITS improvements including real-time traffic, transit, and multimodal traveler information.

        - Purchase of integrated, interoperable emergency communications equipment.

        - Projects that shift traffic demand to nonpeak hours or other transportation modes, increase vehicle occupancy rates, or otherwise reduce demand.

        - Facilities serving electric or natural gas-fueled vehicles.

    - **Surface Transportation Program (STP):** This program provides flexible funding for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Under MAP-21, eligible capital expenditures related to the project could include:

- Construction, reconstruction, rehabilitation, resurfacing, restoration, preservation, or operational improvements for highways.
- Construction of new bridges and tunnels on a Federal-aid highway.
- Capital costs for transit projects including vehicles and facilities used to provide intercity passenger bus service.
- Fringe and corridor parking facilities and programs, including electric and natural gas vehicle charging infrastructure, bicycle transportation and pedestrian walkways, and ADA sidewalk modification.
- Highway and transit safety infrastructure improvements.
- Improvements at intersections with high accident rates or levels of congestion.
- Infrastructure-based ITS capital improvements.
- Environmental restoration and pollution abatement.
- Control of noxious weeds and establishment of native species.
- Congestion pricing projects and strategies, including electric toll collection and travel demand management strategies and programs.

Once specific elements of the Northwest Atlanta corridor project are identified as potentially eligible for CMAQ and/or STP funding, Cobb DOT would work with its regional partners on the Atlanta Regional Commission (ARC) in order to get these funds programmed in the Atlanta Region's Long Range Transportation Plan and TIP.

- **Federal Financing:** The primary source of federal financing for the project would likely be through the Transportation Infrastructure Finance and Innovation Act (TIFIA) Program, that provides Federal credit assistance to eligible surface transportation projects, including highway, transit, intercity passenger rail, some types of freight rail, and intermodal freight transfer facilities. The TIFIA program is designed to fill market gaps and leverage substantial private and other non-federal co-investment by providing supplemental and subordinate capital to projects. The TIFIA program offers the following advantages compared to traditional public financing mechanisms:

    - Long-term loans at the comparable U.S. Treasury yield (State and Local Government Series ("SLGS") rate plus one basis point) – 2.94% for a 35 year loan as of October 8, 2012;
    - Ability to lock in the interest rate several years in advance of a drawdown, without any additional cost;
    - Right to prepay loan draw downs in whole or in part at any time, without penalty;
    - Potential willingness of U.S. DOT to accept more flexible terms, such as back loading;
    - Debt service to reflect anticipated growth in the pledged revenue stream, and thinner debt service coverage margins than otherwise required to obtain an investment-grade rating in the capital markets;
    - Diversified source of debt capital (U.S. Treasury as lender), reducing market saturation; and
    - Lower transaction costs.

    To date, the credit assistance provided by TIFIA has been relatively modest, with annual program funding of $122 million. Under MAP-21, however, the program grows to authorized levels of $750 million in FY 2013 and $1 billion in FY 2014. The new TIFIA funding levels would support as much as $10 billion in project loans annually, compared with approximately $1.2 billion of annual lending capacity under prior law, a nearly eightfold increase in lending capacity. A TIFIA loan may now also cover up to 49 percent of total eligible costs (up from the current cap of one-third of total costs).

    Additionally, MAP-21 removes the current use of evaluation criteria for project selection in the TIFIA program. Under SAFETEA-LU, TIFIA employed a robust set of eight evaluation criteria, including measures of environmental impact, use of new technology, and innovative project organization and delivery. To replace this selection process, MAP-21 transforms TIFIA into a first-come, first-served program with a rolling application deadline.

    It is important to note that TIFIA is a financing instrument and not a funding source. If in the future TIFIA is used to accelerate implementation of the project, Cobb DOT will need to identify a stable, dedicated repayment source.

7.1.2 Potential State Partnerships

The State of Georgia currently does not provide funding to support implementation of fixed guideway projects. However, there may be opportunities to leverage federal funding through state and regional

partnerships on other planned major transportation infrastructure projects directly connected to the project selected for implementation in the Northwest Atlanta corridor.

One of the most promising of these partnerships would be with the Georgia Department of Transportation's (GDOT)/ Georgia State Road and Tollway Authority (SRTA) planned I- 75 and I-575 Northwest Corridor Managed Lanes project in Cobb and Cherokee counties (Managed Lanes Project). Funding for the Managed Lanes Project has been identified and includes the use of a TIFIA loan that would be paid back over time with toll revenue.

To use the Managed Lanes Project's planned funding sources as a potential match for any segment of the Northwest Atlanta corridor transit project that operates along I-75, shared common capital investments would need to be identified. These could potentially include sections of the managed lanes facility, park-and-ride facilities, and roadway improvements required to connect the park-and-ride facilities to the managed lanes. FTA would need to concur that the costs would be eligible for New Starts funding. Additionally the state would need to document the source(s) of funds for common capital investment elements. Ideally, an agreement could be reached where the state would use 100 percent non-federal dollars to implement the common capital investment elements, which would allow Cobb DOT to count these funds as part of the FTA New Starts local match requirement.

If it is determined that the transit project's design characteristics are not compatible with the Managed Lanes Project, there may an alternative approach to leverage the investments in the I-75 corridor. Initial research indicates that the project could be eligible to use toll credits derived from the Managed Lanes Project. It is important to note that the use of the toll credits for a transit improvement project on a segment that follows the US 41 alignment would first require approval from the state. Additionally, in order to use the toll credits, documentation would need to be provided to demonstrate that there will be toll credits available. This documentation would require four years of operating experience combined with historic state use of toll credits.

7.1.3 Potential Local Capital Funding Sources and Partnerships

Other potential local capital funding sources and partnerships include the following (see Appendix F for information about other transit projects that have utilized these sources).

- **Future Voter Approved Local Funding Source:** A significant source of funding for new high capacity transit projects across the U.S. is a dedicated local funding source approved through a local referendum. As the project is further developed, Cobb County could evaluate potential dedicated transit funding sources and request approval from the County's voters to support implementation of the project.

