

5.0 TIER 2 SCREENING

5.1 Development of Tier 2 Alternatives

The result of the Tier 1 Screening was a set of feasible transit alignments that would connect activity centers along I-20 East Corridor with central Atlanta and the existing MARTA heavy rail system. The Tier 2 Screening paired these alignments with compatible transit technologies, or modes. If a given alignment was compatible with multiple transit technologies, it was analyzed with each technology. The transit technologies identified as suitable for this project included HRT, LRT, and BRT.

In addition to the Tier 2 Build Alternatives, a No Build Alternative and Baseline/TSM Alternative were developed as required by the FTA's New Starts process and were evaluated along with the Build Alternatives.

5.2 Transit Technologies Considered

An initial assessment of technologies was performed to determine their appropriateness for the I-20 East Corridor. Based on their vehicle characteristics, station/stop characteristics, operating service, and capital and operating costs, the technologies considered in the development of Tier 2 Alternatives were BRT, LRT, and HRT (**Figure 5-1** below).

Figure 5-1: Transit Technologies Considered

<p>BRT offers high-frequency, limited-stop service. BRT operates in shared or exclusive right-of-way. This service usually has dedicated stations, traffic signal priority or pre-emption, level-platform boarding or low-floor vehicles, pre-boarding fare payment, and is separated from normal traffic.</p>	<p>Light Rail Transit (LRT) consists of passenger rail cars powered by overhead catenaries. Operating individually or in short trains, service is usually on fixed rails in exclusive right-of-way. LRT and streetcar service can occasionally operate in shared traffic.</p>	<p>Heavy Rail Transit (HRT) operates on electric railway, and is characterized by high speeds, rapid acceleration of passenger rail cars, high platform loading, and grade separated rights-of-way from which all other vehicular and foot traffic are excluded.</p>
		

Source: I-20 East Technology Assessment Report

5.3 Description of Tier 2 Alternatives

The following section contains descriptions of all alternatives developed and evaluated in the Tier 2 Screening. An overview of these alternatives is presented in **Table 5-1** on page 5-2.

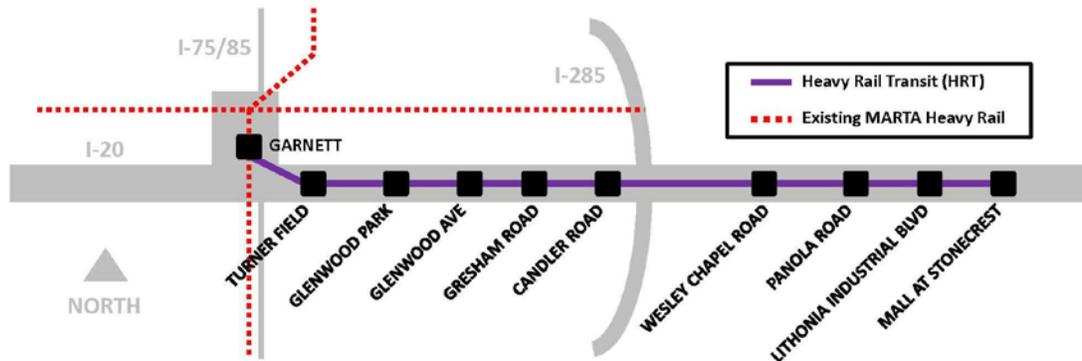
Table 5-1: Tier 2 Description of Alternatives

Alternative Name	Description
HRT1	<ul style="list-style-type: none"> • Heavy rail transit line from downtown Atlanta, east, adjacent to I-20, to the Mall at Stonecrest
LRT1	<ul style="list-style-type: none"> • Light rail transit line from downtown Atlanta, east, adjacent to I-20, to the Mall at Stonecrest
BRT1	<ul style="list-style-type: none"> • Bus rapid transit line from downtown Atlanta, east, adjacent to I-20, to the Mall at Stonecrest
LRT2	<ul style="list-style-type: none"> • Light rail transit line utilizing BeltLine alignment from North Avenue Station to I-20, then east, adjacent to I-20 to Mall at Stonecrest
HRT2	<ul style="list-style-type: none"> • Heavy rail spur from existing MARTA rail line between East Lake and Edgewood Stations, south in a tunnel to I-20, then east, adjacent to I-20 to the Mall at Stonecrest
HRT3	<ul style="list-style-type: none"> • Heavy rail transit extension of existing MARTA line from Indian Creek Station, south, adjacent to I-285, then east, adjacent to I-20 to Mall at Stonecrest • Areas along I-20 inside the I-285 Perimeter would be served with BRT

