



CHAPTER FIVE: EVALUATION OF ECONOMIC DEVELOPMENT AND TRANSIT SUPPORTIVE LAND USES



This chapter documents the economic development and transit supportive related criteria of the evaluation of alternatives including the methodology used to calculate and analyze the performance measures. The methodology was based on an examination of existing conditions (outlined in the West Line Baseline Conditions Report, February 2003), a land use build-out analysis, current and future accessibility to different transit modes in potential transit corridors in the study area, market conditions, and estimates of future economic development based on a build and TSM scenario.

5.1 Description of the Methodology

Several steps were undertaken to study the impact of potential transportation improvements on economic development and land use for the various alternatives in this report. With respect to economic development, a gap analysis was performed to determine the difference in the demand and supply of space for several classifications of property. Gaps are expressed as an amount of square feet demanded less the amount of square feet available in a given time period. In this case, estimates were calculated using primary and secondary year 2001 available data. A positive gap indicates that potential opportunities exist for successful commercial real estate transactions; when a negative gap occurs, there is an oversupply of available space in the market.

A gap analysis was used to determine the feasibility of different types of commercial, retail, and residential developments in proximity to potential station locations. Additionally, the gap analysis was used in conjunction with a build-out analysis to determine the corridors with the greatest propensity to satisfy demand for development. This factored prominently in the assessment of the type and potential success of transit supportive/transit oriented development and was a foundation for the evaluation.

Evaluating the economic impacts of each corridor, as well as station location alternatives was essential in determining the best location from an economic development perspective. To accomplish this, economic impacts based on medium and long-range scenarios (2010 and 2025) were evaluated. The medium range scenario had a horizon year that corresponded with the open to traffic date of the proposed transit improvement and were based on the demand determined in the market analysis.

In contrast, the long-range scenario was based on a build-out analysis and was designed to show the potential impacts to the study area when the area reaches full development. An important assumption underlying this analysis is that introducing high-capacity transit does not by itself create new development opportunities, but that it merely relocates development that would otherwise occur elsewhere in the region.

5.1.2 Economic Development Related Evaluation Criteria

Continued economic development is critical to the growth and stability of cities and communities. One of the tools used to support transit-supportive development is a market study. In areas such as the Atlanta Region, the types of pedestrian oriented, mixed-use development recommended for station areas has little precedent. As a result, developers and financiers may assume that the risks inherent in a project outweigh the potential benefits. Studies indicating that there is a market potential for higher density, mixed-use and/or pedestrian oriented development can help convince developers of the viability of such development. Recently, under the ARC Livable Centers Initiative (LCI)

program, the City of Atlanta completed this type of study for the area around the Hamilton E. Holmes MARTA station. Such studies can also assist a transit agency, like MARTA, with an assessment of what level of development is realistic and what additional incentives might be required to further increase the level of station area development. A graphic illustration of the Hamilton E. Holmes LCI conceptual plan is provided as Figure 5.1 on the following page.

As such, economic impacts of both a build scenario and a TSM scenario were quantified through an examination of land use data based on current zoning regulations and future land use plans in place in the study area. Single family residential build-out was based on the number of dwelling units that can be built; multi-family residential housing was calculated by determining the number of acres in the study area zoned residential and multiplying by the maximum number of dwelling units per acre allowed in the zoning code less an adjustment factor to account for ancillary uses such as parking and landscaping. For commercial, office, industrial, or institutional land uses, the build-out calculation involves multiplying the number of square feet zoned for each use by the maximum number of stories allowed in the zoning ordinance. However, since not all sites will be 100% developable due to topography, wetlands, or other constraints, adjustment factors were applied to the number of square feet zoned. To develop adjustment factors, a windshield survey of the study area was conducted.

