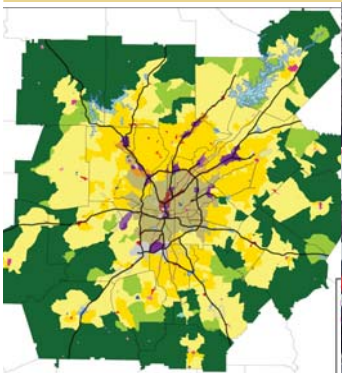




Strategic Regional Thoroughfare Plan

Case Study Report Moreland Avenue Corridor



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JACOBS



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Section 1: Introduction

This report serves as the deliverable associated with Task 5 of the Scope of Services for the Strategic Regional Thoroughfare Plan (SRTP) completed for the Atlanta Regional Commission (ARC). The purpose of the SRTP is to identify a network of surface roadways, called the Regional Thoroughfare Network (RTN), that are most critical in providing regional mobility and connecting major activity centers throughout the Atlanta region and develop policy guidelines to maximize their overall functionality. As such, the RTN will also serve as the Atlanta region's priority network for its Congestion Management Process policies and procedures.

As part of this effort five case studies were identified to serve as examples of the various improvement scenarios that could be used to address the accessibility and mobility issues within the RTN. These case studies were selected based upon a number of factors:

- Type and character of the facility;
- Type of area and land use within the region;
- Transportation system options; and
- Future transportation and land use issues.

The five case studies selected for detailed analysis as part of this study are:

- Moreland Avenue from Glenwood Avenue to North Avenue (City of Atlanta)
- Memorial Drive from Kenningston Road to North Hairston Road (DeKalb County)
- Roswell Road from Northridge Parkway to Marietta Highway (Roswell/Sandy Springs)

- Aviation Boulevard/Conley Road from I-75 to Jonesboro Road (Clayton County)
- McDonough Road (SR 155) from I-75 to Hampton Locust Grove Road (Henry County)

This report documents the investigation, analysis, and evaluations associated with the Moreland Avenue case study.