5.3.1 Heavy Rail Transit Alternative 1 (HRT1)

HRT1 would consist of a new HRT line that would spur from the existing MARTA rail network just south of Garnett Station. From there, the alignment would extend south parallel to Windsor Street, then east along Glenwood Avenue/Fulton Street, before it would enter the I-20 right-of-way at Hill Street. From there, the alignment would extend east, on structure, in the center of the I-20 median. At Glenwood Avenue, the alignment would transition to the side of the interstate and run parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. A conceptual map of this alignment is shown in Figure 5-2 below.

Figure 5-2: HRT 1 Alternative Concept



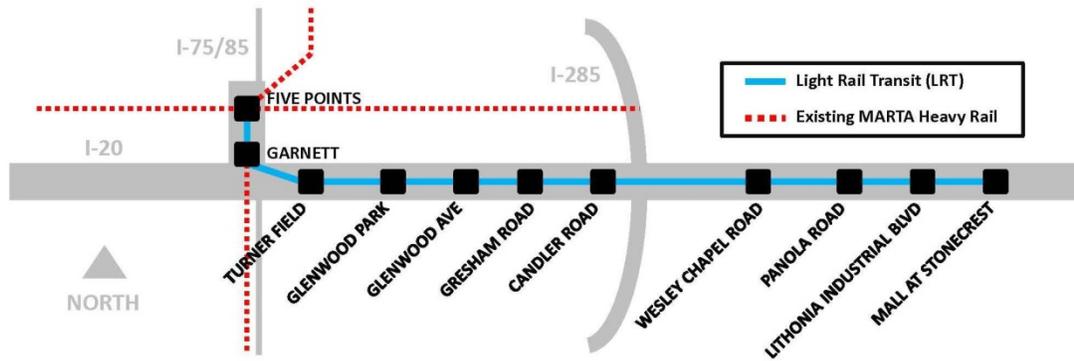
HRT1 would tie into the existing MARTA heavy rail system just south of the Garnett Station. This new service would continue north along the Red/Gold line serving all stations in downtown and Midtown Atlanta. The service would continue to the Lenox station where it would utilize a pocket track for a turn around without disruption to existing service. This alternative would serve as a new MARTA heavy rail line.

5.3.2 Light Rail Transit Alternative 1 (LRT1)

The LRT1 Alternative would be an LRT service that would operate along the same alignment as HRT1. It would extend along Broad Street from Five Points Station to Garnett Station. Then it would operate in an exclusive guideway south of Garnett Station and extend south parallel to Windsor Street, then east along Glenwood Avenue/Fulton Street. It would enter the I-20 right-of-way at Hill Street. From there, the alignment would extend east, on structure, in the center of the I-20 median. At Glenwood Avenue,

the alignment would transition to the side of the interstate and run parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. This alternative would require the construction of a new vehicle maintenance facility. A conceptual map of this alternative is shown in **Figure 5-3** below.

Figure 5-3: LRT 1 Alternative Concept

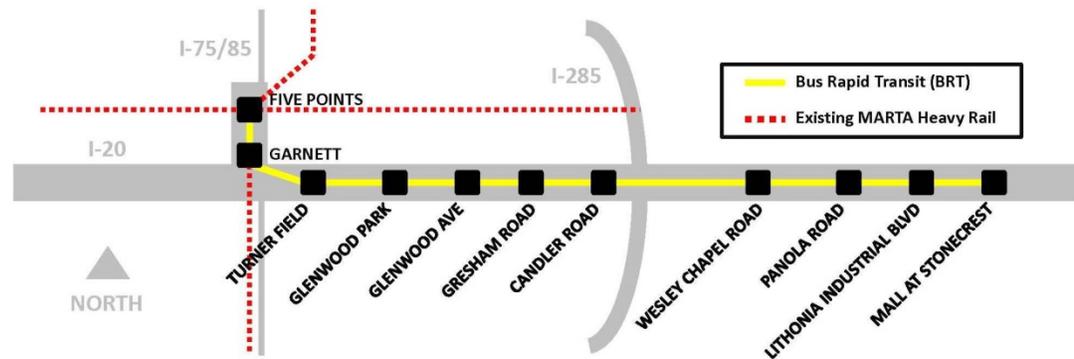


As shown above, this alternative would connect to the existing MARTA heavy rail system at Five Points Station and Garnett Station. LRT1 would serve as a new light rail service in the I-20 East Corridor.