- **Public-Public Partnerships:** Several types of public-public partnerships could be examined to maximize local dollars and provide match for FTA New Starts funds. These include:

    - **Regional Multi-Modal Maintenance and Storage Facility:** In addition to a transit investment in the Northwest Atlanta corridor, there are several other major fixed guideway projects being studied throughout the Atlanta region. A common need for all of these projects will be a maintenance and storage facility. As planning moves forward for these various projects, Cobb County DOT will continue to work with the other regional transit providers to review opportunities to share the cost of purchasing property and constructing a major maintenance facility that could be used by multiple high capacity transit projects.

  - **Multi-jurisdictional Cost Allocation:** The project will provide enhanced transit connections within Cobb County and an enhanced transit connection to Fulton County and the City of Atlanta. Elsewhere in the U.S., projects benefitting multiple jurisdictions have been implemented through regional funding partnerships that allocate system-wide and location specific costs through an adopted cost allocation methodology. A similar approach could be taken in the Atlanta region, if there is the political will among the multiple jurisdictions along the corridor to share a portion of the non-federal funding proportionate to the capital contribution of each partner.

- **Contributions from Local Partners:** The County will continue to explore opportunities for public and private partnerships to support implementation of the project. To date several project partners have provided funding to support preparation of the AA. Potential partnerships could include: Kennesaw State University, Cumberland Community Improvement District, and Town Center Community Improvement District. This could also include partnerships with the jurisdictions within the corridor that are planning infrastructure improvement projects (signalization improvements, utilities relocations/improvements, intersection improvements, etc) that can be coordinated with the transit project.

- **Benefit Assessment Districts / Tax Increment Financing (TIF) Districts:** These districts provide a funding mechanism by which some portion of benefits accruing to privately owned land from a public capital improvement are recouped in order to assist in paying for the improvement. As such these districts provide a form of value capture finance.

  A benefit assessment is a fee on properties in a specified area that is used to pay part or all of the cost of specific capital improvements made within and specifically benefiting that area. In a benefit assessment district, a connection between benefit received and cost charged would be essential, in that assessments charged in benefit assessment districts must be proportional to and no greater than the benefit to the assessed property. Examples of benefit assessment districts can be found in Los Angeles, Miami, San Diego, and Denver.

  A TIF District uses property tax revenues generated beyond an established baseline that are then pledged specifically for infrastructure-related improvements within an area or district.

- **Future Extensions of the Special Local Option Sales Tax:** In March 2011 Cobb County voters approved an extension of the 1-cent Special Local Option Sales Tax (SPLOST) for four more years. The SPLOST is projected to generate $492 million in sales tax revenue to support County capital improvement projects for:

  - Parks, Recreation and Cultural Affairs ($82 million);
  - Transportation ($250 million);
  - Facilities - Libraries, Senior Services, Judicial and Public Health ($16 million);
  - Public Safety ($12 million); and
  - Municipal ($129 million).

  Within the SPLOST Transportation category, $8 million is identified for transit projects including park-and-ride facilities and roadway improvements (queue jump lanes) on Cobb Parkway (US

41). Depending on the final definition of the transit project, specific elements of the project may be consistent with transit improvement projects included in the SPLOST. Additionally, future extensions of the SPLOST could include infrastructure improvements that would benefit existing transit services and also provide incremental implementation of the specific elements of the Northwest Atlanta corridor project.

- **Master Developer Agreement:** For proposed station areas, potential public-private partnership opportunities will be identified, including the development of a Master Developer Agreement. Under this concept, the county could enter into an agreement with a Master Developer who would be responsible for creating the master development plan and executing it through multiple phases, including identifying appropriate land use, assisting with securing necessary properties, designing and constructing stations, and eventual long-term operation. It is important to note that this approach is a financing mechanism and would require a dedicated repayment source for the private sector's upfront financing.

7.2 Potential Operating Revenues

Implementation of a transit project in the Northwest Atlanta corridor will result in an increase in system-wide operating costs for Cobb County Transit. These additional annual O&M costs are estimated at $5.2 million (2012 dollars).

Long term operating funding will likely reflect a combination of existing revenue sources and supplemental sources to cover any potential revenue shortfalls. Figure 7-1: Cobb County Transit FY 2011 Operating Revenues (in millions) summarizes Cobb DOT's FY 2011 operating revenue sources. As shown in the figure nearly all operating funds are provided from three sources: Cobb County General Funds (52 percent); Bus Fares (30 percent); and FTA Section 5307 Urbanized Area Formula Funds (16 percent). In the long-term, these sources will likely remain the transit system's primary revenue sources.

