

WARNER ROBINS AREA TRANSPORTATION STUDY (WRATS)

**TRANSIT FEASIBILITY STUDY
INITIAL PUBLIC TRANSIT SERVICE OPTIONS
09/10/12**

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Introduction

The Metropolitan Planning Organization (MPO) for the Warner Robins Urbanized Area is the Warner Robins Area Transportation Study (WRATS). WRATS plans and coordinates transportation improvements for the Warner Robins metropolitan planning area consistent with federal surface transportation legislation.

The Warner Robins metropolitan planning area consists of all of Houston County and the northeastern portion of Peach County, Georgia. It includes the incorporated cities of Warner Robins, Byron, Centerville and Perry, as shown in Figure 1. The metropolitan planning area of Warner Robins consists of 417 square miles and approximately 149,000 people.

The Transit Feasibility Study (TFS) examines the need for transit services in the Warner Robins metropolitan planning area. As the area continues to grow and develop there is increasing interest in the potential for transit service. Recent success of the BiRD commuter bus service between Macon and Robins Air Force Base (RAFB) underscores the potential for similar service within the Warner Robins metropolitan area. In addition, numerous human service agencies and not for profits have stated that there is a need for transit service in Warner Robins among the populations that they serve. RAFB has been a strong supporter of transit and vanpool service, on base shuttle service, and commute alternatives as a means of reducing the number of vehicles entering and exiting the base and the amount of parking necessary on the base.

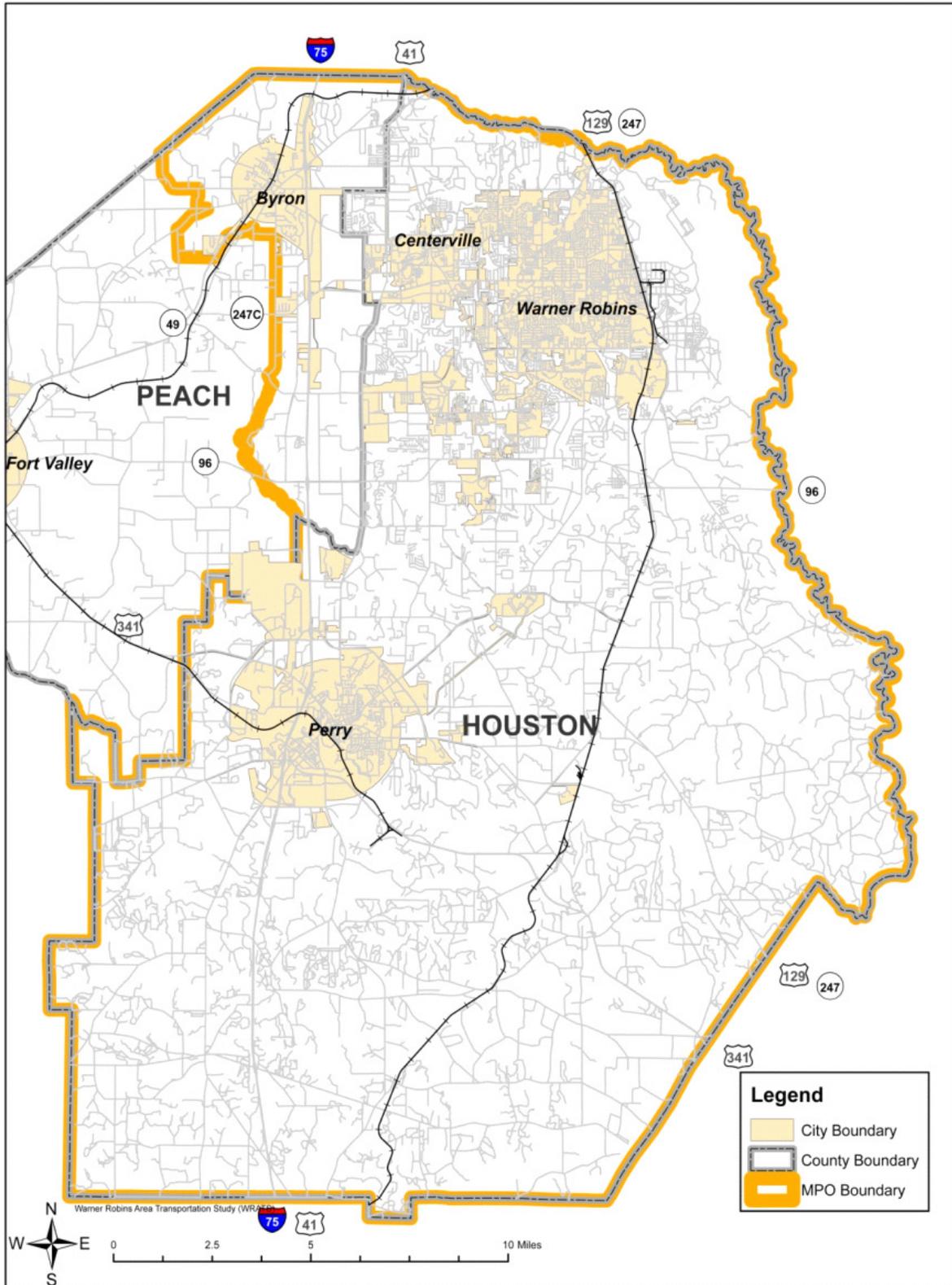
A transit feasibility study conducted by WRATS in 2003 recommended possible phased transit service options and assessed probable ridership and costs. However no action was taken as a result of the 2003 TFS, in part due to concern about who would pay for transit operations and operate the service, and in part due to concerns about the effectiveness of transit service in Warner Robins. A 2001 transit route feasibility study for service between Macon and RAFB resulted in the successful BiRD commuter service.

The 2012 WRATS TFS will update the study conducted in 2003 to reassess the market for transit taking into account demographic and development changes since 2003, and collecting new information from the public and stakeholder agencies on their views about the need for transit service in the Warner Robins metropolitan area. The TFS will provide a Transit Master Plan that identifies costs and funding associated with any recommended transit service options and an Implementation Plan that addresses phasing, marketing and operations for any recommended transit services.

This document documents the development of the initial public transit service options for the Warner Robins metropolitan planning area. It begins with a discussion of the challenges of providing public transit in smaller urbanized areas, a description of the range of transit service types that were considered for the options, and a summary of the current transit services in the Warner Robins area. The service options build on prior study tasks, including the analysis of existing conditions, individual input sessions with various Warner Robins area stakeholders, the on-line transit survey, peer review, and input received the project Steering Committee and public outreach meetings. After receiving initial input on the area's transit needs, a draft service plan was developed. The before-mentioned participants were then given the opportunity to comment on the draft

service plan, resulting in the initial service options presented in this document.

Figure 1 - WRATS Study Area



Public Transit Challenges in Smaller Urbanized Areas

Public transit services have traditionally been designed to serve densely developed areas that allow for large numbers of people to travel along established routes following set schedules. These services, like those operated in larger metropolitan areas, have worked well in heavily populated areas with strongly focused travel patterns, such as commuting to downtowns or other major activity centers.

Many growing communities find that the roadway system alone does not meet all of the needs of their residents and workers. Those market segments that are unable to use a car (e.g., elderly, low income, disabled persons) are often left without any viable mobility choices if a public transit system is unavailable. In the past two decades, transit planners have experimented with a range of transit services to meet the mobility needs of suburban development patterns. For example, many growing communities have looked to provide limited transit service that is targeted at a specific travel market segment or non-traditional transit services (such as flexible route and flexible schedule services) that are more effective for low density areas.

As discussed in the Existing Conditions Report for this study, Warner Robins has experienced significant growth over the past 20 years. In 1990, the population of the WRATS study area was 95,654 and its employment was 52,439. By 2010, its population had grown to 148,802 and its employment was 81,141. The Warner Robins area also has a significant population of persons who are transportation disadvantaged (e.g., disabled persons, senior citizens, low income households, and households without a motor vehicle). The area's overall population density is relatively low, with higher densities of population, employment, and transportation disadvantaged residents concentrated primarily within Warner Robins and Centerville and, to a lesser degree, in Perry and Byron. However, the area is also home to Robins Air Force Base (RAFB), the largest industrial employer in the State of Georgia.

These development patterns have implications on how transit services may be provided. Population density is a basic measure of transit ridership potential; employment density is also an important measure of transit demand because the largest share of transit travel is for commuting to and from work places. Areas with higher densities tend to have higher rates of public transportation usage, and denser areas also make for more efficient transit routes. The lower average density of the Warner Robins metropolitan area means not only that fewer origins or destinations will be within walking distance of transit routes, but also that the distances traveled between points, on average, are longer. In addition, the sparseness and patterns of suburban and rural streets will result in less direct routings and more vehicle miles traveled to serve activities than in more urban settings.

The selection of transit options for a successful transit system in the Warner Robins area will depend to a large extent on segmenting the various travel markets and matching them to the most appropriate transit services. For example, weekday commuter traffic to and from RAFB tends to occur at specific peak times, which are somewhat different from traditional typical peak periods, whereas the Galleria Mall and other commercial areas have peaks extending into the evening and the weekend. By contract, midday travel demand tends to be greater for residents unable to use a car going to medical appointments, social services, and shopping.

Current Transit Services in the Warner Robins Area

Today, limited public transit options exist within the Warner Robins metropolitan planning area. They include human services coordinated transportation within Houston County, fully coordinated transit services in Peach County, a recently implemented express route between Macon and RAFB, and a vanpool program for RAFB employees. Each of these is discussed briefly below.

