



CHAPTER FOUR: EVALUATION METHODOLOGY FOR ENVIRONMENTAL MEASURES



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Based on the project purpose and need statements, several goals and objectives have been established for the project that are intended to measure the effectiveness of each alternative. One of the study goals, "Preserve and Enhance the Environment", includes the following objectives: Reduce impact to residential areas and the built environment; Reduce impact to natural resources; and Improve air quality. This section documents the environmental portion of the evaluation of alternatives including the methodology used to prepare and analyze performance measures based on these objectives.

4.1 Data Development

Background research and preliminary field reconnaissance surveys were conducted to aid in the development of the locally preferred transit technology and alignment for the West Line extension of MARTA's rapid transit services. All preliminary data collection was completed in accordance with generally accepted professional research and survey techniques. Specific research and findings for the following environmental sections is more extensively explained in the Environmental Baseline Analysis Report prepared dated February 2003. As the alternatives are further developed and refined in preparation of the DEIS phase, more intensive surveys and an assessment of environmental impacts will be undertaken in accordance with the National Environmental Policy Act of 1969, as amended (NEPA); the Council on Environmental Quality Regulations for Implementing NEPA; U.S. Department of Transportation/Federal Transit Administration Guidelines; and other applicable statutes, executive orders and regulations. Findings will be submitted to the appropriate agencies for their review and concurrence.

4.2 Results of Environmental Evaluation

The results of specific performance measures used to evaluate project build alternatives will be provided in the following section. For each environmental measure, results are discussed, performance measures are evaluated, and a comparison of alternatives is provided.

The comparison of alternatives in this section is based on a qualitative evaluation of each performance measure. Each alternative was assigned a rating of Very Desirable, Desirable, or Less Desirable. These rating terms do not reflect an assessment of the overall system performance or the utility of any of the evaluation measures. Rather it is a means of qualitatively comparing the alternatives to one another and where appropriate to the TSM Alternative. In the data tables included throughout this section, the ratings are shown as a numeric value. Please note the following equivalencies: 3 points = Very Desirable, 1 point = Desirable, -1 point = Less Desirable.

To arrive at the ratings for the alternatives, the performance measure values were first grouped into 3 equal ranges from highest to lowest. If this was sufficient, ratings were assigned to alternatives based on the ranges. However, in many cases, there were natural breaks in the data that established more logical differentiation among the alternatives, so the ranges were adjusted. Alternatively, where the variance was very small among the values, 1 or 2 ranges were used as appropriate to provide a meaningful comparison between alternatives.

4.2.1 Community Impacts/Disruption

The expansion of the MARTA West Line will require the acquisition of additional right-of-way, as determined by standard rail line or bus lane construction requirements. The majority of acquisitions would include sections of the existing railroad line and adjacent parcels that would be required for drainage at each of the station sites and along the street-running segments of the alignments. In addition, some alternatives would potentially require the use of community property, including residences, businesses and community facilities.

In the discussions below, each of the build alternatives is evaluated relative to the number of residences, businesses, and community facilities that would likely be acquired. A qualitative rating has also been assessed for each alternative relative to the other alternatives.

The number of displacements was measured within the proposed right-of-way for each alternative. Table 4.1 defines the parameters of the qualitative rating system. As shown in table 4.1, the displacement of two or more community facilities is seen as a significant impact because of the perceived disruption to community cohesion. A graphic of the location of all community facilities is provided as Figure 4.1. on the following page.

Table 4.1 : Rating Methodology

	Residential Displacements (persons)	Business Displacements (tenants)	Community Facility Displacements (structures)
Very Desirable (3)	0	<3	0
Desirable (1)	1-18	3-22	1-2
Less Desirable (-1)	>18	>22	>2

Table 4.2 lists the number of residential, business and community facility displacements and a qualitative assessment for each alternative. Alternatives BRT 1 and BRT 1a had no impacts across all of the community impact performance measures and were rated Very Desirable. HRT 1, HRT 2, HRT 3 and HRT 3a had more than 18 residential impacts and were rated Less Desirable. With more than 20 business displacements, BRT alternatives and HRT 3, HRT 3a, HRT 4 and HRT 4a were rated Less Desirable. All HRT alternatives were rated Very Desirable or Desirable for impacts to community facilities. A majority of the BRT alternatives were all rated Less Desirable.

4.2.2 Environmental Justice Benefits and Burdens

This section deals with the potential benefits and impacts of the alternatives on low-income and minority populations. Executive Order No. 12898 of February 11, 1994 requires agencies that receive federal funding to consider and address adverse environmental effects of proposed federal projects on minority and low-income communities.

Low-income and minority communities were defined using the poverty and socioeconomic thresholds from the U.S. Bureau of the Census, in coordination with standard practices of the ARC as described in the RTP. Year 2000 Census block group data was used to identify low-income and minority communities. Census block groups within the study area that have minority populations in excess of 44.63% are considered minority communities and those with no more than 9.46% of the population living below the federal poverty line, are considered low-income communities.