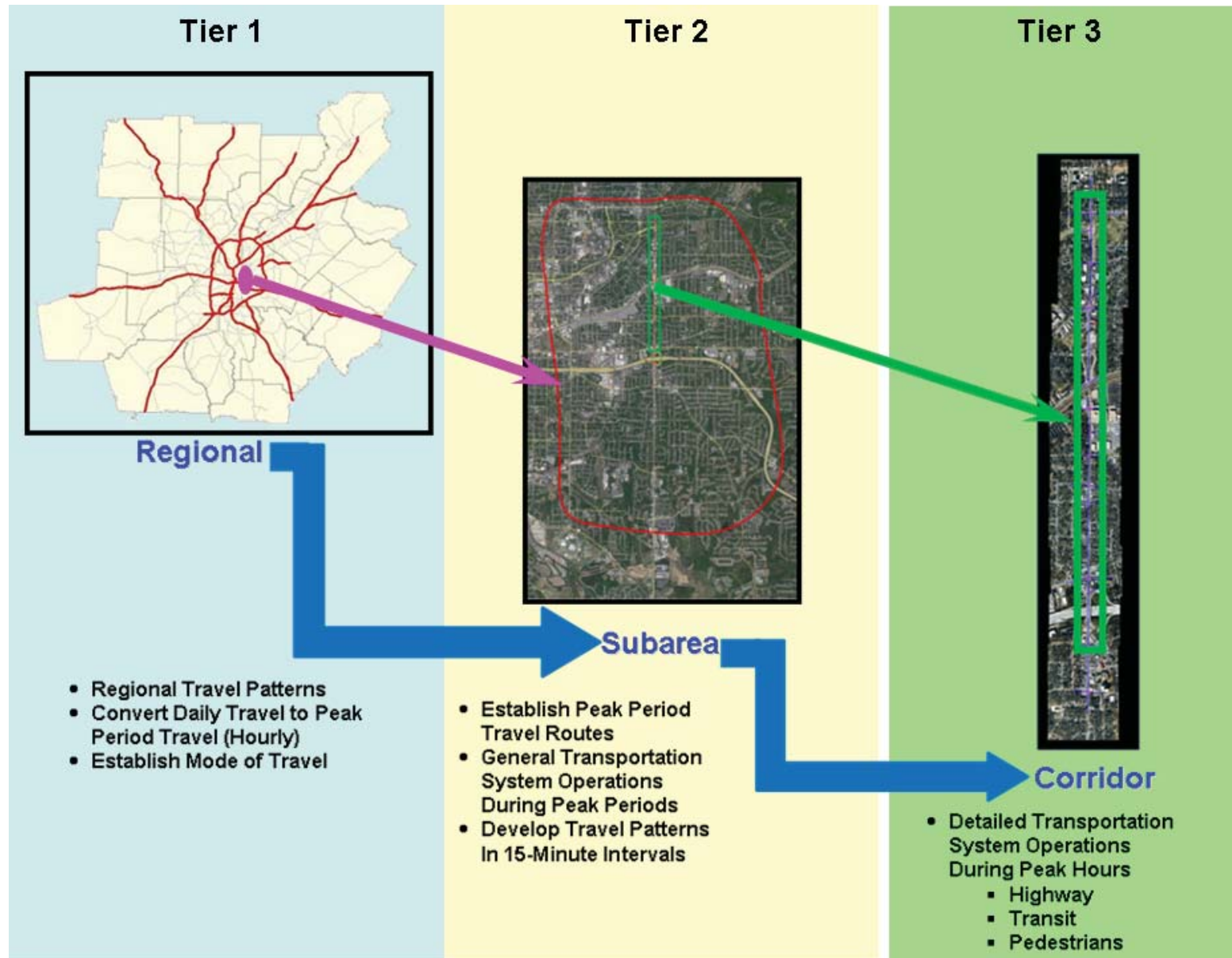
1.1 Case Study Analysis Process

All five case studies followed the same general analysis procedures since one of the primary objectives of the case studies was to evaluate the effectiveness and applicability of the analysis procedures in diverse environments. This process consisted of a three tier procedure depicted in **Figure 1**.

The overall analysis approach is to build upon the foundation provided by the ARC regional travel demand model. This foundation was used to structure a study process that combines analysis of the regional travel demand, the more detailed analysis of travel within a subarea encompassing the study corridor, and operation analysis detail associated with a microsimulation model. The key to successfully performing these three levels of analysis while maintaining overall consistency in the analysis process is the establishment of the required linkages between all three analysis levels.

The regional level of analyses, or macroscopic model, provides an overall level of analysis and can be used to provide a global assessment of the existing and future conditions in the corridor. It can be used to ascertain the impacts of alternative general improvement scenarios and concepts throughout the study area. An important aspect of this level of analysis is an examination of the various travel modes and the impacts of the improvement scenarios on travel mode. These improvement scenarios consider both transportation system modifications and land use changes. General evaluation measures developed at this level of analysis include: vehicle-miles of travel, vehicle-hours of travel, vehicle-hours of delay, percent single occupancy vehicle trips, percent shared ride 2 person vehicle trips, percent shared ride 3 or more person vehicle trips, and percent transit trips.

Figure 1: Traffic Analysis Process



However, this project utilized an additional, more detailed, level of analysis in order to investigate ways to improve the accessibility to important economic engines and activity centers located within and adjacent to the corridor. This more detailed level of analysis must build upon the analysis provided by the macroscopic model and examine specific bottlenecks or chokepoints within a sub-area surrounding the corridor that could reduce the accessibility to key locations. These locations can be examined independently and solutions developed to address these problem areas. However, in many cases relieving a problem at a single location only serves to move the problem to another location downstream. Thus, examination of bottlenecks and chokepoints cannot be undertaken using an isolated analysis approach. Rather, a more system-wide approach focused on the sub-area study needs to be embarked upon. This more detailed level of analysis is generally referred to as a mesoscopic analysis.