The Georgia Department of Human Services (DHS) contracts with the Middle Georgia Regional Commission (MGRC) to provide human services coordinated transportation. The DHS coordinated transportation system provides services to clients of several DHS divisions, including the Division of Aging Services (DAS), the Division of Family and Children Services (DFACS), the Division of Behavioral Health and Developmental Disabilities (DBHDD), and the Division of Public Health (DPS). The system also provides transportation services to clients of the Department of Labor's Vocational Rehabilitation Services Program (DOL/VRS). The MGRC is currently sub-contracting with the Middle Georgia Community Action Agency (MGCAA) to deliver transportation services in both Houston and Peach Counties, as well as six other counties in the Middle Georgia Region.



In Houston County, these transportation services are restricted to DHS clients, and are not available to the general public. The services in Houston County, therefore, do not meet the definition of public transit. Trips for clients are also subject to the limitations of each specific program. This means, for example, that a person who is able to get off of temporary financial assistance through employment loses their eligibility for DHS transportation services once his/her income reaches a certain level, even though they may not yet be able to afford to drive a car.

By contrast, in Peach County, transit services are considered to be fully coordinated. This is because the MGCAA provides not only DHS coordinated human services trips, but also trips for the general public. Trips are bundled and/or combined when applicable, allowing for the most efficient and cost-effective provision of services.

Peach County Transit's public transit services are funded with a combination of Federal Transit Administration (FTA) Section 5311 (Non-urbanized Area Formula Program) and Section 5310 (Elderly and Persons with Disabilities Program) funds, local funds, and farebox revenues. Public transit is provided on weekdays from 8:00 a.m. to 5:00 p.m., with advance reservations required. The fare is \$1.00 per stop up to \$5.00 within Peach County; \$2.00 per stop up to \$6.00 for locations up to 50 miles outside Peach County; and \$0.24 per mile for locations over 50 miles away.

Additionally, the Georgia Department of Community Health's (DCH) Medicaid Non-Emergency Transportation program provides transportation for eligible Medicaid members who need access to medical care or services. However, this program only provides services to members when other transportation is not available and eligibility has been determined. The Middle Georgia Region is currently serviced by Southeastrans, Inc.

As the largest employer in the area, RAFB is experiencing parking availability problems and generates significant traffic congestion associated with employees commuting to and from the base. These concerns, along with a high priority placed on maintaining the area’s air quality attainment status, prompted RAFB and local leaders to explore a number of avenues to encourage the use of transit and carpools/vanpools in recent years.



In November 2010, the Macon-Bibb County Transit Authority (MTA) implemented a service known as the “Buses into Robins Daily” (BiRD) route. This route operates weekdays from 4:45 a.m. until 10:05 a.m. and then again from 1:20 p.m. until 7:00 p.m. Frequencies range between 20 and 60 minutes. The fare for the route is \$3 one-way (\$6 per daily round trip), but is 100% reimbursable for military personnel and civilian employees enrolled in the Transportation Incentive Program (TIP). Additionally, RAFB administers a vanpool program with approximately 60 commuter vans and

partners with the Clean Air Campaign. The Clean Air Campaign helps commuters find carpooling partners and offers cash and prizes to commuters who carpool, vanpool, bicycle or walk. The TIP offers financial benefits to those who share rides in vehicles carrying six or more passengers.

Public Transit Service Types Considered

The various types of possible public transit service options vary in terms of level of service, routing, and scheduling. Level of service is related to the span of service provided throughout the day and on which days the service is provided and how frequently the service is provided. Routing is the path or alignment the vehicles travel to provide access to the system for riders and to serve destinations. Scheduling defines when transit vehicles will be available to riders for service at predetermined times between locations. Both routing and scheduling can be fixed or flexible. Both fixed and flexible services are being considered for the Warner Robins area, as they are well suited for smaller urbanized and/or rural areas. A brief summary of the service types considered for this study are described below.

Express Bus Service

Express transit service traditionally consists of commuter-oriented routes that originate at one or more park & ride facilities and terminate at a high-density employment destination. They are usually peak-oriented, meaning morning trips operate from the park & ride to the employment destination while afternoon trips operate in the reverse sequence. Stops on express transit service are often limited to the route termini. However, exceptions have been made in locations where local services intersect the express route and provide connection opportunities to passengers on the local route who share the same destination as the express route. However, to keep the express route timely



and competitive with the single-occupancy vehicle, it is important to apply connecting stops sparingly. Upon reaching the employment destination, express routes may also be used to distribute riders within the workplace campus. This is particularly applicable to larger sprawling facilities such as the RAFB.

Local Bus Service

Local bus service is best described as fixed-route service that operates along a pre-determined alignment. In most cases, local service operates on a regularly published schedule. This allows riders to plan their trips with a minimum amount of time spent waiting for the bus to come along. Given the diversity of riders' origins and



destinations, local transit passengers may find it necessary to connect to one or more routes to complete their journey. A local transit route may include a mix of origins and destinations including residential, commercial and institutional uses. As such, local transit service fills many more trip purposes than its express counterpart. While express routes can operate independently with little to no interaction with other services, local transit service routes work best when they are part of a comprehensive network of routes. Thus, local service may be comprised of several routes that either cross or meet at predetermined transfer points.

Unlike express service, local transit service is subject to federal Americans with Disabilities (ADA) requirements to provide complementary paratransit service within $\frac{3}{4}$ mile of the route's alignment. Complementary paratransit requirements are discussed further below.

Deviation/Flex Route Bus Service

One variation of local transit service is route or point deviation, or flex route, service. In this service model, the local route is designed with enough flexibility in its schedule to deviate from the regular alignment to serve locations within a limited nearby buffer area. With route deviation service, vehicles travel along a fixed route and maintain a schedule, but may leave and return to the fixed route to pick up passengers within a limited distance from the route. With point deviation service, vehicles make stops at certain points at scheduled times, but the vehicle has the flexibility to follow any route needed to pick up passengers along the way.

Deviation service offers the advantage of offering the potential for curb-to-curb service for any rider. While the additional convenience of flexible route service may help attract choice riders, it clearly offers better service opportunities for individuals needing special service who might otherwise require a demand response alternative (such as the disabled and elderly). It also has the added benefit of spreading the limited resources of the system to more areas of the community. Deviation service in the Warner Robins area would allow the transit vehicles to reach further into the residential neighborhoods of the community without good walk access to collector or arterial roadways, and thus bring the service closer to residents. Another benefit of deviation service is that it does not require complementary paratransit service, because it is considered equivalent to that which would be required under the ADA. Thus, the deviation service model can provide some level of cost savings.

The disadvantages of deviation service are that it can result in a more volatile schedule and may lengthen the time on board for passengers. Deviation service works best in areas where most of the riders have some flexibility in their schedules that allow for deviations without it being seen as a decrease in service quality.

Demand Response Service

Demand response service is the most flexible type of service, and is activated based on passenger requests. Also known as Dial-a-Ride service, passengers call ahead to request a ride for a particular date and time between a particular origin and destination. Passengers are picked up and dropped off either at the door or at the closest curb location along the road. A demand-response operation can be characterized by two main attributes. First, the vehicles do not operate over a fixed route or on a fixed schedule except, perhaps, on a temporary basis to satisfy a specific need. Second, the vehicle typically is dispatched to pick up several passengers at different pick-up points before taking them to their respective destinations and may even be interrupted en-route to these destinations to pick up other passengers.



Demand response service can be provided as subscription service, advanced reservation service, or real-time scheduling service. Subscription services work best when a passenger or group of passengers requests the same trip repetitively. These trips are scheduled on a subscription or “standing order” basis. Advanced reservation services require passengers to call ahead and reserve a ride for a particular date and time in the future, for every trip they make. Many operators provide both subscription and advanced reservation services. Real-time scheduling closely resembles taxi operations and allows passengers to call and request a trip just before it is needed. This type of service is not common among public transit operators as a stand-alone service, but some providers will try to fit last-minute callers into scheduled trips when possible.

In terms of ADA requirements, if no fixed-route service is provided, the options available for a public demand response service (ranked low cost to high) are:

1. Provide no demand response service, as there is no federal ADA requirement in an area without fixed-route service.
2. Provide demand response service in a limited geographic area with a limited level of service. *Operational implications – provides curb-to curb or door-to-door service operated in a fashion which does not place constraints by origin and destination, but may not reach or optimally serve all residents.*
3. Provide demand response service on a county-wide basis at optimal level of service. *Operational implications – provides curb to curb or door to door service operated in a fashion which does not place constraints by origin and destination.*

Complementary Paratransit Service

Complementary paratransit service is a specific type of demand response service, required by the ADA. The regulations to the accommodation of disabled individuals as specified in the ADA. The ADA regulations are intended to mainstream people with disabilities into a common transportation system by ensuring that the basic system is accessible, and to provide a “safety net” of service for those who cannot use the fixed-route system. In most communities, this requirement is met by providing a separate service in addition to fixed-route local bus service to accommodate disabled persons who cannot use the fixed-route system.

The ADA also includes requirements regarding vehicle accessibility. In almost all cases, vehicles used in transit service must be readily accessible to and usable by individuals with disabilities, including individuals who use wheelchairs. In simple terms, this means that the vehicles must have wheelchair positions and lifts or ramps.



When local fixed-route service is provided, paratransit service must also be provided to those individuals unable to use the fixed-route service, as defined in the ADA. The paratransit service element must be “complementary” and “comparable” to the fixed-route transit service. Specifically, the paratransit service must, at a minimum:

- be provided in all areas where local fixed-route service is operated (defined, at a minimum, as all areas within $\frac{3}{4}$ of a mile of fixed routes);
- offer at least “next day” service, with advance reservations more than one day in advance to be defined locally;
- have a fare that is no more than twice the base, non-discounted fixed-route fare;
- be provided during all days and hours that local fixed-route service is operated;
- be provided for all types of trips, without prioritization; and
- be offered without waiting lists, trip caps, or other capacity constraints.

