Strategic Regional Thoroughfare Plan

Final Report: Major Accomplishments and Next Steps

October 2011

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Section 1: Introduction and Overview

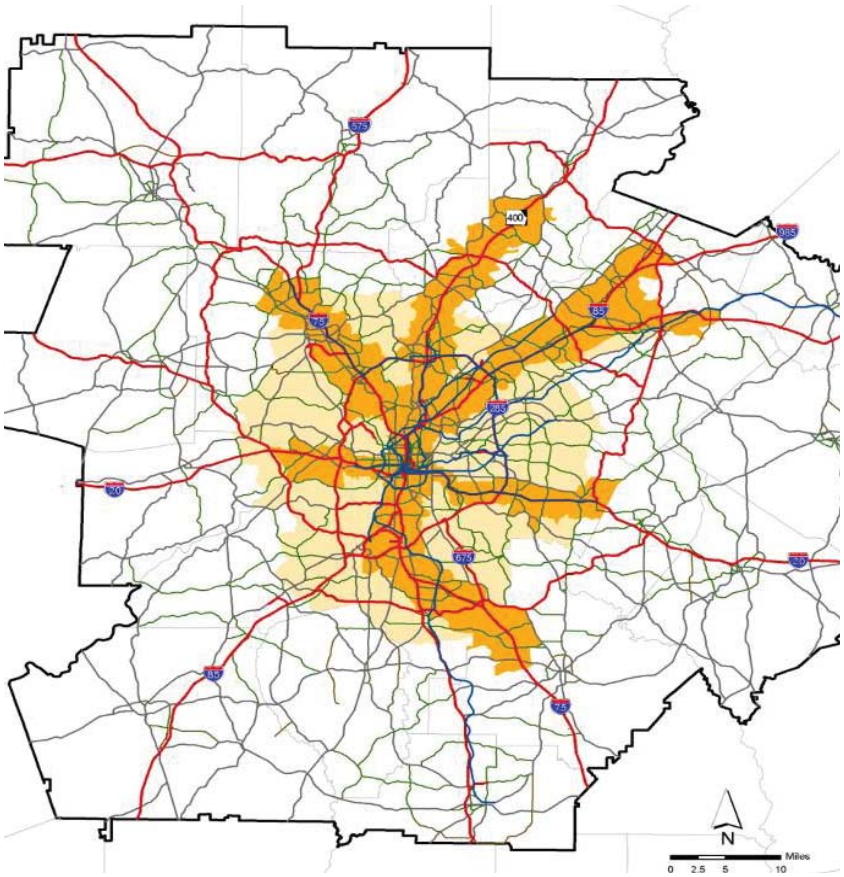
The Strategic Regional Thoroughfare Plan (SRTP) for the Atlanta Regional Commission (ARC) was undertaken in recognition that arterials are the most challenged facilities in the Atlanta Region. They accommodate multiple types of users with competing interests – such as long-range commuters, transit riders, freight movements, and bicyclists and pedestrians. The focus of the SRTP is to achieve more cohesive planning, operations, and management to promote more efficient project implementation and increased accountability for projects along those arterials most critical to mobility in the region.

The purpose of this report is to document the major efforts resulting from the completion of the SRTP. The four primary accomplishments through the SRTP include:

- The identification and classification of a prioritized roadway component of the Regional Strategic Transportation System (RSTS), shown at right in **Figure 1** – called the Regional Thoroughfare Network (RTN) - for improvements and congestion management related activities;
- The development of guidelines on management and design in relationship to area context and multimodal needs;
- The creation of a geo-referenced data set – called a Linear Reference System (LRS) - of roadway attributes, including INRIX data, that sets the framework for a future data clearinghouse; and
- The completion of case studies that help craft scenario building and testing for the Multimodal Corridor Scoping and Concept Design (MMCS) program.

The SRTP effort included an outreach program that included presentations to various community groups. The sections that follow document the activities above as well as detail how these SRTP efforts impact the ARC work program moving forward.

Figure 1: 2006 Regional Strategic Transportation System



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Section 2: Network Identification and Classification

The intent of the RTN is to focus future transportation system management, operations, and maintenance activities on critical corridors to protect or enhance regional multimodal mobility. This section provides an overview of how the RTN was defined, identified, and classified and describes the factors considered during this process.

More detail on the sections that follow can be found in the *Regional Thoroughfare Network Identification and Classification Report* developed under the SRTP work effort.

2.1 Definition and Function of Regional Thoroughfares

The RTN provides the ARC and its member local governments a network on which to proactively plan and develop effective and sustainable multimodal strategies consistent with their land use and development contexts and transportation functions to serve passenger and freight travel.

A regional thoroughfare is defined as:

"A transportation corridor that serves multiple ways of traveling, including walking, bicycling, driving, and riding transit. It connects people and/or goods to important places in Metropolitan Atlanta. It is managed by applicable special traffic control strategies and suitable land development guidelines in order to maintain travel efficiency, reliability, and safety for all thoroughfare users. In light of this special function, the thoroughfare network receives priority consideration for infrastructure investment in the Metro Atlanta region."

2.2 Metro Atlanta Network Identification Process

Based on the thoroughfare definition, the process for identifying Metro Atlanta's RTN was completed through three major steps:

- Development of draft sample thoroughfare networks based on regional plans and policies to facilitate discussion of the overall criteria for inclusion on the RTN;
- Quantitative assessment of these networks through use of the regional travel demand model to identify their overall regional mobility characteristics; and
- Refine network based on input from local jurisdictions and stakeholders.

These milestones are illustrated in **Figure 2** on the following page.

Using the results of the peer region review and feedback from Technical Coordinating Committee (TCC) members, a set of detailed policy-based and performance-based criteria for identifying the RTN was formulated. A critical consideration was the need to meaningfully integrate the RSTS with Metro Atlanta's Unified Growth Policy Map (UGPM). This transportation-land use linkage forms a strong foundation for the overall organizational structure of the RTN.

2.3 Input from TCC Members and Other Community Stakeholders

In order to gather input on the recommended RTN from a local perspective, meetings were held with representatives from each of the member jurisdictions of the TCC and/or the Transportation and Air Quality Committee (TAQC). This includes members from each of the 18 counties of the ARC (except Walton) in addition to the City of Atlanta. In order to facilitate discussion, copies of the two draft networks were presented as candidates based on a combination of policy considerations and performance-based criteria. In addition to these meetings, briefings were held with several civic, community, and business organizations.

Throughout the course of the outreach activities, some general themes emerged regarding guiding considerations in identifying the RTN.

- *The RTN needs to be limited in size.* In light of its overall purpose in the regional transportation system, there is general consensus that the RTN needs to be significantly smaller than the adopted RSTS. In this regard, the RTN must only include facilities that serve the highest regional mobility function.

Figure 2: Regional Thoroughfare Network Identification Process

Step 1: Develop Draft Networks

- Review of Plans and Policies
- Review of Available Data
- Linkage to UGPM and Travel Desire Lines

Step 2: Quantitative Analysis

- Based on Travel Demand Model
- Discounted for Interstate Trips
- Several Scenarios Analyzed

Step 3: Network Refinement

- Input from TCC and Stakeholders
- GDOT Recommendations
- System Redundancy, Connectivity , Spacing

- *System management should be a major focus of the RTN.* Given the limited amount of funding available for transportation capacity improvements in terms of both right-of-way and construction costs, there was general agreement that emphasis should be on system management guidelines. This direction should be followed in order to alleviate the need for large capital investments.

- *Multimodal travel is extremely important.* As the population of Metro Atlanta continues to grow, special attention needs to be given to transit and the improvements within Concept 3 – Regional Transit Vision. This is not only to promote improved mobility and more dense development patterns in the urbanized areas of the region, but also to provide commute options and nodal development opportunities in suburban and exurban areas.

- *Serving freight is critical.* As the region continues to grow, so too will the needs for transporting goods and services. In meeting the challenges of accommodating more travelers in the region, it is important to manage and plan the RTN to preserve freight operations. Freight mobility is also a critical factor in promoting economic development opportunities.

- *Geographical boundaries warrant consideration.* Roadways that traverse natural geographical features, particularly river crossings, are important because alternative corridors to serve the same trip are usually limited.

- *Access to regional transportation facilities should be prioritized.* Access to interstate highways and regional transportation facilities (e.g. Hartsfield-Jackson Atlanta International Airport (H-JAIA), MARTA stations, etc.) is important from a regional perspective.

- *The land use and development context that transportation facilities serve influences the RTN.* The function of a specific thoroughfare will be dependent on the urban form and land development patterns that it serves. Of the two draft networks, Draft Network 1 was seen as much more favorable to the suburban and exurban counties. This is logical since it is more highway-oriented than Draft Network 2. This is a preliminary indication that:
    - ◊ Concept 3 has a larger influence on the future transportation network in the more urbanized core counties in which roadways are more constrained by existing development. Thus, roadway preservation and management is a critical need in these areas.
    - ◊ In suburban environments, less dense development types surrounding the roadway network dictate the need to focus on addressing greater trip lengths with greater peak hour fluctuations. Nonetheless, several of the proposed Concept 3 regional transit improvements would address these trips. There is a greater need for operational and capacity improvements to the roadway network in some of these areas in order to access employment centers and/or Concept 3 transfer points.
- *The RTN designation has land use implications.* A critical component of managing the RTN will be the development of regional thoroughfare management guidelines. These guidelines will include recommendations for policies associated with street design, access management, and development patterns along the RTN, based upon a corridor's regional function and travel characteristics. Therefore, there is need to have consensus and land use policy support from local jurisdictions in order for these guidelines to be effective and supportive of ARC in its RTN management practices. In turn, these guidelines can also serve the jurisdictions by providing sound regional policy rationale for local development decisions. In order to provide consistent ARC policy direction to the local governments, the RTN must be developed and classified to support the ARC UGPM.
- *Periodic review and updates to the RTN are needed.* Given the fact that development and travel patterns in the region change over time, there is a need for periodic review of the network – both from a network identification and a classification perspective. This also allows for the appropriate roadway facilities that are currently programmed to be incorporated, as appropriate, as they are constructed. While their overall functionality cannot be determined, some improvements such as bypasses may need to be taken into account in the context of overall regional mobility. The management guidelines developed for the RTN can also serve to shape future growth and mobility in developing counties.

2.4 Comments from GDOT

GDOT is an important partner in operating and managing the RTN, and plays a critical role in the operations and management of RTN facilities that are part of the State Highway System. GDOT reviewed the local government jurisdiction input on November 1, 2010 and communicated its additional comments on RTN identification factors:

- Emphasis for inclusion on the RTN should be given to roadway facilities that carry significant volumes of traffic for significant distances.
- The RTN will provide a much-needed tool for GDOT in determining priorities for roadway capacity and maintenance projects.
- In order to capitalize on and be consistent with existing data collection and management practices, facilities on the GDOT Regional Traffic Operations Program (RTOP) should be included on the RTN.

2.5 Final RTN Identification Criteria

Based on the identified need to promote mobility, and multimodal and freight travel at a regional scale on non-interstate and non-expressway facilities, as well as the feedback received from GDOT, local government jurisdictions, and other key stakeholders, a set of core criteria was established for the identification of the RTN:

- *National Highway System (Non-Freeway Segments)* – The FHWA defines the National Highway System (NHS) as roadways important to the nation's economy, defense, and mobility.

- *Principal Arterials* – The highest functional classification that the Federal Highway Administration (FHWA) designates to non-freeway facilities is Principal Arterials. These facilities are defined as those that most promote mobility by carrying a large number of trips for greater distances.

- *Regional Mobility Corridors* – These facilities include corridors in Metro Atlanta that demonstrate regional mobility based on the qualitative analysis performed to identify the RTN. These facilities averaged over 10,000 trips per day (AADT) with an average trip length of 20 miles or more.

- *Regional Truck Routes* – These roadway segments have been designated as Regional Truck Routes on the Atlanta Strategic Truck Route Master Plan (ASTRoMaP). This system defines the road segments in the region that "support the efficient movement of truck traffic without disproportionately impacting existing communities, the environment, or the transportation network."

- *Concept 3 Premium Transit Roadway Alignments* – Roadway facilities that have been identified within Concept 3 for premium transit enhancements such as Bus Rapid Transit (BRT), Arterial Rapid Bus, etc. are included in the RTN.

- *GDOT Regional Traffic Operations Program (RTOP) Corridors* – Cross-jurisdictional regional corridors identified by GDOT for performance monitoring activities and prioritization of operational and maintenance improvements are included in the RTN.

A graphic showing the coverages for these criteria is presented in **Figure 3**. A regional coverage comparison of the facilities meeting each of these core criteria was developed by the project team. Given the varying nature of each network, layering the networks to derive the RTN resulted in redundant segments or lack of connectivity in the network. Thus, a process to review and refine the final network was undertaken.

The end result of this exercise was a refined RTN with the following characteristics:

- A total of approximately 1,800 centerline miles – approximately 45% of the non-freeway RSTS;

- Approximately 93% of the non-freeway premium transit alignments within Concept 3;

- Approximately 45% of the non-interstate freight vehicle miles traveled;

- Approximately 45% of all trips in the region greater than 20 miles; and

- All of the corridors identified for the GDOT RTOP program and ASTRoMaP.

2.6 Thoroughfare Network Classification Framework

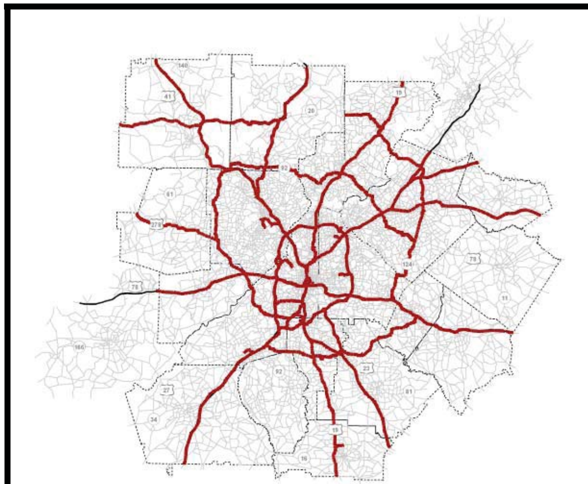
The purpose of the classification scheme is to enable the development of transportation and land use management strategies that are oriented to specific community and corridor contexts and that can be used to protect mobility and system efficiency along RTN facilities.

Based on the work accomplished in the RTN network identification process, coordination with ARC's PLAN 2040 activities, and the feedback from GDOT, local jurisdictions, and other key stakeholders, a four-part framework was developed to classify individual segments of the RTN. The four elements comprising this framework also influenced the development of a set of RTN performance measures that are compatible with those used for ARC's PLAN 2040 development.