5.3.3 Bus Rapid Transit Alternative 1 (BRT1)

The BRT1 Alternative is a BRT line that would follow the same alignment as HRT1 and LRT1. It would operate in-street along Broad Street from Five Points Station to Garnett Station. It would then operate in an exclusive guideway south of Garnett Station and extend south parallel to Windsor Street, then east along Glenwood Avenue/Fulton Street, before it would enter the I-20 right-of-way at Hill Street. From there, the alignment would extend east, on structure, in the center of the I-20 median. At Glenwood Avenue, the alignment would transition to the side of the interstate and run parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. A concept of the BRT1 Alternative is shown in **Figure 5-4** below.

Figure 5-4: BRT 1 Alternative Concept

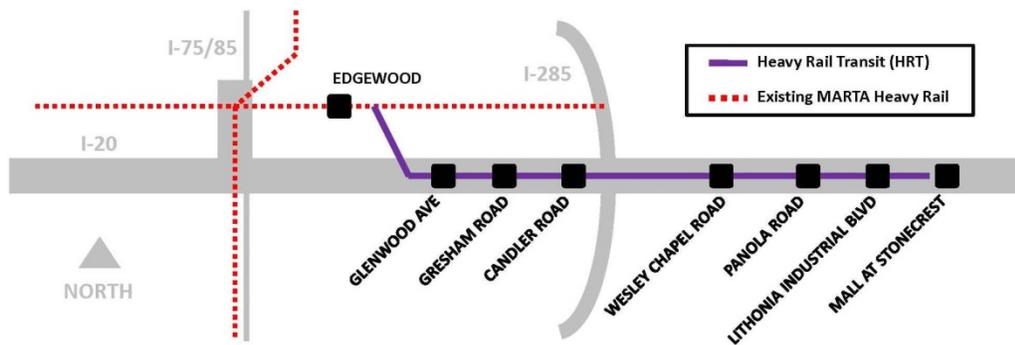


As shown above, this alternative would connect to the existing MARTA heavy rail system at Five Points Station and Garnett Station. BRT1 would serve as a new bus rapid transit service in the I-20 East Corridor.

5.3.4 Heavy Rail Transit Alternative 2 (HRT2)

HRT2 would be a new HRT line that would spur from the existing MARTA rail network between the Edgewood/Candler Park Station and the East Lake Station. This alternative would utilize the existing tunnel portal constructed with the east-west line that was originally intended for the proposed Tucker – North DeKalb line. This tunnel portal would allow the HRT2 line to enter a tunnel alignment before leaving the MARTA right-of-way. This is necessary to ensure that this alternative does not adversely affect the surrounding historic neighborhoods. The tunnel alignment would extend south to I-20 where it would surface and run parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. A conceptual map of this alternative is provided in **Figure 5-5** below.

