# 4.0 RTAP PLANNING PROCESS

## 4.1 GATHER INPUT

A plan is only as good as the data and input on which it is based. For this reason, considerable effort focused on gathering a wide range of input to assist in developing a thorough understanding of issues, concerns, aspirations, desires, deficiencies and needs as they relate to travel and the transportation system, with a particular emphasis on transit, in the Atlanta metropolitan region. Input was garnered from a wide variety of sources, including:

- Public outreach meetings and interviews
- Project Advisory Committee
- Previous transit and transportation studies
- Currently programmed and proposed transit services
- Regional Transportation Plan Update
- RTAP Needs Assessment

## 4.2 DEFINE GOALS AND OBJECTIVES

Goals and objectives play a critical role in the development of the evaluation process; they establish the basis by which the relative success of alternative transit services may be measured. An initial set of goals and supporting objectives were developed by the RTAP Team based on researching the goals and objectives of regional transportation agencies and organizations including GRTA, ARC, and GDOT and goals and objectives of other studies (e.g., Northern Sub-Area Study, Northwest Connectivity Study, Marietta-Lawrenceville Transit Study). After review and comment by the RTAP PAC, the following four goals and supporting objectives have been developed for the RTAP.

### Goal 1. Existing Transit Systems

*RTAP will preserve, modernize, and integrate existing transit systems.*

- Optimize customer access and ease of use through a coordinated, regional travel information system.
- Enhance the responsiveness of transit systems to rider needs through upgraded customer service, enhanced personal security and improved travel safety.
- Implement a marketing strategy that will retain current transit riders and attract new ones.
- Optimize transit operations to serve efficiently all current and potential transit riders.
- Provide transit choices and alternatives that meet the specific travel needs of target market segments.
- Implement an integrated fare structure and policies for all transit systems.
- Provide incentives for transit use and disincentives for other transportation modes.

## Goal 2. Mobility & Accessibility

*RTAP will improve regional mobility and accessibility to centers of activity.*

- Provide transit choices to satisfy a full range of transportation demands.
- Expand transit system access and capacity to support increases in transit ridership and to relieve passenger crowding on vehicles.
- Provide seamless connections among public transit services and between public transit services and other modes.
- Increase competitive transit choices to and within regional activity centers.
- Provide appropriate transit services in areas currently not served by transit.
- Proactively respond to anticipated changes in travel patterns.

## Goal 3. Development and Land Use Coordination

*RTAP will protect the environment and enhance the quality of life through improved coordination with land use and metropolitan development.*

- Provide transit services that support transit-oriented, mixed use, and sustainable development.
- Implement transit services that are compatible with future land use plans.
- Implement transit projects that support economic development initiatives.
- Provide transit improvements that will relieve highway congestion and reduce air pollution.
- Enhance the development potential and economic vitality of disadvantaged neighborhoods and communities.
- Respond to the diverse land use characteristics (e.g., urban, suburban and rural) and transportation needs within the region.

## Goal 4. Fiscal and Economic Feasibility

*RTAP will provide transit improvements that are fiscally responsible, economically feasible, publicly, politically supported, and equitable to all parts of the region.*

- Maximize benefits to the region as a whole - both transit users and the community at large – by achieving the best value for funds invested in transportation.
- Secure a stable, dedicated and equitable funding source for transit.
- Maintain and improve other sources of transit funding by working with transit partners, communities, and participating agencies within the region.

## 4.3 ENVIRONMENTAL JUSTICE

Identifying regional transit needs requires an examination that looks beyond locating areas of high densities and concentrated travel patterns, and expands the analysis to areas of environmental justice concern as an attempt to alleviate economic hardship as well. Providing the region's disadvantaged citizens, as well as the elderly and disabled citizens, with the means to reach employment and essential services affords them greater opportunities to reach economic independence. For these reasons, areas of environmental justice concern were included as part of the Transit Needs Assessment and consequently in the development of concepts, projects and services. A benefits and burdens assessment on the environmental justice community will be completed as part of the next phase of the RTAP.

## 4.4 IDENTIFY POTENTIAL PROJECTS, SERVICES & POLICIES

Based on the extensive public involvement activities (Chapter 1) and the **Transit Needs Assessment** (Chapter 2) and a comprehensive search of previous transportation studies and proposals, more than 50 potential fixed guideway transit corridors were identified in the 13-county region. These potential corridors covered all areas of the region and every major freeway corridor.

After the initial identification of potential fixed guideway projects, GRTA presented the project information to the Project Advisory Committee. Project profiles were developed for each potential project that identified the physical characteristics, service characteristics, order-of-magnitude capital cost estimates and performance measures (including ridership forecasts).

It must be emphasized that the project profile data provided to the Project Advisory Committee represents an initial assessment of the physical, service, capital cost and performance measures associated with each project. The level of technical analysis used to estimate this data is appropriate for this "systems-level" planning study. That is, alignments and station locations were approximated; further refinement of each would be the subject of ensuing project development phases (e.g., alternatives analysis, preliminary engineering, environmental impact statement, final design).