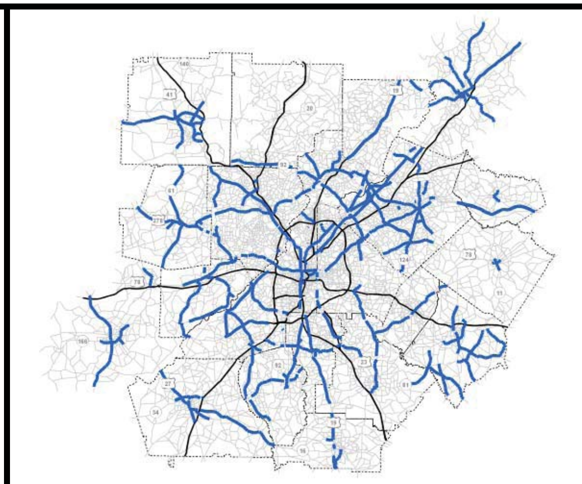
Building from the overall purpose and goals of the RTN and the identification of the network, the following four (4) dimensions were seen as critical to classifying the RTN segments:

- *Mobility for People and Goods* – this dimension reflects the overall regional significance of the facility as evidenced by its importance to freight movement as well as its service for commute trips. The idea of "trip mix intensity", or extent to which the facility is playing a major role in a combination of

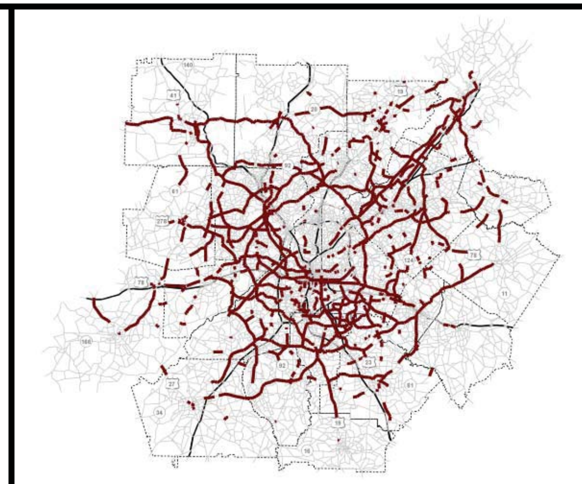
Figure 3: Regional Coverage of RTN Core Criteria Facilities



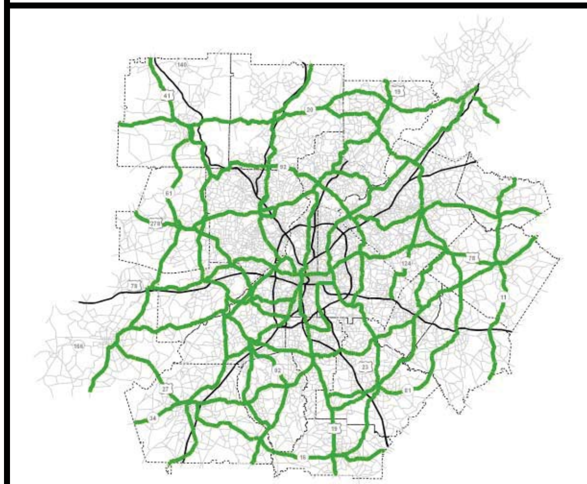
National Highway System



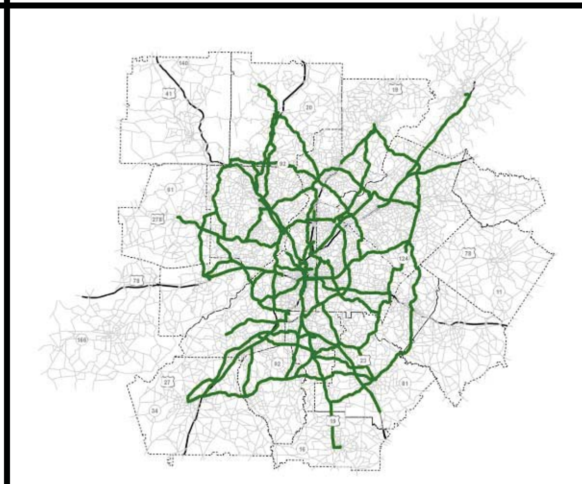
Principal Arterials



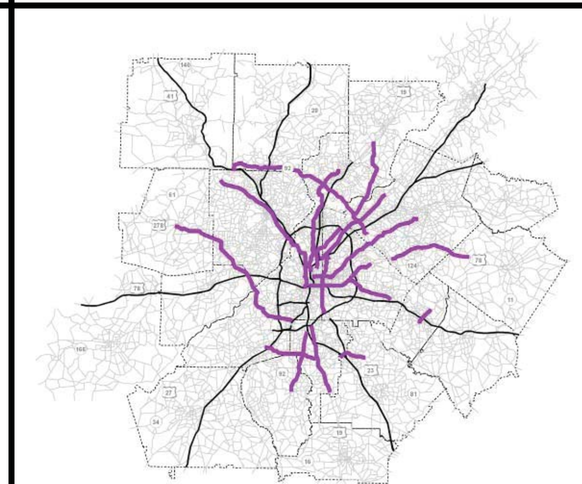
Regional Mobility Roadway Segments



Regional Truck Routes (ASTRoMaP)



Concept 3 Premium Transit Roadway Alignments



GDOT Regional Traffic Signal Operations Program Corridors

regional person travel and freight movements, is reflected in this part of the framework.

- *Land Use Connectivity* – this dimension reflects the critical importance of the RTN in connecting major regional activity centers, including core cities, town centers, transit-oriented developments, regional industrial/logistics centers, and other regionally-significant locations.
- *Network Connectivity* – this dimension focuses on the role the RTN segments play to provide regional mobility by serving as freeway-to-freeway connectors, connectors to other limited access roadways, or connectors to other State-owned facilities.
- *Multimodal Functionality* – this element reflects the extent to which a roadway facility serves travel modes other than single-occupant vehicles, including various modes of transit, such as regional bus services and bus rapid transit lines (BRT), regional bicycle and pedestrian facilities, etc.

Developing an easy-to-use framework was a primary goal in the creation of the RTN classification system. Thus, a three-level framework utilizing the four dimensions of the regional thoroughfare system was devised as shown in **Table 1**. The three levels in the matrix stratify RTN segments as "high", "medium", and "low" according to the four major classification criteria. The classified network resulting from this framework is presented in **Figure 4** on page 10.

Table 1: RTN Classification Framework

	Mobility of People and Freight	Land Use Connectivity	Network Connectivity	Multimodal Functionality
Criteria Definition	**Percent of Work Trips and Freight Trips**	**Number of Regional Attractors, Regional Areas, Town Centers, and/or Industrial/ Logistics Areas (per UGPM)**	**Type/Extent of Connection**	**Type of Transit Served on Segment (other modes served as planned)**
Level I	"High"	" Primary" – Serves 5 or more UGPM areas	Freeway-to-Freeway or Interstate Connector Route	"High" – Premium Transit Service on Segment
Level II	"Moderate"	"Intermediate" – Serves 3-4 UGPM areas	Freeway-to-Activity Center/ Town Center Connector	" Moderate" – Local Transit Service on Segment
Level III	"Low"	"Basic" – Serves 0-2 UGPM areas	Freeway-to- Other Limited Access or U.S. Route Connector or Other System Connector	"Basic" – Paratransit or No Transit on Segment

Section 3: Management and Design Guidelines

A critical component of the SRTP effort was the development of the *Management and Design Guidelines for the Regional Thoroughfare Network* (Guidelines). The purpose of the document is to provide guidance for decision makers and professionals regarding specific factors that impact the overall functionality of the RTN.

The intent of these guidelines is to maintain and improve mobility performance of major arterial facilities collectively, recognizing that the system as a whole is greater than the sum of its parts, and to prompt more strategic land use and multimodal choices to correspond with desired mobility performance. The underlying standards of these guidelines are those expressed in *Context Sensitive Solutions for Designing Major Urban Thoroughfares for Walkable Communities* (ITE, 2010) and the GDOT *Context-Sensitive Design Manual* (CSDM).

In keeping with this approach, the design guidelines have been developed to reflect:

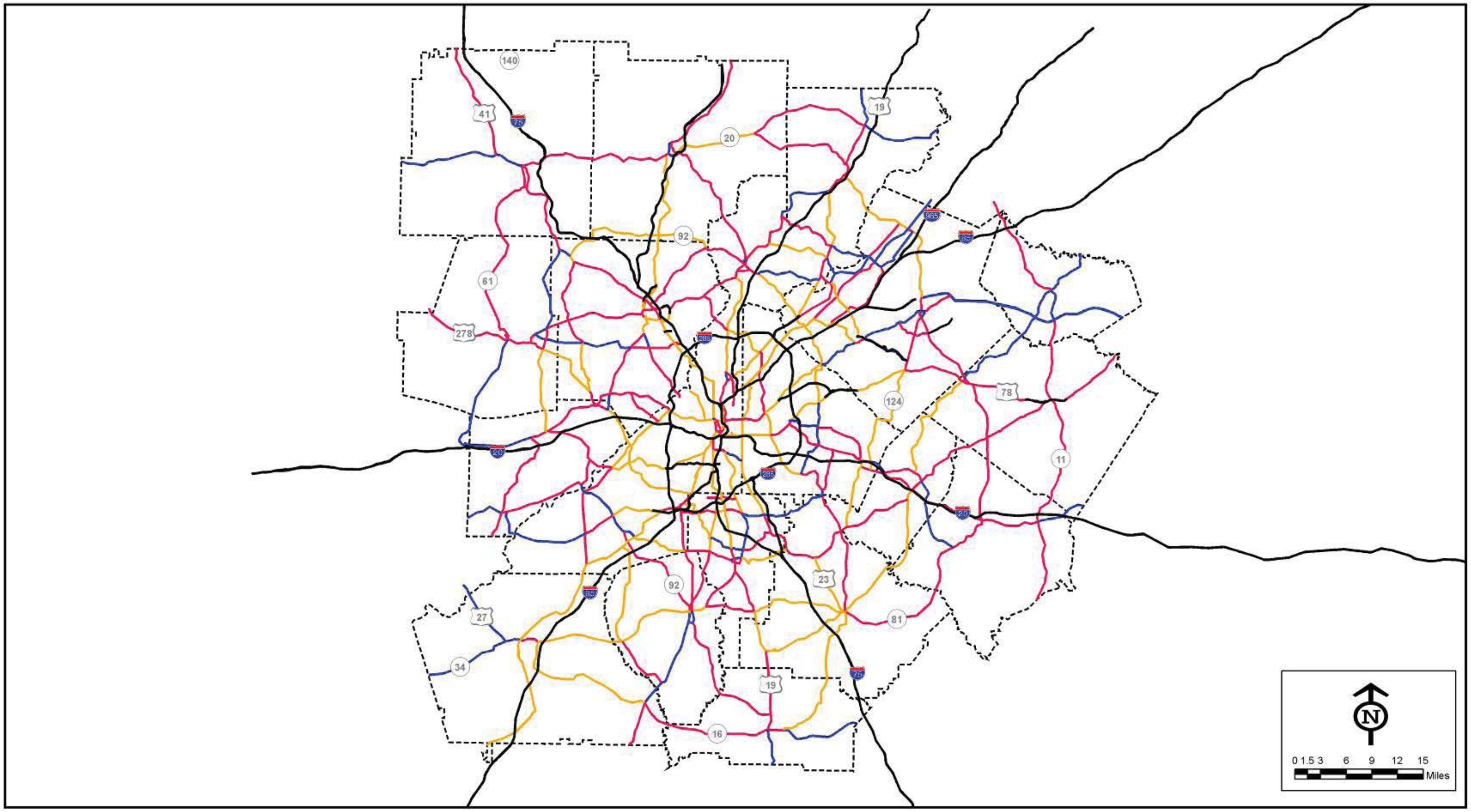
- RTN Classification – a hierarchy of the overall regional mobility function of thoroughfares, as shown in **Figure 4** on page 10.
- Unified Growth Policy Map (UGPM) – a basis for identifying the appropriate land use context for each segment of the RTN at the regional scale, as shown in **Figure 5** on page 11.

The primary components of the Guidelines include the following:

- The decision-making process for the thoroughfare designer, offering guidance on choosing an appropriate cross-section based on the land use context and expected travel speeds. Guidance in selecting thoroughfare designs for implementation of the Concept 3 regional transit plan, the Atlanta Region Bicycle Transportation and Pedestrian Walkways Plan, and the Atlanta Regional Freight Mobility Plan is also provided.
- Detailed cross section designs for different levels of thoroughfare class and land use context, as well as guidance on designing auxiliary roadway features that may be called for in thoroughfare projects.
- Tools for local governments to use in coordinating with transportation agencies (ARC, GDOT, et al.) in thoroughfare management focused on the connections between access management, street network and corridor development.

The sections that follow highlight the major elements of these efforts.