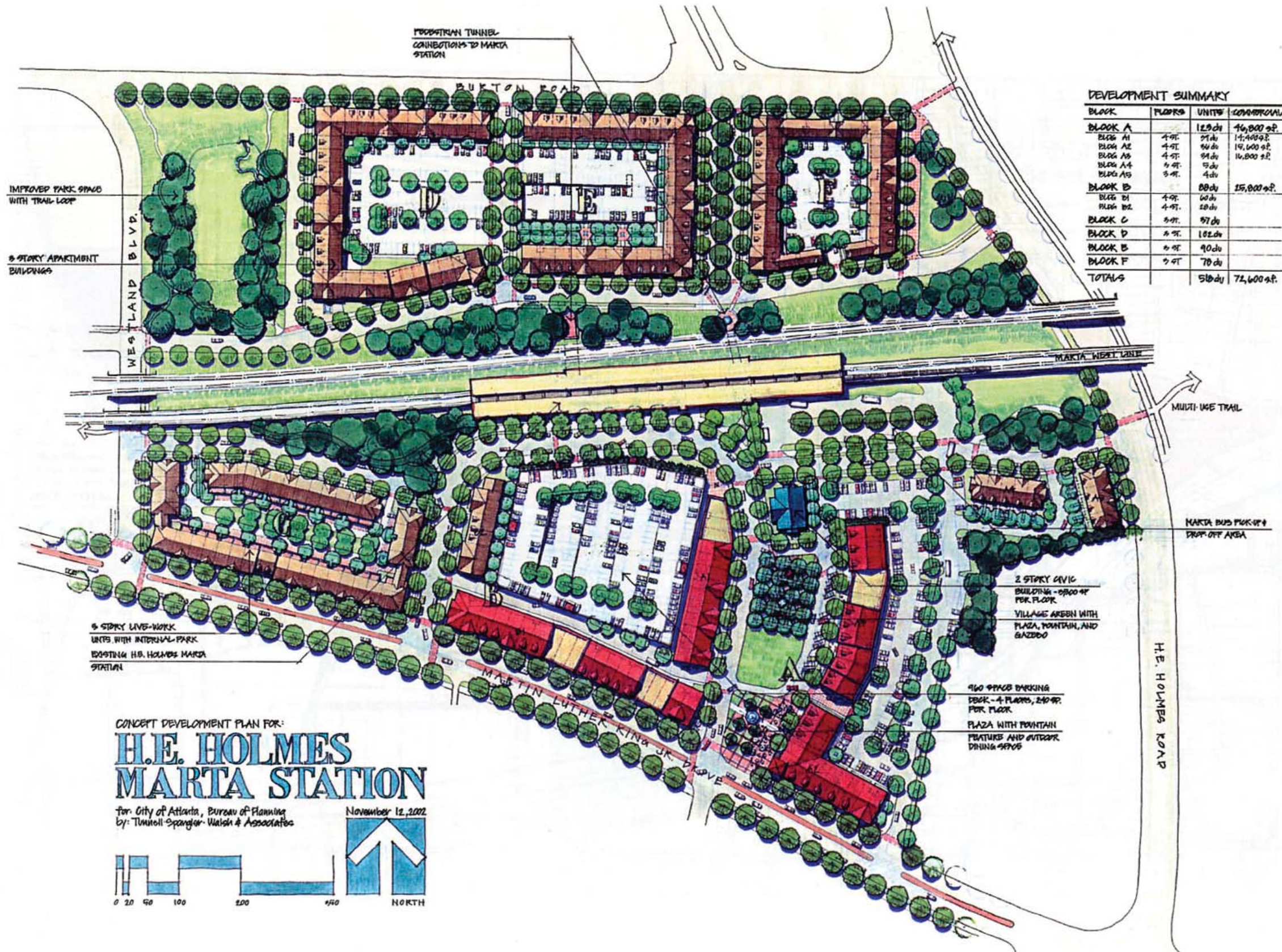
Several economic indicators were used to analyze the economic development potential provided by various corridor and station locations. Sales tax revenues were the key indicator derived from estimates based on projected sales per square foot by product type for the medium range scenario and by projected average sales per square foot for the long-range scenario. Another important indicator was annual local property taxes, which were estimated based on the capital portion of the previously discussed construction cost estimates. Second tier economic indicators included:

- Square feet of new industrial space;
- Number of new residential units;
- Value of new capital investment;
- Additional population; and
- Additional employment.

To fully arrive at the long-range impacts of the various alternatives in this report, an assessment of the amount of development of single family and multi-family dwelling units and square feet of commercial, office, and industrial space was undertaken. This analysis was based on land use and zoning data from current Fulton County and City of Atlanta adopted zoning regulations and future land use plans. Estimates were forecasted for a horizon year of 2010 not 2025 as with transportation improvements. This is because forecasting markets (and the assumption behind them) become unrealistic beyond a 10-year period.

From this set of estimates, a second step in the process consisting of an overview of the physical, social, demographic, governmental, and economic conditions, trends and projections shaping the real estate market in the Atlanta region was undertaken. Understanding the effects of these variable conditions is critical in determining potential development constraints and opportunities in the study area.

Figure 5.1: Hamilton E. Holmes LCI TOD Plan



The third step in this process encompassed a determination of the areas where economic growth in the Atlanta region has been occurring. Detailed economic indicators evaluated included:

- Population;
- Employment;
- Unemployment;
- Labor force;
- Unemployment rate;
- Per capita income; and
- Housing permits issued.

Analysis of office, industrial, retail, and residential markets at both the regional and sub-market level was essential in providing an understanding of existing and future supply and demand for each product type. The definition of sub-markets differs for each sector primarily by geographical boundaries. The boundaries were defined by several market analysis firms primarily based on geography; their reports served as the foundation for estimating inventory rates, vacancy rates and rental rates.

Supply for the region, sub-market, and study area, of office, industrial, retail, and residential product was determined from data produced from the market research firms, as well as land use information provided as part of the Strategies for Metropolitan Atlanta Regional Transportation and Air Quality (SMARTRAQ) database obtained from the GRTA in association with ARC. These supply figures were used in the gap analysis to determine economic development opportunities around the potential station locations and within the corridors.

Lastly, an assessment of vacancy rates was made as a way to gauge, at a specific moment in time, the health of the market and input for demand. The amount of rent currently charged by comparable properties, within the region, sub-market, or study area is key to evaluating the potential income and economic impact of new development. In conjunction with vacancy rates, rental rates were analyzed based on data from reports produced from various market research firms.

Office demand in the study area was determined by establishing a demand ratio for the Atlanta region by dividing occupied square feet of office space by the number of office workers. Using forecasts of employment from the Georgia State Economic Forecasting Center, future office demand was calculated by multiplying future employment by the demand ratio.

Retail demand estimates required a much different methodology. The initial step in the retail demand analysis was determining the trade area that was defined, in part, by drive time. This approach is based on central place theory, which suggests the trade area is a function of how far people will travel to obtain retail goods. Based on the predominant type of retail in the study area, a drive time of 10 minutes from the edges of the study area was used to determine the trade area boundaries. For this analysis, the following data items were required:

- Population within the trade area (total or households);
- Per capita or average household income within the trade area;

- Sales per square foot;
- Drive time;
- Percent of income spent on type of good;
- Displaced sales percentage; and
- Net leakage percentage.

Residential demand was determined by analyzing population, income and accessibility to employment, shopping and schools. The following 5 components of population were critical for measuring demand for different product types:

- Growth;
- Age;
- Household population;
- Non-household population; and
- Tenure.

A disaggregate demand analysis for different housing types was used, and key inputs to this disaggregated model were:

- Total new households;
- Total owner households;
- Total renter households;
- Household income;
- Owner propensity;
- Annual turnover rate; and
- Study area estimated capture rate.