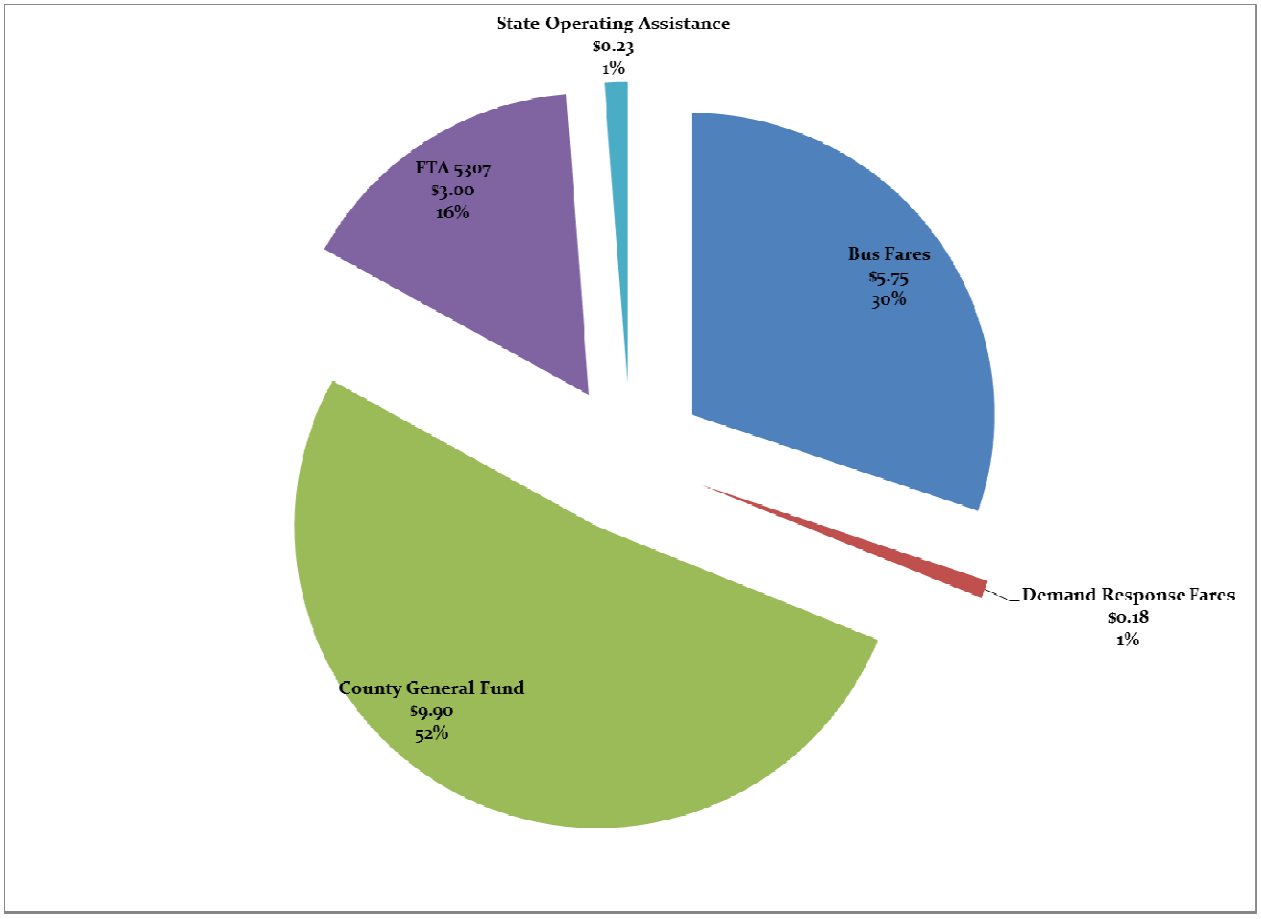

Figure 7-1: Cobb County Transit FY 2011 Operating Revenues (in millions)

The following provides an overview of the existing and potential supplemental revenue sources that could support long-term operation of the existing transit system as well as the new transit service in the Northwest Atlanta corridor.

Existing Operating Revenue Sources

- **Fare Revenue:** The existing bus route in the corridor (CCT Route 10) is one of the busiest public transit bus routes in the Southeastern United States. The current estimated fare box recovery ratio for Route 10 is 47 percent. At this point of project development, it is assumed that the project's fare box recovery ratio for Northwest Atlanta transit service will be similar to the levels currently achieved by Route 10.

- **Reallocation of Existing Fixed Route Bus Service Costs within the Corridor:** A key planning component of the project development process is the development of an integrated service plan that reflects the incorporation of the new Northwest Atlanta transit service into CCT's route network. An outcome of this service plan will be the reduction of Route 10's hours and miles of service. The operating cost savings from this reduction could be reallocated to support operating costs within the corridor related to the implementation of the new transit service.

- **FTA Section 5307 Urbanized Area Formula Funds:** As mentioned previously, Section 5307 funds can be used for preventive maintenance activities on existing capital infrastructure. These preventive maintenance activities are included as on-going operating expenses. As a result, Section 5307 funds are included as both a capital and operating revenue source. Cobb County currently programs approximately $3.0 million per year in Section 5307 funds to support eligible preventive maintenance activities. This level can vary depending on the level of preventive maintenance projects required on a year-to-year basis.

- **Cobb County General Funds:** As stated above, the largest source of operating funds for CCT is from the County General Fund. The annual county subsidy is determined by defining the gap between projected expenses and the revenue from all other sources. Funding for transit operations (approximately $10.0 million) currently accounts for about 3 percent of Cobb County's approximately $330.0 million total General Fund.

Potential Supplemental Revenue

Following are additional sources that could be used to generate revenue for ongoing O&M costs of the new transit service.

- **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**: In addition to supporting implementation of capital projects, CMAQ funding is also eligible to support the first three years of operation of a new transit service. Cobb DOT would have to work with ARC to identify realistic annual levels of funding that could assist with the operating costs for the project for the first three years of service.

- **Contributions from Local Partners:** The County will continue to explore opportunities for public and private partnerships to support implementation of the project. For operations, these partnerships could include but not be limited to contributions from: Kennesaw State University, Cumberland Community Improvement District, Town Center Community Improvement District, as well as the jurisdictions within the corridor served directly by the project. As noted above, similar contributions would also be sought for project capital costs.

- **Future Voter Approved Local Funding Source:** A future voter-approved dedicated transit funding source could provide a long term operating funding source for the project as well as maintenance and expansion of the existing transit system.

- **Benefit Assessment Districts/ TIF Districts**: In addition to being used for capital costs, these previously described districts could provide assistance in covering the on-going operating and maintenance costs at stations.

- **Advertising Revenue:** Revenues can be derived from advertisements placed inside and/or outside the vehicles; at stations; and/or in schedules, maps, flyers, and other promotional materials. A potential emerging source is advertising revenue generated from smart phone apps that provide passengers with real time travel information. The Charlotte Area Transit System and the Jacksonville Transportation Authority are two agencies currently investigating this source.

- **Naming Rights:** Major businesses in Cobb County could pay for naming rights of the entire system or for individual stations or railcars. Examples of transit systems funded in part through naming rights include the TECO Trolley in Tampa and the HealthLine BRT System in Cleveland.