When local fixed-route service is provided by a public entity, paratransit service is a required complementary element. However, for other types of services, the paratransit requirements differ:

- Commuter (express) bus service does not require complementary paratransit service, however all vehicles must meet ADA accessibility requirements.
- Route or point deviation service does not require complementary paratransit service, because it is considered equivalent to that which would be required under the ADA.

- Demand response service does not require complementary paratransit service, because it is considered equivalent to that which would be required under the ADA.

Service providers can choose to expand the paratransit service beyond the basic requirements if they so desire. If fixed-route service is provided, the options available for the complementary paratransit service (ranked low cost to high) are:

1. Provide complementary paratransit service only in the required ¼ mile buffer area only at levels required in ADA. *Operational implications – paratransit service would provide origin/destination service within the fixed-route buffer area.*
2. Provide complementary paratransit service in required buffer area plus demand response service in expanded geographic area (which could include the entire urbanized area or county) with a limited level of service (i.e., a limited service schedule such as only on certain days of the week or with user pre-scheduling requirements). *Operational implications – would function in a fashion which mirrors fixed-route service providing origin/destination service focused primarily on the required buffer area, with feeder demand response service in the and out of the buffer area.*

Circulator Service

Circulator service is a form of fixed-route bus service that operates within the confines of a small area, such as downtown area, regional activity center (e.g., large office and/or retail employment centers, military installations), or suburban neighborhood. These routes typically connect to other more regional transit services, such as local bus routes (or rail stations in large urbanized areas). These circulators cater to short trips, and passenger fares are typically nominal or free.

Vanpool Service

Vanpool service is comprised of vans operating as a ride sharing arrangement, providing transportation to a group of individuals traveling directly between their homes and a regular destination within the same geographical area. The vehicles usually have a minimum seating capacity of seven persons, including the driver. Vans are driven by the commuters. Vanpoolers typically agree to meet at a central place in the mornings and are dropped off at work by the driver.

Many transit agencies operate vanpool service in addition to local and/or express bus service. Some simply administer free, personalized ridematching services to help commuters who have similar work hours and origination and destination points find vanpool partners. Others also provide the van, gas, maintenance and insurance for a monthly fare.



Initial Public Transit Service Options

After soliciting input from the Steering Committee, stakeholders, and the public and analyzing the unique travel needs of the Warner Robins metropolitan area, two types of service were identified for potential

implementation—express transit service and local transit service. Two options for meeting the ADA paratransit requirements were also identified: providing deviation service or providing a separate paratransit system.

Express Bus Service

As discussed earlier, the Warner Robins area is served by a single express route between Macon and RAFB – MTA’s BiRD route. This study recommends expansion of express services to serve RAFB employees living in other nearby communities, specifically Byron, Centerville, Lake Joy and Perry. These potential express routes are described below. Each route name is color-coded to correspond with its depiction on the map (Figure 2) that follows.

Byron-Centerville-RAFB Express

An express route between North Peach Park and RAFB via Galleria Mall is recommended to serve the residents of Byron and Centerville who work at or near RAFB. Fenced-in parking is already provided at North Peach Park in Byron, thus few (if any) capital improvements would need to be made for service start-up. Likewise, parking at the Galleria Mall in Centerville is also plentiful and would only require a use agreement for service implementation. From the North Peach Park, the route would operate east on White Road and Thompson Road to North Houston Lake Road and turn south. The bus would then deviate into the Galleria Mall to serve the park & ride area. Returning to Watson Boulevard, the route would continue east to RAFB’s Gate 4 and distribute passengers on base, much like the MTA BiRD route does today. In the afternoon, trips would operate in the reverse sequence, returning to Galleria Mall and North Peach Park.

Proposed route characteristics are as follows:

- Distance: 10.3 miles (one-way)
- Service frequencies: every 30 minutes in the peak period/direction
- Span of service: Monday–Friday; 5:00–9:00 a.m. and 2:30 -6:30 p.m.

Perry-Lake Joy-RAFB Express

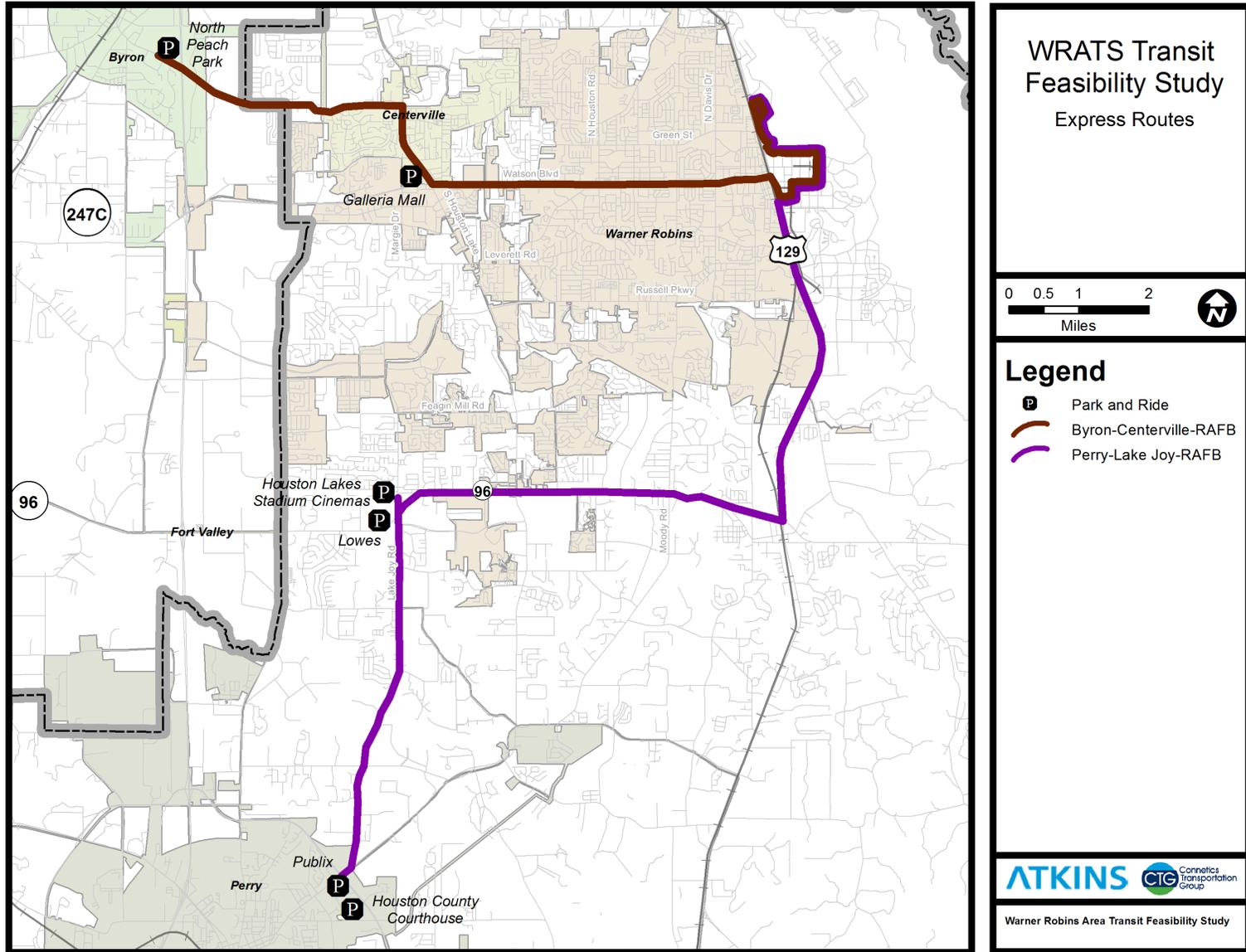
An express route between the Paradise Shoppes of Perry (Publix near Perry Parkway and Houston Lake Road) the Houston Lakes Stadium Cinemas (near Lake Joy Road and GA 96) and RAFB is recommended to serve the Perry and Lake Joy communities. Parking appears to be plentiful at both sites during the peak daytime hours and would only require use agreements with the respective property owners. In absence of such an agreement with the Paradise Shoppes of Perry, the nearby Houston County Courthouse property would also be suitable for park & ride operations. Likewise, the adjacent Lowes Home Improvement property would be a suitable replacement for the Houston Lakes Stadium Cinemas should parking at that facility be unattainable. From the Perry park & ride, the route would operate west on Perry Parkway and then north on Houston Lake Road and Lake Joy Road to the Lake Joy park & ride. From here, the route would return south on Lake Joy Road and then east on GA 96. At GA 247, the route would continue north to RAFB’s Gate 4 and distribute passengers on base, much like the MTA BiRD route does today. In the afternoon, trips would operate in the reverse sequence, returning to the Lake Joy and Perry park & rides.

Proposed route characteristics are as follows:

- Distance: 17.0 miles (one-way)

- Service frequencies: every 30 minutes in the peak period/direction
- Span of service: Monday–Friday; 5:00–9:00 a.m. and 2:30 -6:30 p.m.

Figure 2– Proposed Express Routes



Local Bus Service

Four local transit routes are proposed for the Warner Robins area. These routes are intended to serve a variety of trip purposes including employment, shopping, education and medical trips. Thus, they serve a variety of land uses along their respective paths. The local bus routes are assumed to be interlined to provide for operational efficiencies. This technique matches routes with excess layover time with routes with insufficient layover time, thus reducing revenue bus-hours and bus-miles. It can also allow for a reduction in the number of peak buses required when layover times are more robust. The following sections describe these potential local services. Each route name is color-coded to correspond with its depiction on the map (Figure 3) that follows.

Watson Boulevard

A local service between Galleria Mall and RAFB via Watson Boulevard is recommended to serve Warner Robins' commercial spine. From the mall, the route would operate south on Margie Drive and then east on Watson Boulevard to RAFB. Stops would be placed every 750-1,000 feet¹ or as demand dictates and right-of-way permits. Popular locations served along the route would include Warner Robins Place, City Crossing, Watson Central Shopping Center, Houston Mall Shopping Center, Williams Plaza Shopping Center, Houston Medical Center, Macon State College and Warner Robins City Hall. Upon reaching RAFB's Gate 3, the route would turn around prior to the gate and return to Galleria Mall using the reverse sequence of travel.