Figure 4.1: Community Facilities

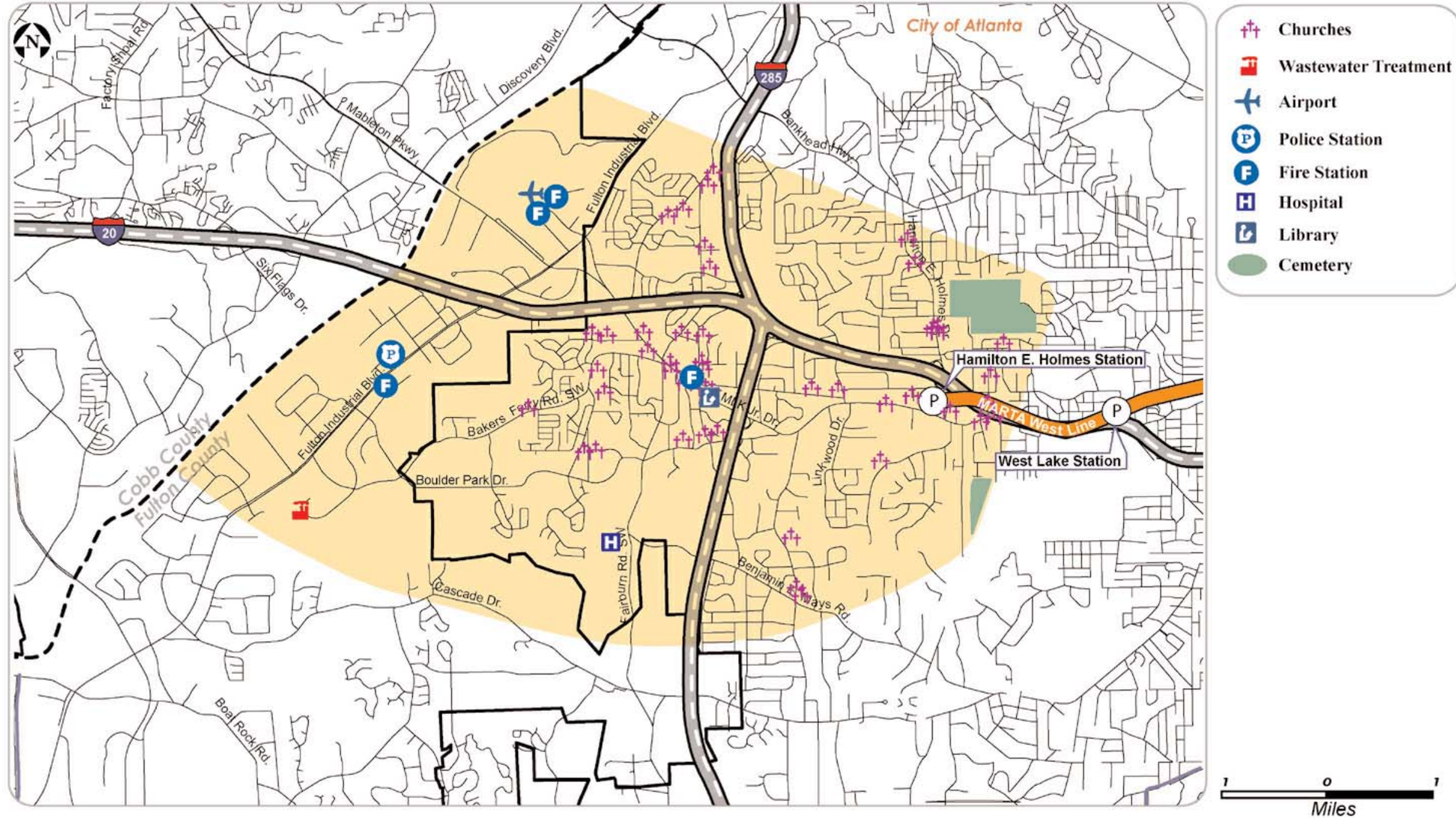


Table 4.2 : Community Impacts

Alternatives	Residents		Businesses		Community Facilities	
	Displacements	Rating	Displacements	Rating	Displacements	Rating
TSM	0	-	0	-	0	-
BRT 1	0	3	0	3	0	3
BRT 1a	0	3	0	3	0	3
BRT 2	8	1	28	-1	1	1
BRT 3	12	1	30	-1	3	-1
BRT 3a	12	1	30	-1	3	-1
BRT 3b	12	1	30	-1	3	-1
BRT 3c	12	1	30	-1	3	-1
BRT 3d	12	1	30	-1	3	-1
HRT 1	29	-1	2	3	0	3
HRT 2	23	-1	2	3	1	1
HRT 3	19	-1	23	-1	1	1
HRT 3a	19	-1	23	-1	1	1
HRT 4	5	1	24	-1	0	3
HRT 4a	5	1	24	-1	0	3
HRT 5	14	1	12	1	0	3

Socioeconomic data was collected for every block group in the study area. The results show that every block group is in excess of 90% minority and 17 of 21 block groups have more than 9.5% of the population living below the poverty line. The analysis shows that all communities are low-income and/or minority. The evaluation is designed to measure the impacts of the build alternatives relative to the benefits of each alternative to low-income and minority communities within the study area, as well as outside the study area.

The assessment of impacts to low-income and minority populations includes an assessment of the benefits and burdens on such communities. The following evaluation measures have been calculated using year 2000 Census block data, transit travel time, and highway distances to evaluate benefits to these groups:

- Distance traveled in miles within 30 and 45-minute transit trips from minority and low-income census block groups within the study area;
- Number of low-income households accessible to Fulton Industrial Boulevard Business District (FIBBD) within 40 and 60-minute transit trips;
- Number of persons in block groups that meet EJ thresholds within 1/2 mile of rail or BRT stations; and
- Existing employment within 1/2 mile of rail or BRT stations.

Table 4.3 lists parameters of the qualitative rating system for the environmental justice evaluation criteria. A qualitative assessment of each alternative in comparison to the other alternatives is provided below. Table 4.4 provides a summary of the results. A graphical illustration of EJ communities within the study area is provided as Figure 4.2.

Table 4.3 : EJ Rating Methodology

	Distance of Transit Trips (30 min)	Distance of Transit Trips (45 min)	# Households Access to FIBBD (40 min)	# Households Access to FIBBD (60 min)	Min./Low In Persons near stations	Employment near station
Very Desirable (3)	> 8 miles	> 9 miles	>70K	> 140K	<6K	>8K
Desirable (1)	6 – 8 miles	8 – 9 miles	40k – 70K	120 – 140K	1K – 6K	6K – 8K
Less Desirable (-1)	< 6 miles	< 8 miles	<40K	< 120K	>1K	<6K

A. Distance Traveled within a 30 and 45-minute Transit Trip from Minority and Low-Income Block Groups within the Study Area (EJ Benefit)

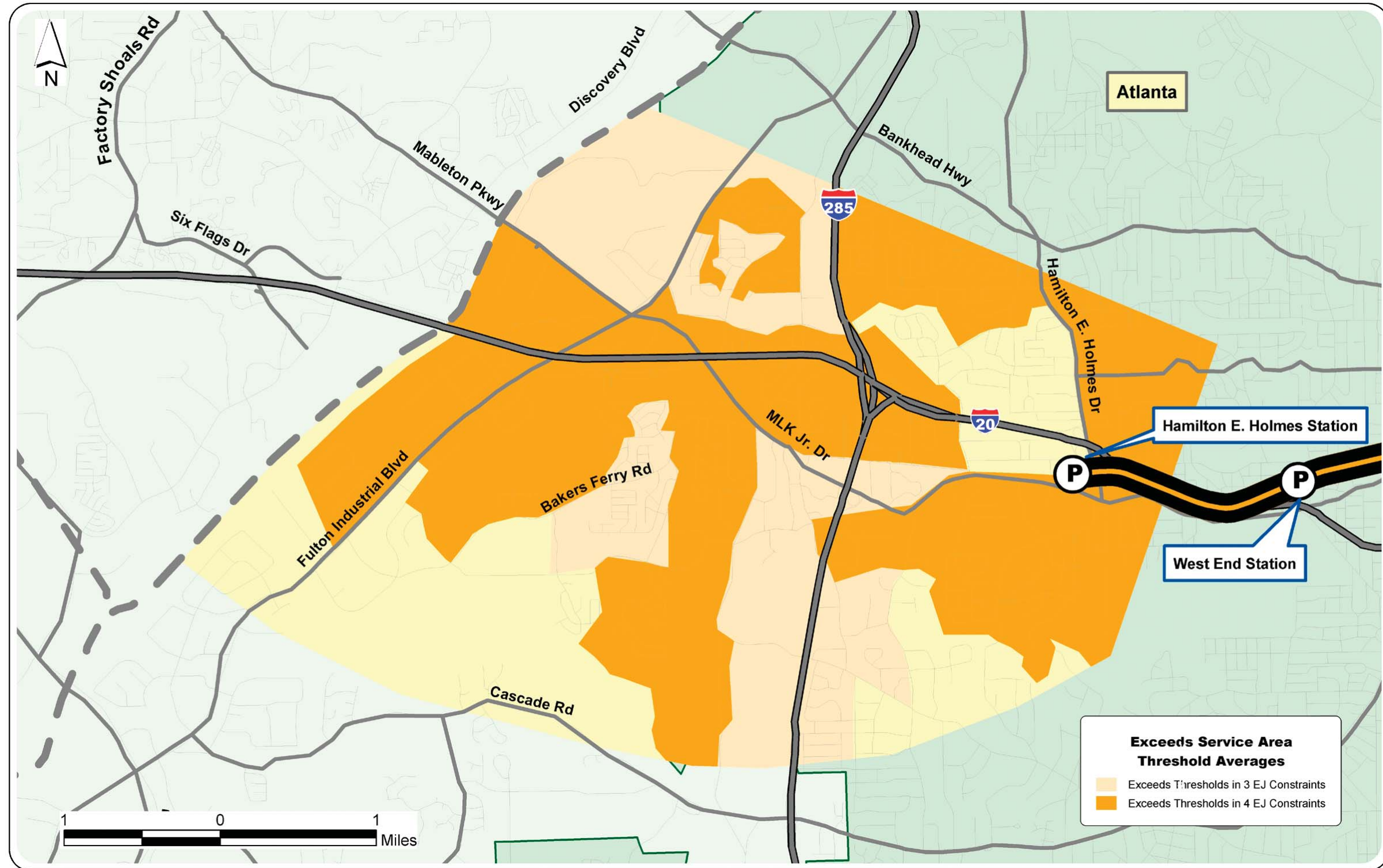
The increase in level of service provided by the proposed West Line extension would increase the distance that low-income and minority populations could travel within a 30- or 45-minute transit trip from the study area. Under the TSM Alternative, a 30 or 45-minute transit trip could provide access to potential employment or other destinations within approximately 5.6 miles and 8.4 miles, respectively. The heavy rail alternatives would provide the greatest increase in distance traveled because of the greater average travel speeds.