- **Parking Fees:** A parking fee is a tax or surcharge levied on paid parking. The fee could be applied within the project corridor or within the County limits for the use of off-street commercial or employer provided parking spaces. If applied within the corridor, there would be some degree of relationship between traffic and parking within the corridor relative to parking requirements and parking tax. If applied County-wide, the relationship between the parking fee and operating costs within the corridor would be less direct. More likely, a County-wide parking fee would be used to fund a variety of improvements, and would not be used solely to fund operating costs for new transit service in the Northwest Atlanta corridor.

7.3 Preliminary Findings and Next Steps

Following are preliminary findings related to funding options for the Northwest Atlanta corridor:

- There is a reasonable list of potential capital funding sources that would support implementation of new transit service in the corridor. The primary capital sources would include:
    - FTA New Starts Program that would provide funding of between 50 percent and 60 percent of the projected capital costs;
    - Other federal funding sources including flexible federal highway funds which could be used for specific elements of the project;
    - Public-public partnerships with other regional transit providers considering fixed guideway projects to share the capital costs of jointly developing a maintenance and storage facility; and
    - Public-public partnerships with local jurisdictions, GDOT, CIDs, and major institutions.
- Other potential capital revenue sources include a future local voter approved dedicated funding source, creation of a benefit assessment district to support station related costs, and master developer agreements with developers to support station related capital costs.
- The primary potential operating revenue sources include:
    - Farebox recovery ratios that are similar to the level currently achieved by CCT Route 10 (47 percent);
    - Reallocation of funds currently used to operate and maintain Route 10 which will be replaced in part by the new transit service; and
    - Continued funding from the County General Fund, which is the largest source of operating revenue for the CCT's existing transit system. However, transit operations only accounts for approximately 3 percent of the County's total General Fund.
- Other potential operating revenue sources include: CMAQ funding (first three years of operations); potential annual contributions from local project partners, and the establishment of station area improvement districts and/or TIF districts.

Key next steps in the financial planning process include:

- Continuing discussions with public partners within the corridor to identify potential public-public partnership opportunities;
- Developing a system-wide long-range cash flow model that will allow Cobb DOT to evaluate a variety of capital and operating funding strategies and implementation schedules;
- Identifying which station locations may be viable candidates for a Master Development Agreement; and
- Evaluating the revenue generation potential of benefit assessment districts and/or tax increment finance districts.

8. Locally Preferred Alternative and Recommended Next Steps

As described in Section 5, a process that combined technical analysis and public input was used to screen alternatives in the Northwest Atlanta corridor and identify the best solutions to meet the corridor purpose and need. Following the completion of the Tier II technical analyses, additional outreach with key corridor stakeholders was conducted to present the results of that technical evaluation and to discuss conclusions and recommendation for the LPA.

During both the technical analyses and the outreach, however, it was recognized that there are two distinct travel markets in the I-75 and US 41 corridor. Demand along I-75 involves the peak period commuter market which is oriented inbound in the morning and outbound in the evening. Although there are major employment destinations located throughout Cobb County (e.g. City of Marietta and the Cumberland area) a majority of the trips traversing I-75 have ultimate destinations outside of Cobb County and are reached through connectivity with the rest of the regional transportation network.

The other major travel market involves trips into Cobb County from the City of Atlanta and then to and between major activity centers along US 41. The demands of this travel (e.g. between Marietta and Kennesaw State University) are in both directions and occur throughout the day, not just during peak periods. Even though access to employment is one of the primary trip purposes for this market, just as prominent are trips for medical, recreational, shopping, and other such purposes. Because the alternatives evaluated in the Tier II screening focused service on either the I-75 or US 41 alignments, the result was that one, but not both, travel markets could be well served.

Additionally, the Tier II alternatives have significant capital and operating costs, especially in proportion to the predicated levels of demand. As a result, Cobb County and its partners examined the findings of the Tier II evaluation and sought strategies to right-size the investment while still serving the primary travel markets and addressing the identified project goals and objectives. The outcome of this scrutiny was the identification of a **hybrid LPA alternative consisting of Bus Rapid Transit (BRT) along US 41 and enhanced express bus service along I-75**. The following sections describe the development, costing and evaluation of the resulting hybrid LPA alternative.

8.1 LPA Development and Costing

The LPA represents a refinement of Alignment 4a, which was the highest ranked alternative as part of the Tier II screening results. The LPA is shown on Figure 8-1: Locally Preferred Alternative. LPA service would include arterial BRT on US 41 plus express buses operating in the programmed I-75 managed lanes north of I-285 and the existing I-75 HOV lanes south of I-285, complementing the needs of both the commuter riders and local riders.

The recommended transit station locations include KSU, Town Center/Big Shanty, Barrett Lakes Parkway, Canton Road (hospital), Allgood Road, White Water, Roswell/Big Chicken Station, University/South Loop, City of Marietta's GreenTech Corridor, Dobbins ARB gate, Windy Hill Road, Cumberland Parkway North, Akers square/Cumberland Parkway South, Mt. Paran, West Paces Ferry Road, Howell Mill Road, Beltline, Atlantic Station, and MARTA Arts Center Station.