Proposed route characteristics are as follows:

- Distance: 5.8 miles (one-way)
- Service frequencies: every 60 minutes in the peak, midday, and early evening periods
- Span of service: Monday–Friday; 6:00 a.m.–8:00 p.m.

South Houston Lake Road

A local service between Galleria Mall and Middle Georgia Technical College via Houston Lake Road is recommended to serve the growing Houston Lake/GA 96 area. From the mall, the route would operate east on Gunn Road and then south on Houston Lake Boulevard to Leverette Road. Here the route turns left and continues to Carl Vinson Parkway, south to Russell Parkway and then west back to Houston Lake Road. The bus continues south on Houston Lake Road until reaching Cohen Walker Drive and turning right to Middle Georgia Technical College (MGTC). Upon reaching MGTC, the route will complete a loop via Bear Country Boulevard and GA 96, returning to Galleria Mall using the reverse sequence of travel as the southbound trip. Stops would be placed every 750-1,000 feet or as demand dictates and right-of-way permits. Popular locations served along the route would include the Houston County Annex Building, Houston County State Court, Georgia Drivers License Department, Pilgrim Center, The Shoppes at Houston Lake, Georgia Department of Families and Children's Services, Houston County Health Department and Houston County High School. In addition, there are several apartment communities and medical offices situated along the route.

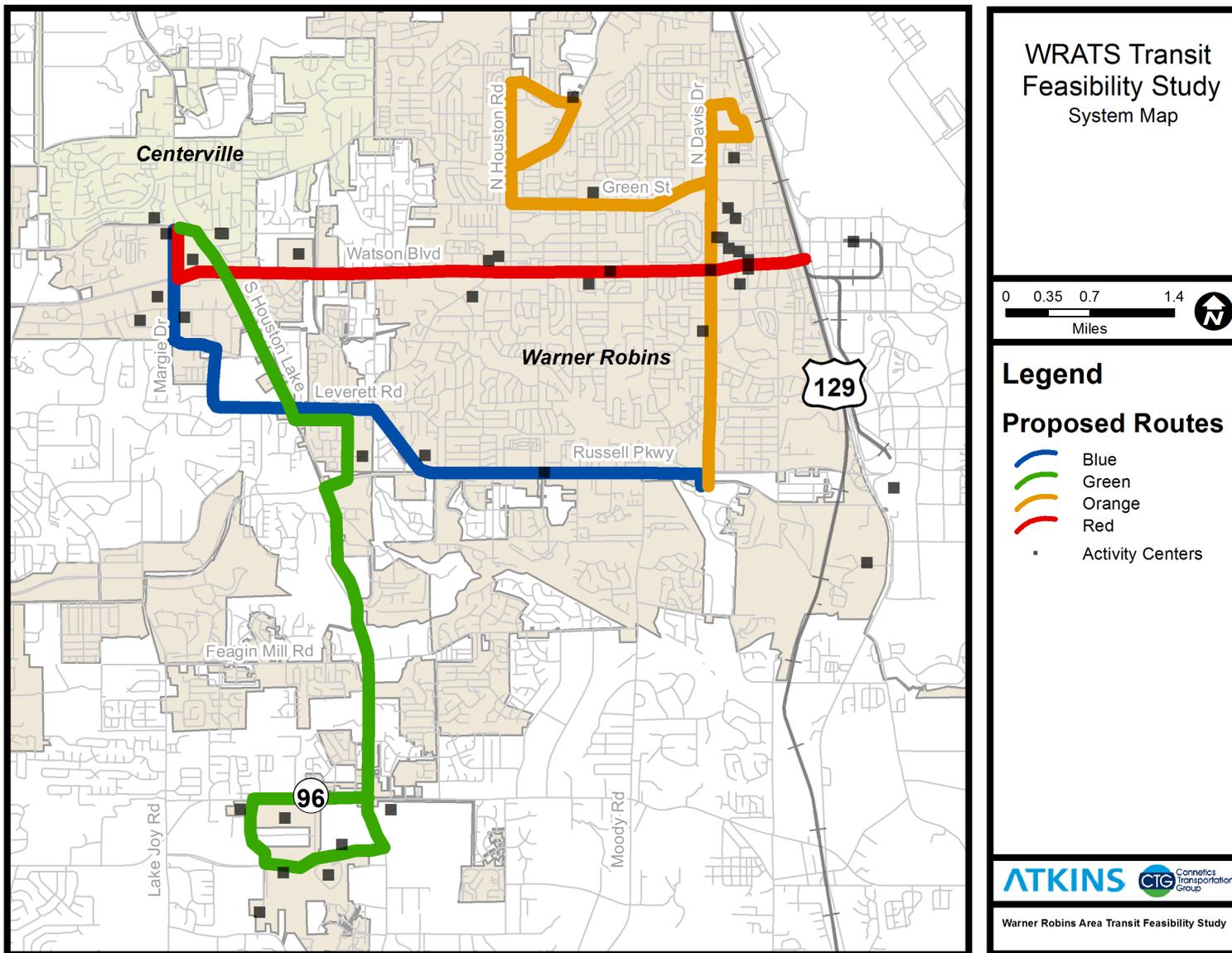
Proposed route characteristics are as follows:

- Distance: 7.5 miles (one-way)

¹ TCRP Report 19 – Guidelines for the Location and Design of Bus Stops

- Service frequencies: every 60 minutes in the peak, midday, and early evening periods
- Span of service: Monday–Friday; 6:00 a.m.–8:00 p.m.

Figure 3 – Proposed Local Routes



Russell Parkway

A local service between Galleria Mall and the South Warner Robins Walmart via Russell Parkway is recommended to serve Warner Robins' second major east-west arterial and commercial activity center. From the mall, the route would operate south on Margie Drive and then east on Smithville Church Road to Leverette Road. Here the route continues to Corder Road, turning right and then left on Russell Parkway. The route's eastern terminus is at the Walmart located near Russell Parkway and Davis Drive. Stops would be placed every 750-1,000 feet or as demand dictates and right-of-way permits. Popular locations served along the route would include Fort Valley State University, Warner Robins Middle School and the Houston County Career and Technology Center. In addition, there are several apartment communities situated along the route as well as multiple employment opportunities at area hotels and retail businesses. Upon reaching Walmart, the route would turn around and return to Galleria Mall using the reverse sequence of travel.

Proposed route characteristics are as follows:

- Distance: 6.3 miles (one-way)
- Service frequencies: every 60 minutes in the peak, midday, and early evening periods
- Span of service: Monday–Friday; 6:00 a.m.–8:00 p.m.

Davis Drive

A local service between the South Warner Robins Walmart and Warner Robins' north side via Davis Drive is recommended to serve some of Warner Robins' most economically challenged neighborhoods. From Walmart, the route would travel north on Davis Drive. At Green Street, the bus would operate a one-way branch loop via Davis Drive, Tabor Drive and Ignico Drive and back to southbound Davis Drive. At Green Street the route would travel west and then north on Houston Road. The northern terminus is completed via a one-way loop along Greenbriar Road and Elberta Road back to southbound Houston Road. At Houston Road, the route would return to the South Warner Robins Walmart using the reverse sequence of travel, including the one-way branch loop along Tabor and Ignico Drives. Stops would be placed every 750-1,000 feet or as demand dictates and right-of-way permits. Popular locations served along the route would include Warner Robins High School, Happy Hour Service Center, Middle Georgia Community Action Agency, Georgia Military College, Warner Robins Houston County Housing Authority, Houston County Council on Aging and Northside High School. In addition, there are several apartment and public housing communities situated along the route as well as a number of neighborhood markets and retail businesses.

Proposed route characteristics are as follows:

- Distance: 7.5 miles (one-way)
- Service frequencies: every 60 minutes in the peak, midday, and early evening periods
- Span of service: Monday–Friday; 6:30 a.m.–8:30 p.m.

Flex Route Service

Many areas across the country have come to realize that there are areas in their service zone that do not have the population and/or employment density to support cost-effective local fixed-route service. Nonetheless, there are still needs and demands for service in the area which outweigh the capacity of a typical demand-responsive service. In instances like these a hybrid between fixed-route and demand-response service has proven to be an effective delivery model. Such a route is recommended to serve the Perry Community as outlined below and shown in Figure 4.