Figure 4: Regional Thoroughfare Network



L E G E N D

Regional Thoroughfare Network Classification

- 1
- 2
- 3

County Border

Limited Access/Freeway

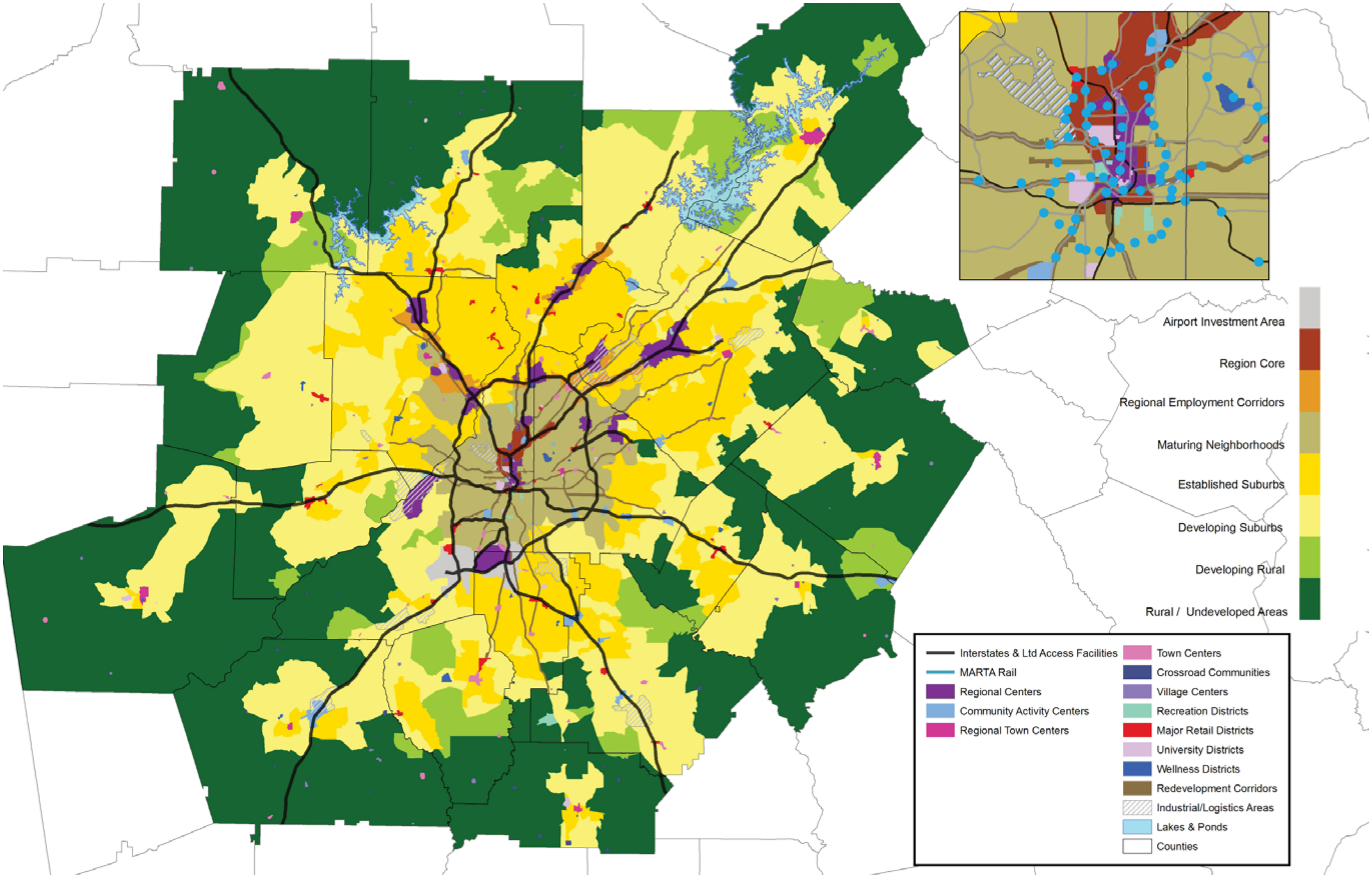
Data Sources: ARC, FHWA, GDOT

Date: Aug 2011

Strategic Regional Thoroughfare Plan

Regional Thoroughfare Network

Figure 5: Unified Growth Policy Map



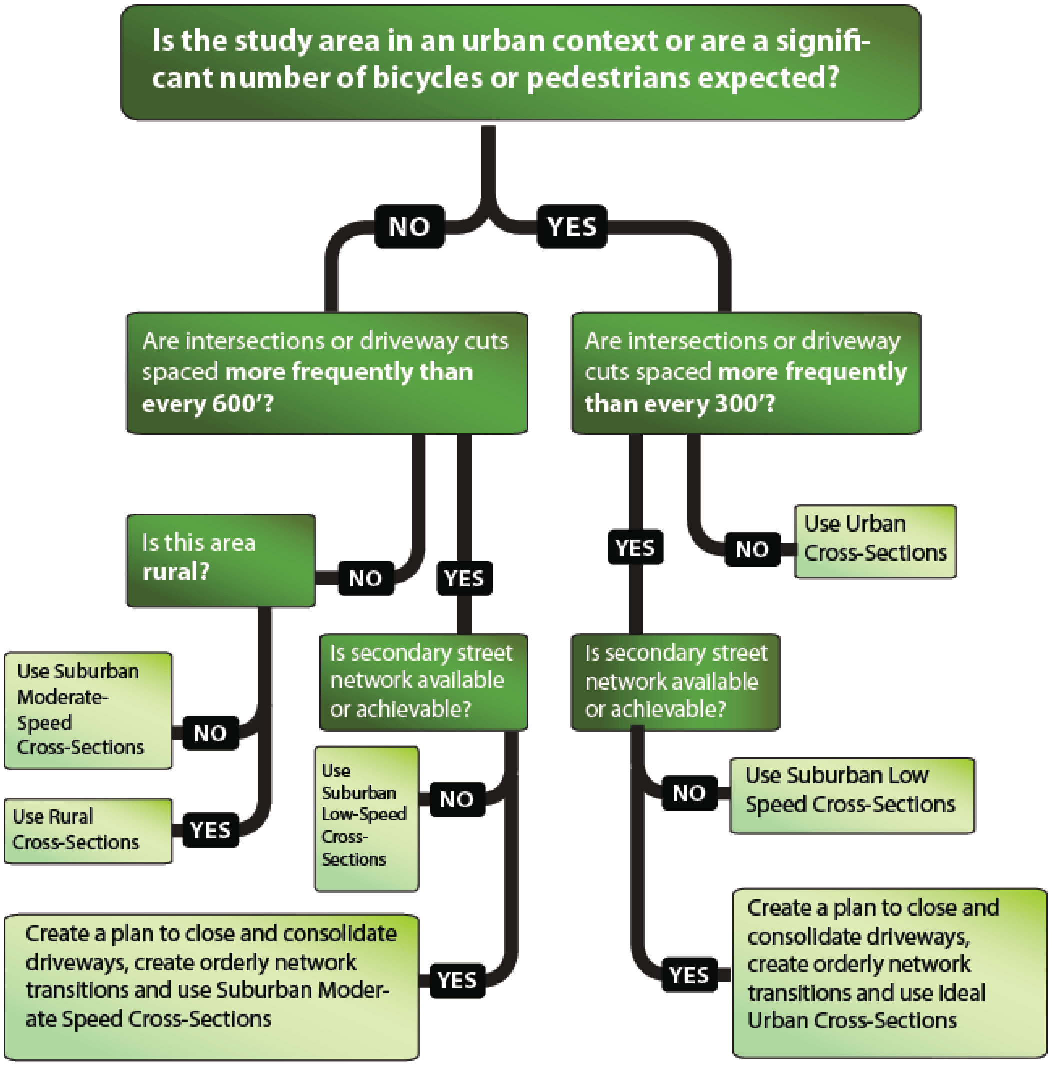
3.1 Decision Making Process

The flowchart diagram shown in **Figure 6** is intended to provide guidance in understanding the land use context in which RTN facilities operate. This is based on specific factors such as the availability of the street network, the spacing of driveway access points, and the demand for multimodal travel. In addition to the selection of context and identification of the appropriate thoroughfare level, thoroughfares need to accommodate the needs of multiple transportation agencies and the communities they serve. Therefore, special considerations apply to corridors that serve transit, bicyclists, and freight.

3.2 Elements of Design

A total of 12 cross section categories were developed to coincide with the thoroughfare classification level and the context (urban, suburban, and rural) in which they operate. Because of the predominance of suburban contexts in the Atlanta region, consideration has been given in the street designs for different speeds. The typical sections were developed in accordance with AASHTO's *Policy on Geometric Design of Highways and Streets* (the 'Green Book') and follow the context-sensitive approaches of the Institute for Transportation Engineers' *Designing Walkable Urban Thoroughfares* publication. However, because most of the RTN consists of routes under GDOT's jurisdiction, they must follow the standards defined in the GDOT *Design Policy Manual* and/or CDSM or need to be granted design exceptions or variances.

Figure 6: Decision-Making Process for Design



As is noted in the foreword of the Green Book, "sufficient flexibility is permitted to encourage independent design tailored to particular situations." The discussion of lane width for urban areas in particular reflects a high degree of flexibility. It is noted that lane widths "may vary from 10 to 12 ft. (3.0 to 3.6 m) for arterials." For lower-classified RTN facilities, similar flexible language encourages the tailoring of an urban street cross section to site-specific conditions. Lane widths substantially less than 12 ft. (3.6 m) are considered adequate for a wide range of volumes, speeds and other conditions.

The cross-sections shown in this section present geometric dimensions that vary from GDOT's design standards, primarily because of the likelihood of constraints in establishing right-of-way in urbanized areas. Each of the cross-sections responds to what are expected to be realistic circumstances throughout the Atlanta metropolitan area. Perhaps of equal importance, there is a need for vehicle speeds and motorist behavior to fit into the overall context of more urbanized areas. Therefore, this suggests that the Atlanta region needs a broader set of design options.

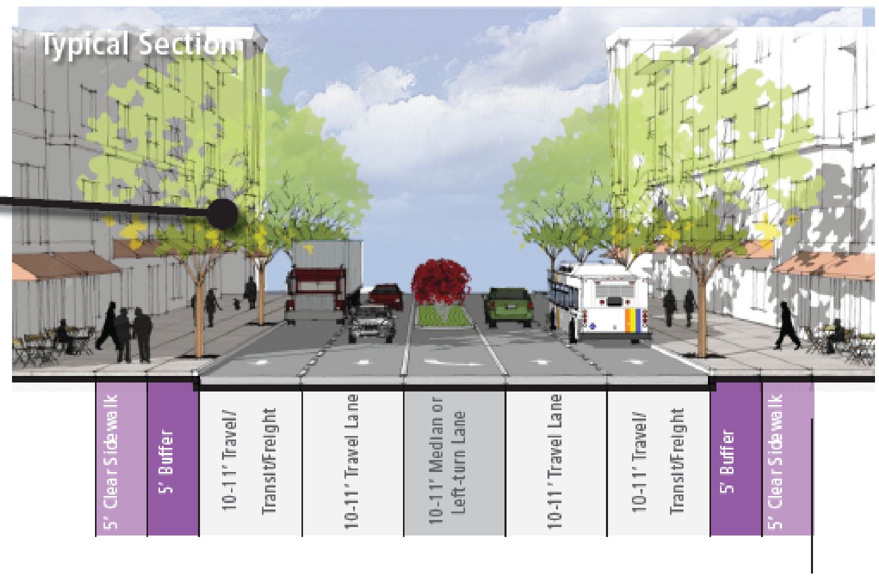
Many of the RTN corridors serve a complex array of purposes, many of them often competing for priority. Project planners and designers must consider all at once safety for all roadway users, roadway capacity and vehicular mobility, and the walkability of a roadway for short-trips and those who do not or cannot drive. Balancing these priorities involves trade-offs. For example, pedestrian crossings may need to be longer than what is ideal because a thoroughfare's status as a freight route demands that larger intersection turning radii be used. However, in this case, the pedestrian crossings can still be designed safely and in a way that makes the pedestrian's path clear and easy to follow. As another example, the addition of a bicycle lane in a space-constrained corridor might mean that narrower travel lane widths are used, potentially leading to lower travel speeds for vehicles but ensuring that the travel modes that have been identified as important to the thoroughfare corridor are accommodated safely.

An example and users guide for Urban Level I thoroughfare typical sections are shown in **Figure 7** on the following page.

Each cross-section template also presents variations on the typical section to be used on thoroughfares in the Atlanta Region Bicycle Plan, the Concept 3, or ASTRoMaP. Because these are variations on the typical section, they will require additional right-of-way beyond that specified for the typical cross-section. The project designer may also need to respond to multiple plans on the same corridor, such as a transit corridor also specified as a bicycle corridor. **Figure 8** on page 15 provides an example and user guide for these situations.

Figure 7: Sample RTN Design and User Guide – Typical Section

The typical section *illustrates the main components of the traveled way. It specifies buffer space and sidewalk width as well. To provide flexibility in the event of constrained rights-of-way, the buffer does not need to be landscaping, only a distance between the sidewalk clear area and the outer lane of the traveled way.*



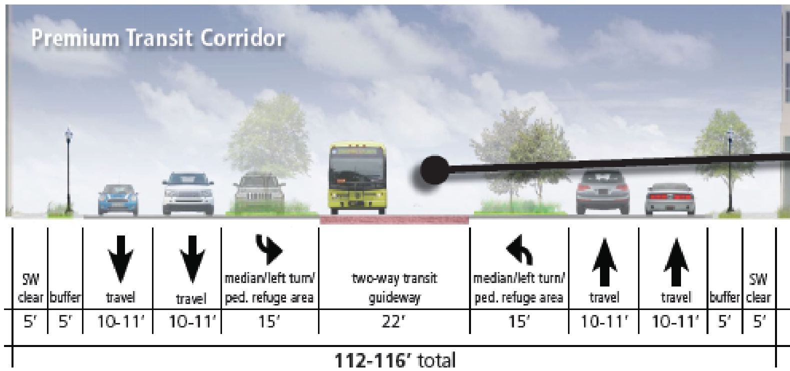
The explanatory text *provides general information on the cross-section and the intended conditions in which it should be used.* ***The table of standards*** *that accompanies it describes geometric design elements in greater detail. It is important to remember that these are guidelines, and good engineering judgment should always be used in applying them. In some cases, certain elements may not be used in a given section.*

Urban thoroughfares are routes of regional significance in the context of the Atlanta region's downtowns and traditional urban centers. Their right of way is typically constrained; designs need to provide basic sidewalk space for pedestrians while still meeting a basic roadway capacity need.

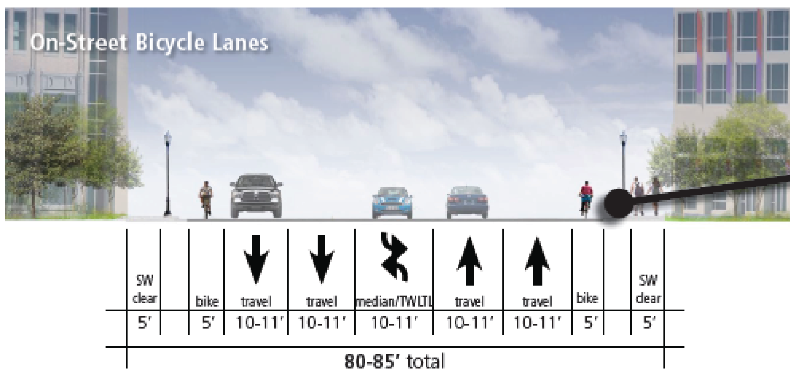
The diagrams on the opposite page illustrate street design components that are likely to be used in coordination with implementing the Concept 3 plan, Atlanta Regional Bicycle Plan, and LCI Plans.