This mesoscopic analysis was carried out by using a more rigorous analysis process that incorporated an increased level of analysis procedures such as dynamic traffic assignment (DTA). The DTA process specifically addresses the issue of motorist selection of differing routes during periods of congestion along with the changing of these routes within the congested time period itself. For this study process, route selection was made for 15 minute time slices. This DTA process allowed for an examination of queues and delays associated with congestion. Using the DTA process is a relatively new approach that has become available with the advent of new software programs and enhanced computer hardware. DTA procedures have recently been tested successfully in the Atlanta metropolitan 20-county region to determine its viability in large scale applications. This step down process provides the necessary integration of macroscopic and mesoscopic analysis procedures to ensure analysis consistency and compatibility. This level of analysis allowed for an examination of travel and transportation network characteristics during peak periods. The trips for each of the AM and PM peak periods within the study area are developed by extracting the trips from the regional travel demand model using hourly assignments. Thus, regional travel demand model assignments are made for the AM peak period (6:00 AM – 9:00 AM) and PM peak period (3:00 PM – 7:00 PM) by mode (SOV, SR 2, SR 3+, commercial vehicle, medium trucks, and

heavy trucks). This process maintains the trip pattern connection between the regional travel demand model and the mesoscopic model. These trips are then assigned to the study area network using DTA procedures for each time period in 15-minute increments. General evaluation measures developed at this level of analysis include: vehicle-hours of delay, average peak period speed on the various facilities by mode, and locations of major queues.

The third level of analysis is microscopic analysis which dealt with the detailed operational characteristics of the transportation network at specific locations, along the corridor, or within isolated areas of the overall corridor. This microscopic analysis was carried out by extracting the area to be studied in detail from the mesoscopic model and using more rigorous analysis procedures of a micro traffic simulation model. The traffic volumes and travel patterns established in the mesoscopic analysis are incorporated into the microscopic analysis, thus maintaining the integration with the macroscopic and mesoscopic levels of analysis.

1.2 Report Organization

This report is organized as follows:

- Chapter 2.0 – Overview of Study Area
- Chapter 3.0 – Scenario Development Process
- Chapter 4.0 – Testing Results
- Chapter 5.0 – Conclusions

Section 2: Overview of Study Area

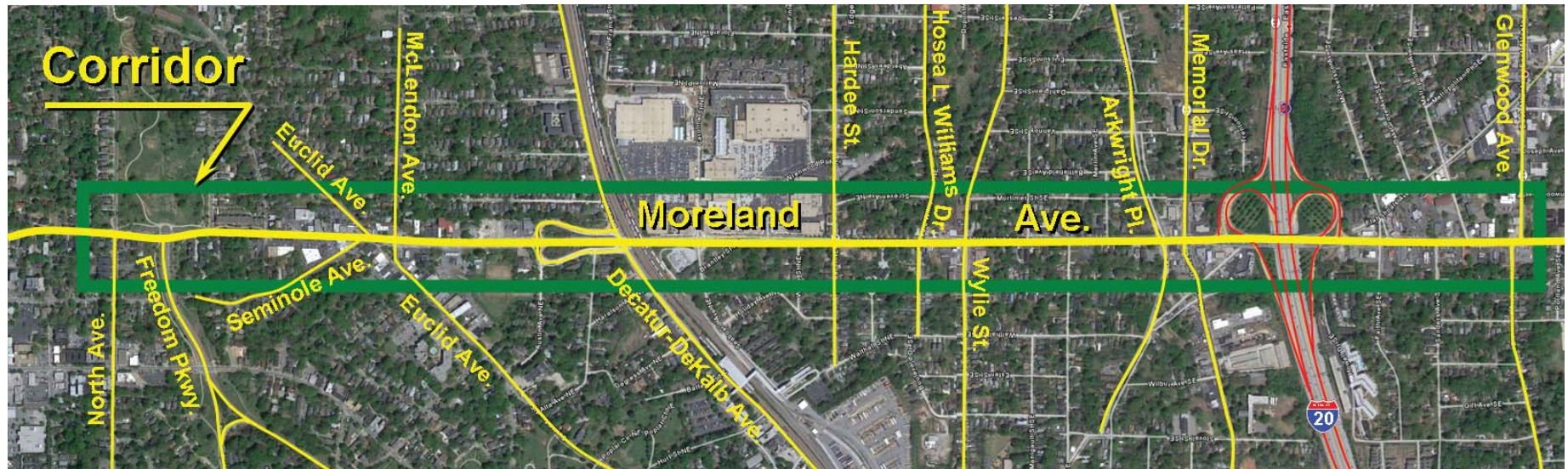
The study area (analysis sub-area) is generally bounded on the north by Ponce de Leon Avenue, on the south by Glenwood Avenue, on the east by Moreland Avenue and on the west by I-75/85. The Study area is shown in **Figure 2**.