Table 4.4 : Benefits to Low-Income and Minority Populations

Alts	Increased Distance of Transit Trips (miles) for Low-Income & Minority Populations			# Low Income Households with Access to FIBBD			Minority/ Low Income Persons w/in 1/2 mile of stations	Rating	Employment w/in 1/2 mile of stations	Rating
	30-Minute Trip	45-Minute Trip	Rating	40-Minute Trip	60-Minute Trip	Rating				
TSM	5.57	8.43	-	25,092	95,085	-	0	-	0	-
BRT 1	6.83	8.84	1	48,330	118,264	1	586	-1	8,806	3
BRT 1a	7.02	8.83	1	61,386	135,177	1	2,715	1	9,088	3
BRT 2	6.35	8.81	1	37,045	106,575	-1	9,277	3	6,702	1
BRT 3	6.35	8.81	1	37,045	106,575	-1	9,277	3	6,702	1
BRT 3a	6.01	8.77	1	37,045	106,575	-1	6,619	3	6,464	1
BRT 3b	6.12	8.85	1	39,431	96,900	-1	2,743	1	6,117	1
BRT 3c	6.12	8.85	1	39,431	96,900	-1	4,489	1	6,182	1
BRT 3d	6.12	8.85	1	39,431	96,900	-1	3,271	1	6,073	1
HRT 1	9.06	9.38	3	75,811	152,484	3	2,715	1	9,088	3
HRT 2	9.06	9.38	3	75,811	152,484	3	2,715	1	9,088	3
HRT 3	8.3	9.33	3	73,461	141,199	3	4,576	1	9,167	3
HRT 3a	8.84	9.39	3	74,672	142,361	3	3,244	1	9,044	3
HRT 4	8.3	9.33	3	73,461	141,199	3	4,576	1	9,167	3
HRT 4a	8.84	9.39	3	74,672	142,361	3	3,244	1	9,044	3
HRT 5	8.84	9.39	3	74,672	142,361	3	3,244	1	9,044	3

Within a 30-minute trip, the differences in travel distances between the BRT and HRT alternatives is more significant than within a 45-minute trip because more time, proportionately, would be spent on the faster technology (HRT). The average 30-minute BRT trip would be approximately 6.4 miles, while the average HRT 30-minute trip would be approximately 8.7 miles. During the 45-minute trip, the average BRT trip would run approximately 8.83 miles and the average HRT trip would run approximately 9.35 miles. All HRT alternatives received ratings of Very Desirable for this measure due to having trip distances greater than 8 miles and 9 miles for the 30 and 45-minute thresholds, respectively. All BRT alternatives received a Desirable rating. There is a very small difference

Figure 4.2: EJ Communities



between the trip distances for 30-minute and 45-minute commutes, primarily because the facility has the most direct alignment to Fulton Industrial Boulevard.

B. Number of Low-Income Households Accessible to Fulton Industrial Boulevard Business District within 40 and 60-minute Transit Trips (EJ Benefit)

Using the travel demand model definition low-income households include households in the Atlanta region with average incomes less than \$20,000. The increase in level of service provided by the proposed West Line extension would provide greater access for low-income populations to jobs at the Fulton Industrial Boulevard Business District (FIBBD).

Under the TSM Alternative, 40-minute and 60-minute transit trips would provide access to the FIBBD for 25,092 and 95,085 low-income households, respectively.

All HRT alternatives received a Very Desirable rating. Alternatives HRT 1 and HRT 2 would increase the number of households accessible to FIBBD to 75,811 during a 40-minute trip and to 152,484 for a 60-minute transit trip. Conversely, alternatives BRT 2, BRT 3, and BRT 3a would provide the smallest increase over the TSM Alternative, increasing access for 37,045 low-income households on a 40-minute transit trip. BRT alternatives 3b, 3c and 3d would provide the lowest increase over the TSM alternative with a 60-minute transit trip. All these alternatives received a rating of Less Desirable.

C. Number of Persons in Block Groups that Meet EJ Thresholds within 1/2 Mile of Rail or BRT Stations (EJ Benefit)

As a traditionally transit dependent population, low-income and minority persons derive significant benefits from living within a 1/2 mile walking distance of transit stations. Alternatives BRT 2, BRT 3 and BRT 3a have over 6,000 persons living in block groups identified as EJ communities within a 1/2 mile of the proposed BRT stations. While Alternative BRT 1 has the lowest number (586) within a 1/2 mile of the proposed BRT stations and was rated Less Desirable.

D. Existing Employment Within 1/2 Mile of Rail or BRT Stations (EJ Benefit)

Access to employment within a 1/2 mile of rail or bus stations is another benefit to low-income and minority populations using transit. All HRT alternatives, and BRT 1 and 1a were rated Very Desirable, because they have the highest proximity to existing employment, with over 8,800 existing jobs within a 1/2 mile of the proposed stations. Conversely, Alternative BRT 3b, which has the lowest proximity to existing employment, with 6,117 existing jobs within a 1/2 mile of the proposed BRT stations, was rated Desirable.

E. Number of Persons in Block Groups that Meet EJ Thresholds within 200 Feet on Either Side of Alignment Centerline (EJ Burden)

A criterion that is representative of potential impact to low-income and minority populations is the location of such persons living within proximity of the proposed alignments. Potential impacts could include noise and vibration, potential property displacements, and community disruption. To evaluate this measure the number of persons living in block groups that met EJ thresholds within 200 feet of the alignment centerline was calculated. Table 4.5 provides the rating methodology for this measure. Table 4.6 lists each alternative and the EJ population within 200 feet of the alignments and subsequent ratings.