Design Element	Standards
Right-of-Way	70-74'
Number of Lanes	3 or 5, depends on capacity need
Intersection Control	Signals most common, roundabouts may be used on 3-lane sections
Median	8-10', to fit within 10' two-way left turn lane
Lane Widths	10-11'
Turn Lanes	To be used at intersections as needed
Clear Zone	Minimum 1.5' from back of curb
On-Street Parking	7.5' when used (see diagram on opposite page)
Sidewalk	5' minimum clear width required
Bicycle Lane	5' minimum when used (not including gutter)
Utilities	Underground or within landscape width
Landscaping	5' minimum width when used, either for tree wells or parkway strip
Lighting	Within landscape width

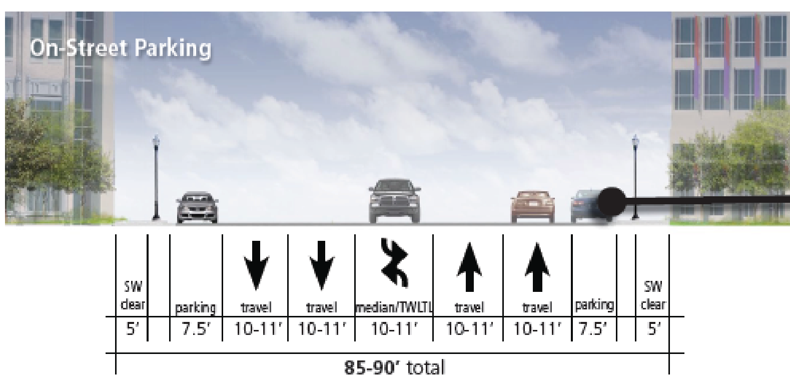
Figure 8: Sample RTN Design and User Guide – Mode Specific Considerations



The transit corridor section *illustrates how a center-aligned transit guideway would be integrated into the section. Recommended design uses medians on either side of the guideway; this space allows the placement of transit station platforms and left turn lanes, as needed.*



The bicycle corridor section *illustrates the placement of on-street bicycle lanes, which are the preferred means of accommodating bicycle routes on RTN thoroughfares. More detailed guidance on bicycle facility design (especially at intersections) is provided in Section 3.3.*



On-street parking *may be added in some extents of the RTN routes, especially in urban and maturing suburban context areas. On-street parking can count toward the minimum spacing between the sidewalk clear width and moving travel lanes.*

3.3 Transit Considerations

Many thoroughfares accommodate local and regional bus transit services offered by MARTA or another of the region's local public transit agencies. The design guidelines for streets on the RTN that are served by local or regional buses should reflect the needs of safe and efficient public transportation service. In addition, new premium transit service lines and extensions of existing MARTA rail lines called out in Concept 3 – the approved transit vision for the Atlanta region - warrant consideration.

Given cost limitations and the demand for transit, the most common type of transit service along the RTN is expected to be bus service-either local or regional. An example of typical bus stop locations is shown on to the right. More detailed design standards for bus as well as other Concept 3 prescribed technologies such as streetcar and light rail (shown in **Figure 9**) are included in the Guidelines.

The following should be considered as transit planning design factors that affect RTN facilities located along Concept 3 corridors.

- Preservation of future right of way for transit operations
- Adequate turn lanes and curb radii for transit vehicles
- Adequate street grade for light rail vehicles
- Pavement strength for transit vehicle stops
- Station spacing and stop and station locations
- Configuration of station or stop with passenger waiting facilities, signage, landscaping and lighting
- Pedestrian access and safety around stations and stops
- Adequate clearance (horizontal and vertical) for outdoor lighting, signal systems and street trees
- Signal priority and preemption needs for transit vehicles
- Coordinating vehicle left-turn lanes with median station locations
- Possibility of queue jump lanes at intersections
- Parking restrictions near stations and stops
- Coordination of transit stations and stops with on-street parking lanes
- Resolution of bike/bus conflicts where bicycle lanes share the same right of way (bike lane passes along the curb side of the bus lane for safety.)

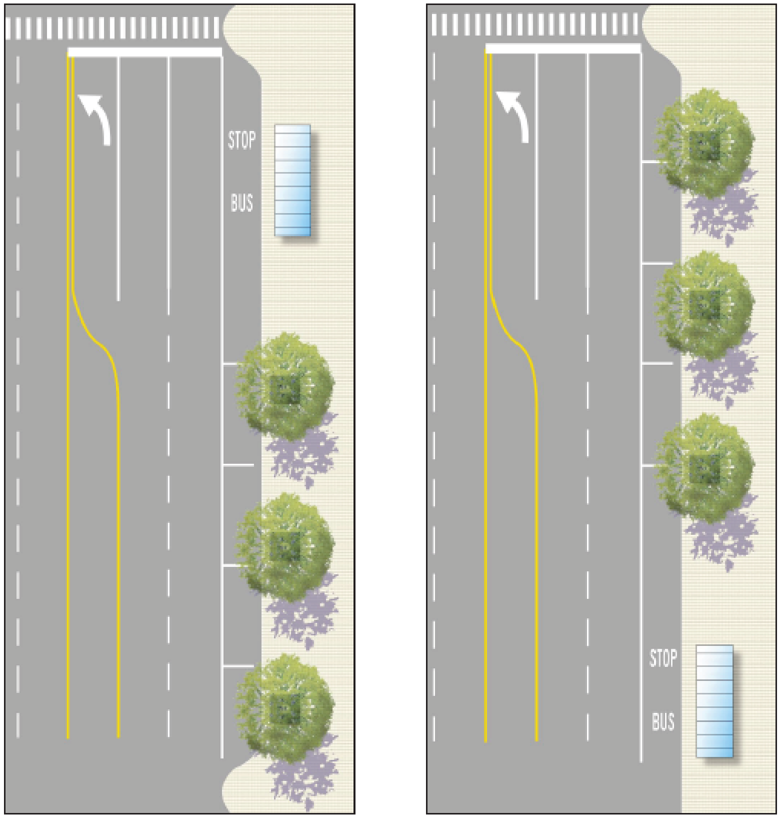


Figure 9: Examples of Concept 3 Prescribed Transit Technologies

Modern Streetcar. *Modern streetcars run in mixed traffic, like buses, and are accessed from streetside stops.*

Light Rail Transit. *Light rail has the ability to run on-street in mixed traffic, but can also operate in its own right of way for faster travel.*

3.4 Bicycle Considerations

The primary means for accommodating safe travel for bicyclists on the RTN is through the provision of paved, dedicated, marked and signed bicycle lanes or separate off-street multi-purpose trails along the corridor in accordance with the AASHTO *Guide for Development of Bicycle Facilities* (1999). Given the high level of functional classification of these thoroughfares and the expected volumes and speeds of traffic they will carry, establishing off-road bicycle facilities is the preferred design option on bicycle routes on RTN streets and roads. The ARC regional bicycle plan recommends bike lanes or parallel side paths on arterials that are within:

- ½-mile of schools
- 1 mile of major parks and greenways
- 1 mile of MARTA stations and premium transit operations service centers.

It also provides a Level of Service (LOS) evaluation metric for bicycle travel on major streets throughout the Atlanta Region using a range of values from A to F, where LOS D is the minimum acceptable level of service. It recommends a LOS of B for bicycle travel in all Livable Centers Initiatives (LCI) study areas and in Regional Places (the urban areas of the UGPM). It recommends a LOS of C for all other segments of the Bicycle Study Network.

Level of Service is based on a mathematical formula that considers factors such as:

- Speed and volume of traffic on the roadway
- Percentage of vehicles on the roadway that are trucks
- Width of outside through lane
- Pavement conditions.

Strategies for improving bicycle LOS on existing roadways that are not slated for major reconstruction include:

- Restriping existing roadways to encroach onto the paved shoulder or narrow the travel lanes in order to provide a shoulder for use by bikes that is at least 4 feet in width (5 feet is preferable) outside a travel lane. As always, designers should weigh the other needs of the thoroughfare, especially expected transit and truck use of the thoroughfare that may limit the feasibility of this approach.
- Widening an existing shoulder to provide a paved bicycle lane. Where a rumble strip exists, the width of the bicycle lane should be at least 4 feet measured outside the rumble strip.

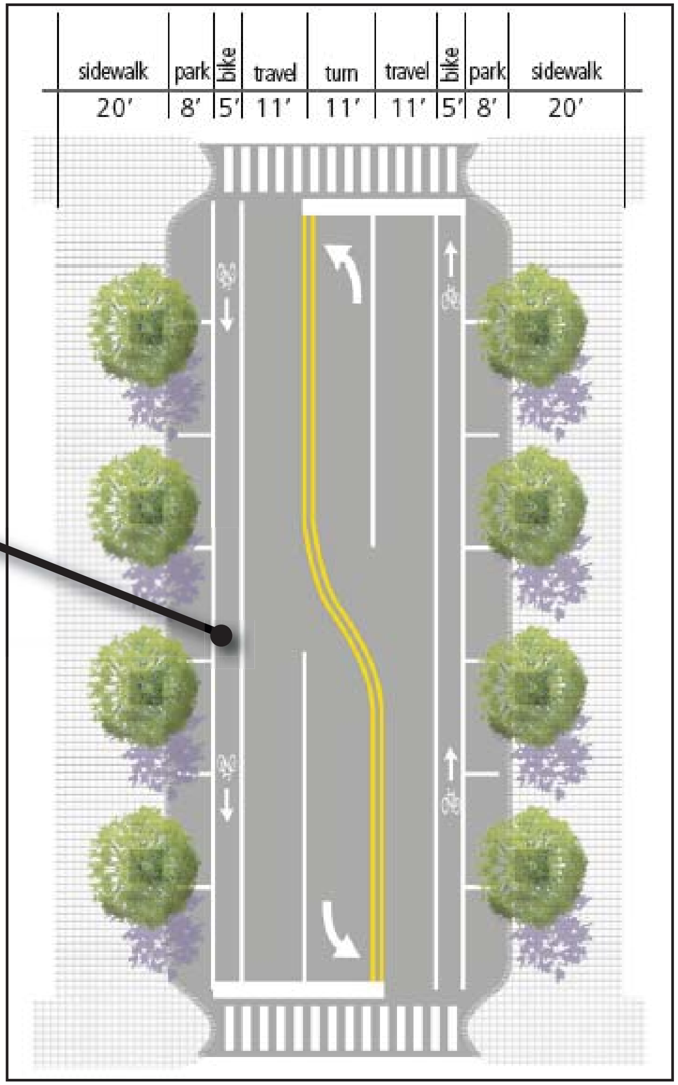
Bicycle lanes are conventionally designed as striped space between the traveled way and any on-street parking (or in the absence of parking, the curb).

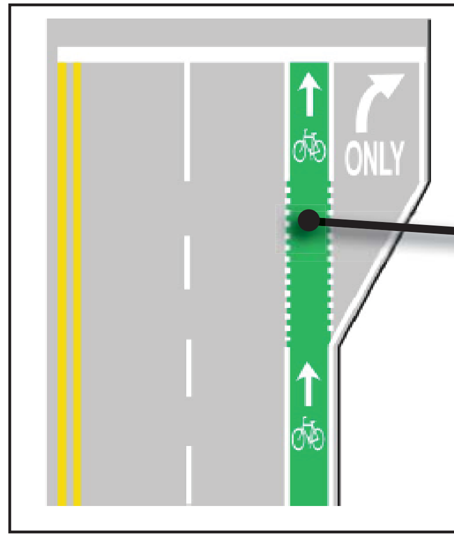
However, there are other special considerations when designing for bicycle travel, particularly dedicated right turn lanes, which create an expectation among drivers that they have less impedance in making turns. Right turn lanes should be located to the right of a bicycle lane that continues through an intersection in order to avoid this conflict. The proper treatment for this condition, as outlined in the 2009 *Manual on Uniform Traffic Control Devices*, is to continue the bicycle lane on a straight path and provide a transition space (with short dashed lines) through which right turning vehicles merge into the turn lane.

Sample bicycle lane designs, including those for right turn lanes and the bike box concept, are shown in **Figure 10**.

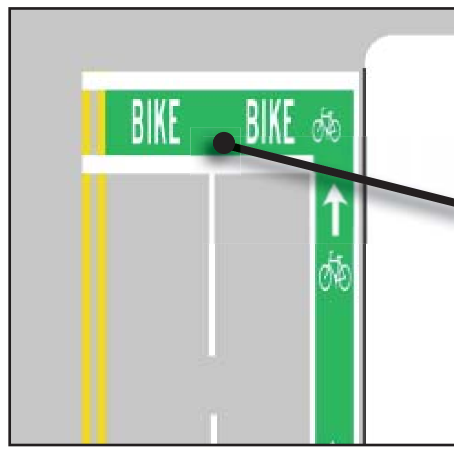
Figure 10: Sample Bicycle Lane Configurations

Typical Bicycle Lane Configuration. *Bicycle lanes are conventionally designed as striped space between the traveled way and any on-street parking (or in the absence of parking, the curb).*





Bicycle Lanes and Right Turn Lanes. *Bicycle lanes should be placed to the right of regular travel lanes, but not to the right of dedicated right turn lanes.*



Bike Boxes. *These traffic control treatments are growing in use, though they are still experimental. Their advantage is in placing cyclists at the front of a traffic queue, allowing a 'head start' in making turning movements.*

3.5 Freight Considerations

Although most truck travel in the region will continue to use interstate routes, especially for through trips, the ASTRoMaP network illustrates that many of the RTN corridors are also freight corridors that need to be designed to accommodate truck traffic. This affects the geometric design, signalization and access management features needed for the RTN routes that are also on the ASTRoMaP.

Commercial vehicles rely on properly engineered and constructed roads to move through the region in order to deliver freight in a timely and safe manner. Design deficiencies can have significant cost impacts on truck carriers in the region. Tight maneuvering can lead to increased travel times, increased safety hazards, and property damage. Truck-friendly design of an arterial should be based on the following considerations:

- Appropriate functional class
- Connectivity, continuity and accessibility, especially to intermodal facilities and major terminals
- Adequate travel lane width- 12 to 13 feet wide
- Adequate shoulder width
- Posted speed limit at least 45 MPH
- Bridge conditions (adequate weight limit, vertical clearance, and bridge sidewalk width)
- Lack of at-grade railway crossings
- Appropriate nearby land use (relatively low amount of travel in residential areas)
- Acceptable crash history
- Adequate design speed (shallow horizontal and vertical curves)
- Signal timing and coordination that favors through movements
- Adequate sight distance on curves, at intersections and driveway approaches
- Adequate turning radii at intersections
- Longer turn lanes and acceleration lanes
- Adequate pavement standards
- Adequate clear zone along route
- Few steep grades and provision of passing lanes on steep grades
- Long transitions for grade changes at intersections and driveways
- Good route signage and wayfinding information on route

Section 4: Data Management and Performance Monitoring

Given its function to serve as a prioritized network for transportation system operation and management practices, the RTN will serve as the non-freeway network subject to the ARC Congestion Management Process (CMP). In its previous CMP practices, the ARC has commissioned specific travel time and other data collection efforts to determine needed improvements on selected corridors. In the future, ARC will work in partnership with GDOT and local jurisdictions to help in obtaining data and monitoring the RTN system for congestion management purposes.

4.1 Linear Reference System

As a follow-up to the latest CMP efforts, a linear reference system (LRS) was developed by ARC that offers a geo-referenced data set of roadway attributes including:

- Number of lanes
- Speed limits
- Presence of traffic signals/intersection control
- Location of school zones
- Presence of divided/undivided roadways

The purpose of the LRS is to provide the foundation for a data clearinghouse for use by the ARC, its member local government jurisdictions, and planning partners (GDOT, GRTA, et. al.) in transportation system planning, operations, and management efforts.

To this end, the ARC has researched potential data subscriptions from private vendors and integrated INRIX data into the LRS. INRIX data is that generated in real time and stored into a central database and can be researched through a number of LRS queries. The data will allow the ARC and its partners to compare real time and historical travel time data to identify congested locations and the level of congestion along corridors throughout the region. More specifically, the LRS can be used to identify bottlenecks, conduct temporal/seasonal analysis, and/or calculate delays. This, in turn, helps focus overall CMP efforts and transportation investments.