Figure 5-5: HRT 2 Alternative Concept

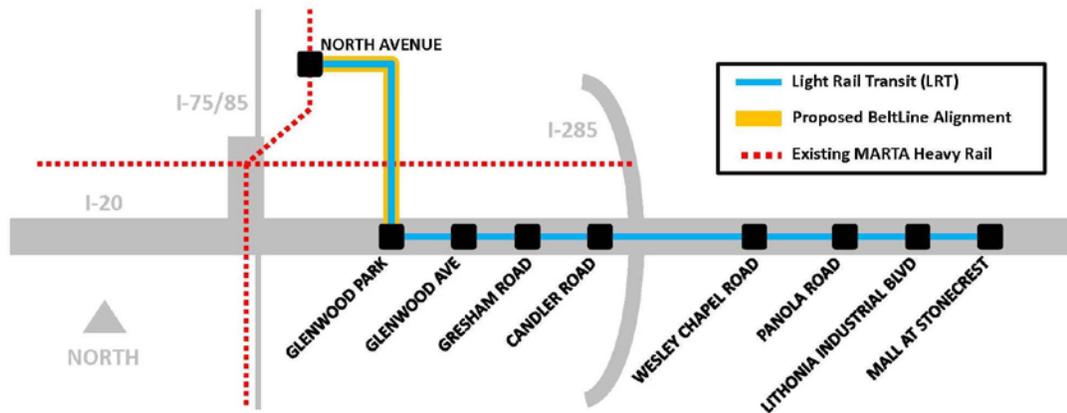


This alternative would tie into the existing MARTA heavy rail system between the Edgewood/Candler Park Station and the East Lake Station. Rather than add a third HRT service along the east-west line, this alternative would extend the MARTA Green Line from its current eastern terminus at Edgewood Candler Park Station to the Mall at Stonecrest. The Blue Line service would be unchanged.

5.3.5 Light Rail Alternative 2 (LRT2)

LRT2 is proposed as new LRT line that would originate at the North Avenue Station and operate in-street along North Avenue east to the proposed BeltLine alignment, which it would follow south to I-20. It would then extend east in an exclusive guideway, on structure, in the center of the I-20 median. At Glenwood Avenue, the alignment would transition to the side of the interstate and run parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. This alternative would require the construction of a new vehicle maintenance facility. A conceptual map is provided in **Figure 5-6** on page 5-5.

Figure 5-6: LRT 2 Alternative Concept

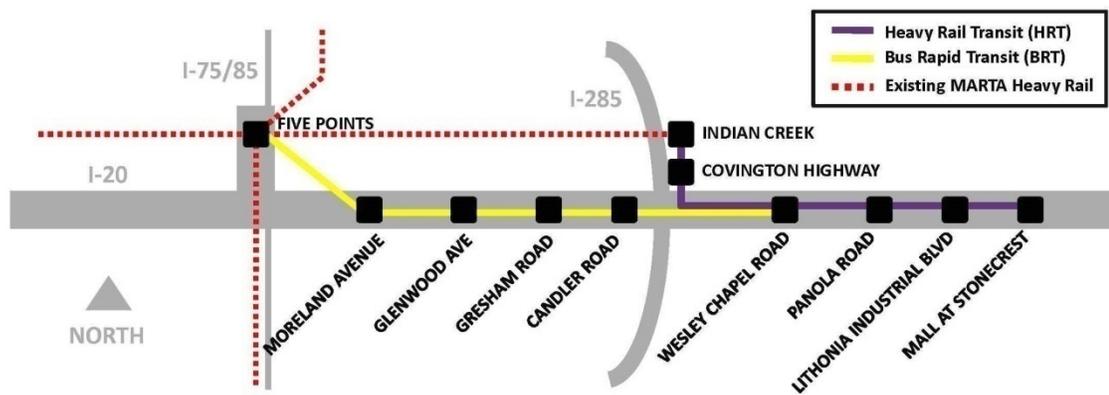


As shown above, this alternative would utilize the BeltLine alignment to access Midtown Atlanta and the MARTA heavy rail system. LRT2 would serve as a new light rail service in the I-20 East Corridor.

5.3.6 Heavy Rail Transit Alternative 3 (HRT3)

HRT3 would extend the existing MARTA east-west heavy rail line 12 miles from the Indian Creek Station, south parallel to I-285, then east parallel to I-20 to the Mall at Stonecrest in eastern DeKalb County. This alternative would also include BRT service operating on I-20 between the Five Points Station and Wesley Chapel. This would be a premium BRT service which could potentially run in-street, in High Occupancy Vehicle (HOV) lanes, High Occupancy Toll (HOT) lanes, dedicated lanes or in the shoulder of the interstate, which will be determined as part of subsequent environmental and engineering studies to provide the best possible transit solution within existing constraints. A conceptual map of this alternative is provided in **Figure 5-7** below.

Figure 5-7: HRT3 Alternative Concept



HRT3 would extend MARTA's existing Green Line to provide new service in the I-20 Corridor. The extended Green Line would serve all new heavy rail stations as shown in the figure above, and then operate as an express service along the existing east line, serving only select stations in order to minimize travel times between Mall at Stonecrest



and the Five Points Station. The Blue Line service would remain unchanged, providing local service to all existing stations between Indian Creek and Five Points Station.