Table 4.5 : Rating Methodology

	Number of Low-income & Minority persons within 200 feet of alignment centerline
Very Desirable (3)	<1,000
Desirable (1)	1,000 – 1,500
Less Desirable (-1)	>1,500

HRT 1 and HRT 2 produced the lowest number of potential impacts during the evaluation and were rated Very Desirable. All BRT alternatives except BRT 1 are expected to yield more than 1800 potential impacts and were rated Less Desirable.

Table 4.6 : EJ Burdens - (Number of persons in block groups that meet E.J. thresholds within 200 foot of alignment centerline)

Alternatives	Number of Persons	Rating	Alternatives	Number of Persons	Rating
TSM	-	-	BRT 3D	1,882	-1
BRT 1	1,243	1	HRT 1	896	3
BRT 1a	1,882	-1	HRT 2	868	3
BRT 2	1,882	-1	HRT 3	1,459	1
BRT 3	1,882	-1	HRT 3a	1,459	1
BRT 3a	1,882	-1	HRT 4	1,116	1
BRT 3b	1,882	-1	HRT 4a	1,116	1
BRT 3c	1,882	-1	HRT 5	1,459	1

4.2.3 Transit Dependent Population

Service to transit dependent persons is important to the success of any major transit investment. A significant transit dependent population is located within the study area and would have improved access with the alternatives. Table 4.7 outlines the range of the transit dependent population used to define the rating for each alternative.

Table 4.7 : Rating Methodology

	Transit Dependent Persons w/in 1/2 mile of stations
Very Desirable (3)	<4,000
Desirable (1)	2,000 – 4,000
Less Desirable (-1)	>2,000

Transit dependent persons in this criterion, are defined as the elderly aged 65 and older and persons without access to automobiles, which is consistent with the ARC definition. To develop this measure the number of persons in block groups that meet potentially transit dependent thresholds within ½ mile of rail or BRT stations was calculated. This data was obtained from the 2000 Census by block groups. Table 4.8 lists each alternative, the number of transit dependent persons who live within a ½ mile of the proposed project stations and the qualitative assessment for each alternative.

Alternatives BRT 2 and BRT 3 received Very Desirable rating for having the highest number (9,277) of persons living in block groups that met transit dependent thresholds within a ½ mile of the proposed BRT stations, while Alternative BRT 1 has the lowest number (586) and was rated Less Desirable.

Table 4.8 : Station Proximity to Transit Dependent Persons

Alternatives	Transit Dependent Persons w/in ½ mile of stations	Rating	Alternatives	Transit Dependent Persons w/in ½ mile of stations	Rating
TSM	0	-	BRT 3d	3,271	1
BRT 1	586	-1	HRT 1	2,715	1
BRT 1a	2,715	1	HRT 2	2,715	1
BRT 2	9,277	3	HRT 3	4,576	3
BRT 3	9,277	3	HRT 3a	3,244	1
BRT 3a	6,619	3	HRT 4	4,576	3
BRT 3b	2,743	1	HRT 4a	3,244	1
BRT 3c	4,489	3	HRT 5	3,244	1

4.2.4 Noise and Vibration

Noise and vibration sensitive resources include housing, parks, historic resources, churches, cemeteries, libraries, schools and hospitals/medical centers. Noise and vibration criteria do not apply to most commercial or industrial uses because the activities within these buildings are not negatively impacted with higher noise levels. Sensitive resources were identified using aerial photography, land use maps and field verification. The proximity of each alternative to noise and vibration sensitive land uses was used in the comparative evaluation (i.e. ratings) of alternatives. Table 4.9 defines the rating methodology for noise and vibration impacts.

A. Noise Sensitive Land Uses

The number of noise sensitive land uses is measured within 700 feet of the HRT alternatives and within 500 feet of the BRT alternatives. Table 4.10 lists each alternative, the number of noise sensitive land uses within the appropriate screening distances and qualitative ratings. All BRT alternatives received Desirable ratings. As shown, alternative HRT 1 is in proximity of 339 noise sensitive land uses and was considered Very Desirable. HRT 2 received a Desirable rating, however, all other HRT alternatives were rated Less Desirable.

B. Vibration Sensitive Land Uses

The number of vibration sensitive land uses is measured within 200 feet of the HRT alternatives and within 50 feet of the BRT alternatives. Table 4.10 lists each alternative, the number of vibration sensitive land uses within the appropriate screening distances and a qualitative rating. As shown in the table, all variations on BRT Alternative 3 (i.e. a-d) were not in proximity of any vibration sensitive land uses and were therefore, given a rating of Very Desirable, while alternatives HRT 3 and 3a were in proximity of the highest number of vibration sensitive land uses, and were given a rating of Less Desirable.

Table 4.9 : Rating Methodology

	Potential Noise Impacts	Potential Vibration Impacts
Very Desirable (3)	<400	<50
Desirable (1)	400 - 600	50-100
Less Desirable (-1)	>600	>100

Table 4.10 : Potential Noise & Vibration Impacts

Alternatives	Noise		Vibration	
	Potential Impacts	Rating	Potential Impacts	Rating
TSM	0	-	0	-
BRT 1	427	1	5	3
BRT 1a	427	1	5	3
BRT 2	463	1	5	3
BRT 3	432	1	0	3
BRT 3a	428	1	0	3
BRT 3b	428	1	0	3
BRT 3c	428	1	0	3
BRT 3d	428	1	0	3
HRT 1	339	3	65	1
HRT 2	479	1	65	1
HRT 3	745	-1	132	-1
HRT 3a	745	-1	132	-1
HRT 4	813	-1	70	1
HRT 4a	813	-1	70	1
HRT 5	615	-1	86	1

4.2.5 Parkland Resources

There are 7 public parklands and recreational facilities (i.e. state, county, or municipal owned) within the study area. Impacts were calculated within the test alignment and within a ½ mile of rail or BRT stations. Table 4.11 defines the rating methodology for parkland impacts. Table 4.12 lists each alternative, the number of potential parkland impacts and qualitative ratings. As shown in the table, Alternative BRT 1 would not impact any parkland resources, and therefore was given a rating of Very Desirable, while, alternatives BRT 2 and BRT 3 would impact six of the parklands, and were given a rating of Less Desirable. A graphic illustration of parkland resources is provided on the following page as Figure 4.3.