It is recognized that even with the LRS, data will still be needed from local jurisdictions to identify operational deficiencies along specific segments or to update/validate the data within the LRS. The LRS will allow the uploading of various datasets – including link traffic counts, intersection turning movement counts, roadway attributes, crash data, bicycle and pedestrian facilities, and travel time data.

A sample view of the LRS (depicting INRIX average speeds, roadway characteristics, and queried travel times) is provided in **Figure 11** on page 22.

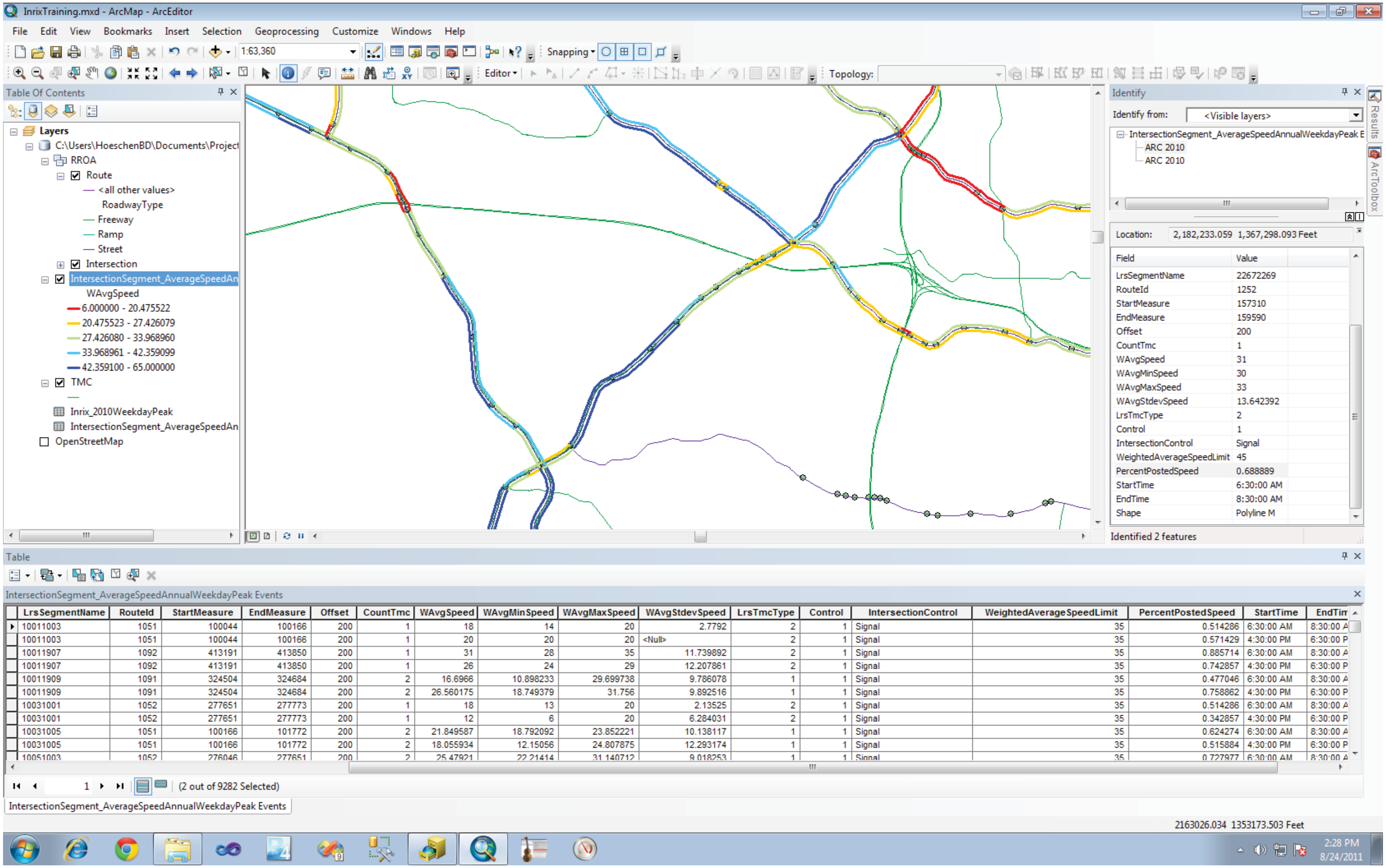
4.2 Benefits of the LRS

Once complete, the LRS can be used to manage the RTN. This will provide benefits to ARC and its planning partners as follows:

- Assist in the identification of most needed improvements for the region's Transportation Improvement Programs (TIPs) and Long-Range Transportation Plans (LRTPs);
- Identify potential areas/facilities needing additional analysis and provide baseline characteristics for the upcoming MMCS program;
- Identify areas where data collection may be needed;
- Provide a consistent data source for studies conducted by different agencies throughout the region; and
- Evaluate the effectiveness of completed projects based on previous and current travel trends, once the LRS has been in place over time and historical data have been obtained.

In summary, all of these functions enabled by the LRS will aid in the planning, operations, performance monitoring, and management of the RTN over time and will contribute to more efficient CMP practices.

Figure 11: Sample LRS View



4.3 Relationship to PLAN 2040 and Performance-Based Planning

As part of the RTN identification and classification activities, a multimodal network classification framework was developed. Based upon this framework, performance measures that relate to each of the four RTN classification criteria categories - Mobility of People and Freight, Land Use Connectivity, Network Connectivity, and Multimodal Functionality - were developed to enable ARC and its planning partners to monitor the progress of the RTN in performing its regional functions and determining the need for corrective actions and/or additional investments.

In coordinating the RTN development with the long-range planning effort, it was determined that the RTN performance measures come reasonably close to the plan-level PLAN 2040 performance measures under consideration. However, the PLAN 2040 project-level performance measures are defined against more generic regional network development objectives and are not particularly focused on thoroughfares.

4.4 Development of Performance Measures and Targets

As a follow-up to the classification process, available data sources were assessed to derive the performance measures and the identification of performance measure targets. The following describes the process of developing performance measures based on the classification framework from the following data sources:

- ARC regional travel demand model, which provided information for many of the mobility performance measures;
- UGPM land use database;
- ARC roadway crash database;
- GIS bike/pedestrian network, as developed for the ARC Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan Study; and
- ASTRoMaP truck route GIS network.

The approach to select performance measures and targets relied heavily on graphical data analysis. For a candidate performance measure, a histogram showing the empirical distribution of its data values across segments or thoroughfares was prepared. In many cases, the histogram was presented in a way that showed 5% quantiles of the empirical distribution, and that highlighted the upper and lower 25% of the distribution. The histogram was then examined to determine if the spread of values was such that different levels of performance could clearly be distinguished. If so, the corresponding variable was a strong candidate to be retained as a performance measure, and some appropriate quantile of the distribution was chosen as a target; otherwise, the variable was deemed unsuitable for use as a measure.

In some cases, an additional graphical analysis was performed. In this analysis, the correlations between candidate measures for each performance criterion were visually assessed. Uncorrelated measures present information about different aspects of segment or thoroughfare performance. Conversely, there would be little point in selecting strongly correlated performance measures, since the facility performance information that is conveyed by each measure would be very similar. Thus, where multiple candidate measures were seen to be strongly correlated, only one was retained.

The performance measure targets resulting from this analysis are presented in **Table 2** on page 24.

Table 2: Performance Measure Targets

Performance Measure	Target
Average Speed	>25 mph
Crashes (all types)	100 crashes cutoff for top 25th percentile
Crashes (all types) per Million VMT	Less than 10% of segments with greater than 15 crashes per million VMT
Conventional Transit within 2 miles of Town Center	75% of segments
Premium Transit within 2 miles of Town Center	25% of segments
Bike & Pedestrian Infrastructure within 2 miles of Town Centers	15% of segments
Conventional Transit within 2 miles of Regional Center	75% of segments
Premium Transit within 2 miles of Regional Center	25% of segments
Bike & Pedestrian Infrastructure within 2 miles of Regional Centers	15% of segments
Freight Corridor within 2 miles of Industrial Logistics Centers	80% of segments

Section 5: Case Studies and Major Findings

5.1 Overview

In an effort to test the effectiveness of a more precise dynamic transportation assessment for the MMCS program to be implemented by the ARC, a series of case studies were performed along the following RTN corridors. These corridors were selected based on their specific characteristics, and are shown in **Figure 12** on page 26:

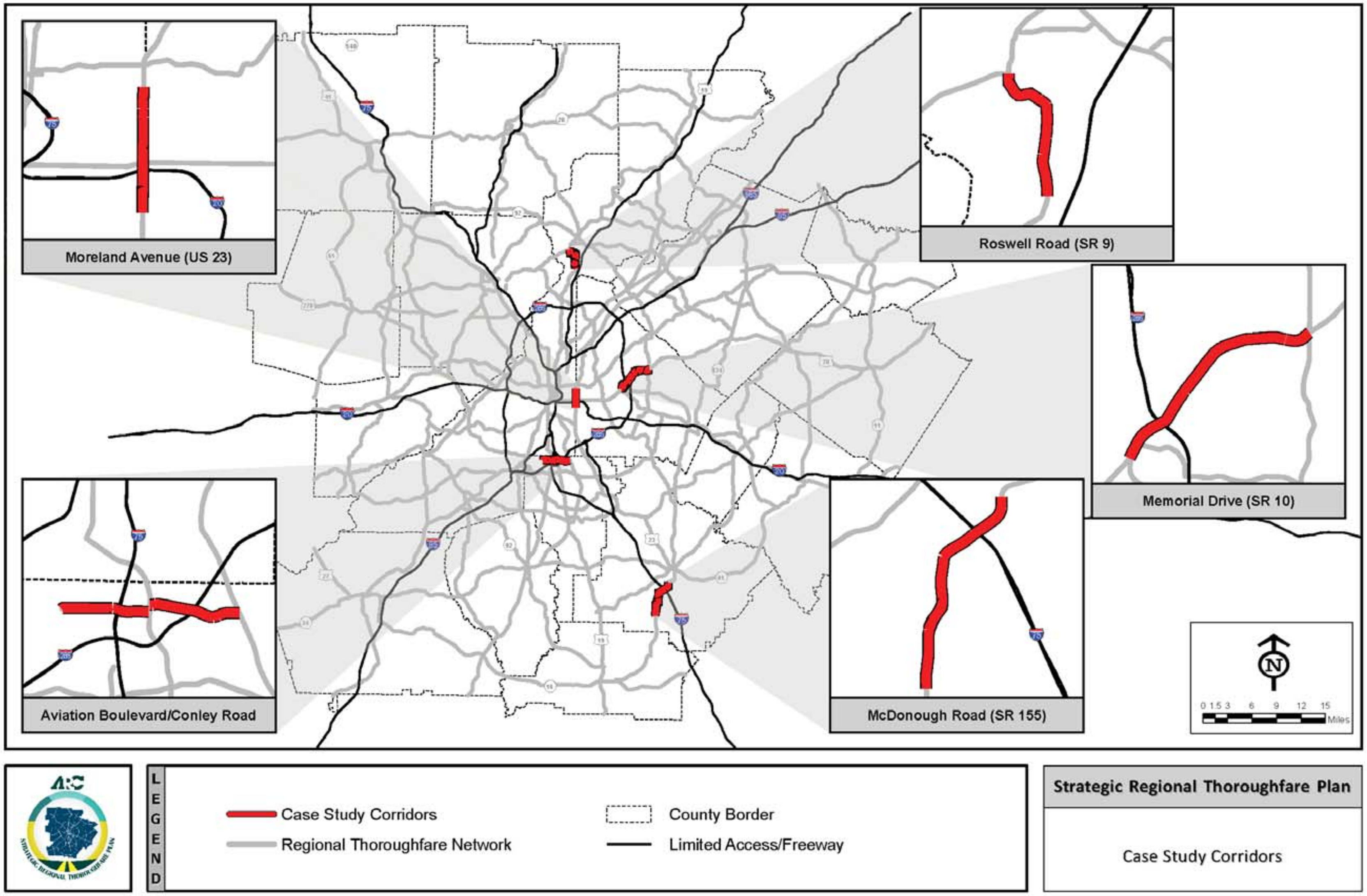
- *Roswell Road (SR 9) from Northridge Drive to SR 120* – represents a multijurisdictional (Sandy Springs and Roswell) corridor with older suburban development patterns and different characteristics between municipalities with regards to roadway configuration and land use policy.
- *Moreland Avenue (US 23) from McLendon Avenue (Little 5 Points) to Ormewood Avenue* – represents a constrained older urban corridor with conflicting needs regarding pedestrian, transit, and freight needs.
- *McDonough Road (SR 155) from I-75 to Hampton-Locust Grove Road* – represents a developing corridor with a high level of freight traffic that provides access to I-75 for commuter traffic.
- *Memorial Drive (SR 10) from MARTA Kensington Station to North Hairston Road* – represents a corridor with redevelopment needs and an existing premium transit treatment – a high frequency express bus with queue jumpers and traffic signal preemption.
- *Aviation Boulevard/Conley Road from H-JAIA to SR 54* – represents a relatively undeveloped corridor with tremendous development potential with the: 1) opening of the Hartsfield-Jackson Atlanta International Airport (H-JAIA) international terminal, 2) Mountain View Redevelopment Plan, and 3) potential transportation investments – including an interchange at I-285 and MARTA heavy rail extension to the area.

The remainder of this section details the main steps in the overall case study process, as illustrated in **Figure 13** on page 27:

- Role of focus groups developed to guide the case study process;
- Methodology used to develop alternative scenarios for testing;
- Process of modeling transportation impacts of scenarios; and
- Major findings from the case study exercise.

More detail on the individual scenarios and results of these case studies are available in the individual case study reports available on the ARC web at www.atlantaregional.com.

Figure 12: Case Study Locations



5.2 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. As illustrated in **Figure 13**, 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 (detailed in Section 6 herein).

5.3 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. A sample scenario matrix (for Moreland Avenue) is provided in **Figure 14** on page 28.