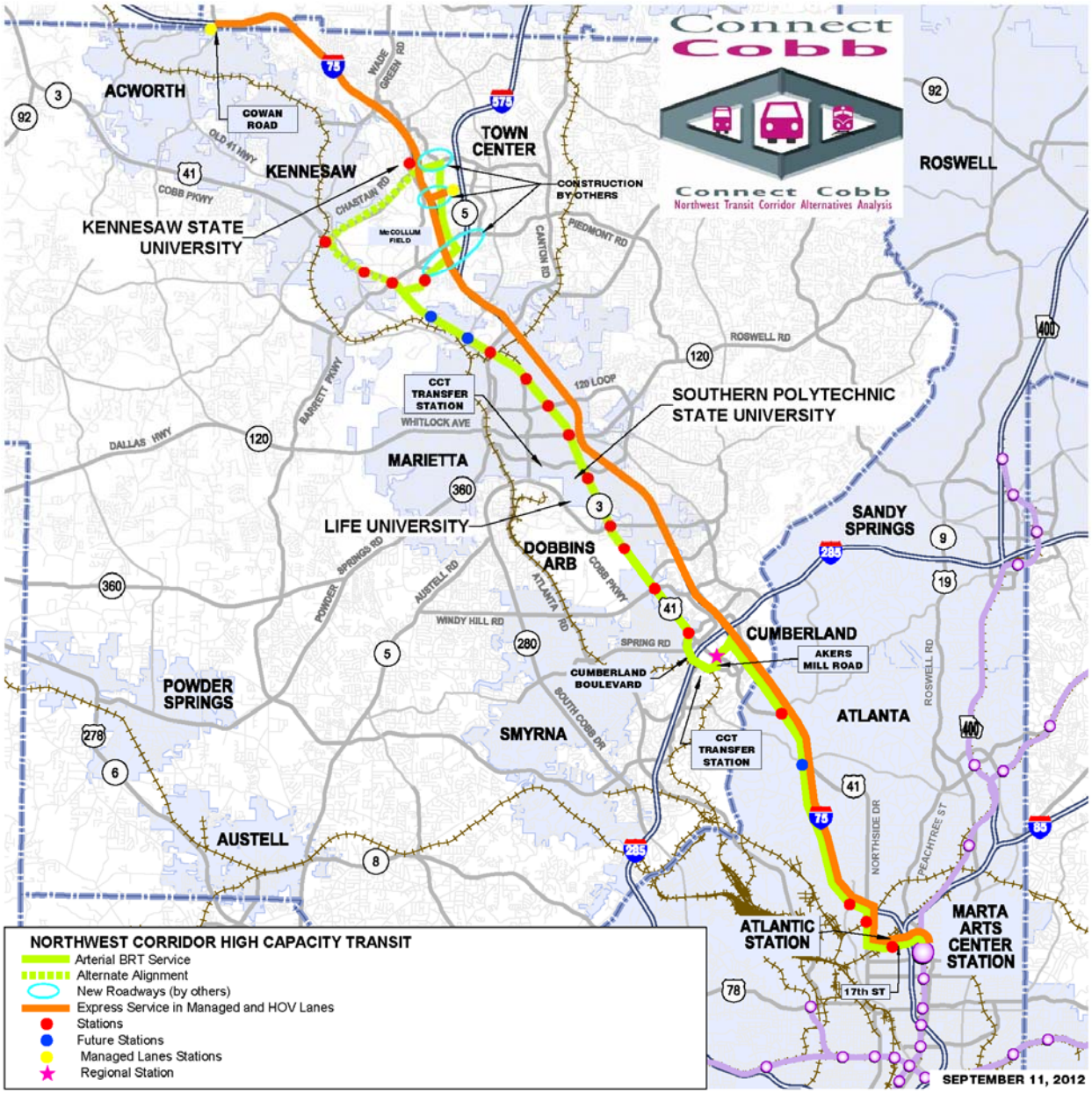

Figure 8-1: Locally Preferred Alternative

To supplement this high capacity transit service, localized access would be made available through establishing a series of circulator and feeder operations in Cobb County for the following areas:

- Acworth-Kennesaw-Kennesaw State University
- Acworth
- Kennesaw
- Kennesaw State University

- Town Center Area
- Marietta
- GreenTech Corridor
- Smyrna
- Cumberland Galleria Area

Additional conceptual engineering analyses were conducted for select segments of the LPA alignment. Firstly, it was recommended that the BRT and express bus services could operate within the existing HOV lanes of I-75 south of I-285 from Akers Mill Road to Northside Drive, with exit ramps at two of the stations (Northside Parkway and Howell Mill Road) to serve stations. This change eliminates the need to construct dedicated guideway for much of the distance from Cumberland to midtown Atlanta. Analysis was also conducted to determine if the BRT technology could utilize existing street networks and operate within the existing general purpose travel lanes without severely impacting the LPA travel times and speeds. The two locations evaluated for operations within general traffic lanes where near KSU and near Atlantic Station.

An initial option for the northern most segment of the LPA was considered. This option would begin service at Kennesaw State University, travel within dedicated BRT lanes along Chastain Road /McCollum Parkway, onto US 41 in BRT dedicated lanes, It was determined that grade separation for the fixed guideway from McCollum Parkway to US 41 posed significant capital expenditures and could be impacted by the flight approach zone for McCollum Field. Consequently the other option was selected for the LPA. This alignment would begin service at Kennesaw State University, travel across a bridge proposed over I-75 by Cobb County while operating in-street, then onto Busbee Drive and Busbee Parkway, operating in-street. The BRT service would then utilize the proposed Barrett Lakes Boulevard extension, cross over I-75 and enter into the median of US 41.

The BRT would operate in the median of US 41 in dedicated lanes through most of the length through Cobb County. The BRT service would then enter the I-75 HOV lanes via the existing ramps at Akers Mill Road and travel within the existing HOV lanes and utilize the Northside Drive HOV exit ramps. Exclusive BRT exits would be provided at Northside Parkway and Howell Mill Road to serve the proposed BRT station. The BRT service would then operate in-street along Northside Drive and 17th Street, thus accessing MARTA Arts Center Station from 14th Street.

LPA design scenarios and capital costs are presented on the following pages. Figure 8-2: US-41 with median BRT illustrates how BRT would operate on US 41, using dedicated median right-of-way, and Figure 8-3: I-75 with median BRT illustrates how BRT would transition to I-75 using the existing HOV lanes (12 foot lanes, with 10 foot center shoulder). Table 8-1: LPA Capital Cost presents capital costs for the LPA.