Figure 4.3: Parkland Resources

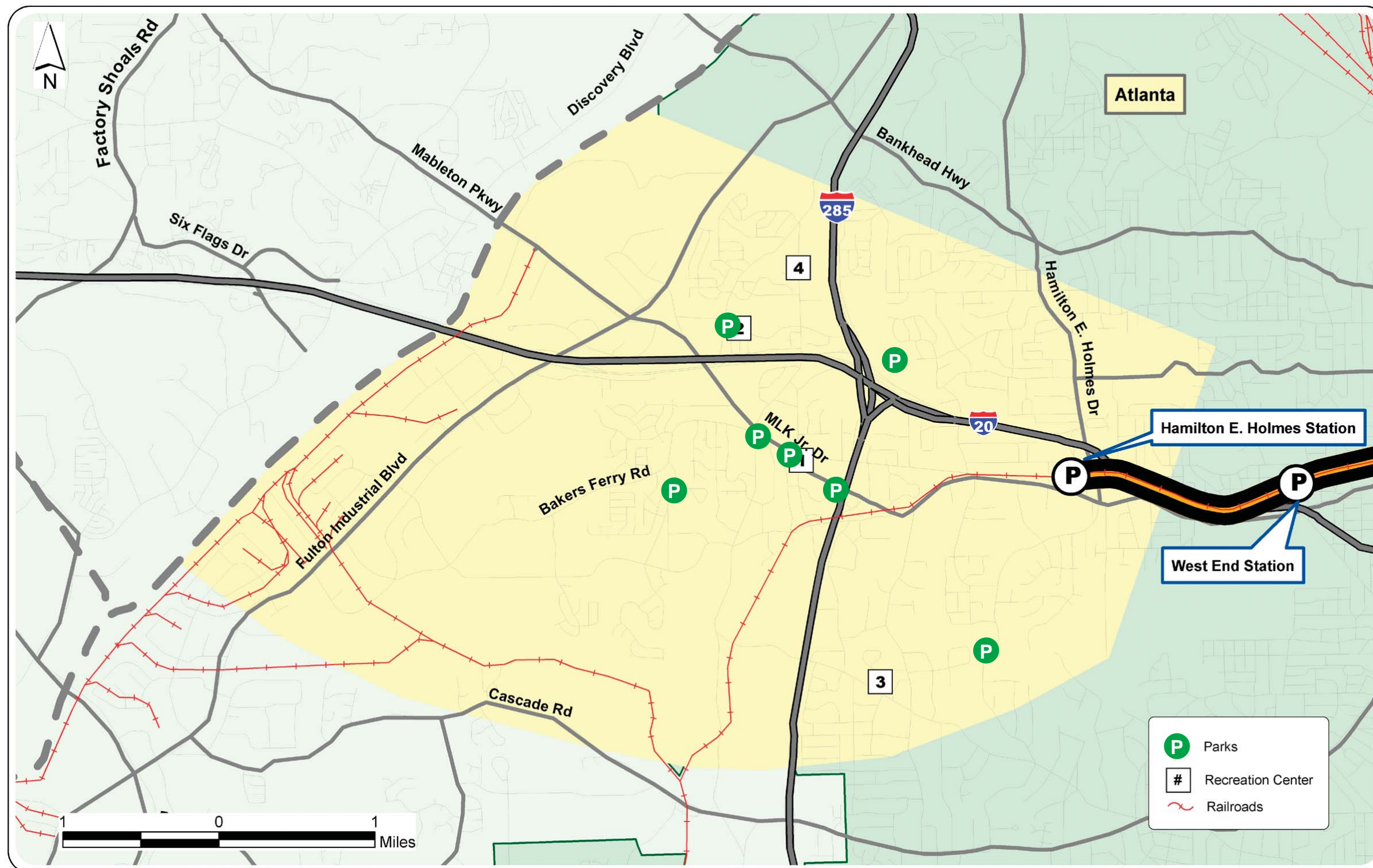


Table 4.11 : Rating Methodology

	Parkland Impacts
Very Desirable (3)	0
Desirable (1)	1 - 4
Less Desirable (-1)	>4

Table 4.12 : Parkland Resources

Alternatives	Parklands		Alternatives	Parklands	
	Potential Impacts	Rating		Potential Impacts	Rating
TSM	0	-	BRT 3d	2	1
BRT 1	0	3	HRT 1	3	1
BRT 1a	3	1	HRT 2	3	1
BRT 2	6	-1	HRT 3	4	1
BRT 3	6	-1	HRT 3a	2	1
BRT 3a	5	-1	HRT 4	4	1
BRT 3b	4	1	HRT 4a	2	1
BRT 3c	2	1	HRT 5	2	1

4.2.6 Impacts on Cultural and Historical Resources

The analysis of cultural and historic resources inventoried historical sites and cemeteries within the alternative corridors. An assessment of archaeological resources was not conducted for this Alternatives Analysis. Results of quantitative analyses were used in comparative evaluation (i.e. ratings) of alternatives. Table 4.13 defines the rating methodology for impacts to historic and cultural resources. Table 4.14 lists each alternative, the number of cemeteries and historic resources within the potential impact areas and qualitative ratings.

Table 4.13 : Rating Methodology

	Potential Impact to Cemeteries	Potential Impact to Historic Resources
Very Desirable (3)	<2	<5
Desirable (1)	2-3	5 - 15
Less Desirable (-1)	>4	>15

A. Cemeteries

There are 2 major cemeteries within the study area, including the potentially NRHP eligible Westview Cemetery, which is located in the eastern portion of the study area, near the existing Hamilton E. Holmes MARTA station. There are other cemeteries within the study area, however, they are located on church properties. The identified cemeteries are generally evenly distributed throughout the study area. Impact was calculated within the test alignment right-of-way and within ½ mile of rail or bus stations. As shown in the table below, Alternatives BRT 1, HRT 3, HRT 4, and HRT 5 are in proximity to 1 cemetery and earned a rating of Very Desirable, while Alternatives BRT 2 and BRT 3 are in proximity to 5 cemeteries, and therefore rated Less Desirable.

B. Historical Sites

The historic resource information gathered for this analysis included the most significant historic properties located in or near the study area. The properties identified in this section include resources that: 1) are listed in the National Register of Historic Places (NRHP) or identified as eligible for listing in the NRHP; 2) are identified as significant in the Comprehensive Plans of the County; and/or 3) have been identified as significant by historic preservation planners in the County. A graphical illustration of historical sites within the study area is provided as Figure 4.4.

Eight potential historic districts and approximately 140 NRHP sites listed or potentially eligible individual historic resources have been identified within the study area. Impact was calculated within the test alignment right-of-way and within ½ mile of rail or bus stations, based on the preliminary historic survey. However, since a cultural resources report has not been formally submitted to the Georgia State Historic Preservation Office (SHPO), both the boundaries of the historic districts and the number of individual historic resources are subject to change, as are the potential effects of the various alternatives on the historic resources. As shown in the table below, the results of the preliminary historic survey demonstrate that Alternative BRT 1 is located within ½ mile of 2 NRHP listed or eligible sites and was given a rating of Very Desirable. Alternatives BRT 2 and BRT 3 are within the proximity of 30 resources and were given ratings of Less Desirable.