Figure 13: Case Study Process

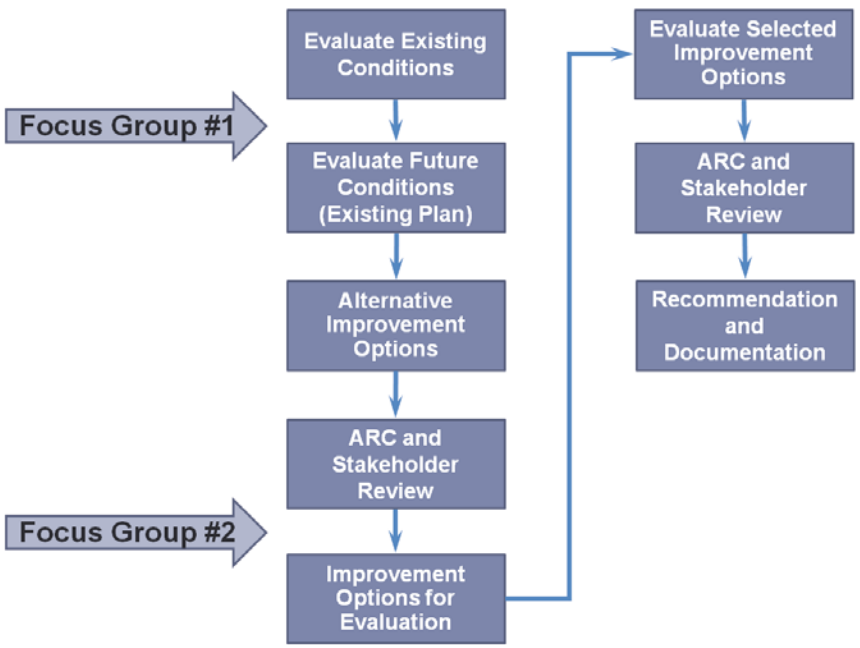


Figure 14: Sample Case Study Scenario Matrix

TRANSPORTATION INPUT	LAND USE/SOCIO-ECONOMIC INPUT			
	Existing Land Use	2040 - LCI Full Build Out	2040 - LCI "Half Build-Out"	2040 Official Forecast
Existing 2010 Network: -Existing Bus Operations -Existing RTOP -Existing Pedestrian and Bicycle Volumes	✓ "Current Base Condition"			✓ "Future No-Build Scenario"
Long Range Plan Network: -Any capacity projects included in the *Envision6* Regional Transportation Plan (RTP)				✓
Transportation Scenario #1: -Exisiting MARTA local bus service carried forward; -Existing RTOP carried forward into the future; -Various isolated intersection improvements adopted from the previous LCI and Connect Atlanta studies; -Mid-block pedestrian crossings (where appropriate); -Pedestiran signal phasing at all signals along the corridor; -Other pedestrian amenities that are able to be simulated (raised median; crossing refuges); -Bike lane or bike sharrows; at least one east-west bike crossing device.		✓	✓	
Transportation Scenario #2: -All of the features from Scenario #1, plus; -Arterial Bus Rapid Transit (BRT) from Inman Park Rail Station to south end of study area; operating on a dedicated lane in both directions.		✓	✓	

5.4 Scenario Testing Process

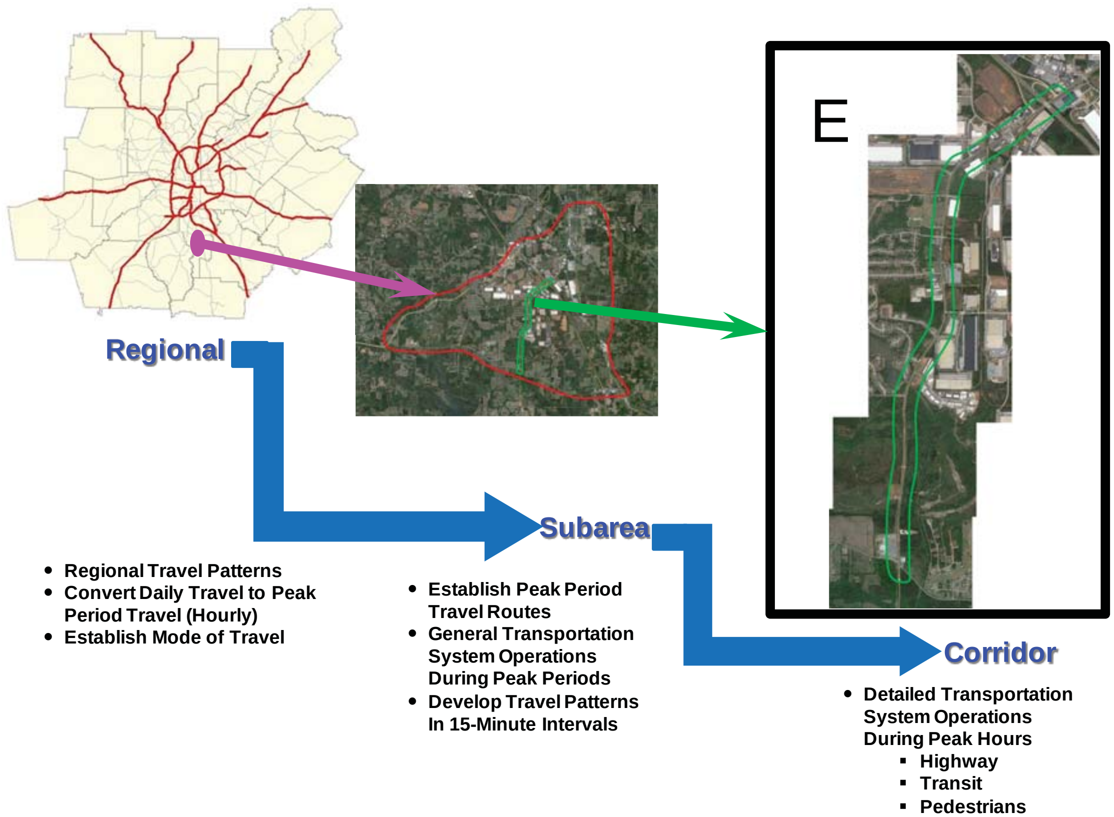
All five case studies followed the same general analysis procedures since one of the primary objectives of the case studies was to evaluate the effectiveness and applicability of the analysis procedures in diverse environments. The process for testing the various scenarios was done through a three-step process, as illustrated in **Figure 15**.

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. 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 is needed. This more detailed level of analysis is generally referred to as a mesoscopic analysis.

Figure 15: Case Study Scenario Testing Process



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). 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. The DTA procedures have been 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 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 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.

5.5 Implications for Multimodal Corridor Studies

Given the diversity of the travel characteristics along the subject corridors, there are some observations that can be gleaned from the overall case study process and examples from specific corridors.

Overall Implications

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:

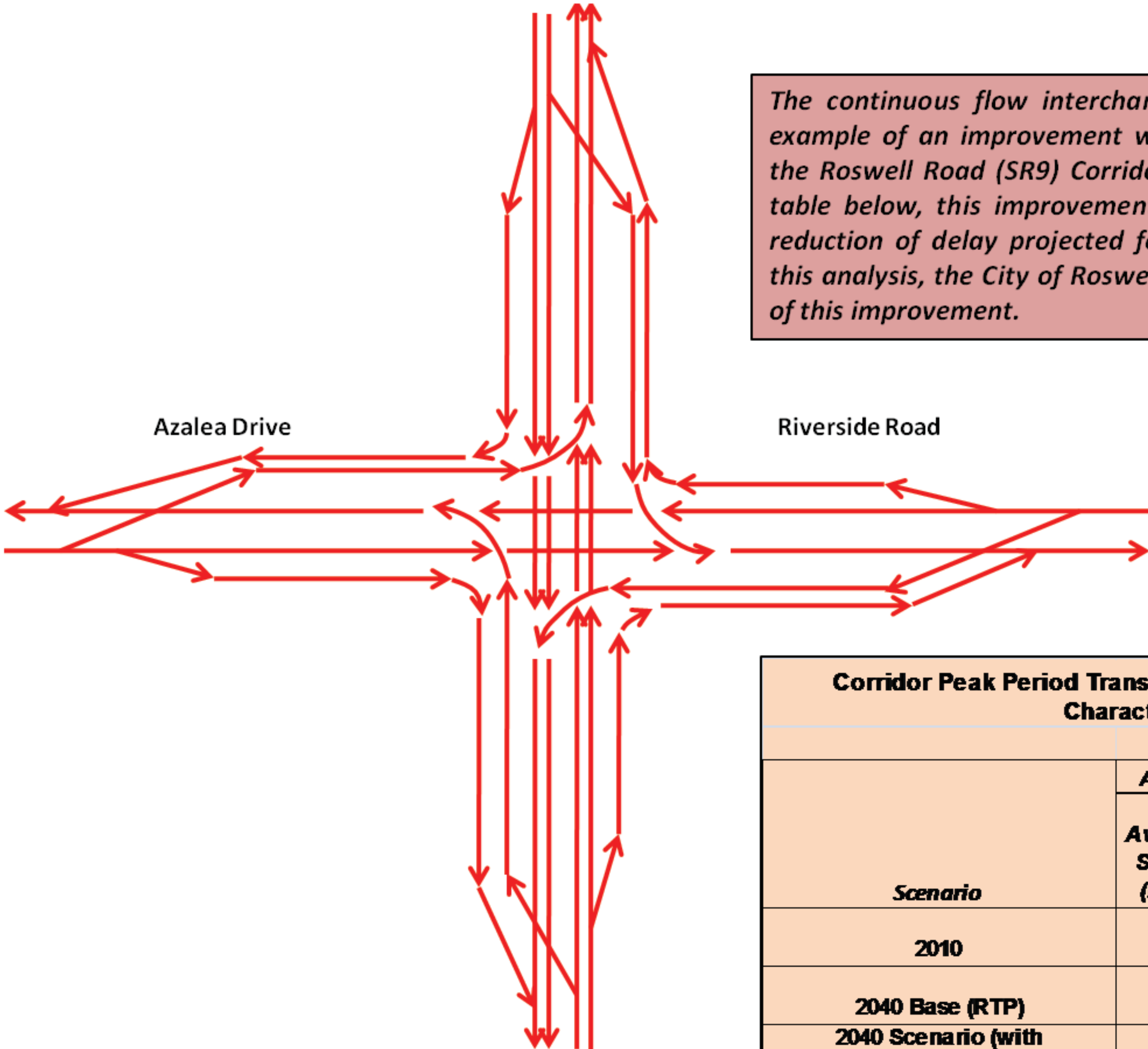
- *Focus groups* – Given their local expertise, a focus group consisting of a combination of technical staff from local jurisdictions, GDOT officials (along state roadways), and representatives from citizen and business groups along the subject corridor provides an effective tool for scenario building.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

Corridor Level Findings

The following corridor specific findings resulted from the testing process that can also serve as a benchmark for future MMCS efforts:

- A significant operational improvement at a single key intersection can result in a substantial improvement in the operating conditions within a corridor. This was demonstrated along Roswell Road (at Riverside/Azalea) and Conley Road (with the realignment of Old Dixie Highway intersection). In the case of Roswell Road (as shown in **Figure 16**), the City of Roswell is pursuing one of the improvements tested based on the case study results.
- While increased development can increase delay along a specific corridor, the overall impacts to delay within its travel shed can actually be improved - particularly in urban environments - by redirecting traffic to that corridor. In addition, increased delay is not necessarily a negative issue in areas trying to promote more multimodal travel environments. This was reflected in the Moreland Avenue case study.

Figure 16: Sample Case Study Result



The continuous flow interchange shown on the right is an example of an improvement within a scenario developed for the Roswell Road (SR9) Corridor case study. As shown in the table below, this improvement would result in a significant reduction of delay projected for the roadway. As a result of this analysis, the City of Roswell is investigating the feasibility of this improvement.

Corridor Peak Period Transportation System Operating Characteristics

Scenario	*AM Peak Period*		*PM Peak Hour*	
	Average Speed (MPH)	*Average Delay (Sec. Per Veh.)*	*Average Speed (MPH)*	*Average Delay (Sec. Per Veh.)*
2010	14.4	79.5	21.3	63.7
2040 Base (RTP)	14.9	100	12.5	135
2040 Scenario (with Transportation Improvements)	*21.6*	*66.5*	*24.7*	*44.5*

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Section 6: Outreach Activities

In addition to the network identification outreach (noted in Section 2) and the case study focus groups (noted in the previous section), the outreach activities associated with the SRTP effort primarily focused on briefings with community, business and/or civic groups. These briefings provided an overview of the SRTP effort and sought to gauge their interest on future study activities. To this end, briefings were held with the following organizations:

- Regional Business Coalition
- Bicycle and Pedestrian Task Force
- Social Equity Advisory Committee
- Transportation Management Association/Clean Air Campaign Alliance
- Metro Atlanta Chamber of Commerce
- Association of County Commissioners
- Georgia Stand-Up

In addition to the briefings noted above, a total of 75 minority groups throughout the Atlanta region – consisting of African American, Hispanic, and Asian organizations – were contacted to also gauge their interest in the SRTP. In addition, 35 minority media outlets were contacted. Presentations to the Social Equity Advisory Committee and Georgia Stand-Up were facilitated though this outreach.

Ceebtsheej Hmong Baptist
El Universal Gráfico
Radio El Patron - 105.3 FM
Asian American Legal Advocacy Center, Inc.
St. Michael the Archangel Catholic Church, Hispanic Ministry
Hispanic Initiative of Lakeview Community
WOWNOW
1st Presbyterian of Cartersville
MUST Ministries Cherokee
Radio VIVA
Walton County Chamber of Commerce
North Lanier Baptist
WATB 1420 AM
Coweta Branch NAACP
Hindu Temple of Atlanta
Urdu Times
St. Phillips AME
Estadio Sports
V103 Radio
La Voz Hispana
Georgia Hispanic SDA
The Atlanta Voice
Salem Bible Church
La Vision de Georgia
The Korean American Association of Greater Atlanta
Georgia Latino News
Atlanta Latino
ACCIÓN
Henry County NAACP
Friends for Life
GALEO Coalition for a New Georgia
Vida Latina
Radio Korea
Eastside Baptist Church
Pleasant Grove Baptist
WRFG 89.3FM
Mundo Hispanico
MAVISION WANX- Channel 26 Atlanta
Punto
Carniceria Potosina
Bethlehem Baptist Church
Graves Chapel AME
Balon Sports News Inc
El Rapto
LaVision
Goodwill of North Georgia, Inc.

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Section 7: Next Steps and Recommendations

The purpose of this section is to provide an overview of the potential influence of specific elements of the SRTP on future work program and/or coordination activities of the ARC. The section documents how the work products of the SRTP will assist in the following activities:

- Establishing a framework for the MMCS program consistent with the GDOT Project Development Process (PDP)
- Supporting expansion of GDOT RTOP program along RTN
- Identifying data collection requirements moving forward
- Supporting the Regional Access Management Initiative
- Assisting with roadway functional classification for regional thoroughfares

7.1 Framework for Multimodal Corridor Studies (MMCS) Program

From a larger perspective, the overall purpose of the MMCS program should be to bridge the gap between GDOT, ARC, and local policies in order to come to consensus for a development strategy that works for all stakeholders.

In order to promote effective management policies along the RTN, the Guidelines recognize the need to coordinate with GDOT during the Project Development Process (PDP). This is particularly relevant because approximately 65% of the RTN is comprised of state roadways. **Figure 17** on page 36 depicts the recommended means for facilitating this coordination. In turn, the overall scope of the MMCS should be to advance a project into the Preliminary Plan Development phase of project development.