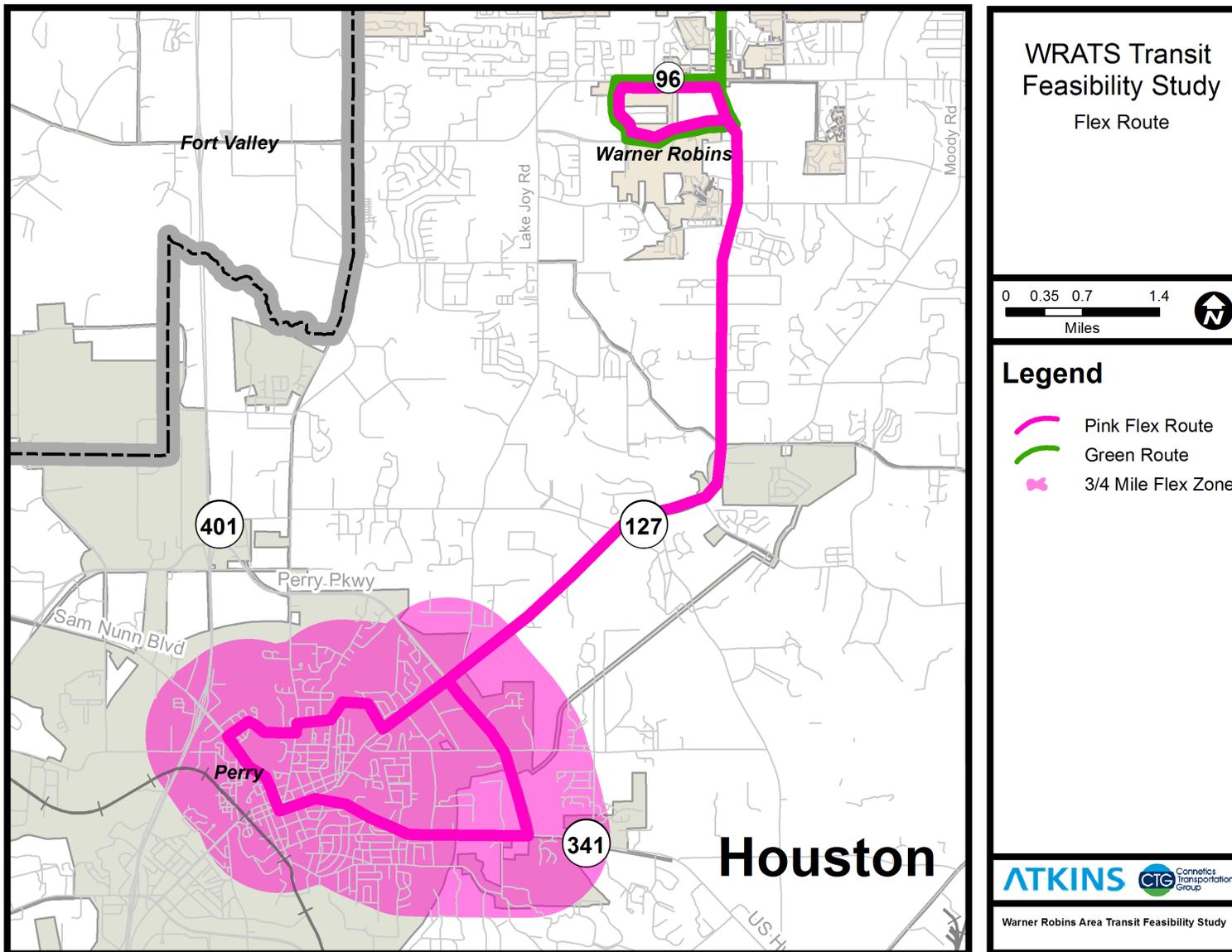
Perry Flex Bus

A flex route service between Middle Georgia Technical College (MGTC) and Perry via Houston Lake Road is recommended to serve the Perry community. From MGTC, the route would complete a loop via Bear Country Boulevard and GA 96, turning southbound on Houston Lake Road toward Perry. Between MGTC and Perry Parkway, the route would operate the same as any traditional local route with stops placed every 750-1,000 feet or as demand dictates and right-of-way permits. South of Perry Parkway, the route would follow a pre-determined routing. However, time would also be built into the schedule to allow demand-responsive deviations within a ¼ mile buffer along each side of the route's alignment. From southbound Houston Lake Road and Perry Parkway the route would continue south to Davis Drive and then right to Park Avenue. At Macon Road (US 41) the route would turn left and then right on Perimeter Road. The route then turns left at Sam Nunn Boulevard (US 341) and continues on Washington Street. At Main Street, the route turns left again and proceeds to Perry Parkway. After turning left on Perry Parkway, the route completes its loop by turning right on Houston Lake Road where the flex zone ends. From here the route makes its way back to MGTC via Houston Lake Road and Cohen Walker Drive. At MGTC connections with the rest of the local route network would be facilitated through a times transfer with the **South Houston Lake Road Route**. Popular locations served along the route would include the Georgia Department of Families and Children's Services, Houston County Health Department, Houston County High School, Pilgrim Center, The Shoppes at Houston Lake, Paradise Shoppes of Perry (Publix), Perry High School, Perry Village Shopping Center, Plaza Shopping Center (Walmart), Perry City Hall, Perry Library, Perry Hospital and the Houston County Courthouse. In addition, there are several apartment communities and neighborhood retail businesses along the route.

Proposed route characteristics are as follows:

- Distance: 23.3 miles (one-way)
- Service frequencies: every 120 minutes in the peak, midday, and early evening periods
- Span of service: Monday–Friday; 6:30 a.m.–8:30 p.m.

Figure 4 – Proposed Flex Route



Complementary Paratransit Service

Under the ADA, any transit system providing local fixed-route service is required to provide complementary paratransit service for disabled persons. Complementary paratransit service is required for passengers who are:

- Unable to navigate the public bus system;
- Unable to get to a point from which they could access the public bus system; or
- Have a temporary need for these services because of injury or some type of limited duration cause of disability.

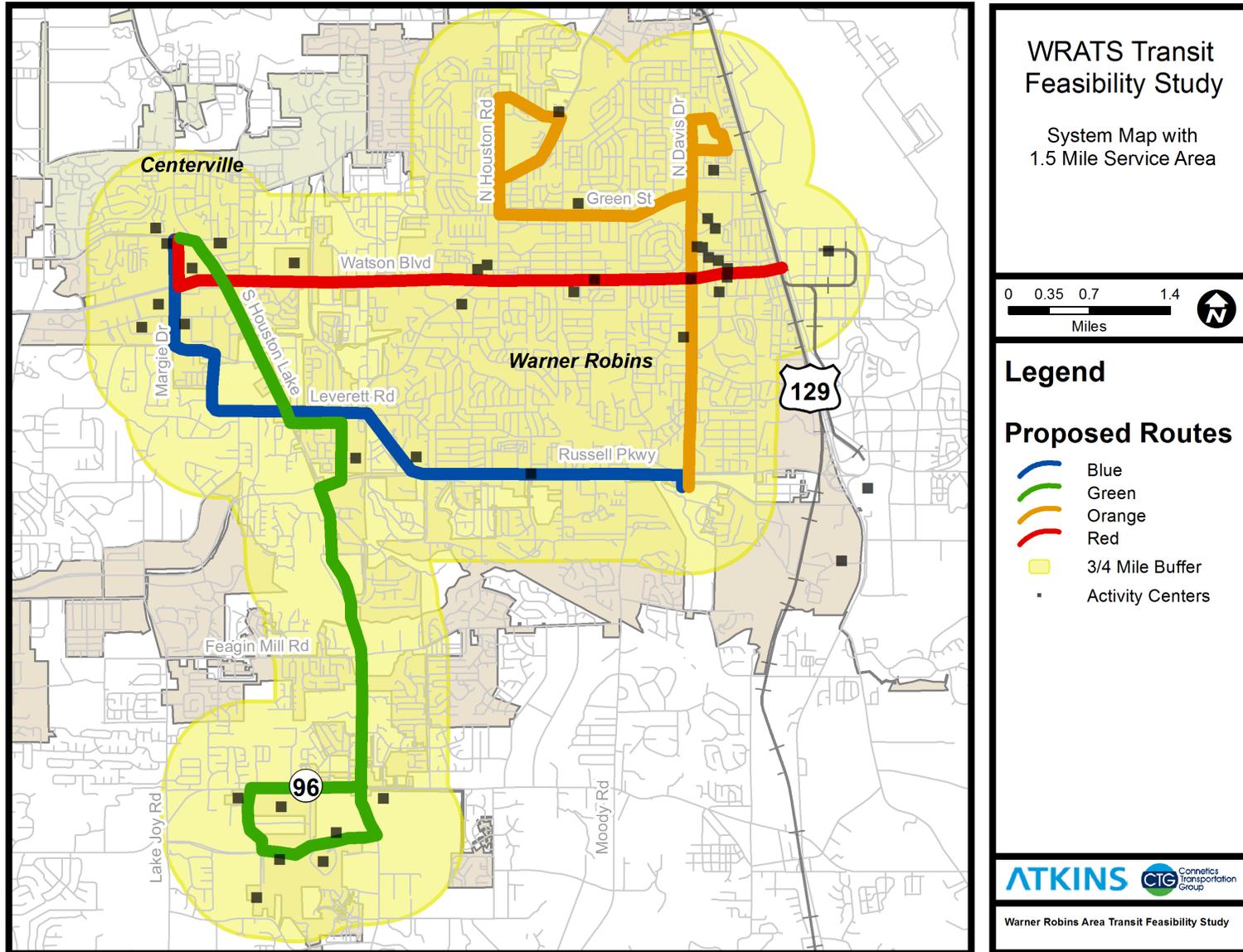
The minimum requirements and expansion options for complementary paratransit service were discussed in a previous section. For this study, it has been assumed that the service would be designed to meet the minimum requirements. Thus, the ADA paratransit service area has been defined as a $\frac{3}{4}$ mile buffer around each local fixed-route.

As previously discussed, express services, such as the **Byron-Centerville-RAFB Express** and **Perry-Lake Joy-RAFB Express** routes, are exempt from complementary paratransit requirements. Also, the demand-response portions of the **Perry Flex Bus** are also exempt, as the $\frac{3}{4}$ mile buffer is already accommodated as part of the route's service area. However, the traditional local service portion of the route (segments north of Perry Parkway) is subject to complementary ADA service. As such, nearly all of Warner Robins and most of Centerville fall within the $\frac{3}{4}$ mile buffer zone and would be eligible for ADA paratransit service, as shown in Figure 5.

There are two ways to approach ADA paratransit service in the Warner Robins area, each with its own set of advantages and disadvantages. The first would be to provide a separate ADA paratransit service. This service would be operated with its own set of buses with trips scheduled in advance through a call center. Trips between nearby origins and destinations at similar times of day would be combined to create shared economies of scale. Local fixed-route service would not be impacted by the ADA paratransit service as both would be operated independently. It is estimated that three buses would be needed to provide dedicated ADA paratransit service.