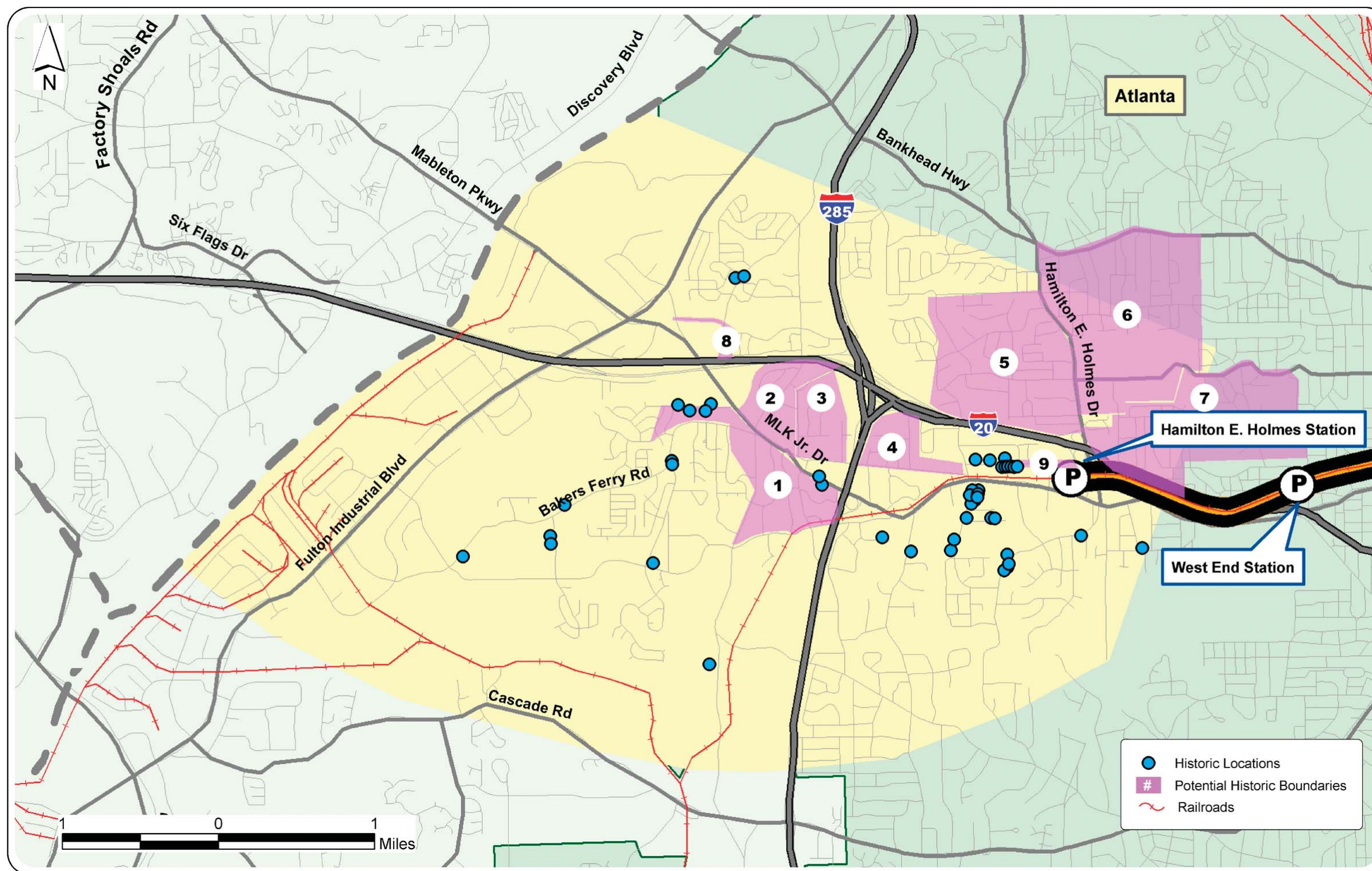
Table 4.14 : Cultural and Historic Resources

Alternatives	Cemeteries		NRHP Listed or Eligible Resources	
	Potential Impacts	Rating	Potential Impacts	Rating
TSM	0	-	0	-
BRT 1	1	3	2	3
BRT 1a	3	1	9	1
BRT 2	5	-1	30	-1
BRT 3	5	-1	30	-1
BRT 3a	4	-1	22	-1
BRT 3b	4	-1	9	1
BRT 3c	2	1	15	1
BRT 3d	3	1	10	1
HRT 1	3	1	10	1
HRT 2	3	1	10	1
HRT 3	1	3	7	1
HRT 3a	2	1	9	1
HRT 4	1	3	9	1
HRT 4a	2	1	11	1
HRT 5	1	3	6	1

4.2.7 Natural Resources

This section addresses the potential for alternatives to impact wetlands and streams. Wetlands and streams were identified for each alternative utilizing a number of resources, including wetland inventory maps, county soil maps, Federal Emergency Management Agency (FEMA) floodplain maps, United States Geographical Survey (USGS) quad maps and aerial photography. Field surveys were conducted to verify map findings. Four wetland sites and 23 streams (9 perennial and 14 intermit-

Figure 4.4: Historical Sites



tents) were identified within the study area. A graphical illustration of wetlands is provided as Figure 4.5.

Impact was calculated within the test alignment right-of-way and within ½ mile of rail or bus stations. Table 4.15 defines the rating methodology for impacts to natural resources. Table 4.16 lists each alternative, the number of stream crossings and the number of acres of potential wetland impact within the potential impact areas and qualitative ratings.

Alternatives BRT 1 and BRT 1a are not anticipated to affect any wetlands and were given ratings of Very Desirable. Alternatives HRT 1 and HRT 2 would impact up to 2.6 acres of wetlands, and therefore were given a rating of Less Desirable. The remaining alternatives would impact between 2.2 and 2.3 acres of wetlands, and therefore were given a rating of Desirable.

Alternatives BRT 1 and BRT 1a would not require any stream crossings and were given a rating of Very Desirable. Alternatives HRT 1 and HRT 2 would require 7 stream crossings, and therefore were given a rating of Less Desirable. The remaining alternatives would require 3 or 4 stream crossings, and therefore were given a rating of Desirable.

Table 4.15 : Rating Methodology

	Potential Wetland Impacts	Stream Crossings
Very Desirable (3)	<1 acre	<3
Desirable (1)	1 – 2.5	3 – 5
Less Desirable (-1)	>2.5	>5

Table 4.16 : Inventory of Natural Resources

Alternatives	Wetlands		Streams	
	Acres Impacted	Rating	Potential Impacts	Rating
TSM	0	-	0	-
BRT 1	0	3	0	3
BRT 1a	0	3	0	3
BRT 2	2.3	1	4	1
BRT 3	2.3	1	4	1
BRT 3a	2.3	1	4	1
BRT 3b	2.3	1	4	1
BRT 3c	2.3	1	4	1
BRT 3d	2.3	1	4	1
HRT 1	2.55	-1	7	-1
HRT 2	2.55	-1	7	-1
HRT 3	2.2	1	3	1
HRT 3a	2.2	1	3	1
HRT 4	2.2	1	3	1
HRT 4a	2.2	1	3	1
HRT 5	2.2	1	3	1

4.2.8 Hazardous Materials

A records search was conducted by Environmental Data Resources, Inc. (EDR) to identify known hazardous waste sites, underground storage tank sites, leaking underground storage tank sites, sites that generate, store, treat or dispose of hazardous substances, landfills, and locations of reported hazardous materials spills. Field surveys were also conducted to verify the locations of known hazardous sites, and to further identify potential hazardous waste sites not identified by the EDR report. Table 4.17 defines the rating methodology for impacts to hazardous materials. Table 4.18 (on page 4-13) lists each alternative, the number of known sources of contamination, the number of potential sources of contamination, and a qualitative rating. A graphical illustration identifying the location of hazardous material within the study area is provided as Figure 4.6.