The following streets provide for east-west travel in the study area: Ponce de Leon Avenue, North Avenue, Decatur-DeKalb Avenue, Memorial Drive, I-20, and Glenwood Avenue. North-south travel is provided by I-75/85, Jackson Street, Boulevard, and Moreland Avenue. East of Moreland Avenue there are no streets that have significant north-south connectivity within a reasonable distance. **Figure 3** shows the details for highway network in the corridor.

Figure 2: Study Area for Moreland Avenue Case Study



Figure 3: Moreland Avenue Corridor



Section 3: Scenario Development Process

The scenarios developed for testing were developed through the utilization of two steps:

- Step 1: Researching recommendations of previous plans, studies or projects that apply to the subject corridors– such as roadway, transit, and bicycle and pedestrian enhancements in addition to redevelopment and land use strategies – that would set a framework for a testing scenarios; and
- Step 2: Based on previous plans and studies, input from focus group members was utilized to develop and/or alter scenarios developed from the first step based on current conditions and/or subsequent events from the time these plans and studies were completed.

In all cases, the scenarios included an Existing 2010 Network, Long Range Plan Network, and an additional transportation scenario coupled with various land use/socioeconomic variables.

3.1 Land Use Overview

The Moreland Avenue case study area is characterized by dense urban development with a mixture of residential and commercial uses. The majority of land uses along Moreland Avenue itself are commercial in nature. However, immediate adjacent to this commercial development is single family and multi-family residential development. The overall development character of the area is not anticipated to significantly change in the future.

3.2 Relevant Plans, Policies or Projects

Ponce de Leon/Moreland Avenue Corridors Study - This study was completed in August 2005 and includes recommendations geared toward making Moreland Avenue into a corridor that enhances and connects neighborhoods while providing neighborhood-scaled transportation facilities.

South Moreland Avenue LCI Study - This study was completed in March 2008 and overlaps the southern end of the Moreland Corridor case study area including the I-20 interchange. The LCI goals include encouraging mixed-use development, providing access to alternative transportation modes, and encouraging more pedestrian-friendly transportation projects.

3.3 Planned and Programmed Improvements

There are no planned or programmed transportation improvement projects in the Moreland Avenue Case Study Area.

3.4 Focus Groups

One of the critical steps in the case study process was to establish focus groups – with a targeted membership of 10-15 participants - to help guide the case study. The focus groups met twice to:

- Provide input into the development of potential scenarios for testing (Meeting #1); and
- Provide feedback on the testing results of those scenarios (Meeting #2).

The members of each of the corridor focus groups were determined through an initial meeting with jurisdictional staff to identify persons that have been active in neighborhood/community associations and/or participated in previous studies related to the study corridors. Members were also solicited from the SRTP Environmental Justice outreach program.

Input Provided

There was a significant interest in understanding, as much as possible, traffic diversion reaction to the simulation scenarios that are developed. This is especially important when simulating traffic calming measures that improve walkability and bicycling. Pedestrian accidents are frequent in the Little Five Points area (near McLendon Avenue). Mansfield Avenue was chosen as the northern terminus so we could analyze a mid-block crossing there.

Questions raised:

- How real is this?
- How will you prioritize?
- What are the performance goals?
- How much of this is number-crunching, and how much will simulate what's really happening on the road and side-walks?