5.3.7 Baseline/TSM Alternative

The Baseline/TSM Alternative is intended to be the best that can be done to improve mobility without making a major capital investment in guideway infrastructure. This alternative is generally considered to be a low cost approach to addressing transportation problems in the study corridor. As such, the improvements associated with the Baseline/TSM Alternative are developed to respond to and satisfy the defined purpose and need associated with enhancing mobility in the study area. These improvements typically consist of a variety of actions to improve existing transportation services including modifications to existing bus routes, additions to existing park-and-ride facilities, and minor roadway signal improvements. The FTA guidance designates the Baseline/TSM Alternative to serve as the benchmark against which the Build alternatives are evaluated in the New Starts program. To this end, the Baseline/TSM Alternative is utilized during the Tier 2 alternatives evaluation as the basis for calculating incremental costs and benefits of a fixed guideway facility.

The I-20 East Baseline/TSM strategy focuses on developing a set of new express routes that provide linkages to downtown markets via connections to the existing MARTA heavy rail stations at Five Points or Indian Creek. The key objective of the Baseline/TSM strategy is to facilitate convenient transit access and connectivity by increasing service frequency, reducing transit travel times, and creating convenient opportunities for transfers to occur. To accomplish these objectives, new park and ride facilities, improvements to existing transit services and additional express services are proposed as part of the Baseline/TSM Alternative. More detail on the development and operational characteristics can be referenced in the *Baseline/Transportation System Management Alternative Report*.

The I-20 East Baseline/TSM strategy is a low cost approach to solving transportation needs in the corridor and includes the following:

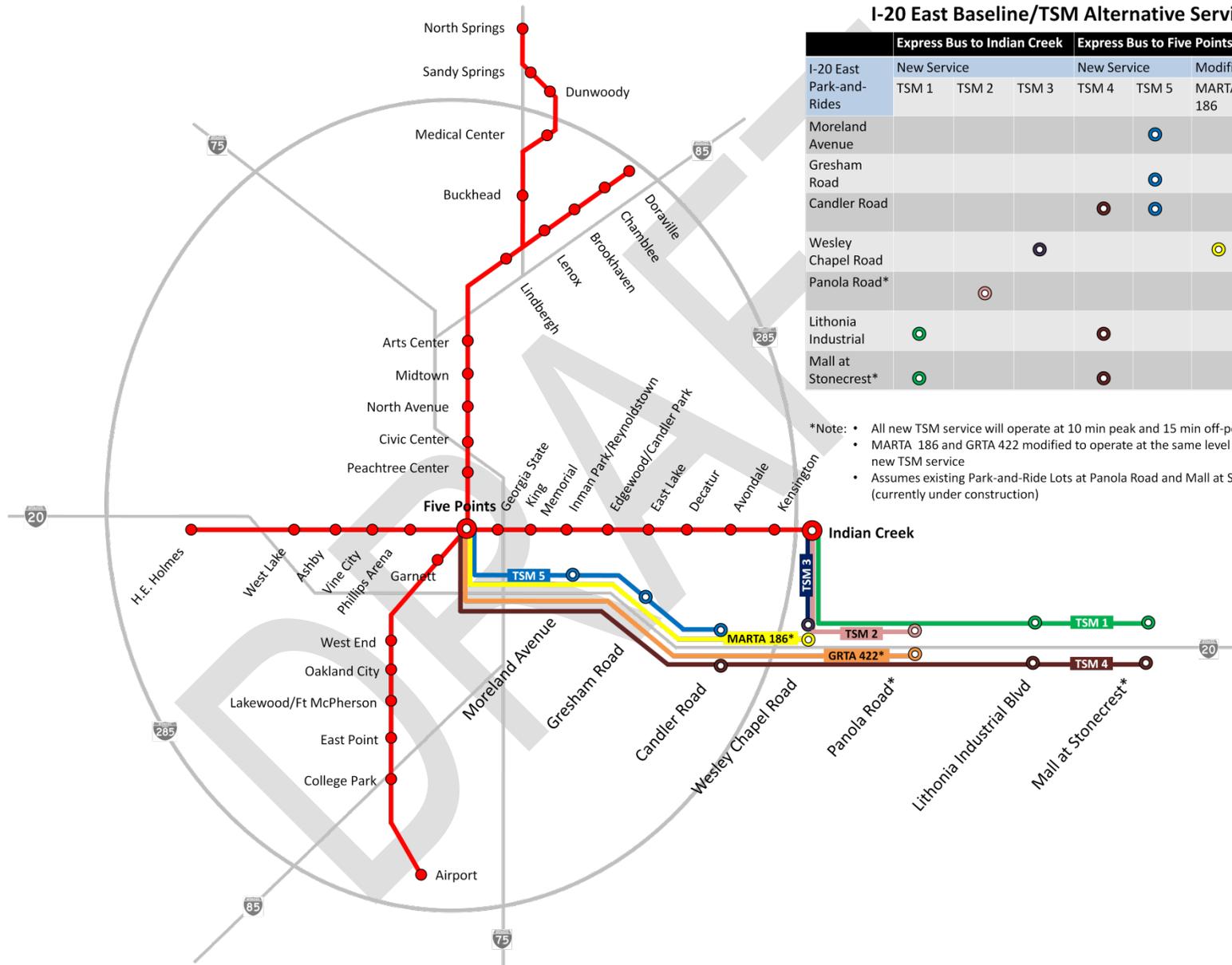
- Provide new park and ride facilities to expand opportunities to access transit.
- Enhance existing transit services to provide greater transit connectivity and accessibility within the corridor and the existing rail network; and
- Provide new limited stop express service with competitive travel times and destinations served by the Build alternatives.