Table 4.17 : Rating Methodology

	Known Sources of Contamination	Potential Sources of Contamination
Very Desirable (3)	<10	<10
Desirable (1)	10 – 20	10 – 20
Less Desirable (-1)	>20	>20

A. Number of Known Sources of Contamination Within 1000 Feet of Alignment Centerline and ½ Mile of Rail or BRT Stations

Known sources of contamination within 1,000 feet of the centerline of the proposed alignment and within ½ mile of proposed stations were identified. The identified sources may contain hazardous materials from a past or ongoing use. Alternatives HRT 1 and HRT 2 were in proximity of 13 known sources of contamination, and alternatives BRT 1 and BRT 1a were in proximity of 15 known sources. Therefore these 4 alternatives were given a rating of Desirable. The remaining alternatives were in proximity of 22 known sources of contamination and were given a rating of Less Desirable.

B. Number of Potential Sources of Contamination within 1000 Feet of Alignment Centerline and ½ Mile of Rail or BRT Stations

Potential sources of contamination were identified within 1,000 feet of the centerline of the proposed alignment and within ½ mile of proposed stations. The identified sources may contain hazardous materials from a past or ongoing use. Alternatives BRT 1 and BRT 1a were in proximity of 11 potential sources of contamination and therefore were given a rating of Desirable. Seventeen potential sources of contamination were in the proximity of Alternatives HRT 1 and HRT 2, which were also given a rating of Desirable. The remaining alternatives were in proximity of 31 potential sources of contamination and were given a rating of Less Desirable.

4.2.9 Air Quality

Nitrous Oxide (NOx) and Volatile Organic Compounds (VOCs) are common emissions from petroleum-dependent vehicles and when combined in the presence of sunlight produce ozone. Ozone is known to impact the health of individuals with respiratory disease and some allergies.

Procedures used to calculate these emissions are similar to the procedures used by ARC in the air quality conformity determination for the 2025 Limited RTP Update. Mobile emissions have been

Figure 4.5: Wetlands

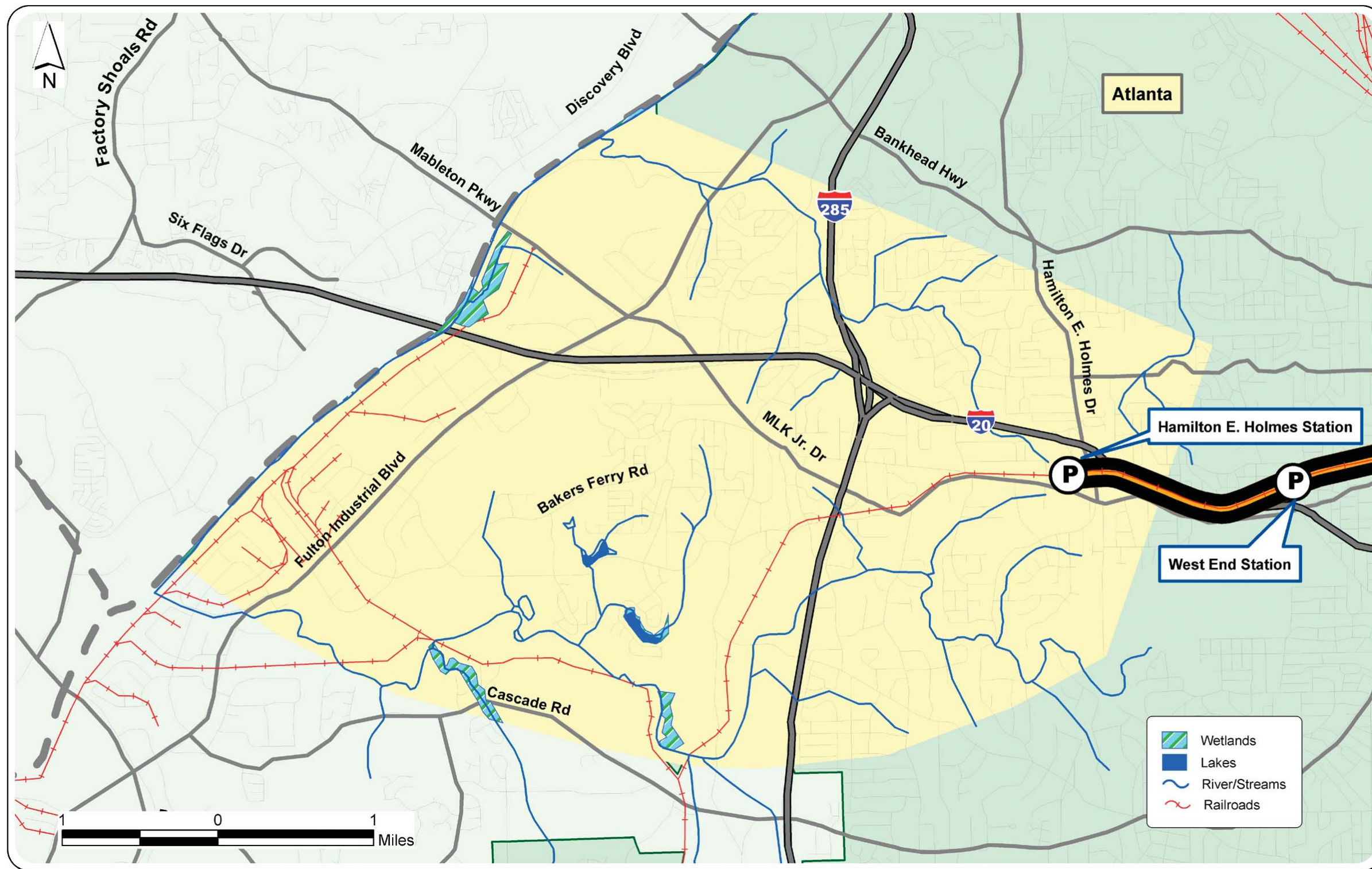
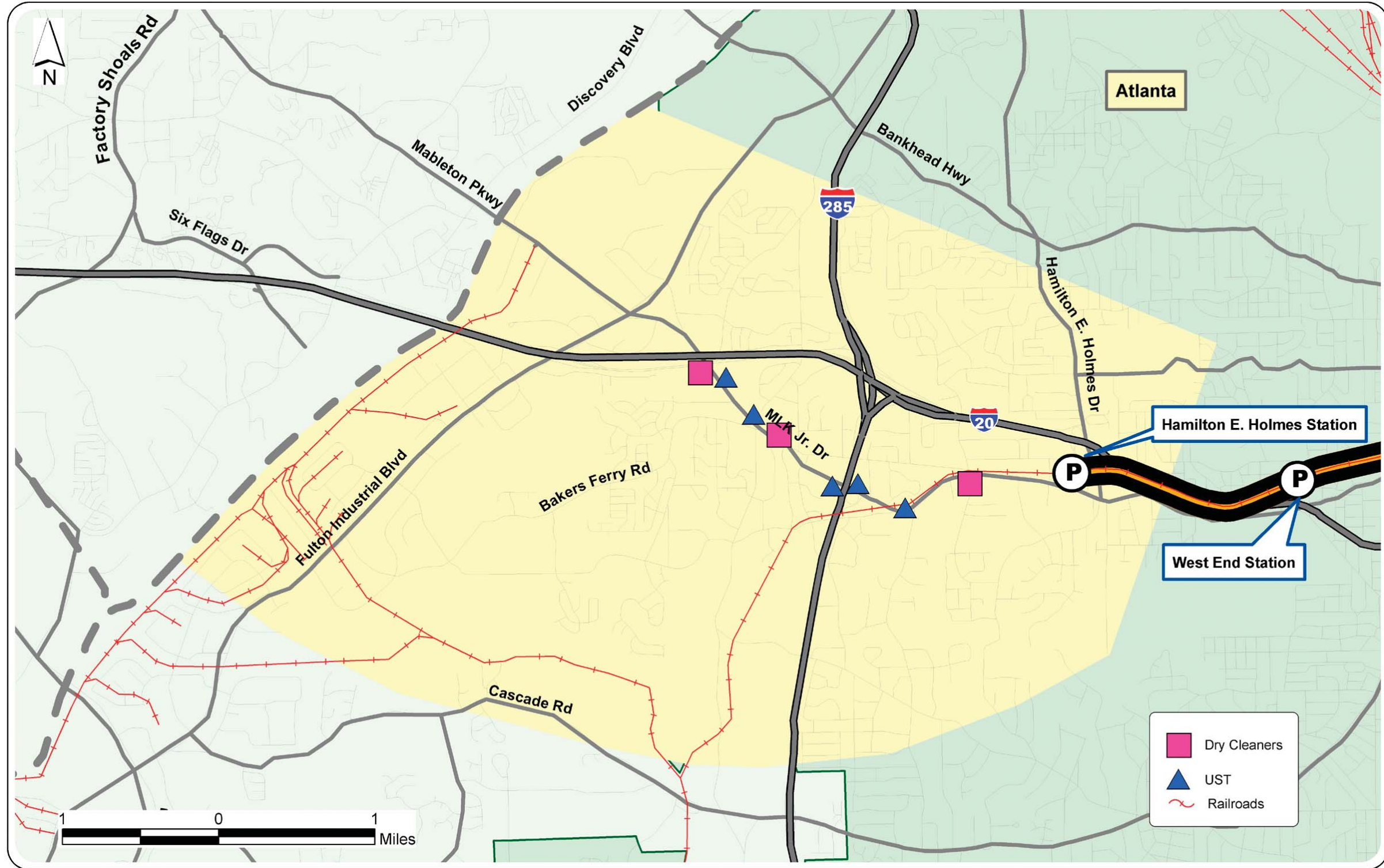