3.5 Scenarios Tested

This case study examined four scenarios:

- Scenario 1: 2010 Existing Conditions
- Scenario 2: 2040 Existing RTP
- Scenario 3: 2040 With Partial LCI Land Use
- Scenario 4: 2040 With Full LCI Land Use

The transportation and land use assumptions within each scenario are summarized in **Table 1**.

Table 1: Scenario Transportation and Land Use Assumptions

	Transportation Assumptions	Land Use Assumptions
Scenario 1	<ul style="list-style-type: none"> • Existing conditions for the network year (2010) 	<ul style="list-style-type: none"> • Existing 2010 land use
Scenario 2	<ul style="list-style-type: none"> • All regional capacity projects are included from the Envision6 Regional Transportation Plan. No RTP projects are planned in the Moreland Avenue study area or corridor 	<ul style="list-style-type: none"> • Official 2040 land use forecast from the Envision6 Plan
Scenario 3	<ul style="list-style-type: none"> • Intersection realignment at Moreland Avenue / Glenwood Avenue • I-20 Interchange redesigned to be urban diamond interchange with traffic signals • Arterial Bus Rapid Transit (BRT) on separate right-of-way from Inman Park MARTA Station to south end of study area • Signal pre-emption for BRT • Mid-block pedestrian crossing at Little Five Points between Euclid Avenue and Mansfield Road 	<ul style="list-style-type: none"> • Official 2040 Envision6 land use plan used as basis • Specific traffic zones were identified with guidance from the LCI studies for land-use modification • Level of development was increased at these zones to result in a 5% increase in trips out of zones
Scenario 4	<ul style="list-style-type: none"> • Intersection realignment at Moreland Avenue / Glenwood Avenue • I-20 Interchange redesigned to be urban diamond interchange with traffic signals • Arterial Bus Rapid Transit (BRT) on separate right-of-way from Inman Park MARTA Station to south end of study area • Signal pre-emption for BRT • Mid-block pedestrian crossing at Little Five Points between Euclid Avenue and Mansfield Road 	<ul style="list-style-type: none"> • Official 2040 Envision6 land use plan used as basis • Specific traffic zones were identified with guidance from the LCI studies for land-use modification • Level of development was increased at these zones to result in a 10% increase in trips out of zones

Section 4: Scenario Testing Results

The Dynamic Traffic Assignment and Microsimulation Model results are presented in **Tables 2** and **3**, respectively. **Table 4** shows daily transit boardings for buses along the Moreland Avenue corridor.

Major Findings – Comparison

When comparing the Study Area statistics, it can be seen that when going from 2010 to 2040 RTP there is significant reduction in average speed in the AM Period and slight reduction in average speed in the PM Period. In the AM Peak Period, vehicle miles of travel (VMT) is only increased by about 7% while the vehicle hours of travel (VHT) increases by over 71%. The PM Peak does not show as large an increase in VHT, but there is already significant congestion in 2010, so it is not capable of handling much additional volume to increase VHT by 2040. In the Scenario cases, it can be seen that with improvements to the transportation system within the corridor, VMT is able to be increase with less of an increase in VHT compared to 2040 RTP. This results in a slight improvement to average speed in the study area for both AM and PM Peak Periods compared to 2040 RTP.

When comparing the Corridor Peak Period statistics, it can be seen that there is significant reduction in average speed and corresponding increase in vehicle delay between 2010 and 2040 RTP conditions. The implementation of the transportation improvements in the two Scenario networks indicates an increase in average speed, almost back to the 2010 levels for both AM and PM Peak Hour. The full build out of the LCI land use shows that there would be a slight increase in trips in the corridor which would increase average delay per vehicle compared to partial LCI build-out.

These analyses provide insights into the relationship between land use and the supporting transportation system. Thus, an optimum level of development can identified for a particular transportation system. Conversely, an optimum transportation system can be identified for a given level of development. In addition, the impacts of

the development patterns on mode of travel can also be assessed as demonstrated in **Table 4** with the scenarios including the implementation of an arterial BRT system along Moreland Avenue.