5.1.3 Land Use Related Evaluation Criteria

The provisions of the TEA-21 and its predecessor, the Intermodal Surface Transportation Efficiency Act (ISTEA) expanded the role of the Metropolitan Planning Organization (MPO) in local transportation planning. ISTEA also emphasized that planning consider the overall social, economic, energy and environmental effects of transportation decisions. Policies concerning land use are equally important as a determinant of development patterns. In this regard, evaluating existing and future land use and measuring different land use criteria can assist MARTA and the region in analyzing the benefits of transit. ARC has recognized the development influence of transportation decisions and through programs such as the Livable Centers Initiative, has begun to address the relationship of land use on transportation patterns and investment decisions.

With this in mind, transit supportive land uses can maximize access by transit (and non-motorized transportation). In particular, transit-oriented development refers to residential and commercial areas that are designed to support activities that are physically close together in an effort to reduce the number of single occupant vehicle trips. Public policy, in the form of comprehensive plans, zoning laws and other regulations can have an effect on the accessibility of transit by attracting individuals and businesses to locate along a corridor or at a station location.



A significant shift in a type of land use can increase the viability of transit. Zoning regulations that encourage mixed-use development, for example, are seen as a positive factor supporting transit in the eyes of the FTA since the mix of activities can generate increased transit demand, as well as a level of comfort in and around a station. The FTA evaluates several factors that apply to study areas and potential transit corridors. These factors include:

- Growth management;
- Transit supportive plans and policies;
- Supportive zoning regulations near transit stations; and
- Land use implementation tools and performance impacts.

To encourage transit use, it is important that an area exhibit certain land use characteristics, including high population and employment densities and a pedestrian friendly environment that strongly support major transit capital investment. The performance measures analyzed below target the amount of developable land, the compatibility of development with transit, the connectivity of the street network and sidewalk network as it relates to potential station locations and the potential tax revenues associated with building out land near potential stations.

The following land use and economic development evaluation criteria and the supporting performance measures will be considered in making investment decisions for the MARTA West Line project. While many of these criteria go beyond traditional transportation concerns in establishing an integrated land use and economic development approach for project evaluation, they were designed to reflect the broad range of benefits and impacts that may be realized by the proposed transit improvement.

5.2 Results of Economic Development and Transit Supportive Land Use

The results of specific performance measures used to evaluate the BRT and HRT alternatives relative to land use and economic development criteria are discussed after each description and definition. For each land use and economic development measure, results are discussed, criteria are evaluated, a brief interpretation of the significance meaning is given and a comparison of alternatives is made.

The marketing data results were analyzed quantitatively and qualitatively. The evaluation of each criterion for each alternative was assigned a rating of Very Desirable, Desirable, or Less Desirable. The ratings 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 to the TSM Alternative. In the data tables included throughout this section, the ratings are shown as a numeric value. The values are as follows: 3 – Very Desirable, 1 – Desirable, -1 – Less Desirable.

5.2.2 Developable Land

The presence of easily developable land is an indicator of the feasibility of implementing appropriate and marketable real estate projects to enhance a station area and provide an attraction for transit riders as either an origin or destination. The private/public collaborative opportunities to develop

real estate depend on the ability to concentrate development where it is easiest to alter zoning regulations. Vacant and underutilized property provides this opportunity. Table 5.1 describes the rating methodology. Table 5.2 (on the following page) lists all of the alternatives, quantifies the vacant and underdeveloped land near stations and provides qualitative ratings.

Table 5.1 : Rating Methodology

	Vacant parcels (square feet) within ½ mile of Stations	Underdeveloped parcels (square feet) within ½ mile of Stations
<i>Very Desirable</i> (3)	>18,000,000	>10,000,000
<i>Desirable</i> (1)	8,000,000 – 18,000,000	5,000,000 – 10,000,000
<i>Less Desirable</i> (-1)	<8,000,000	<5,000,000

A. Square Feet of Vacant Parcels Within ½ Mile of Rail or BRT Stations

The regional definition of vacant property is property zoned for agricultural purposes. This is not an acceptable definition for vacant, urban property. For the purposes of this evaluation, vacant property is defined as any parcel of property with an improvement value of \$0, based on the SMARTAQ Land Use database and Fulton County Tax Assessor records. A larger inventory of vacant parcels is desirable as it is easier to assemble vacant land for potential station locations. The greater the amount of square feet of vacant parcels of property, the higher the potential there is for creation of transit supportive development.

BRT 2, BRT 3, and BRT 3a had the greatest amount of vacant land near station sites and were given a Very Desirable rating. The remaining BRT alternatives received a Desirable rating with the exception of BRT 1, which received a Less Desirable rating due to a relatively small amount of square feet of vacant property. Two of the HRT alternatives, HRT 3 and HRT 4, had similar amounts of vacant property around station sites as the BRT alternatives and were also rated Very Desirable.

B. Square Feet of Underdeveloped Parcels Within ½ Mile of Rail or BRT Stations

This performance measure is closely related and complementary to the vacant parcels measure. There is no standard definition for underdeveloped parcels in the metropolitan Atlanta or the State of Georgia. The definition used in this report is based on the adopted Buildable Lands amendment to the Growth Management Act for the State of Washington that determines the amount of land suitable for urban development and evaluates its capacity for growth. A ratio of building to land of .33 was used as the basis for examining redevelopment potential.

With more than 14 million square feet of underdeveloped parcels, alternatives BRT 2, BRT 3, and BRT 3a were given a rating of Very Desirable. BRT 1 performed poorly relative to the other alternatives with less than 2 million square feet of underdeveloped parcels and was given a rating of Less Desirable.

HRT alternatives ranged from 7-10 million square feet of underdeveloped parcels around station sites. The alternatives with approximately 7 million square feet were rated Desirable, while those above 10 million were considered Very Desirable in the evaluation process.