Capital costs were estimated using order-of-magnitude unit costs for comparable projects; cost estimates would be refined in ensuing project phases. Finally, ridership estimates were developed using the sketch planning tool developed for the RTAP project; projections developed using the regional travel demand model will vary due to differences in model structure (e.g., the highway network is static in the sketch planning model), mode choice algorithms, and base transit network assumptions.

### Physical Characteristics

Physical characteristics were first defined for each potential project including the corridor end points (i.e., from "A" to "B"), route length (miles), capacity (i.e., high, medium or low), possible station locations, and general alignment.

**Capacity:** Potential projects were categorized as high, medium or low capacity for the purposes of defining representative service characteristics (e.g., speeds, service frequency) and cost estimates.

- High capacity projects were characterized by an exclusive right-of-way, high average speeds (30 mph or more) and very frequent service during peak and midday periods.

Typical examples of high capacity projects would be extensions to MARTA's heavy rail system.

- Medium capacity projects are also characterized by an exclusive or semi-exclusive (shared with other modes) right-of-way, moderate average speeds (20 to 30 mph) and frequent service during peak and midday periods. Typical examples of medium capacity projects include light rail transit (LRT) and bus rapid transit (BRT).

- Low capacity projects are characterized by on-street operations that may feature semi-exclusive transit lanes. Generally, operating speeds are 10% to 20% faster than buses running in mixed traffic. Typical examples are bus-only lanes and streetcars running in traffic lanes.

**Passenger Stations**: The preliminary number and location of passenger stations were identified for each project for the purposes of ridership forecasts. The number and location of stations were based on professional judgment of likely station locations given the assumed transit capacity (e.g., high, medium and low) and the tributary area and development patterns of each corridor. Typically, average station spacing for high capacity extensions would be about 2-3 miles, medium capacity lines about 1-2 miles, low capacity lines about ½-1 mile, and intercity lines about 6-10 miles.

**General Alignment**: For a systems-level study, it is not practical to develop engineering drawings (plan and profile) for each potential project. However, since the assumed grade would have a significant impact on the estimated capital construction cost, an effort has been made to estimate order-of-magnitude levels of at-grade, aerial and subway alignments. The assumed grade has been based on a professional judgment given the assumed transit capacity (e.g., high, medium and low), topography and development patterns of each corridor.

## Service Characteristics

Service characteristics were based on simple operating assumptions for each project including average speed, end-to-end running time, span of service, days operated, service frequency, peak vehicles and annual revenue vehicle-hours.

**Average Speed**: The average speed represents the average commercial speed for each potential project from terminal to terminal during peak periods. The average commercial speed includes in-vehicle running time, station dwell times and all intervening delays (e.g., intersection cycle times). It does not include typical non-revenue time such as layover, report or turn-in times. The average commercial speed was estimated based on typical speeds for similar projects and reflects the assumed transit capacity, extent of exclusive right-of-way, and number of stations. Where operating plans have been developed for previously studied projects, the average speed was based on the operating plan for a comparable alignment alternative.

**Run Time**: One-way run times were calculated based on the estimated average commercial speed and the route length. For projects that have previously been studied, the estimated run time for a comparable alternative was used.

**Span of Service**: Span of service refers to the number of hours that a transit project is operated on a typical weekday. The span of service, together with the assumed service frequency, determines the estimated revenue vehicle-hours and annual operating and maintenance (O&M) costs.

**Days Operated**: The number of days operated for a typical week. For high and medium capacity projects, transit service is

typically operated seven days a week. For low capacity, intercity and major activity center circulator projects, transit service is usually operated just on weekdays.

**Service Frequency**: The service frequency (i.e., time between buses or trains) was assumed for each potential project based on typical operations for comparable projects. Typical service frequencies for weekday peak, base/midday, and evening periods and weekends have been defined. The weekday peak and base/midday frequencies are important inputs to the sketch planning tool for the estimation of ridership.

**Peak Vehicles**: The number of vehicles required to operate the peak period service was estimated for each project based on the projected ridership, service characteristics (e.g., service frequency and one-way run time), and assumed seating capacity and passenger load factors for high, medium and low capacity projects. In general, the daily ridership forecasts were used to estimate a peak hour maximum line load (service demand). The number of cars per train or buses were then calculated to provide a corresponding service supply, given assumed loading characteristics.

**Vehicle-Hours**: The number of revenue vehicle-hours operated measures how many vehicles are in service throughout an average day. One vehicle-hour is simply one vehicle that operates in service for one hour. Annual O&M costs were calculated by multiplying the number of annual revenue vehicle-hours by an average unit cost per vehicle-hour.

### Order-of-Magnitude Capital Cost Estimates

Order-of-magnitude capital cost estimates were estimated for each potential project in accordance with Federal Transit Administration (FTA) guidelines. Unit costs for a range of transit modes including heavy rail transit, light rail transit, commuter rail and bus rapid transit, were developed by GRTA at a Costing Workshop attended by Atlanta area planning partners and consultants. The purpose of the workshop was to develop a common methodology and costing guidelines for use on the RTAP and several current transit major investment studies.