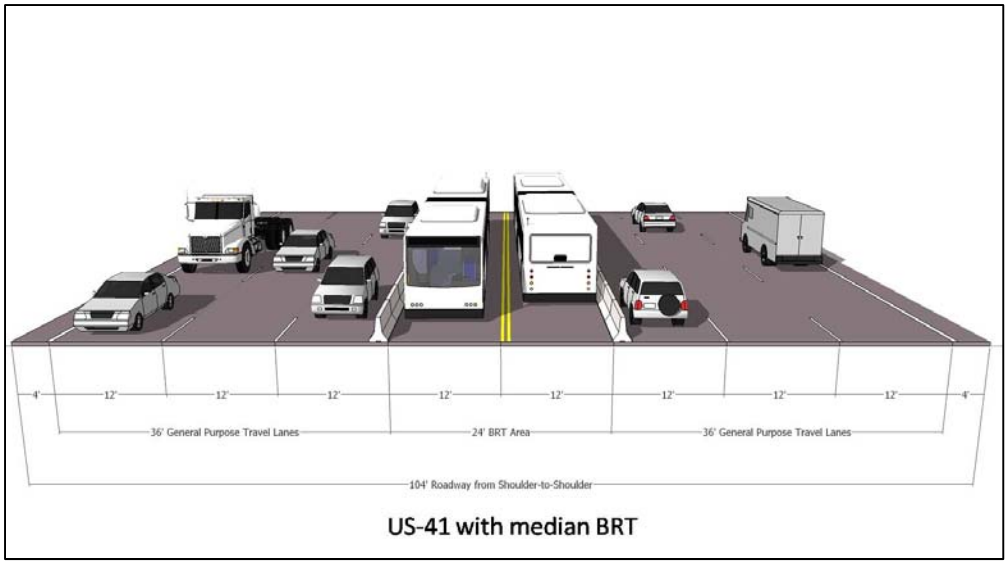

Figure 8-2: US-41 with median BRT

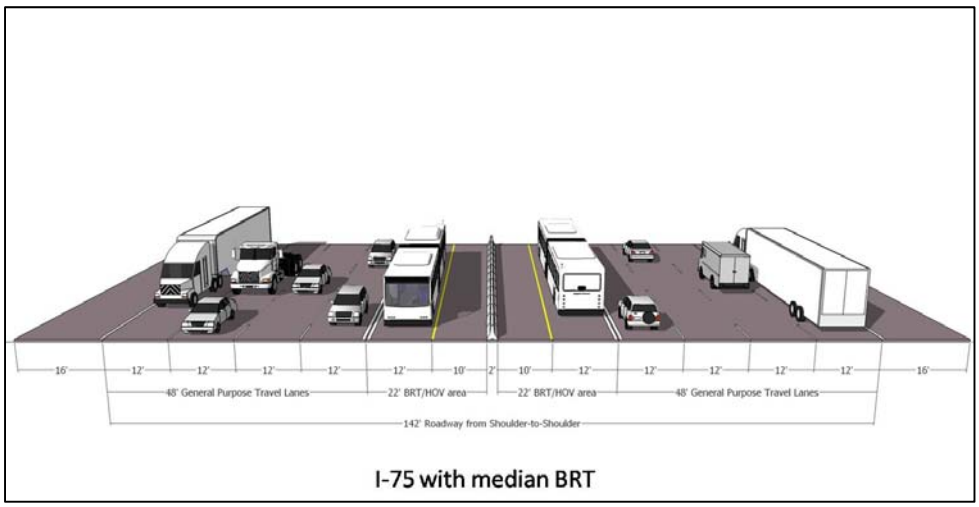

Figure 8-3: I-75 with median BRT

Table 8-1: LPA Capital Cost

Cobb County AA				
Connect Cobb Transit				
Capital Cost Estimate				
(2011 Dollars in Millions)				
CAT			*Option 1 (1,3,4,5)*	*Option 2 (2,3,4,5)*
No.		**Description**	***KSU-TC-AC***	***KSU-CR-AC***
	Length (Mile):		25.34	25.98
	Number of Stations:		18	17
	Number of Revenue Vehicles:		15	15
10	**GUIDEWAY & TRACK ELEMENTS**		243.80	318.14
20	**STATIONS, STOPS, TERMINALS, INTERMODAL**		102.44	100.61
30	**SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS**		14.76	14.76
40	**SITEWORK & SPECIAL CONDITIONS**		82.36	86.44
50	**SYSTEMS**		32.39	32.81
		Construction Subtotal (Sum Categories 10 - 50)	475.75	552.75
60	**ROW, LAND, EXISTING IMPROVEMENTS**		11.99	14.10
70	**VEHICLES**		56.09	56.09
80	**PROFESSIONAL SERVICES**		210.40	241.56
90	**UNALLOCATED CONTINGENCY**		290.04	323.12
Art in Transit			5.20	5.97
		Total Project Cost	**$1,049.47**	**$1,193.59**
		Cost per mile	41.41	45.94

Figure 8-4: Potential Station at Kennesaw State University and Figure 8-5: Potential Station along US 41 depict potential station build-out and development character on both fixed-guideway and shared segments. These illustrations depict a modern, articulated BRT vehicle operating in dedicated space within the median.

Figure 8-4: Potential Station at Kennesaw State University

Figure 8-5: Potential Station along US 41

8.2 LPA Evaluation

The LPA was evaluated using the same performance metrics as the Tier II alternatives. These metrics were developed to address the primary goals and objectives identified through the development of the purpose and need. As the LPA is actually a hybrid of other build alternatives, many of the scores are derived from the scores of the Tier II alternatives discussed earlier. The transportation measures are based on an additional travel demand model run performed for the hybrid LPA and the cost measures have also been updated accordingly.

A brief comparison of the LPA to the Tier II alternatives is provided below in Table 8-2. As shown, the LPA will serve most of the potential riders in the corridor at a fraction of the cost of the fixed guideway alternatives. The full evaluation of the LPA and the Tier II alternatives is illustrated in Table 8-3: Evaluation of LPA and Tier II Alternatives. As shown, the resulting LPA combines some of the best features of the build alternatives yet lowers the project costs, resulting in an alternative which scores significantly higher that all others tested.