Table 5.2 : Developable Land within ½ Mile of Stations

Alternative	Vacant parcels (square feet) within ½ mile of Stations	Rating	Underdeveloped parcels (square feet) within ½ mile of Stations	Rating
TSM	NA	-	NA	-
BRT 1	5,564,725	-1	1,134,089	-1
BRT 1a	16,684,114	1	8,752,851	1
BRT 2	25,601,884	3	14,510,330	3
BRT 3	25,601,884	3	14,510,330	3
BRT 3a	23,078,571	3	12,729,590	3
BRT 3b	16,535,266	1	7,842,791	1
BRT 3c	11,959,183	1	9,035,686	1
BRT 3d	12,769,228	1	6,836,816	1
HRT 1	16,684,114	1	8,752,851	1
HRT 2	16,684,114	1	8,752,851	1
HRT 3	19,827,413	3	10,477,702	3
HRT 3a	12,918,073	1	7,748,004	1
HRT 4	19,827,413	3	10,477,702	3
HRT 4a	12,918,073	1	7,748,004	1
HRT 5	12,918,073	1	7,748,004	1

5.2.3 Development Constraints

For the purposes of this evaluation, development constraints relate to parcels with physical barriers to large-scale real estate development including steep slopes, flood plains and irregular-shaped boundaries. Additionally, parcels of small size are also considered difficult to develop. The two performance measures used to evaluate the alternatives relative to development constraints were:

- Number of large, rectangular parcels within ½ mile of rail or BRT stations; and
- Number of large, rectangular parcels free of physical constraints within ½ mile of rail or BRT stations

Table 5.3 describes the rating methodology. Table 5.4 lists all of the alternatives, quantifies the development constraints near stations and provides a qualitative rating.

Table 5.3 : Rating Methodology

	Number of large, rectangular parcels within ½ mile of rail or BRT stations	Number of large, rectangular parcels free of physical constraints within ½ mile of rail or BRT stations
<i>Very Desirable</i> (3)	>200	>190
<i>Desirable</i> (1)	100 – 200	90 - 190
<i>Less Desirable</i> (-1)	<100	<90

A. Number of Large, Rectangular Parcels Within ½ Mile of Rail or BRT Stations

A greater number of parcels indicates a higher proclivity for development. In this case, rectangular shaped parcels that are at least ¾ acre in size are considered suitable for development.

With more than 200 of parcels, alternatives BRT 2, BRT 3, BRT 3a and BRT 3c were given a rating of Very Desirable. BRT 1 performed poorly relative to the other alternatives with less than 100 parcels of property conducive for development and was given a rating of Less Desirable. All of the HRT alternatives had less than 200 developable parcels within a half-mile of stations.

B. Number of Large, Rectangular Parcels Free of Physical Constraints Within ½ Mile of Rail or BRT Stations

This performance measure identifies large, rectangular properties that have good development potential due to the absence of environmental constraints including slopes of greater than 25% and 100 year floodplain. In this case, the greater number of parcels, the more suitable sites exist for development.

Alternatives BRT 2, BRT 3 and BRT 3a had the highest number of parcels without environmental constraints. BRT 1 performed very poorly and was rated Less Desirable. All of the other alternatives had between 135 and 150 parcels and were given a rating of Desirable.

Table 5.4 : Development and Environmental Constraints

Alternatives	Number of large, rectangular parcels ¹ within ½ mile of stations	Rating	Number of large, rectangular parcels ¹ free of physical constraints within ½ mile of rail or BRT stations	Rating
TSM	NA	-	NA	-
BRT 1	99	-1	83	-1
BRT 1a	162	1	136	1
BRT 2	328	3	253	3
BRT 3	328	3	253	3
BRT 3a	264	3	199	3
BRT 3b	172	1	138	1
BRT 3c	201	3	146	1
BRT 3d	173	1	139	1
HRT 1	162	1	136	1
HRT 2	162	1	136	1
HRT 3	178	1	142	1
HRT 3a	163	1	137	1
HRT 4	178	1	142	1
HRT 4a	163	1	137	1
HRT 5	163	1	137	1

5.2.4 Existing Economic Activity

An understanding of existing economic and market conditions is essential to determining the future economic impacts of transit developments. The following performance measures are intended to provide a basis for business stability and investment potential that will feed into the evaluation of alternative corridors.

- Number of business licenses/building permits issued within the last five years within ½ mile of rail or BRT stations;
- Business stability rating within ½ mile of rail or BRT stations;
- Number of businesses complemented by transit oriented development/transit access within ½ mile of rail or BRT stations;
- Sales volume of businesses within ½ mile of rail or BRT stations;
- Existing number of employees within ½ mile of rail or BRT stations;

The following sections include descriptions of each performance measure, tables of evaluation results and a brief assessment of the results. The rating methodologies for each performance measure are also provided. Tables 5.5 and 5.7 describe the rating methodology, while Tables 5.6 and 5.8 show the results.

A. Number of Business Licenses/Building Permits Issued Within the Last Five Years Within ½ Mile of Rail or BRT Stations

This performance measure is intended to provide an overview of business development patterns near potential stations. Areas with higher levels of business license and permitting activity within the last five years will be considered more Desirable, as the stations and existing businesses tend to attract more development due to the effects of clustering and heightened activity.

With more than 70 new business licenses issued, alternatives BRT 2, BRT 3, and BRT 3a were given a rating of Very Desirable. BRT 1, HRT 3a and HRT 4a performed poorly relative to the other alternatives with less than 50 new business licenses.

B. Business Stability Rating Within ½ Mile of Rail or BRT Stations

This performance measure is based on credit ratings, obtained from a private vendor (InfoUSA). Businesses with a credit rating of “B” or higher are considered stable, while businesses with a rating of “C” or below are considered less stable. The lower the stability rating, the less favorably a potential station location is rated. For the purposes of this report, the performance measure is based on the proportion of businesses meeting the threshold rating of “B”.