Order-of-magnitude unit costs (i.e., millions of dollars per route-mile of construction) were estimated for each mode based on costs of comparable projects (source: FTA New Starts annual reports). The order-of-magnitude unit costs include all costs associated with implementation of the project including guideway elements, passenger stations, yard and shops, systems elements, vehicles, special conditions, right-of-way, and project soft costs (e.g., agency and engineering costs). Year-of-expenditure cost data was inflated or deflated to 2002 dollars. Finally, the average order-of-magnitude unit costs were factored to reflect projects that may have a significant amount of aerial/subway profile.

Order-of-magnitude capital costs were then estimated for each potential project based on the project length (route-miles) and a corresponding unit cost. For high capacity projects, costs were estimated as heavy rail transit (e.g., MARTA). For medium capacity and activity center circulator projects, costs were estimated as either light rail transit or bus rapid transit. For low capacity projects, costs were estimated as either exclusive bus rapid transit or shared lane bus rapid transit. Costs were presented in constant 2002 dollars.

## 4.5 EVALUATE POTENTIAL PROJECTS & SERVICES

Atlanta is a large, complex region, and no single transit service, project or concept will be able to respond to the variety of needs. Therefore, it was reasonable to expect that the Draft Concept Plan would include a host of services that when implemented could address the greatest number of RTAP Goals and Objectives. Two problems faced the study team at the outset of this stage of the project – first, how to systematically and cost-effectively evaluate the large number of alternatives, and second, how to achieve an objective evaluation of performance in the context of other services that may be proposed.

To address these concerns, initial projects or concepts were packaged into scenarios. The scenarios comprised specific services, projects or concepts that addressed particular transit service needs. No attempt was made to develop the "final" scenario or plan at this stage, but rather this format was used to achieve an objective evaluation process. Through this process, the intent was to establish a series of scenarios that offered varying areas of focus, as well as levels of service at varying levels of cost.

Further, this packaging process did not dilute the importance of any single service, project or concept since each could ultimately be implemented as part of a final set or package of improvements. However, the definition of scenarios enabled the evaluation of related services, projects and concepts on a regional scale. Several scenarios were developed and evaluated at this stage of the process and refined through an iterative evaluation process.

A sketch planning tool developed for the project was the primary method used in the qualitative evaluation of alternatives and scenarios. The nature of the tool allowed for relatively quick evaluation of alternatives that permitted an iterative process to occur where projects were refined to improve overall performance and effectiveness.

A number of performance measures were calculated for each potential project, including average daily ridership, population and jobs within walking distance of a proposed station, connections to regional activity centers, and cost-effectiveness. These key performance measures are described below.

**Average Weekday Riders**: The sketch planning tool was used to forecast the number of transit boardings (i.e., unlinked trips) for each potential project or project segment in the forecast year 2025. Both home-based work (HBW) and total transit trips were reported. It is important to note that the number of boardings is not the same as the number of new transit riders generated by a project, since some boardings may be current riders that are diverted to the new project. *The number of riders reported for each project reflects ridership just on that individual facility by the specified route. In other words, additional ridership that may be generated on ancillary or feeder bus routes is not reported.*

Finally, the sketch planning tool was not used to forecast ridership for either the commuter rail or the regional activity center circulators. In the case of the commuter rail projects, the sketch planning tool has been developed for the 13-county area. Therefore, it is not capable of projecting ridership for lines that extend outside the non-attainment area (e.g., Macon, Athens).

For the regional activity center circulators, the sketch planning tool was unable to estimate ridership that occurs within a traffic analysis zone. The estimation of ridership for activity center circulators would require the development of a detailed traffic analysis zone system within each study area that would be the subject of a detailed major transit investment study (e.g., Perimeter Center study).

**Population and Jobs within 0.5 Miles**: The sketch planning tool was used to estimate the population and jobs within air-line walking distance (0.5 miles) of passenger stations for each potential project. Total population and employment was reported for the forecast year 2025. Environment justice (EJ) populations were also reported for the year 2000 based on the most recent census.

**Connections to 10 Regional Activity Centers**: The Atlanta Regional Commission has defined 10 regional activity centers (RAC) in the metropolitan region: City Center (downtown Atlanta), Cumberland/Galleria, Hartsfield Atlanta International Airport, Midtown Atlanta, Perimeter Center, Glenridge Medical Center, Lenox/Phipps, Peachtree Corners, Gwinnett Place, and Buckhead. The number of connections by transit – with 0 or 1 transfer – between each potential project and the 10 RACs was reported.

**Annual Capital Cost per Rider**: The annual capital cost per rider is a measure of each project's effectiveness. The annual capital cost was estimated by multiplying the estimated project capital cost by an annual factor of 10 percent that reflects the life cycle (years) of a typical fixed guideway project and a representative discount rate (about 7 percent).

## Promising High and Medium Capacity Projects

GRTA evaluated all of the high and medium capacity potential projects. After reviewing the preliminary results with the Project Advisory Committee, several iterations were performed – adding new projects and testing several potential projects as a higher or lower capacity (e.g., some high capacity projects were tested as medium capacity projects). Results are described in Chapter 5.