Table 8-2: Comparison of LPA and Tier II Alternatives

Alternative	TSM Alternative	Alt. 1 - Light Rail Transit	Alt. 2a - Light Rail Transit	Alt. 2a - Bus Rapid Transit	Alt. 4a - Light Rail Transit	Alt. 4a - Bus Rapid Transit	LPA
Description	New Route Along US 41	Acworth to Arts Center Station along I-75	Acworth to Arts Center Station along US 41	Acworth to Arts Center Station along US 41	KSU to Arts Center Station along US 41	KSU to Arts Center Station along US 41	New Route along US 41
Alignment Length (route miles)	29.2	27.4	27.9	27.9	25.3	25.3	25.3
Daily Ridership Forecasts	8,766	39,694	24,930	18,671	31,669	17,488	24,000
Cost (millions)	$520	$3,734	$2,946	$2,411	$2,731	$2,259	$1,049
Cost/Mile (millions)	$18	$136	$106	$86	$108	$89	$41

Table 8-3: Evaluation of LPA and Tier II Alternatives

Goals/Objectives	Measure	No Build	TSM (Express bus and increased service)	Build Alternatives: 1-LRT Acworth to Midtown I-75	2a-LRT Acworth to Midtown via US 41 in Cobb, I-75 in Fulton	2a-BRT Acworth to Midtown via US 41 in Cobb, I-75 in Fulton	4a-LRT KSU to Midtown US 41 in Cobb, I-75 in Fulton	4a-BRT KSU to Midtown US 41 in Cobb, I-75 in Fulton	LPA
Transportation		1.0	1.2	3.6	3.4	3.9	3.4	3.5	3.3
Reduce congestion/improve traffic flow	Changes in travel patterns	1	1	4	4	4	3	3	3
	Increased pedestrian and bicycle connectivity	1	1	4	5	4	5	4	4
	Reduction in VMT (daily)	1	1	2	5	5	4	4	3
Plan for current and future needs	Increased transit capacity	1	2	2	5	5	4	4	4
	Reduced walk times for transit	1	1	5	4	3	4	3	4
	Transit Access for low income/traditionally underserved	1	1	5	4	4	4	4	3
	Flexibility (ability to expand service and capacity cost effectively)	1	1	5	3	3	5	2	3
Reduce travel delay	Reduction in VHT (daily)	1	1	2	3	3	5	5	1
	Reduction in Peak Period Corridor Travel Times	1	1	5	2	3	1	3	4
Improve travel efficiency	Increased transit ridership	1	2	1	4	4	3	5	4
	Improved connectivity	1	1	2	3	3	5	5	4
Improve safety	Reduced vehicular crashes	1	1	5	1	4	2	3	3
	Reduced Trips using automobile	1	1	3	2	5	1	3	3
Land Use		1.1	1.3	3.1	4.1	4.1	4.3	4.3	4.3
More efficient use of land	Reduced parking needs	2	3	2	4	4	4	4	4
	Improved bicycle and pedestrian infrastructure	1	1	3	4	4	5	5	5
Increase housing choices	Diversity of housing and income levels	1	1	3	4	4	4	4	4
	Better housing/jobs balance	1	1	5	3	3	3	3	3
	Increased transit-oriented development	1	1	3	5	5	5	5	5
	Increased location efficient housing	1	1	3	4	4	5	5	5
Promote active, healthy lifestyles	Increased public facilities, such as parks, green space, health and education	1	1	3	5	5	4	4	4
Economic Development/Redevelopment		1.0	1.0	3.0	5.0	5.0	4.7	4.7	4.7
Stimulate local economy	Increased employment and income levels	1	1	3	5	5	5	5	5
	Net economic growth	1	1	4	5	5	5	5	5
	Increased commercial/retail spaces	1	1	3	5	5	4	4	4
	Decreased/stabilization of foreclosure rates								
	Creation of more mixed use complexes within walking distance of transit	1	1	2	5	5	4	4	4
Leverage public and private investment	Revenue generated from land development	1	1	3	5	5	5	5	5
	Encourage public/private partnerships at stations	1	1	3	5	5	5	5	5
Environment and Air Quality		3.0	3.5	3.5	3.1	2.8	3.2	3.1	3.0
Minimize adverse environmental impacts to the built and natural environment.	Estimated community impacts/disruptions for (residential, business, community, facilities, churches)	5	5	4	2	2	3	3	3
	Noise sensitive land uses within proximity to alignments	5	5	3	2	2	2	2	2
	Environmentally sensitive resources within ½-mile of alignment (wetlands, water bodies, parks, historic structures)	5	5	4	2	2	3	3	3
Improve air quality	Change in daily emissions of VOC and NOx	1	2	5	5	3	5	3	3
	Use the cleanest possible transit technology	1	4	5	5	4	4	5	4
Consult with local and regional stakeholders	Coordinate with neighboring jurisdictions	3	3	3	3	3	3	3	3
	Seek input from all benefitted and burdened communities	3	3	3	3	3	3	3	3
	Provide equitable access to educational and informational project material	3	3	3	3	3	3	3	3
	Provide multiple avenues for public comment to ensure participation from all interested parties	3	3	3	3	3	3	3	3
	Educate public on the viability of transit options	3	3	3	3	3	3	3	3
Promote environmental justice	Minority, low-income, elderly and disabled populations within 1/2 mile of stations; Minority, low-income, elderly and disabled populations within 1,000 feet of alignments	1	2	3	3	3	3	3	3
Financial		3.7	4.7	1.7	1.3	2.0	1.7	2.0	4.3
Maximize cost efficiency and cost effectiveness	Cost per mile	5	5	1	1	2	1	2	4
	Total capital, operating and maintenance costs	5	5	1	1	2	1	2	4
	Cost per trip	1	4	3	2	2	3	2	5

Project Goals	No Build	TSM	1-LRT Acworth to Midtown I-	2a-LRT Acworth to Midtown US 41, more stations	2a-BRT Acworth to Midtown US 41, more stations	4a-LRT KSU to Midtown US 41, more stations	4a-BRT KSU to Midtown US 41, more stations	LPA
Transportation	1.0	1.2	3.6	3.4	3.9	3.4	3.5	3.3
Land Use	1.1	1.3	3.1	4.1	4.1	4.3	4.3	4.3
Economic Development/ Redevelopment	1.0	1.0	3.0	5.0	5.0	4.7	4.7	4.7
Environment and Air Quality	3.0	3.5	3.5	3.1	2.8	3.2	3.1	3.0
Financial	3.7	4.7	1.7	1.3	2.0	1.7	2.0	4.3
Grand Total:	9.8	11.6	14.9	16.9	17.8	17.2	17.5	19.6