While said coordination may not be possible for all improvements along the RTN, a critical step of implementing the MMCS is the identification of corridors subject to this program. ARC will partner with GDOT in this process to help insure that study results continue into further stages of the GDOT project development process. As such, the following criteria could be used to identify potential MMCS corridors:

- Capacity improvements planned or programmed within the RTP and the phasing of the project with respect to anticipated funding – higher funding priorities should be prioritized for MMCS accordingly.
- Conflicted corridors - those that exhibit conflicting functions in that they serve a high number of through trips but also serve local trips and/or serve as activity center hubs.
- Classification of impacted thoroughfares – corridors identified as providing the greatest regional mobility should take precedence.
- Facilities with multiple projects of differing modes – capacity improvements along roadways within Concept 3 or the ARC Bikeways Plan should be developed to accommodate all modes planned along a corridor.
- Facilities currently on or subject to the expansion of the GDOT RTOP program – inclusion of these facilities allows greater data collection activities in order to identify baseline conditions, test alternative scenarios in the modeling process and monitor the overall benefits of the recommended improvements once implemented. Data sharing between the programs will also be very beneficial.

The typical sections within the Guidelines developed for the RTN were designed in recognition of the need to create a balance between providing multimodal mobility and preserving the area land use context. Most of the policies contained within the Guidelines are allowable within GDOT's *Context-Sensitive Design Manual* (CSDM). The CSDM allows the design process to have a flexibility that recognizes the role of roadways in not only the transportation network, but in the community as a whole. The scope of services for MMCS should 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 CSDM outlines a framework that allows for incorporation of these principles into the concept development process. As part of the Guidelines, it is recommended that the CSS outline be developed into a more formal process that forms the basis for design criteria development for roadways on the RTN. As such, the GDOT Offices of Project Development and/or Innovative Project Development should be engaged at the onset of the MMCS process. A framework for a typical MMCS effort is provided in **Figure 18**.

As noted, 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 (**Figure 15** on page 29). **Figure 19** on page 38 provides an example of a typical section that could result from an MMCS that would be carried forward into the NEPA 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.

Figure 17: MMCS Integration into the GDOT PDP

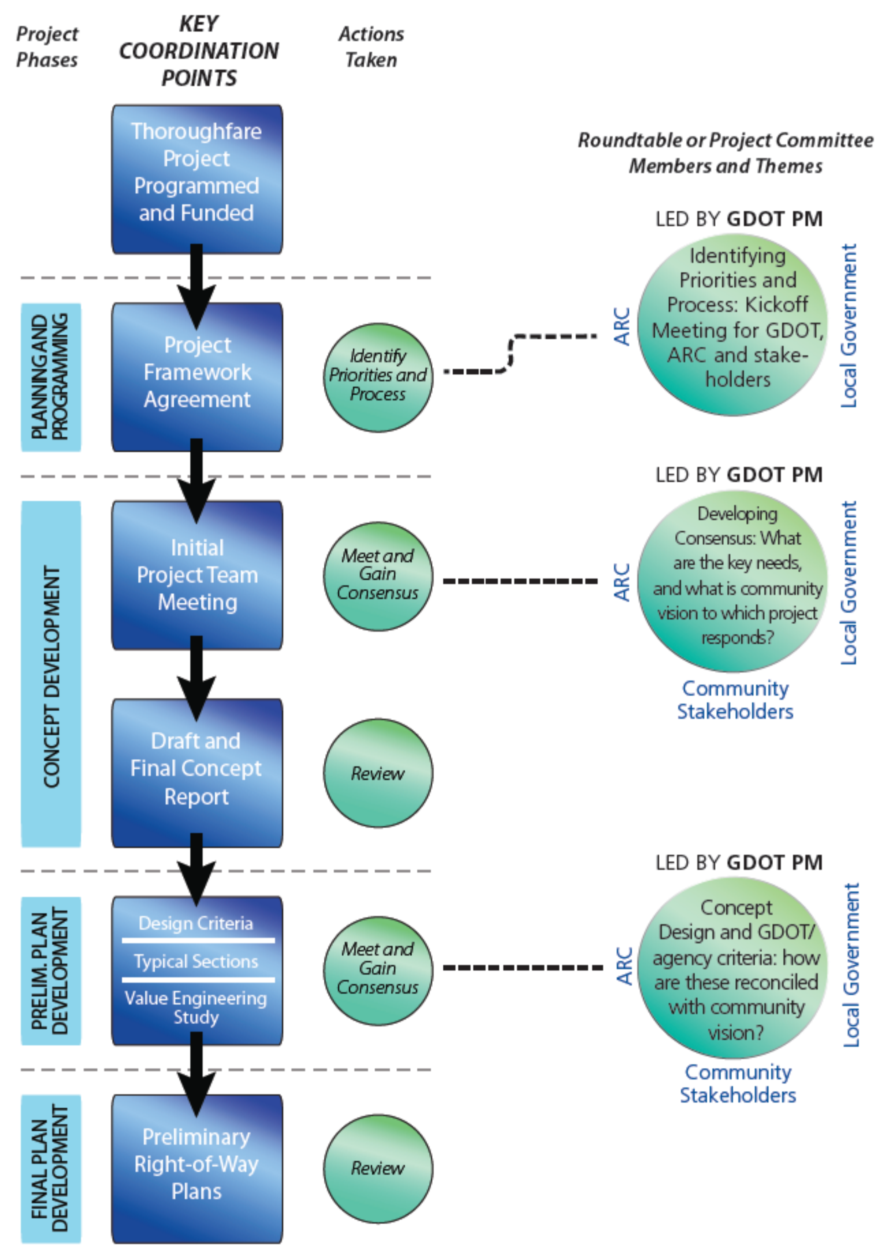


Figure 18: MMCS Process and Results

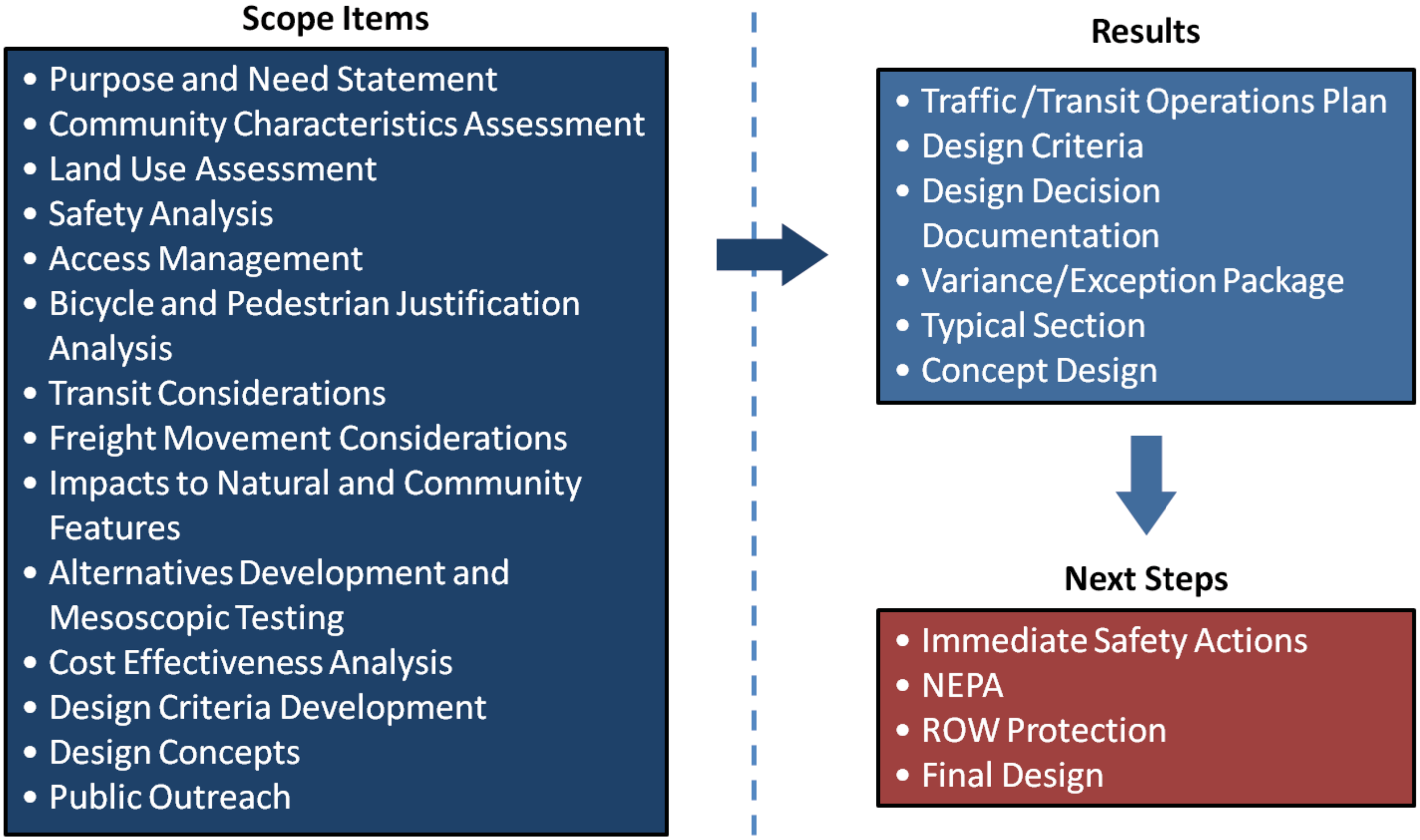
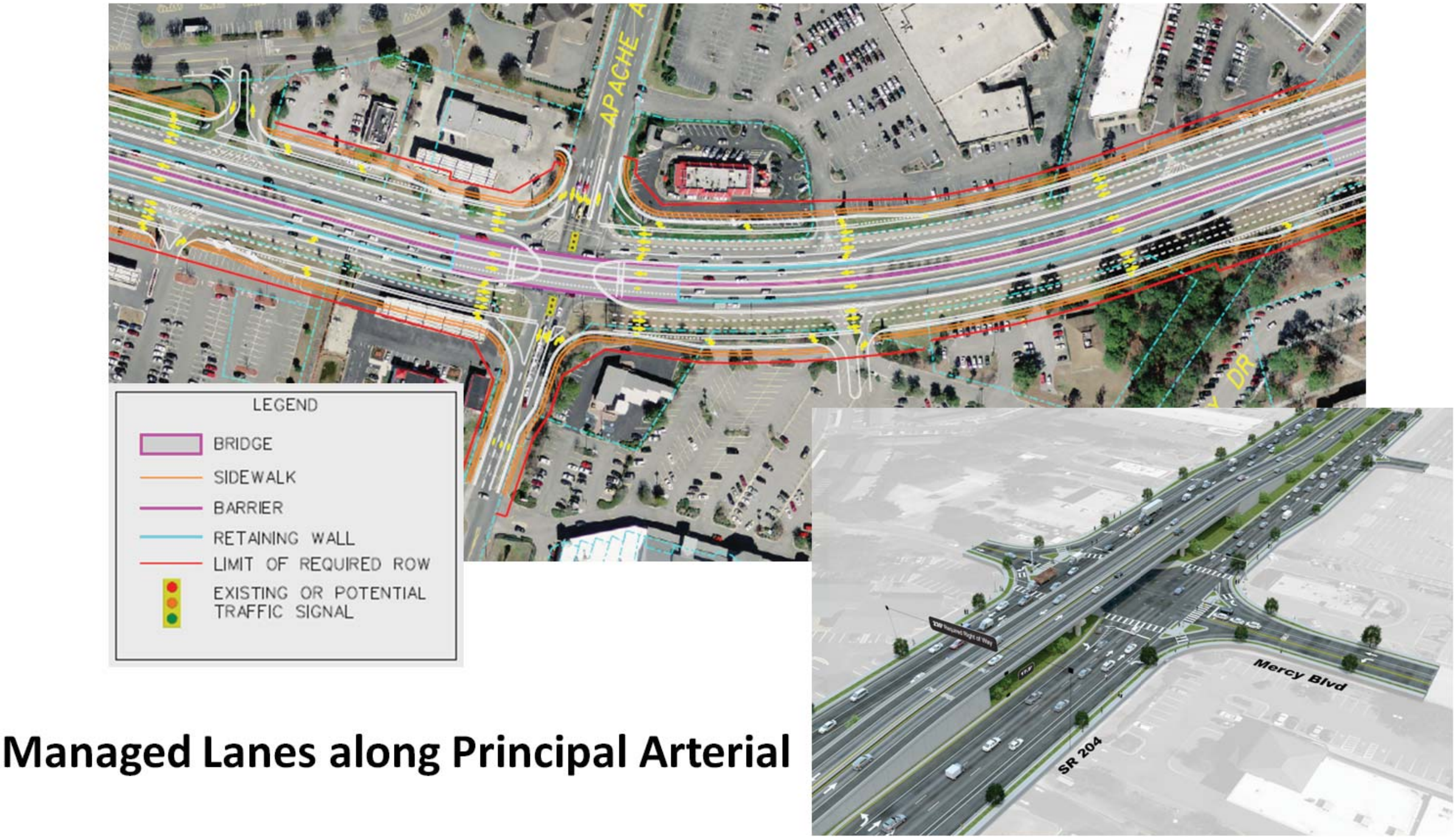


Figure 19: Sample MMCS Typical Section



7.2 Coordination with GDOT RTOP Program

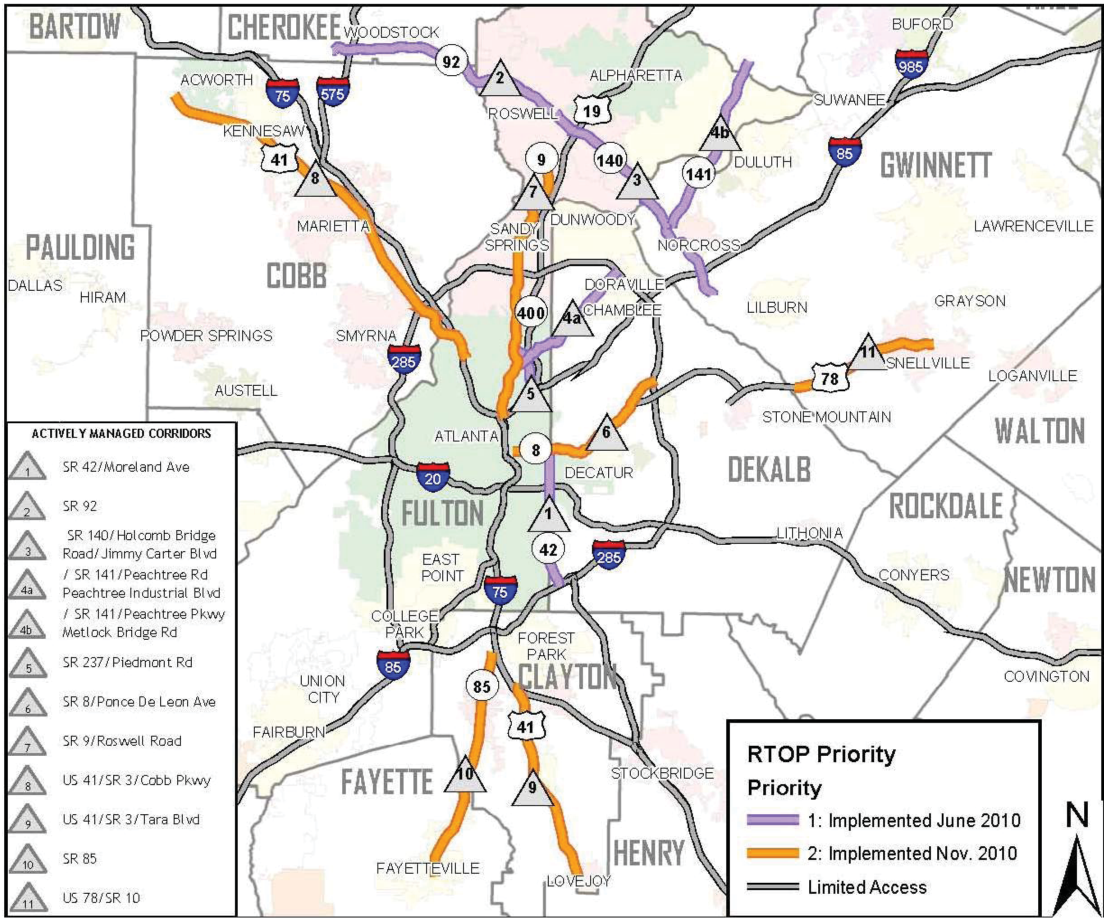
As noted in Section 2 herein, one of the core criteria established for the identification of the RTN was the designation of a roadway as an RTOP corridor. These are cross-jurisdictional regional corridors identified by GDOT for performance monitoring activities and prioritization of operational and maintenance improvements to increase throughput during peak periods.