Table 5.5 : Rating Methodology

	Number of business licenses/building permits issued	Business Stability Rating	Businesses complemented by transit oriented development/transit access
Very Desirable (3)	>70	>0.46	>150
Desirable (1)	50 - 70	0.43 – 0.46	75 - 150
Less Desirable (-1)	<50	<0.43	<75

Within the vicinity of the BRT 1 alternative lie the Fulton Industrial Boulevard Business District and the business community of MLK Jr. Drive. The former represents the location of some of the largest employers in Fulton County. These businesses are particularly solvent and are often subsidiaries of larger, national and multi-national firms. This alternative met the threshold of .50 and received a Very Desirable rating. Alternatives BRT 2, and BRT 3 performed poorly and were given a rating of Less Desirable.

HRT alternatives ranged from .45 to .47 of the number of businesses with a credit rating of “B” or better. The alternatives at .47 were rated Very Desirable, while those above .45 were considered Desirable in the evaluation process.

C. Businesses Complementated by Transit Oriented Development/transit Access Within ½ Mile of Rail or BRT Stations

Generally, retail and office developments support transit. Office uses create a stable base of trips in the morning and afternoon peak traffic periods that can be made without an automobile. Retail uses complement office uses and support transit by providing amenities for a transit dependent population. A diverse number of uses near a station adds variety and vitality to an area and can spread the demand for transit during the course of an entire day. This measure was calculated by identifying the number of retail and office business types in proximity to new station locations. The businesses were classified by using Standard Classification Codes (SIC).

Table 5.6 : Business Development and Stability

Alternatives	Within ½ mile of Rail or BRT stations					
	Number of Business Licenses/ Building Permits Issued w/in last 5 years	Rating	Business Stability Rating	Rating	Businesses complemented by transit oriented development/transit access	Rating
TSM	NA	-	NA	-	NA	-
BRT 1	36	-1	0.51	3	62	-1
BRT 1a	52	1	0.45	1	98	1
BRT 2	79	3	0.41	-1	180	3
BRT 3	79	3	0.41	-1	180	3
BRT 3a	75	3	0.43	1	166	3
BRT 3b	59	1	0.43	1	119	1
BRT 3c	59	1	0.46	1	130	1
BRT 3d	50	1	0.43	1	114	1
HRT 1	52	1	0.45	1	98	1
HRT 2	52	1	0.45	1	98	1
HRT 3	50	1	0.47	3	105	1
HRT 3a	43	-1	0.45	1	93	1
HRT 4	50	1	0.47	3	105	1
HRT 4a	43	-1	0.45	1	93	1
HRT 5	43	-1	0.45	1	93	1

Within a ½-mile area of the BRT 2, BRT 3, and BRT 3a alternatives, there are more than 150 businesses that have SIC codes classifying them as retail and office, as shown in Table 5.6. These 3 alternatives received Very Desirable ratings. Alternative BRT 1 performed poorly in comparison and was assigned a rating of Less Desirable.

All of the HRT station alternatives received Desirable ratings due to the large number of retail and office uses adjacent to the stations.

D. Sales Volume of Businesses Within ½ Mile of Rail or BRT Stations

Sales volume of businesses is intended to measure the degree of economic activity taking place around a potential station location. Potential station locations with higher sales volumes within ½ mile are considered to have a high degree of economic activity. This activity is an indication that a potential station location might be viable because it is a place where people congregate.

Businesses with a sales volume of more than \$525,000,000 per year were found near alternatives BRT 2, BRT 3, BRT 3a, BRT 3b, and BRT 3c. These alternatives were given a Very Desirable rating. Alternatives BRT 1, HRT 3a and HRT 4a performed poorly relative to the other alternatives with less than 500,000,000 in sales volume and were given a rating of Less Desirable. The remaining BRT and HRT alternatives performed reasonably well and were given a rating of Desirable.

E. Existing Number of Employees Within ½ Mile of Rail or BRT Stations

The concept of accessibility is a key to understanding the need to have a large number of people working within a station location because it reflects the attractiveness of the destination and the ease of reaching it. This performance measure examines the aggregate number of people working within a ½ mile of a potential transit station location. Alternatives BRT 1 and BRT 1a, all HRT alternatives, and HRT/BRT were given a rating of Very Desirable, each with more than 8,500 employees within a half mile of the stations. The remaining BRT alternatives performed reasonably well and were given a rating of Desirable.

Table 5.7 : Rating Methodology

	Sales volume of businesses within ½ mile	Existing number of employees within ½ mile
<i>Very Desirable</i> (3)	>\$525,000,000	>8,500
<i>Desirable</i> (1)	\$500,000,000 – 525,000,000	5,000 – 8,500
<i>Less Desirable</i> (-1)	<\$500,000,000	<5,000

Table 5.8 : Sales Volume of Businesses & Number of Employees

Alternatives	Sales volume of businesses within ½ mile	Rating	Existing number of employees within ½ mile	Rating
TSM	NA	-	NA	-
BRT 1	\$ 468,615,000	-1	8,806	3
BRT 1a	\$ 513,810,000	1	9,088	3
BRT 2	\$ 588,720,000	3	6,702	1
BRT 3	\$ 588,720,000	3	6,702	1
BRT 3a	\$ 587,624,000	3	6,464	1
BRT 3b	\$ 542,672,000	3	6,117	1
BRT 3c	\$ 542,429,000	3	6,182	1
BRT 3d	\$ 505,352,000	1	6,073	1
HRT 1	\$ 513,810,000	1	9,088	3
HRT 2	\$ 513,810,000	1	9,088	3
HRT 3	\$ 504,577,000	1	9,167	3
HRT 3a	\$ 476,490,000	-1	9,044	3
HRT 4	\$ 504,577,000	1	9,167	3
HRT 4a	\$ 476,490,000	-1	9,044	3
HRT 5	\$ 476,490,000	-1	9,044	3