Figure 4.6: Hazardous Materials



estimated for the region to reflect the impact of the transit improvements on areas outside the study area. The mobile emissions for the alternatives were calculated based on the congested speeds and vehicle miles traveled (VMT) from the 4 time-of-day highway assignments. It is usually expected that the increase in transit riders would decrease the number of individual vehicles on the road, and therefore result in a lower volume of NOx and VOC emissions. This is not always the case. The diversion of highway users to the transit system can result with higher speeds on the highway network that can lead to increased emissions. Another potential situation is that more highway users are attracted to use the facilities that have experienced less congestion due to transit improvements and travel because of the diversion to the transit system. This situation can also lead to more emissions because it can alter travel patterns, speeds and volumes on the highway system.

Table 4.18 : Sources of Contamination

Alternatives	Contamination			
	Known Sources	Rating	Potential Sources	Rating
TSM	0	-	0	-
BRT 1	15	1	11	1
BRT 1a	15	1	11	1
BRT 2	22	-1	31	-1
BRT 3	22	-1	31	-1
BRT 3a	22	-1	31	-1
BRT 3b	22	-1	31	-1
BRT 3c	22	-1	31	-1
BRT 3d	22	-1	31	-1
HRT 1	13	1	17	1
HRT 2	13	1	17	1
HRT 3	22	-1	31	-1
HRT 3a	22	-1	31	-1
HRT 4	22	-1	31	-1
HRT 4a	22	-1	31	-1
HRT 5	22	-1	31	-1

Table 4.19 defines the rating methodology for impacts to air quality. Table 4.20 lists each alternative, the increase or decrease in daily regional NOx and VOC emissions (in Kilograms Kg.) and a qualitative rating.

Table 4.19 : Rating Methodology

	Regional NOx emissions (tons)	Regional VOCs emissions (tons)
Very Desirable (3)	>129.76	>73.63
Desirable (1)	129.46 - 129.76	73.27 - 73.63
Less Desirable (-1)	>129.46	>73.27

A. Tons of NOx Emitted within the Region

The TSM alternative value for NOx emitted within the region is 129.6241 tons. As demonstrated in the table below, every alternative would result in such slight increase or decrease of tons of NOx emissions that all were given the rating of Desirable.

B. Tons of VOCs Emitted within the Region

The TSM alternative value for VOCs emitted within the region is 73.427 tons. As demonstrated in the table below every alternative will most likely result in such a slight increase or decrease of tons of VOC emissions in that all were given the rating of Desirable.

Table 4.20 : Daily Regional Air Quality Emissions

Alternatives	Air Quality			
	Regional NOx emissions (tons)	Rating	Regional VOCs emissions (tons)	Rating
TSM	129.62	-	73.43	-
BRT 1	129.47	1	73.28	1
BRT 1a	129.55	1	73.33	1
BRT 2	129.53	1	73.34	1
BRT 3	129.53	1	73.34	1
BRT 3a	129.67	1	73.46	1
BRT 3b	129.53	1	73.35	1
BRT 3c	129.53	1	73.35	1
BRT 3d	129.53	1	73.35	1
HRT 1	129.65	1	73.50	1
HRT 2	129.65	1	73.50	1
HRT 3	129.59	1	73.45	1
HRT 3a	129.76	1	73.63	1
HRT 4	129.59	1	73.45	1
HRT 4a	129.76	1	73.63	1
HRT 5	129.76	1	73.63	1

4.3 Summary

The environmental evaluation measures the impact of the 8 proposed BRT alternatives and 7 proposed HRT alternatives for the extension of the MARTA West Line project.

The project study area has been developed to a considerable extent. Therefore, impacts to the natural environment would be minimal, while impacts to communities may be substantial. The largest obstacle for the implementation of the project would be the potential impact to existing land uses adjacent to the project alignment corridors. The project alternatives, depending upon which is selected, may result in the displacement of up to 29 residents, 30 businesses and 3 community facilities. Similarly, the proximity of the alternative alignments to developed residential areas has the potential to result in a significant number of noise and vibration impacts.

Overall, the northern corridor of the BRT alternatives (BRT 1 and 1a) performs the best on the environmental evaluation. This corridor would utilize a planned high-occupancy vehicle (HOV) lane, and therefore result in the least impact to the natural and built environments. The northern and central corridors for the HRT alternatives perform moderately well due to the small number of proposed stations and significant benefits to low-income and minority populations. The central corridor of the BRT alternatives performed poorly due to high numbers of potential displacements.