GDOT has yet to formalize the RTOP corridor selection process; however, a three-phase approach was used to initially prioritize corridors for the program. In addition to traversing multiple jurisdictions, the factors used for prioritizing regional corridors were as follows:

- *Phase 1* - ARC CMP Corridors, AADT, SkyComp Data
- *Phase 2* - Lane Configurations, AADT
- *Phase 3* - AADT, Regional Travel Trends (generated from SRTP identification efforts)

The end result was the identification of 28 corridors with four levels of priority. The 11 corridors currently in operation under the RTOP program are Priority 1 and 2 Corridors, shown in **Figure 20**. It should be noted that all of the 28 corridors identified for RTOP prioritization are included within the RTN.

Figure 20: RTOP Corridors Currently in Operation (Priority 1 and 2)



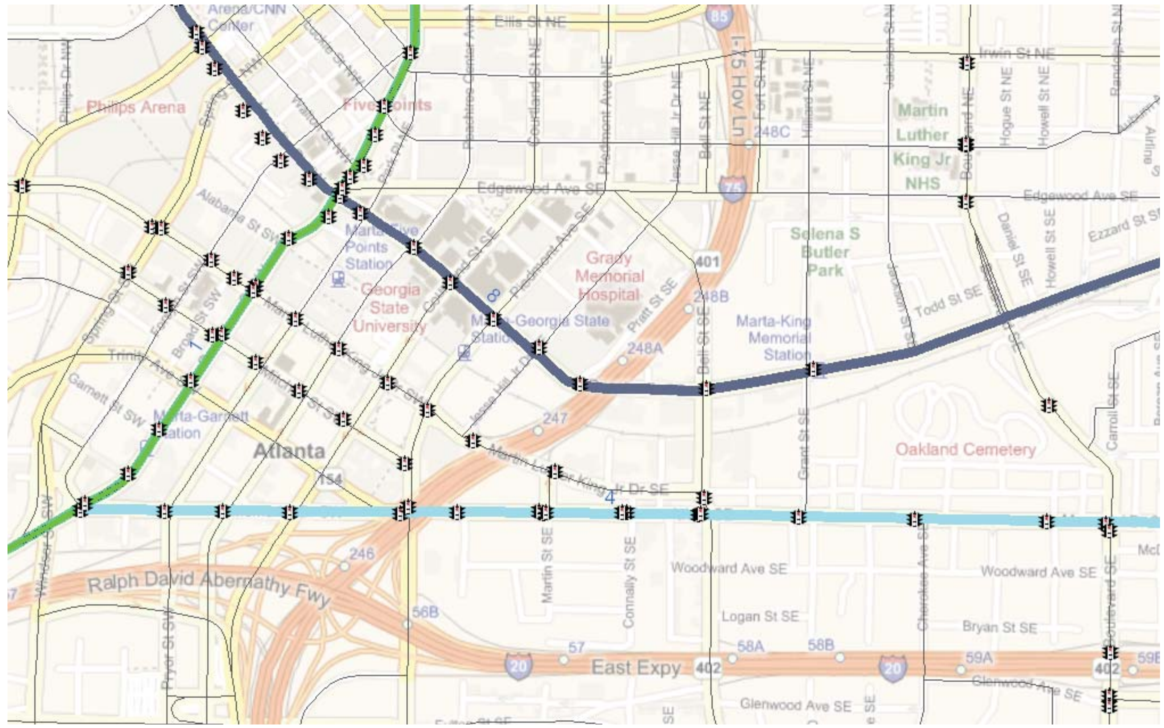
As the RTOP program continues to evolve, there are two SRTP work efforts that can assist in its maintenance and expansion:

- *LRS* –The INRIX travel time data, traffic signal information and other data in the LRS can be used to not only identify needed modifications to the existing signal system, but also identify characteristics that could assist in the prioritization of future corridors. An example of the intersection control points within the LRS is provided in **Figure 21**. As the LRS continues its expansion (through the CMP program) to include other factors such as AADT, LOS, etc., these functions can be even further enhanced.

- *Performance Measures* – There are specific measures identified in the Performance Measurement Report – such as peak hour volumes, daily speeds, crash data, etc. – that can be useful in developing a more formalized program for expansion for the RTOP program. As the LRS is expanded to include these factors, it can be utilized to facilitate this process.

Another function of coordination could be use of RTOP data to validate the data within the LRS and/or the regional travel demand model. This is discussed in further detail in the section that follows.

Figure 21: Sample of Intersection Control Points from ARC's LRS



7.3 Recommendations for Data Collection and Monitoring

There are three primary areas for data collection and monitoring moving forward that will facilitate the ARC CMP program:

- Enhancement of the LRS – As noted in Section 4 herein, the development of the LRS establishes an expandable data analysis tool for performance monitoring activities along the RTN. As the CMP continues, it is anticipated that the LRS will be expanded to include other attributes (such as crash data, travel demand model outputs, etc.) that will further assist in the identification of transportation issues throughout the region on both the corridor and system-wide levels. Another important element of the LRS as the CMP advances is the annual purchase of INRIX data to allow for historical comparison of travel time conditions; this will assist in identifying changing conditions, programming needs and, in the long-term, evaluating the effectiveness of projects implemented along the RTN.

- RTOP Integration –As the RTOP program continues to expand its corridors, the integration with the LRS will become increasingly useful in the ARC CMP process and the MMCS program. The RTOP currently employs a system called TACTICS for its data management needs. Both the LRS and TACTICS are SQL based applications and, as such, could offer data sharing opportunities. For example, TACTICS allows for the assigning of traffic timing schedules that are responsive to deviations in travel time and system performance for a given day or peak period.

- Data Sharing and Management – As the LRS continues to evolve, the ultimate goal would be to allow its access and use by other planning partners in the region, including GDOT. As such, another critical element to performance monitoring will be the ability to share data among the regional planning partners. This data clearinghouse would include data collected from efforts such as corridor studies, traffic impact studies, and future MMCS studies as well as data collected from the RTOP program.

- Supplemental Data Collection – While the INRIX data purchased for the LRS is a viable tool, more traditional data collection activities such as traffic counts, turn movement counts, etc. will still be needed to validate information within the LRS and the regional travel demand model. This will include not only data collected for ARC efforts, but also that collected from regional planning partners and shared through the aforementioned data clearinghouse.

- Supplemental ARC Staff – In order to coordinate, facilitate and/or manage the recommended data collection and performance monitoring activities noted above, it is also recommended that ARC assign specific personnel to maximize the utility of these efforts and provide a single source of contact for the data sharing program. Said personnel should at a minimum have experience in working with Geographical Information Systems (GIS) and some level of database management training.

7.4 Support the Regional Access Management Initiative

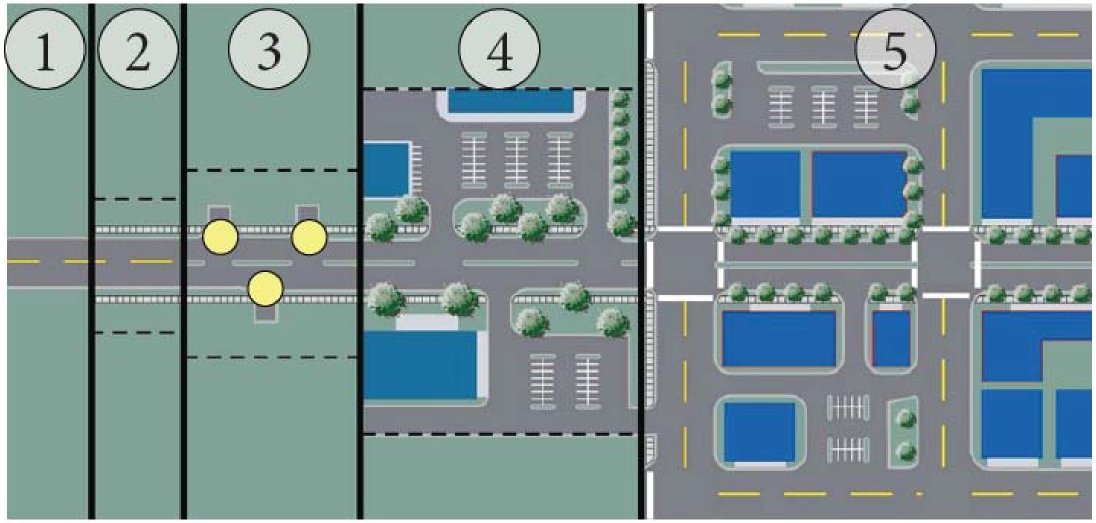
The Regional Access Management Initiative is a cooperative initiative between ARC, GDOT, and the Georgia Regional Transportation Authority. As part of this initiative, projects programmed for capacity improvements under L230 transportation funds are required to include an access management plan to preserve the effectiveness of said improvements.

Figure 22 provides an overview of access management practices given the level of development along a given thoroughfare.

In addition to the general guidelines provided, the Guidelines specifically note the following:

- Thoroughfares in suburban, transitioning rural and rural environments are identified as those in most need of access management due to the inconsistent or scarce development patterns that characterize them.
- In the local development review process, it recommended that local governments adopt corridor plans, LCI study recommendations or other specific-area plans developed using the Guidelines as policy, and commit to the implementation of items that are within their purview, such as zoning changes and access management regulations.
- Access management plans and policies that feature cross-access easements, side access points from cross streets, and other strategic approaches to reducing the number of driveway access points on

Figure 22: Access Management Approaches in Different Contexts



	Approach	Applicability
1	No management: applies in rural contexts with limited driveway access	Local roads with relatively low volumes (ADT > 4,000; rural contexts)
2	Right-of-way management: applies along major roadways where growth is expected	Higher-volume roads but in predominantly rural, low-density settings (rural and high-speed suburban contexts).
3	Access identification: Specifies points where access and intersections are allowed	Existing roads where development is expected; capacity projects and new roads (suburban and urban contexts)
4	Driveway-based management: Organizes access for multiple buildings and properties for safe spacing	In established built environments without regular side-streets, or in between these side streets where they exist but are not on a regular block-level spacing (suburban and urban contexts).
5	Public street-based management: relies on existing side streets to provide service access instead of driveways off of a corridor's principal road	In established built environments with regular side-street spacing (urban contexts)

thoroughfare roadways are recommended. While the consolidation of driveways along a corridor can be partially accomplished when specific properties submit development applications, it is also recommended that local governments take a proactive role by working with property owners to promote access management strategies.

- In protecting freight corridors, it is recommended that those facilities on the ASTRoMaP network also adopt access management policies consistent with freight movements.

The points noted above indicate the following with respect to the Regional Access Management Initiative:

- Capacity improvements along the RTN in suburban and rural areas (per the UGPM) should be considered as candidates for the L230 program during the RTP update process.
- Access management plans developed under the L230 along the RTN should be consistent with the recommendations of the Guidelines in addition to LCI plans and local access management strategies.

7.5 Functional Classification for Regional Thoroughfares

Another core criterion used in identifying the RTN was the functional classification attributed to a facility. As such, facilities classified as Principal Arterials by the USDOT were generally included on the RTN. However, the only Principal Arterials that are relevant to the RTN are 'other principal arterials' since they are the non-controlled access facilities and the only Principal Arterials that have direct access to adjacent land uses. With that said, most of the RTN consists of facilities classified as Urban Minor Arterials and, in some cases, Urban Collectors. Given the thresholds above and the scale at which this classification level applies, there is very little correlation between the USDOT functional classification and thoroughfare level classification (described in Section 2).

Every ten years, the US Census Bureau updates the definition and boundaries of urbanized areas for the entire country which, in turn, triggers a functional reclassification process. The next such update is scheduled to occur in 2012. Since a majority of transportation improvement funding tends to come from the Federal Highway Administration (FHWA), the functional classification system determines which roadways are eligible for Federal aid. As such, the functional classification of RTN facilities plays an important role in the funding eligibility of potential projects on the RTN and, therefore, the ability to manage the system.

As the federally-designated Metropolitan Planning Organization (MPO) for the Atlanta region, the ARC has authority to assist FHWA in the reclassification process in determining the functional classification of all roadways in the region. Therefore, at a minimum, the ARC should work with the FHWA to reclassify all RTN facilities as Minor Arterials or higher to maximize funding eligibility on the network.

7.6 Next Steps

In summary, the SRTP effort has provided the framework for a number of ARC programs moving forward. These include typical MPO functions such as long range planning and programming and CMP related activities as well as those related to special programs unique to ARC such as the MMCS and Regional Access Management Initiative. Follow up activities should include:

- Developing a formalized partnership with GDOT in the MMCS program and data sharing procedures related to the RTOP program. This is particularly critical to the success of the MMCS program in resulting in projects that can be implemented and monitored as part of the ARC CMP.
- Developing more detailed criteria for identifying corridors subject to the MMCS program and establishing a more defined scope of services. Said scope should incorporate the use of the design guidelines, scenario testing methodology and associated coordinating mechanisms identified herein.
- Enhancing the LRS to include a more robust dataset - including link traffic counts, intersection turning movement counts, roadway attributes, crash data, bicycle and pedestrian facilities, and travel time data – and the ability to share this data with regional planning partners. As noted within, further enhancements to the LRS will heighten its utility with respect to CMP, MMCS, and other initiatives throughout the Atlanta region.

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