5.2.5 Transit Supportive Land Use

Land use and development patterns are key components in creating a successful transit system. They create an environment around transit stations that is walkable and supports transit use by providing for a mix of land uses (i.e., office, residential, retail) in a safe, clean, vibrant and active place. The goal of transit-supportive land use as a performance measure is to determine if land use and development patterns in the study area demonstrate a mix of uses and pedestrian facilities that create and enable a focal point or "center," near to or at a potential station location. To evaluate this criterion the following performance measures were used:

- Year 2010 residential units within ½ mile of rail or BRT stations;
- Year 2010 population density within ½ mile of rail or BRT stations;
- Year 2010 projected tax revenues (sales and property) within ½ mile of mile of rail or BRT stations;
- Year 2025 commercial/retail build out potential within ½ mile of rail or BRT stations (square feet);
- Year 2025 residential build out potential within ½ mile of rail or BRT stations;
- Zoning consistency with transit supportive land uses within ½ mile of rail or BRT stations (square feet);
- Existing employment density within ½ mile of rail or BRT stations;
- Existing population density within ½ mile of rail or BRT stations; and
- Transit supportive character rating within ½ mile of rail or BRT station

Tables 5.9, 5.11, 5.13, 5.15 and 5.17 illustrate the rating methodology for each of the transit supportive criteria and the results are depicted in Tables 5.10, 5.12, 5.14, 5.16, and 5.18.

A. Year 2010 Residential Units Within ½ Mile of Rail or BRT Stations

Driven by strong employment and population growth, the residential market in the Atlanta Region was extremely healthy as property values increased steadily throughout the past decade. As with other markets, the residential market has peaked. To gauge demand so that an assessment of ridership potential can be compared with the market potential for housing, the total number of units was aggregated and demand was examined as it clusters within a ½ mile of a potential transit station location.

With a projected market demand of more than 800 units of housing, alternatives BRT 2 and BRT 3 were given a rating of Very Desirable. BRT 1 performed poorly relative to the other alternatives with a projected demand of only 289 units of housing and was given a rating of Less Desirable.

Within the station areas of all of the HRT alternatives, there is a reasonable amount of demand for housing. With a projected market demand of 578 units of housing, all HRT alternatives were given a rating of Desirable.

B. Year 2010 Population Density Within ½ Mile of Rail or BRT Stations

For this measure, the 2010 population was derived by multiplying the increase in the number of Year 2010 housing units over Year 2000 housing units by the average household size in study area. This amount was then added to the Year 2000 population for all census block groups within ½ mile of each potential station location. The projected 2010 population was then divided by the number of acres within ½ mile of each potential station location to arrive at persons per acre.

Population densities must be at a level where public transportation can compete effectively. A future 2010 density of approximately 5 persons per acre was deemed critical. National standards show that 5 persons per acre are at the low end an acceptable density for BRT. In the vicinity of the BRT 2, BRT 3, BRT 3a, BRT 3b, BRT 3c and BRT 3d alternatives there is a high population density projected and these alternatives were given ratings of Very Desirable. The BRT 1 alternative did not perform well and received a Less Desirable rating.

In the vicinity of the HRT alternatives there is a no population density projected as high as the BRT alternatives and these alternatives were given a rating of Desirable.

C. Year 2010 Projected Tax Revenues (Sales and Property) Within ½ Mile of Mile of Rail or BRT Stations

An important assumption underlying this analysis is that introducing high-capacity transit does not, by itself create development, it merely relocates development that would otherwise occur elsewhere in the region. By examining potential localized revenues, an assessment of the best station locations can be made. Sales tax revenues were estimated based on projected sales per square foot by product type. Annual local property taxes were estimated based on the capital portion of construction cost estimates. This performance measure examines potential localized station revenue streams and therefore offers an assessment of the best locations.

Table 5.9 : Rating Methodology

	Year 2010 residential units	Year 2010 projected population density	Year 2010 projected tax revenues
<i>Very Desirable</i> (3)	>800	>4.50	>\$1,750,000
<i>Desirable</i> (1)	400 - 800	3.0 - 4.5	\$1,000,000 - \$1,750,000
<i>Less Desirable</i> (-1)	<400	<3.0	<\$1,000,000

Alternatives BRT 2 and BRT 3 had the highest projected sales and property tax revenues of approximately \$2,000,000, and were given a rating of Very Desirable. BRT 1 performed poorly relative to the other alternatives with a projected demand of less than \$1,000,000. All HRT alternatives have projected sales and property tax revenues of approximately \$1,400,000 and were given a rating of Desirable.

Table 5.10 : Economic Development and Stability

Alternatives	Within ½ mile of Rail or BRT stations					
	Year 2010 residential units	Rating	Year 2010 projected population density	Rating	Year 2010 projected tax revenues	Rating
TSM	NA	-	0	-	0	-
BRT 1	289	-1	2.76	-1	\$ 711,456	-1
BRT 1a	578	1	4.19	1	\$ 1,422,912	1
BRT 2	1021	3	5.10	3	\$ 2,845,824	3
BRT 3	1021	3	5.10	3	\$ 2,845,824	3
BRT 3a	578	1	5.10	3	\$ 2,134,368	1
BRT 3b	578	1	4.90	3	\$ 1,422,912	1
BRT 3c	578	1	4.90	3	\$ 1,422,912	1
BRT 3d	578	1	4.70	3	\$ 1,422,912	1
HRT 1	578	1	4.19	1	\$ 1,422,912	1
HRT 2	578	1	4.19	1	\$ 1,422,912	1
HRT 3	578	1	4.40	1	\$ 1,422,912	1
HRT 3a	578	1	4.00	1	\$ 1,422,912	1
HRT 4	578	1	4.40	1	\$ 1,422,912	1
HRT 4a	578	1	4.00	1	\$ 1,422,912	1
HRT 5	578	1	4.00	1	\$ 1,422,912	1