The second option is to create flex routes out of all of the local fixed-route services. This type of service would meet the ADA requirements because it is considered equivalent to what is required under the ADA. Much like the Perry Flex Bus, a $\frac{3}{4}$ mile buffer zone would be created around all local routes. Buses would be able to deviate within that buffer zone. Buses would have a limited amount of time available within each trip when, provided time is available, the bus can be rerouted to pick up and drop off passengers at locations that are not on the route. Additional time would be embedded into each schedule to support these deviations, making the on-time performance much more volatile to through riders. Using the flex route model, it is estimated that two additional buses would need to be operated among the four local routes to maintain a 60-minute frequency.

Figure 5 – Local Fixed Route Service with ¾ Mile ADA Paratransit Buffer



Transfer Locations

The Local and Flex Route service described above will be dependent on timed transfers to maximize connectivity between routes. This means that whenever possible, routes will be deliberately scheduled to meet at various locations where their alignments intersect. As such, appropriate facilities will need to be provided to accommodate the potential staging of multiple buses as well as awaiting passengers. Key transfer locations and the routes that serve them in the initial service options include:

- Galleria Mall - **Byron-Centerville-RAFB Express**, **Watson Boulevard**, **South Lake Houston Road** and **Russell Parkway**
- South Warner Robins Walmart - **Russell Parkway** and **Davis Drive**
- Intersection of Watson Boulevard & Davis Drive (on-street) - **Watson Boulevard** and **Davis Drive**
- Middle Georgia Technical College (on-street) - **South Lake Houston Road** and **Perry Flex Bus**

Estimated Operating Requirements

While the initial service options focus on a single set of route alignments, there are two options concerning ADA paratransit service delivery which impact the revenue-hours, revenue-miles and number of buses needed to operate the system and ultimately the cost to provide the service. Operating requirements were estimated for the initial transit service options, including annual revenue-hours, annual revenue-miles, and peak buses. These characteristics were estimated for the proposed express, local, and flex routes, as well as ADA paratransit service. Estimates of revenue-hours and revenue-miles, both daily and annualized, are outlined below in Figure 6. Route level operating statistics are provided in greater detail in Appendix A at the conclusion of this document for the express, local, and flex route service. ADA paratransit service estimates were based on ratios of peak local route vehicles to paratransit vehicles, and peak paratransit vehicles to paratransit revenue bus-hours and bus-miles for the most comparable peer systems.

Figure 6 – Estimated Operating Requirements for Initial Service Options

Route Name	Route Description	Separate Paratransit Service			Flex Route Paratransit Service		
		Daily Revenue Bus-Hours	Daily Revenue Bus-Miles	Peak Vehicles Required	Daily Revenue Bus-Hours	Daily Revenue Bus-Miles	Peak Vehicles Required
Express Service: 5:00-9:00 a.m./2:30-6:30 p.m.		16 trips			16 trips		
Brown	Byron-Centerville-RAFB	16	165	2	16	165	2
Purple	Perry-Lake Joy-RAFB	24	272	3	24	272	3
Local Service: 6:00 a.m.-8:00 p.m.		60-minute frequency			60-minute frequency		
Red	Watson Boulevard	14	162	1	21	204	1.5
Blue	Russell Parkway	14	210	1	21	252	1.5
Green	South Lake Houston Road	14	176	1	21	218	1.5
Orange	Davis Drive	14	210	1	21	252	1.5
Flex Service - 6:30 a.m.-8:30 p.m.		120-minute frequency			120-minute frequency		
Pink	Perry Flex Bus	15	176	1	15	176	1
ADA Paratransit Service: 6:00 a.m.-8:00 p.m.							
ADA Paratransit Service		21	315	3	n/a	n/a	n/a
Total Daily Statistics		132	1,686	13	139	1,539	12
Total Annual Statistics		32,700	418,200		34,500	381,700	

Implementation Considerations

This section evaluates the various management options for operating the proposed transit service options. The management structure must allow for effective and efficient management and control of costs while being consistent with the laws and regulations that define the City’s and/or partnering local government’s powers.

Potential Management Options

There are a number of potential management options available to local officials to implement and operate the fixed route transit service. Each management option has distinct advantages and disadvantages that can vary significantly depending on overall City/County objectives, the type(s) of services to be provided, financial resources, accountability, ease of implementation, legal impacts, and other issues.

Four management options were defined, representing different types of involvement by the City of Warner Robins and other public entities in providing the services identified. Opportunities for the public entities to contract out the transit services were given special attention. One benefit from contracting service is obtaining a lower cost through competitive bidding. The competitive process would give bidders an incentive to offer their services at the lowest possible cost. A second benefit is flexibility in dealing with employees and workplace issues. Where public employees provide public services, it can be difficult to make major changes, such as major expansion or reduction in the amount of service provided. By contrast, when a service provider is retained by contract to provide service, the contracts can be structured to be periodically reviewed, or to require regular renewal or renegotiations at which time changes can be made. Also, if any of the new proposed transit services proved to be unsuccessful, the public agency likely could more easily discontinue that service if it was contracted out.

A broad outline of potential management options for providing the public transit services are presented below. All of these options assume a primary role by the City of Warner Robins, given the proposed focus of the service area on Warner Robins, although Houston County, the City of Byron, the City of Centerville, and the City of Perry would likely also be public partners, depending on the services implemented. Another potential option could be for the MGRC to assume the primary role in providing the transit services, in partnership with the local governments.

Option A – City Owned & Operated. The City of Warner Robins would have the primary responsibility to plan, finance and operate all of the recommended public transportation services. The City would purchase vehicles and employ all personnel required for service delivery.

Option B -- Contract Service. This option would involve the City of Warner Robins having overall responsibility for the operations and contracting with a service provider which would be responsible for providing all aspects (buses, garage, bus stops/shelters, employees) of the recommended public transit services. Under this approach, the City would most likely issue a Request for Proposals (RFP) to qualified operators who would develop technical and cost proposals for a pre-determined level of service specified in the RFP. Then, the City would receive proposals, evaluate, and select the best qualified service provider based on a set of pre-determined evaluation criteria.

It is important to note that the service provider could be private or public. Thus, the MGCAA, MTA, or any one of the numerous companies providing contract transit services could propose and be selected to provide the services. As previously discussed, the MGCAA is already providing service in the area (Georgia DHS coordinated transportation services in Houston County and fully coordinated transit services in Peach County), and MTA is providing express service between Macon and Warner Robins. Additionally, in early 2012, MTA sought and was granted authority by the State of Georgia to contract with counties and municipalities outside of Bibb County to provide public transit services.

Option C – City Owned/Operations Contracted Out. This approach is essentially a combination of the two options described above. The City would have overall responsibility for the operations and would purchase and own the vehicles, and perhaps, the vehicle operations and maintenance facility. Then, a service provider would be retained by contract to hire the employees, operate, and maintain the new transit services. In Georgia, there are several transit systems that are examples of this type of service delivery, including Liberty County Transit (serving Hinesville). While the City of Hinesville owns the vehicles, the operations and maintenance are contracted to a private provider.

Option D -- Multi-agency Operating Agreement. Another option would be an interagency operating agreement wherein a public partnership would be formed between two or more

partners (e.g., City of Warner Robins, Houston County, City of Byron, City of Centerville, City of Perry, MGRC). The agreement would establish partner roles and responsibilities for administration, planning, financing, operating and maintaining the various transportation services.

Evaluation of Management Options

The management options discussed above were analyzed with respect to three concerns: legal issues, functional criteria, and compatibility with alternative service plans.

Legal Issues. Each of the management options potentially requires some action by the local governments within the transit service area. An additional legal requirement could be for a voter referendum dependent on financing options that may be considered. The Georgia Constitution prohibits a county from incurring any new debt without the assent of a majority of voters voting in an election held for that purpose. A fiscal liability that cannot be discharged by taxes levied within the year in which the liability is undertaken is considered “debt,” although multi-year vehicle leases are specifically exempted from this requirement by state law.

Functional Criteria. The functional criteria that the public entities take responsibility for is an important concern. With Option A, it is assumed that the City of Warner Robins would take on all functional responsibilities. At the other extreme with Option B, the City could rely on a contract to provide all services including the direct operations, the acquisition of fixed assets (buses, operations and maintenance facility, bus stops and shelters), and marketing and customer service. In between with Option C, the City can retain all responsibilities except for the “pure” transportation and maintenance functions (i.e., for drivers and vehicle maintenance). Option D acknowledges that the service will likely extend into multiple jurisdictions and will involve multiple funding partners. Where in this spectrum the public entities will eventually choose to position themselves will depend on a number of considerations, including knowledge and experience of staff, assumption of risk, and implementation time.

Compatibility with Alternative Service Plans. Regardless of the level of investment in services that the public entities decide to pursue, Option B or C would offer a new public service without significantly increasing the number of City employees and affecting their associated expertise with both the delivery and maintenance of a transit system.

Other Implementation Considerations: Deadhead Costs

“Deadhead” is defined as the time and distance between the overnight parking facility and the first stop of the service. Likewise, the reciprocal time and distance for the return trip in the evening is also considered “deadhead.” Calculated hours and miles in the estimated operating requirements section are based strictly on in-service revenue periods and do not take deadhead into consideration. This can vary significantly, dependent on the operator providing the service. Ideally, the service provider will have a presence centralized to Warner Robins to minimize the cost of moving buses and drivers back and forth to/from the operating base. For example, a service provider based in Warner Robins may only

have to travel five miles or 15 minutes to start the service day. However, a provider based in Macon (e.g., MTA) would have to travel much further distances (approximately 20 miles or 45 minutes), unless there was a local operating and maintenance facility established in the Warner Robins area. Ultimately deadhead adds to the cost of providing service as it consumes resources without raising revenue; thus it should be carefully avoided to ensure efficient operations.