Figure 5-8 on page 5-7 presents a map of the proposed Baseline/TSM Alternative, which includes the new and improved express routes and identification of new park-and-ride lots.

5.3.8 No Build Alternative

The No Build Alternative represents future transportation conditions if no investments are made beyond transportation projects that are already planned and committed in Atlanta region's fiscally constrained long-range transportation plan. As such, it serves as the base case against which each of the Build alternatives is compared.

Figure 5-8: Baseline/TSM Alternative



I-20 East Baseline/TSM Alternative Service Plan

	Express Bus to Indian Creek			Express Bus to Five Points		Modified Service*	
I-20 East Park-and-Rides	New Service TSM 1	New Service TSM 2	New Service TSM 3	New Service TSM 4	New Service TSM 5	MARTA 186	GRTA 422
Moreland Avenue					●		
Gresham Road					●		
Candler Road				●	●		
Wesley Chapel Road			●			●	
Panola Road*		●					●
Lithonia Industrial	●			●			
Mall at Stonecrest*	●			●			

*Note:

- All new TSM service will operate at 10 min peak and 15 min off-peak headways
- MARTA 186 and GRTA 422 modified to operate at the same level of service as new TSM service
- Assumes existing Park-and-Ride Lots at Panola Road and Mall at Stonecrest (currently under construction)

5.4 Cost Estimates for Tier 2 Build Alternatives

Cost estimates for the Tier 2 Alternatives are based on a refinement of the Tier 1 cost estimates through the integration of factors specifically related to the chosen technology for each alignment advancing from Tier 1. More specifically, this included:

- Matching appropriate technologies for the alignments advancing from Tier 1;
- Operational characteristics of a given technology with respect to the existing and planned transit infrastructure; and
- Right-of-way availability to accommodate a specific technology.

As such, the documents utilized to refine the initial Tier 1 estimates to develop cost estimates for Tier 2 Alternatives were as follows:

- *Station Cost Estimating Methodology* - This memorandum provided preliminary costs for HRT, LRT, and BRT technologies based on a comparison of similar projects throughout the U.S and was utilized to refine the Tier 1 cost estimates to include capital costs for stations based on their location and type.
- *Conceptual Right-of-Way Cost Estimating Methodology* – This memorandum documented the development of right-of-way costs for each alternative. Right-of-way estimates were developed through the assumption of an 80' footprint for each alternative and applying land values based on Tax Assessor Office information from Fulton and DeKalb Counties. These initial estimates were then inflated to reflect market values, scheduling, and administrative and court costs.

Table 5-2 below presents the concept level cost estimates for the Tier 2 Build Alternatives. Please refer to the *I-20 East AA/DEIS Cost Estimating Methodology* and *Conceptual Right-of-Way Cost Estimating Methodology* memoranda for more detail on the methodology employed to develop these estimates.