Analysis of a pedestrian crossing was carried out by the installation of a mid-block pedestrian signal on Moreland Avenue in the Little Five Points area between Euclid Avenue and Mansfield Road. The analysis indicated that this type of pedestrian treatment could be employed with minimal impact on the traffic operations in the area.

Table 2: Study Area Peak Hour Transportation System Operating Characteristics

Scenario	AM Peak Period			PM Peak Period		
	Vehicle Miles of Travel (VMT)	Vehicle Hours of Travel (VHT)	Average Speed (MPH)	Vehicle Miles of Travel (VMT)	Vehicle Hours of Travel (VHT)	Average Speed (MPH)
2010	279,518	16,631	16.8	292,334	38,205	7.7
2040 Base (RTP)	298,415	28,502	10.5	301,333	48,282	6.2
2040 Scenario (with Partial LCI land use)	284,187	26,547	10.7	285,621	45,698	6.3
2040 Scenario (with Full LCI land use)	291,265	26,154	11.1	292,863	42,581	6.9

Table 3: Corridor Peak Period Transportation System Operating Characteristics

Scenario	AM Peak Hour		PM Peak Hour	
	Average Speed (MPH)	Average Delay (Sec. Per Veh.)	Average Speed (MPH)	Average Delay (Sec. Per Veh.)
2010	16.7	83.2	18.3	67.4
2040 Base (RTP)	10.9	169.7	11.9	137.5
2040 Scenario (with Partial LCI land use)	16.3	95.6	17.9	81.4
2040 Scenario (with Full LCI land use)	14.1	114.6	15.4	92.8

Table 4: Corridor Transit Boardings

Scenario	Daily Transit Boardings
2010	590
2040 Base (RTP)	810
2040 Scenario (with Partial LCI land use)	890
2040 Scenario (with Full LCI land use)	920

Section 5: Conclusion

5.1 Implications for RTN

One of the major conclusions is that land use can have a significant impact on the evaluation measures. As can be seen the increasing of the development in Scenarios 3 and 4 significantly increase the travel delays in the corridor. On the other hand the overall delays in the study area are generally reduced.

Another implication of this analysis is that shifts between automobile and transit are not related to just providing higher levels of transit service. Other factors need to be considered in determining provisions of premium transit services.

5.2 Implications for Multimodal Corridor Studies

In order to promote a balance between providing multimodal mobility and preserving the area land use context along the more significant RTN facilities, the ARC will be undertaking its Multimodal Corridor Scoping and Concept Design (MMCS) program. The scope of services for MMCS will incorporate Context Sensitive Solution (CSS) principles to address design needs as well as technical analyses carried through in the case studies performed during the SRTP effort.

The sample case study experience indicates that the interactive approach was very beneficial to problem definition and alternatives development. The following aspects of the case studies were particularly useful, and should be carried forward into the MMCS program:

- Focus groups – Given their local expertise, a focus group consisting of a combination of technical staff from local jurisdictions, GDOT officials (along state roadways), and representatives from citizen and business groups along the subject corridor provides an effective tool for scenario building.

- Scenario-building methodology – Through developing the alternative scenarios based on the recommendations of previous plans and studies in combination with input from the corridor focus groups, the MMCS will preserve the utility of past efforts in a context that reflects current conditions along a given corridor.
- Alternative testing methodology – Unlike previous corridor studies conducted by the ARC, the scenario testing methodology employed here (described in previous section) provides more detailed results based on area travel trends.

The end result of the MMCS will be a recommended design concept developed through a cooperative process that, in turn, mitigates potential conflicts during the environmental assessment (as prescribed by the National Environmental Protection Act (NEPA)), final design and construction phases of the project. As such, the ARC will be developing corridor plans that lead to a project further along in the implementation stages. In addition, regional travel trends will be considered in developing the concept by carrying through the travel analysis methodology tested in the case study process. Also, given the level of analysis prescribed herein, another potential result of the MMCS is the identification of short-term safety and/or operational improvements for a corridor.