Ratings:

5	Best
4	Above Average
3	Average
2	Below Average
1	Worst

In comparison to the other Tier II alternatives, the hybrid LPA achieves the following key objectives:

1. Utilizes infrastructure that is existing (I-75 HOV lanes inside I-285) and that is proposed (managed lanes on I-75 outside I-285) bolstering the system's cost effectiveness
2. Supports peak period express commuting trips with a limited number of stops
3. Connects major activity centers within the corridor (e.g. Kennesaw State University, Town Center Area, Southern Polytechnic State University, Dobbins ARB, and Cumberland Galleria)
4. Supports City land use plans (e.g. GreenTech Corridor) with accessibility via the circulators and feeder routes
5. Enhances the efficiency and effectiveness of the demonstrated reverse commute into Cobb County
6. Supports demonstrated localized trip opportunities
7. Demonstrates sensitivity to the human and natural environmental issues
8. Complements economic development and redevelopment opportunities (e.g. Cobb County's Redevelopment Overlay Districts and EDGE initiatives)

This hybrid is better able to meet the needs of both travel demand markets in the corridor as compared to the single alignment alternatives examined in Tier II. The hybrid avoids many of the major engineering, environmental, and financial challenges associated with the fixed guideway alternatives. The hybrid LPA also takes advantage of the planned managed lane investment on I-75. Additionally, the hybrid LPA offers great flexibility in terms of phasing of implementation, funding and operating strategies.

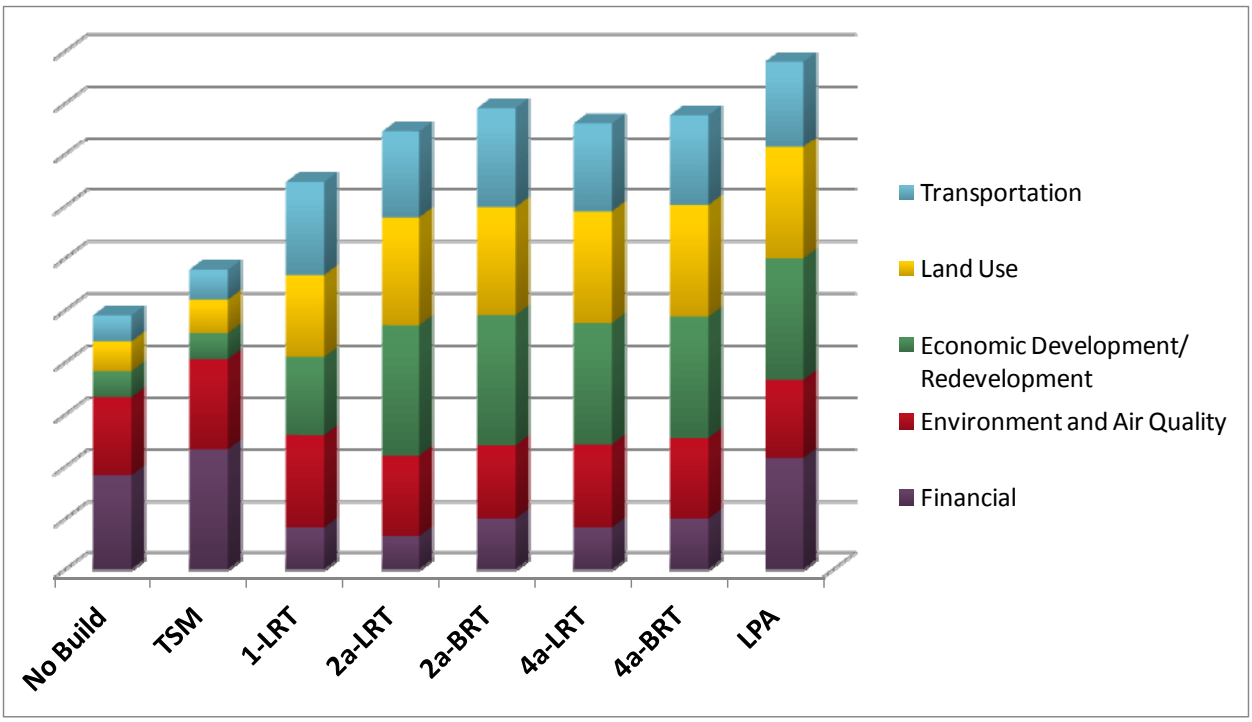

Figure 8-6: Evaluation of Alternatives

8.3 Recommended Next Steps

The Connect Cobb Northwest Transit Corridor Alternatives Analysis has involved a comprehensive and detailed process to screen alternatives and select a LPA for additional analysis in the next phase of project development. That phase will include:

- Local and Regional Adoption of the LPA – It is recommended that Cobb County Board of Commissioners adopt the general findings of this effort, and specifically the identified LPA. This may be accomplished through a separate action or through inclusion of the LPA in the County's Comprehensive Transportation Plan. Similarly, as FTA recognizes adoption by the MPO Board, it is recommended that the LPA be adopted by the ARC Board and included in a future update of the regional long-range transportation plan.

- Additional outreach on the LPA, to ensure that stakeholder issues continue to be identified, as well as to receive input on the range of impacts and other concerns to be addressed in subsequent project development efforts.

- Preparation of an Environmental Assessment (EA) – The environmental impacts of the LPA, in its various components, will each need to be analyzed and disclosed in an EA. Cobb County has already begun this environmental review phase of work.

- Funding – Cobb County (and potentially other funding partners) will have additional decisions and actions to identify and secure the funding to construct and to operate the LPA. This may include seeking federal participation in all or part of the LPA through FTA New Starts or other grant or formula programs.