Table 5-2: Cost Estimates for Tier 2 Alternatives

Alternative #	Alternative Name	Right-of-Way Cost	Capital, Professional, Finance, & Contingency Costs	Total Cost	Annual O&M Costs
HRT1	Heavy Rail Transit 1	\$233.7M	\$3,048M	\$3,281M	\$35.2M
LRT1	Light Rail Transit 1	\$233.7M	\$2,467M	\$2,700M	\$10.4M
BRT1	Bus Rapid Transit 1	\$233.7M	\$1,862M	\$2,111M	\$6.4M
HRT2	Heavy Rail Transit 2	\$116.7M	\$2,612M	\$2,729M	\$23.8M
LRT2	Light Rail Transit 1	\$112.7M	\$1,987M	\$2,115M	\$10.4M
HRT3	Heavy Rail Transit 2	\$107.4M	\$1,718M	\$1,840M	\$18.0M
TSM/Baseline	TSM/Baseline	\$41.9M	\$29M	\$70.9M	\$24.2M

Source: HDR Engineering

5.5 Assumptions and Design Criteria

Table 5-3 on page 5-9 presents the major assumptions considered during the development and evaluation of alternatives. These include design, cost estimating, transit service, forecasting, and right-of-way cost estimating assumptions. Similarly, each transit technology has its own set of design standards developed in conjunction with the vehicle dimension and operating characteristics. The different design criteria for the three transit technologies are found in Appendix A.

Table 5-3: Major Assumptions

Design Assumptions	<ul style="list-style-type: none"> • New HRT stations would be smaller, simpler, and cost less than traditional MARTA HRT stations. • No surface street operation or at-grade rail crossings for LRT alternatives with exception of BeltLine alignment for LRT2. • Sufficient capacity at existing rail maintenance facilities to maintain HRT vehicles. • Sufficient capacity at existing bus maintenance facilities to maintain BRT vehicles. Some additional equipment may be necessary. • LRT alternatives would require a new storage and maintenance facility in the corridor.
Capital Cost Estimates	<ul style="list-style-type: none"> • All cost estimates are reported in 2011 dollars. • Storage and maintenance facilities were only deemed necessary for LRT alternatives. Assumed that HRT and BRT vehicles would be stored and maintained at existing MARTA facilities.
Service Assumptions	<ul style="list-style-type: none"> • 10-minute peak and 20 minute off-peak headways. • Six trains consists for HRT service. • Four train consists for LRT service.
Forecasting Assumptions	<ul style="list-style-type: none"> • No HOV or managed lanes along I-20 east of I-285 in year 2030. • GRTA express bus service would no longer serve the Panola Road park and ride lot.
Right-of-Way Cost Estimates	<ul style="list-style-type: none"> • 80' required right-of-way assumed for corridor. • Property costs based on current assessed value plus escalations factors. • Right-of-way requirements on publicly owned property assumed to have no cost.

5.6 Tier 2 Alternatives Evaluation Results

The purpose of the Tier 2 Screening was to identify the LPA utilizing a robust list of evaluation criteria and MOEs that were identified and utilized to measure the ability of the alternatives to address the identified project goals and objectives. As presented in detail in the *I-20 East Transit Initiative Tier 1 and Tier 2 Screening Report*, alternatives were given a rating for each MOE, and then a rounded average of MOE ratings for each project goal was used to obtain a project goal score. In this way, each alternative was evaluated for how well it addressed each project goal. Project goal ratings were then summed for each alignment to produce overall ratings, presented in **Table 5-4** below. HRT3 attained the highest total evaluation rating for all alternatives with 11 points. HRT1, LRT1, BRT1, and the TSM/Baseline alternatives all ranked second with eight points. HRT2 and LRT2 received ratings of seven.

Table 5-4: Overall Tier 2 Evaluation Results

Project Goal	No Build	TSM	HRT1	LRT1	BRT1	LRT2	HRT2	HRT3
Goal 1: Increase Mobility and Accessibility	0	1	2	2	2	1	1	2
Goal 2: Provide Improved Transit Service within the Corridor	0	1	1	1	1	1	1	2
Goal 3: Support Land Use and Development Goals	0	2	2	2	2	2	2	2
Goal 4: Promote Cost Effective Transit Investments	0	2	1	1	1	1	1	2
Goal 5: Preserve the Natural and Built Environment	0	2	0	0	0	0	1	1
Goal 6: Achieve a High Level of Community Support	0	0	2	2	2	2	1	2
Tier 2 Alternatives: Cumulative Rating	0	8	8	8	8	7	7	11