Estimated Operating & Maintenance Costs

The estimated annual cost to operate, maintain and administer a transit system is an important consideration in a transit feasibility study. Operating and maintenance (O&M) costs are expressed as the annual total of employee earnings and fringe benefits, contract services, materials and supplies, utilities, and other day-to-day expenses incurred.

O&M cost estimates for this transit feasibility study are based on actual operating characteristics and costs for the two agencies currently providing service in or to the Warner Robins metropolitan planning area—MTA and MGCAA. While the choices of if, how, and by whom transit service in the area is ultimately operated have yet to be made, the availability of actual recent cost data for operations in the middle Georgia region was viewed as appropriate for the purposes of estimating a range of possible O&M costs for the Warner Robins area.

In general, steps of the O&M cost estimating process are:

- Develop appropriate cost model(s) to evaluate alternatives;
- Calibrate the model(s) for current year operations;
- Generate operating plans and statistics for each study alternative; and
- Estimate annual operating and maintenance costs for each study alternative.

O&M Cost Models

O&M cost models were developed for MTA's bus operations and demand response service, as well as for MGCAA's demand response service. The O&M cost models can be run for any set of input statistics representing the study alternatives, with the resulting cost estimates firmly based on current productivity, consumption levels and costs. These models are summarized below.

Macon-Bibb County Transit Authority

Two MTA cost models were developed for this study, one for bus operations and the other for demand response service. Both use operating statistics and costs as reported in the Authority's National Transit Database (NTD) for the 2011 Report Year (RY). Operating statistics represent the variables used as cost drivers in the O&M cost models, as shown in Figure 7.

Figure 7 – MTA O&M Cost Model Inputs

Supply Variable Inputs	Operating Statistics
<u>Macon-Bibb Co. Transit Authority</u>	
Bus	
Annual Revenue Bus-Hours	91,209
Annual Revenue Bus-Miles	1,265,947
Garages	0.9
Peak Buses	16
Demand Response	
Total Annual Veh-Hours	9,402
Total Annual Veh-Miles	150,523
Garages	0.1
Peak Vehicles	9

Figure 8 presents the Line Item Detail for the bus and demand response cost models. These tables show MTA’s RY 2011 expenses, the input variable associated with each item and the unit cost calculation. The inflation factor adjusts the 2011 unit costs to 2013 dollars using the CPI for South Urban for 2011-2012, and then assumes the same rate for 2012-2013. The last two columns show unit cost and totals in 2013 dollars.

Figure 8 – MTA O&M Cost Model Line Item Details

BUS LINE ITEM DETAIL

Calibration

Expense Line Item	2011 Bus Expenses	Supply Variable Unit Cost Rate (\$2011)				Base Year Resource Unit Cost	Inflation Factor	Results in: 2013\$	
		Revenue Bus-Hours	Revenue Bus-Miles	Garages	Peak Buses			Resource Unit Cost	Estimated Annual Cost
VEHICLE OPERATIONS	\$2,582,151	\$28.31				\$28.31	1.027	\$29.08	\$2,652,323
VEHICLE MAINTENANCE	\$877,931		\$0.69			\$0.69	1.027	\$0.71	\$901,789
NON-VEHICLE MAINTENANCE	\$51,643			\$57,381		\$57,381	1.027	\$58,940	\$53,046
GENERAL ADMINISTRATION	\$1,652,576				\$103,286	\$103,286	1.027	\$106,093	\$1,697,486
TOTALS	\$5,164,301	\$28.31	\$0.69	\$57,381	\$103,286				\$5,304,644
Key Supply Variable Values		91,209	1,265,947	0.9	16			Rev Hours	91,209
Source:								Rev Miles	1,265,947
MTA's RY 2011 National Transit Database report.								Garages	0.9
								Peak Buses	16

DEMAND RESPONSE LINE ITEM DETAIL

Calibration

Expense Line Item	2011 DR Expenses	Supply Variable Unit Cost Rate (\$2011)				Base Year Resource Unit Cost	Inflation Factor	Results in: 2013\$	
		Revenue Veh-Hours	Revenue Veh-Miles	Garages	Peak Vehicles			Resource Unit Cost	Estimated Annual Cost
VEHICLE OPERATIONS	\$185,542	\$19.73				\$19.73	1.027	\$20.27	\$190,584
VEHICLE MAINTENANCE	\$63,083		\$0.42			\$0.42	1.027	\$0.43	\$64,797
NON-VEHICLE MAINTENANCE	\$3,710			\$37,100		\$37,100	1.027	\$38,108	\$3,811
GENERAL ADMINISTRATION	\$118,745				\$13,194	\$13,194	1.027	\$13,552	\$121,972
TOTALS	\$371,080	\$19.73	\$0.42	\$37,100	\$13,194				\$381,164
Key Supply Variable Values		9,402	150,523	0.1	9			Rev Hours	9,402
Source:								Rev Miles	150,523
MTA's RY 2011 National Transit Database report.								Garages	0.1
								Peak Veh	9

Middle Georgia Community Action Agency

The MGCAA cost model is based on costs and statistics provided in the Agency’s Transit System Budget for FY 2013. This data was supplemented with a telephone call to staff about the number of service garages they use. Figure 9 summarizes the input variables used for the MGCAA.

Figure 9 – MGCAA O&M Cost Model Inputs

Supply Variable Inputs	Operating Statistics
Middle GA Community Action Agency	
Demand Response	
Annual Revenue Veh-Hours	81,362
Annual Revenue Veh-Miles	1,175,072
Garages	30
Total Vehicles	65

Figure 10 presents the Line Item Detail for the Agency’s demand response cost model. The table shows the Agency’s 2013 budgeted expenses, the input variable associated with each item and the unit cost calculation. The inflation factor is set at 1.0 because the expenses are already in 2013 dollars.

O&M Cost Results

Using the O&M cost models described above, an annual O&M cost estimate has been developed for each of the initial service options, using the estimated operating requirements presented earlier. The results of applying the O&M cost models to the initial service options are shown in Figure 11.

As previously noted, the choices of if, how, and by whom transit service in the area is ultimately operated have yet to be made. However, three possible scenarios have been developed that make use of the MTA and MGCAA cost models for illustrative purposes. The first and second scenarios are for the service option previously described as express and local service with a separate paratransit system. Scenario 1 assumes that MTA would operate all types of services. Scenario 2 assumes MTA would operate the express and local routes, while MGCAA would operate the ADA paratransit service. The third scenario is for the service option in which the ADA paratransit requirements are met by operating the local routes as flex routes. Scenario 3 assumes that MTA would operate all types of service. MTA has been operating fixed route service since its inception, while MGCAA’s operating experience is strictly in the demand response realm. For this reason, as well as MGCAA’s current location within Houston County, MGCAA was viewed as a logical candidate to operate the ADA paratransit service.

It is important to note that for each scenario, it was assumed that an operations and maintenance facility would be established at a centralized location in the Warner Robins area for the express, local, and paratransit services. Such a facility would be a key element of the start-up of service with minimal deadhead costs.

Figure 10– MGCAA O&M Cost Model Line Item Details

DEMAND RESPONSE LINE ITEM DETAIL

Calibration

Expense Line Item	2013 DR Expenses	Supply Variable Unit Cost Rate (\$2013)				Base Year Resource Unit Cost	Inflation Factor	Results in:	
		Revenue Veh-Hours	Revenue Veh-Miles	Garages	Total Vehicles			2013\$ Resource Unit Cost	2013\$ Estimated Annual Cost
OPERATING									
Driver Salaries	\$375,000	\$4.61				\$4.61	1.000	\$4.61	\$375,000
Dispatcher Salary	\$25,000				\$384.62	\$384.62	1.000	\$384.62	\$25,000
Fringe Benefits (Hours Driven)	\$29,063	\$0.36				\$0.36	1.000	\$0.36	\$29,063
Fringe Benefits (Peak Bus Driven)	\$1,938				\$29.81	\$29.81	1.000	\$29.81	\$1,938
Vehicle Repair	\$165,000		\$0.14			\$0.14	1.000	\$0.14	\$165,000
Vehicle Insurance	\$55,000				\$846.15	\$846.15	1.000	\$846.15	\$55,000
Drug/Alcohol Testing	\$400	\$0.005				\$0.005	1.000	\$0.005	\$400
Background Investigation	\$700	\$0.009				\$0.009	1.000	\$0.009	\$700
Communications	\$40,000				\$615.38	\$615.38	1.000	\$615.38	\$40,000
Fuel	\$260,000		\$0.22			\$0.22	1.000	\$0.22	\$260,000
Contract Services	\$70,000			\$2,333		\$2,333	1.000	\$2,333	\$70,000
Space, Utilities (estimated)	\$140,000			\$4,667		\$4,667	1.000	\$4,667	\$140,000
Health Insurance (estimated)	\$100,000	\$1.229				\$1.229	1.000	\$1.229	\$100,000
ADMINISTRATIVE									
Salaries	\$80,000				\$1,230.77	\$1,230.77	1.000	\$1,230.77	\$80,000
Fringe Benefits	\$21,500				\$330.77	\$330.77	1.000	\$330.77	\$21,500
Training	\$5,000				\$76.92	\$76.92	1.000	\$76.92	\$5,000
Marketing	\$250				\$3.85	\$3.85	1.000	\$3.85	\$250
Telephone	\$2,500				\$38.46	\$38.46	1.000	\$38.46	\$2,500
Office Supplies	\$2,000				\$30.77	\$30.77	1.000	\$30.77	\$2,000
Employee Health Benefits	\$21,000		\$0.02			\$0.02	1.000	\$0.02	\$21,000
Audit	\$6,000		\$0.01			\$0.01	1.000	\$0.01	\$6,000
Indirect - Admin	\$19,750				\$303.85	\$303.85	1.000	\$303.85	\$19,750
Indirect - Ops	\$105,000	\$1.291				\$1.291	1.000	\$1.291	\$105,000
TOTALS	\$1,525,100	\$7.50	\$0.38	\$7,000	\$3,891				\$1,525,100
Key Supply Variable Values		81,362	1,175,072	30.0	65			Rev Hours	81,362
Source								Rev Miles	1,175,072
MGCAA's Transit System Budget for FY 2013.								Garages	30
								Peak Veh	65