D. Year 2025 Commercial/Retail Build Out Potential within ½ Mile of Rail or BRT Stations (square feet) and Year 2025 Residential Build Out Potential within ½ Mile of Rail or BRT Stations

These measures were given a combined rating based on commercial/retail and residential development potential. For commercial/retail an estimate of the year 2025 maximum number of square feet of commercial and retail space was calculated based on current zoning regulations and future land use plans that are in place in the study area. Residential development potential was measured by estimating the Year 2025 maximum number of units of housing based on current zoning regulations and future land use plans that are in place in the study area. The 2025 build-out scenario is

intended to illustrate maximum development and is an indicator of potential demand for transit.

With a projected build-out of more than 4 million square feet of commercial/retail and more than 3,000 residential units, alternatives BRT 2, BRT, BRT 3a, HRT 3 and HRT 4 have a strong potential to develop transit supportive land use. As a result, they were given a rating of Very Desirable. Conversely, BRT 1 would support only 350,000 square feet of potential commercial and retail growth. In addition, relative to the other alternatives, alternatives BRT 1a and 3b and HRT 1 and 2 also performed poorly with potential retail/commercial growth of less than 3 million square feet. These alternatives were given a rating of Less Desirable.

Table 5.11 : Rating Methodology

	Year 2025 commercial/retail build-out potential (square feet)		2025 build-out of residential units
<i>Very Desirable</i> (3)	>4,000,000	&	>3,200
<i>Desirable</i> (1)	3,000,000 – 4,000,000	&	2,000 – 3,200
<i>Less Desirable</i> (-1)	<3,000,000	&	<2,000

Table 5.12 : 2025 Build-Out Potential

Alternatives	Within ½ mile of Rail or BRT stations		
	2025 commercial/retail build-out potential (square feet)	2025 build-out of residential units	Rating
TSM	NA	NA	-
BRT 1	349,272	0	-1
BRT 1a	2,944,938	3,191	-1
BRT 2	8,014,080	8,584	3
BRT 3	8,014,080	8,082	3
BRT 3a	6,903,577	3,222	3
BRT 3b	2,944,938	4,893	-1
BRT 3c	4,307,911	2,352	3
BRT 3d	3,950,271	3,191	1
HRT 1	2,944,938	3,191	-1
HRT 2	2,944,938	3,191	-1
HRT 3	4,836,110	6,223	3
HRT 3a	3,950,271	2,321	1
HRT 4	4,836,110	6,223	3
HRT 4a	3,950,271	2,321	1
HRT 5	3,950,271	2,321	1

E. Land Zoned for Transit Supportive Uses Within ½ Mile of Rail or BRT Stations (Square Feet)

Land use and development patterns are key components in creating a successful transit system. They create an environment around transit stations that is walkable and supports transit use by providing for a mix of land uses (i.e., office, residential, service) in a safe, clean, vibrant and active

place. The goal of this measure is to examine land use and development patterns with the idea of moving from a large-lot, auto-dominated, dispersed, single-use pattern of development to a pattern with a mix of land uses that easily relate to pedestrian activity and that have a focal point or "center," near to or at the station itself.

This measure was based on zoning categories that allow for development consistent with activities such as retail that produce building types and have an ability to engage pedestrian activity at or near the station. The zoning ordinances of the City of Atlanta and Fulton County were analyzed in order to identify suitable classifications supportive of transit. These classifications included both density and design elements.

There is a strong potential for land that can be developed as transit supportive within the vicinity of alternatives BRT 2, BRT 3, and BRT 3a. With a projected build-out of supportive uses totaling more than 30,000,000 square feet, these alternatives were given a rating of Very Desirable. BRT 1 performed poorly relative to the other alternatives and was given a rating of Less Desirable. With a projected build-out of supportive uses totaling more than 15 million square feet, all of the HRT alternatives were given a rating of Desirable.

Table 5.13 : Rating Methodology

	Land area zoned for transit supportive uses within ½ mile of stations (square feet)
<i>Very Desirable</i> (3)	>30,000,000
<i>Desirable</i> (1)	10,000,000 – 30,000,000
<i>Less Desirable</i> (-1)	<10,000,000

Table 5.14 : Zoning Consistency with Transit Supportive Land Uses

Alternatives	Land area zoned for transit supportive uses within ½ mile of stations (square feet)	Rating
TSM	-	
BRT 1	116,424	-1
BRT 1a	17,552,037	1
BRT 2	43,608,532	3
BRT 3	43,608,532	3
BRT 3a	32,299,832	3
BRT 3b	18,481,923	1
BRT 3c	14,864,219	1
BRT 3d	22,185,583	1
HRT 1	17,552,037	1
HRT 2	17,552,037	1
HRT 3	22,159,006	1
HRT 3a	21,255,697	1
HRT 4	22,159,006	1
HRT 4a	21,255,697	1
HRT 5	21,255,697	1

F. Existing Employment and Population Density Within ½ Mile of Rail or BRT Stations

For transit to be feasible, a sufficient density of persons should live and work close to a transit stop. The greater the density, the greater the likelihood that transit is accessible to a large number of people working near a station location. Employment densities should ideally be at a level of approximately 20 persons per acre to generate sufficient work end related trip-making. However, a value of 10 persons per acre is on the low end of necessary employment density. Similarly, a population density of 5 persons per acre is reasonable for the success of BRT.

Table 5.15 : Rating Methodology

	Existing employment density per acre within ½ mile	Existing population density per acre within ½ mile
<i>Very Desirable</i> (3)	>15	>3.0
<i>Desirable</i> (1)	9 - 15	2 - 3
<i>Less Desirable</i> (-1)	<9	<2.0

The BRT 1 alternative is the only alternative that has employment densities near the level of 20 persons per acre and therefore received a Very Desirable rating. Alternatives HRT/BRT, BRT 2, BRT 3, BRT 3a, BRT 3b, BRT 3c, and BRT 3d did not perform well and received a Less Desirable rating. The HRT alternatives have employment densities that fair well and received Desirable ratings.

Alternatives BRT 2, BRT 3, BRT 3a, BRT 3b, BRT 3c, and BRT 3d alternatives have population densities above 2.8 persons per acre and therefore perform well, receiving a Very Desirable rating. The BRT 1 alternative did not perform well and received a Less Desirable rating. The HRT alternatives have population densities that perform moderately and received Desirable ratings.

Table 5.16 : Employment and Population Densities

Alternatives	Existing employment density per acre within ½ mile	Rating	Existing population density per acre within ½ mile	Rating
TSM	-		-	-
BRT 1	17.6	3	1.1	-1
BRT 1a	9.1	1	2.6	1
BRT 2	3.7	-1	3.5	3
BRT 3	3.7	-1	3.5	3
BRT 3a	4.3	-1	3.5	3
BRT 3b	6.1	-1	3.3	3
BRT 3c	6.2	-1	3.3	3
BRT 3d	6.1	-1	3.3	3
HRT 1	9.1	1	2.6	1
HRT 2	9.1	1	2.6	1
HRT 3	9.2	1	2.7	1
HRT 3a	9.0	1	2.3	1
HRT 4	9.2	1	2.7	1
HRT 4a	9.0	1	2.3	1
HRT 5	9.0	1	2.3	1

G. Transit Supportive Character Rating Within ½ Mile of Rail or BRT Station

The integrated development of mixed-use nodes at transit nodes and corridors along primary routes are key factors in using urban form to support the use of transit. As walking distance to transit stations increase, transit ridership decreases. A ½ mile radius is generally considered the maximum walking distance before ridership decreases. The ease, comfort, quality and amenity of the pedestrian experience can extend this distance. Attention to the quality, amenity and accessibility of the pedestrian environment is warranted as a transit encouragement strategy. This measure examined the following 2 factors to determine the roadway connectivity and the ability to walk to a proposed station location in a direct fashion.

- Roadway System Connectivity
- Sidewalk System Connectivity

The first data item was a proxy for the degree of connectivity of the roadway network. Using a GIS analysis the ratio of the area of the shape defined by a ½-mile trip on the roadway network to the area of a ½ radius around the station location was computed. A score of 1 signifies direct connection to and from a station location, excluding interstates within a ½ mile radius. The second data item is a qualitative rating based on a field survey of the presence and condition of sidewalks. The higher the rating the better the sidewalk network.

Alternatives with a ratio of greater than 0.25 roadway system connectivity and a rating of 3 for sidewalk system connectivity were considered to have a relatively high degree of transit supportive characteristics meaning that BRT 2, BRT 3, BRT 3a, BRT 3b, BRT 3c, and BRT 3d alternatives have sufficient connectivity, perform well and earn a Very Desirable rating. The BRT 1 alternative performed poorly and received a Less Desirable rating. HRT 3, HRT 3a, HRT 3b, and 4a alternatives have sufficient connectivity, perform well and earn Desirable ratings.

Table 5.17 : Rating Methodology

	Roadway System Connectivity	Sidewalk System Connectivity
<i>Very Desirable</i> (3)	>0.25	>3.0
<i>Desirable</i> (1)	0.33	1
<i>Less Desirable</i> (-1)	<0.20	-1

Table 5.18 : Transit Supportive Character Rating

Alternatives	Transit Supportive Character Rating within ½ mile		
	Roadway System	Sidewalk System	Rating
TSM	-	-	-
BRT 1	0.19	-1	-1
BRT 1a	0.33	1	1
BRT 2	0.51	3	3
BRT 3	0.51	3	3
BRT 3a	0.45	3	3
BRT 3b	0.40	3	3
BRT 3c	0.45	3	3
BRT 3d	0.53	3	3
HRT 1	0.33	1	1
HRT 2	0.33	1	1
HRT 3	0.27	3	3
HRT 3a	0.46	3	3
HRT 4	0.27	3	3
HRT 4a	0.46	3	3
HRT 5	0.46	3	3

5.3 Summary of Economic Development and Transit Supportive Land Use Evaluation

The primary goal of the economic development and transit supportive land use evaluation was to distinguish which build alternative presents the greatest likelihood of stimulating growth in the study area. The basic premise of the evaluation is to examine the areas around each alternative's access points and assess whether these areas exhibit certain characteristics that lend themselves to or, at least, do not inhibit economic growth. Those alternatives with a good mix of existing population/employment, healthy businesses and developable land at or near their access points scored the best across these criteria.

The BRT alternatives performed better overall than the HRT alternatives primarily because they generally have more stations and many of the criteria measured a gross number of acres or business revenues. More station sites translate into larger catchment areas for the transit facility and therefore, more business or developable parcels with access. Alternatives with station sites at MLK Jr. Drive near I-285 and/or at Fulton Industrial Boulevard, including BRT 2, 3, and 3a and HRT 3 and 4. These stations exhibited relatively strong business revenues and high potential for development and growth, due to large tracts of re-developable or developable around the stations.

BRT 2, 3, 3a and 3c and HRT 3 and 4 were the highest performing alternatives under the evaluation criteria and received ratings of Very Desirable. BRT 1 only has one station site (FIB/I-20) and, therefore, did not score well and received a rating of Less Desirable. The remaining alternatives all received ratings of Desirable.