Figure 11– Summary of O&M Cost Results

Characteristic	Initial Scenarios for O&M Cost Modeling		
	Scenario 1: Separate Paratransit Operated by MTA	Scenario 2: Separate Paratransit Operated by MTA/MGCAA	Scenario 3: Flex Route Paratransit Operated by MTA
<u>Macon-Bibb Co. Transit Authority</u>			
Bus			
Annual Revenue Bus-Hours	27,500	27,500	34,500
Annual Revenue Bus-Miles	340,000	340,000	381,700
Garages	0.9	1.0	1.0
Peak Buses	10	10	12
Annual O&M Bus Cost	\$2,156,000	\$2,162,000	\$2,607,000
Total MTA Bus O&M Cost per Rev-Hr	\$78.40	\$78.62	\$75.57
Demand Response			
Annual Revenue DR-Hours	5,200	0	0
Annual Revenue DR-Miles	78,100	0	0
DR Garages	0.1	0.0	0.0
DR Peak Vehicles	3	0	0
Annual DR O&M Cost	\$183,000	\$0	\$0
Total MTA DR O&M Cost per Rev-Hr	\$35.19	n/a	n/a
<u>Middle GA Community Action Agency</u>			
Annual Revenue DR-Hours	0	5,200	0
Annual Revenue DR-Miles	0	78,100	0
DR Garages	0	0	0
DR Vehicles	0	3	0
Annual O&M Cost	\$0	\$81,000	\$0
Total MGCAA DR O&M Cost per Rev-Hr	n/a	\$15.58	n/a
<u>Alternative Totals</u>			
Annual Revenue Veh-Hours	32,700	32,700	34,500
Annual Revenue Veh-Miles	418,100	418,100	381,700
Annual O&M Cost	\$2,339,000	\$2,243,000	\$2,607,000
Total O&M Cost per Rev-Hr	\$71.53	\$68.59	\$75.57

Notes:

1. Costs in 2013 dollars.

As shown in Figure 11, the total annual O&M costs are lower for the separate paratransit system scenarios, with a slightly higher cost for Scenario 1 (\$2,339,000) than Scenario 2 (\$2,243,000). The total O&M costs for Scenario 3, the flex route system, is approximately 11% higher than Scenario 1 and 16% higher than Scenario 2.

Estimated Capital Costs

In addition to ongoing operating and maintenance costs, the start-up of new transit service in the Warner Robins metropolitan planning area would require a sizable investment in buses and facilities. These estimated capital costs are described below.

Transit Vehicle Requirements

As discussed in the section on estimated operating requirements above, the need for 13 peak vehicles was established if operating a combination of express, local, flex and dedicated paratransit services. Applying the industry standard spare ratio of 20%, this option would require a total fleet of 17 vehicles. Similarly, the option assuming express, local, and flex route services would require 12 peak vehicles plus 4 spares for a total fleet of 16 vehicles. The spares in the fleet are used whenever vehicles are out of service for maintenance and/or routine inspections.

The cost of transit vehicles can vary based on size/capacity, configuration and fuel type. Traditional heavy-duty transit buses, similar to those seen at MARTA in Atlanta, are among the costliest. Medium-duty transit buses, like those used at MTA in Macon are another option. Both of these are suitable for express and local transit operations. On the other hand, flex and paratransit services are better served by smaller light-duty cut-away style buses due to their smaller size and maneuverability. Figure 12 below provides a glimpse into recent bus purchases at MTA in Macon and also provides an estimate of vehicle costs in 2013 dollars (rounded to the nearest \$1,000). Model year 2011 vehicle unit costs were inflated by 3% per year to represent 2013 dollars.

Figure 12– Estimated Vehicle Unit Costs

Vehicle Type	Manufacturer	Model Number	Fuel Type	Vehicle Length	Seating Capacity	Model Year (MY)	Unit Cost (\$MY)	Unit Cost (\$2013)
Bus	Ford	Goshen Coach, GCII	Diesel	33	30	2013	\$126,092	\$126,000
Bus	ElDorado	35' AXESS	Diesel	35	32	2011	\$371,542	\$394,000
Van	Chevy	Goshen Coach, GCII	Diesel	20	14	2011	\$71,100	\$75,000
SUV	Ford	MV-1	Gasoline	n/a	3	2011	\$41,000	\$43,000

Minimum Normal Service Life:

35' AXESS: 12 years or 500,000 miles

32' Goshen Coach, GCII: 7 years or 200,000 miles

20' Goshen Coach, GCII & MV-1: 4 years or 100,000 miles

For the start-up of the Warner Robins service, the medium-duty and light-duty Goshen Coaches may be the most cost-effective option. While these buses have a shorter life span, their costs are also considerably lower than the heavy-duty AXESS bus. Choosing the less expensive vehicles also limits

financial risk until ridership projections have been met and the system has proven itself a success. There is an added benefit to operating a consistent fleet in areas of maintenance, parts inventory and operator training. Nonetheless, the heavy-duty bus should be reconsidered if the medium-duty fleet becomes more heavily utilized with the addition of weekend and evening service at some point in the future.

It is important to note that FTA regulations require that vehicles purchased or leased with federal funds be maintained and remain in transit use for a minimum normal service life. Therefore, replacement of the vehicles purchased initially could not take place until the minimum service life had been exceeded. Based on the initial service options described earlier, the new transit system would require the vehicles shown in Figure 13.

Figure 13 – Estimated Vehicle Costs

Service Type	Peak Vehicles	Spare Vehicles	Total Vehicles	Bus Model	Vehicle Length	Seating Capacity	Unit Cost	Total Cost
Separate Paratransit Service								
Express and Local	9	3	12	Goshen Coach GCII (or similar)	33'	30	\$126,000	\$1,512,000
Flex and Paratransit	4	1	5	Goshen Coach GCII (or similar)	20'	14	\$75,000	\$375,000
Totals	13	4	17					\$1,887,000
Flexible Route Paratransit Service								
Express and Local	11	3	14	Goshen Coach GCII (or similar)	33'	30	\$126,000	\$1,764,000
Flex	1	1	2	Goshen Coach GCII (or similar)	20'	14	\$75,000	\$150,000
Totals	12	4	16					\$1,914,000

Facilities and Passenger Amenities

Facility and passenger amenity needs for a start-up transit system range from the major, such as a vehicle operations and maintenance facility to the minor bus stop sign and post. Each plays an important role in establishing the transit service. The following sections describe some of the anticipated facility and passenger amenity needs associated with the initial transit service options.

Bus Stop Signs

While this report does not get into the specifics of naming bus stop locations, it is important to be cognizant of the cost to install the initial set of bus stop signs for the service. Assuming stops are placed within the guidelines described earlier in the service plan, there will be an estimated 800 bus stops to be installed. Assuming \$250 per stop for manufacturing and installation, this equates to a \$200,000 initial expense at service start-up.

Transfer Centers

As previously discussed, in order to make passenger transfers as convenient as possible, appropriate facilities will need to be provided to accommodate the potential staging of multiple buses, as well as awaiting passengers. Initially, it is recommended that the transfer centers consist simply of passenger waiting shelters and spaces for buses to temporarily stop. Passenger shelters can vary in cost, depending on the size and aesthetic appeal. On average, a good basic transit shelter costs

approximately \$10,000 to purchase and install. However, less level rights-of-way can prove more challenging and ultimately increase installation costs. Assuming six shelters are desired for the four transfer centers, a total cost of \$60,000 is estimated.

The Galleria Mall and South Warner Robins Walmart will require use agreements to allow transit buses to regularly access the parking facilities and set up transit operations. These agreements are critical to ensure timely relocation should either party choose to end the relationship. The intersection of Watson Boulevard & Davis Drive and Middle Georgia Technical College transfer locations are both planned to occur on-street and will not require any special agreements outside of those needed to erect passenger shelters.

Of the four transfer locations, the Galleria Mall would be the most significant, as three of the four proposed local routes, plus one of the proposed express routes, would meet there. The Galleria Mall transfer center is therefore the most likely candidate for eventual investment in a more permanent transit center. Such a facility would likely include bus bays, lighting, passenger shelters, benches, and other security features. Vacant outparcels are good candidate locations, either through a lease or through purchase. Order-of-magnitude bus bay costs range from \$20,000 to \$30,000 per bay, but may be higher or lower depending on final design. Assuming three bus bays, the additional cost would be approximately \$60,000 to \$90,000.

Passenger Waiting Shelters

Some of the more popular stops along each local route may be candidates for passenger waiting shelters. It may be prudent to wait until the initial service plan is actually implemented and has had the opportunity to take root to pursue extensive installation of additional shelters beyond those at the transfer centers discussed above. Until regular ridership has been established and data collected, additional shelter locations may be a matter of common-sense and available right-of-way, and would likely include major employment and shopping destinations along Watson Boulevard, such as RAFB, Houston Medical Center and Walmart. Similar locations where the routes pass near government offices, schools, and senior activity centers also make strong shelter candidates. Assuming about two additional shelter locations per local and flex route at \$10,000 per shelter, the additional cost would be approximately \$100,000.

Park & Ride Lots

Earlier in the service plan, four sites were identified at potential park & ride lots for service to RAFB. Those sites are:

- North Peach Park (Byron)
- Galleria Mall (Centerville)
- Paradise Shoppes Publix (Perry)
- Houston Lakes Stadium Cinemas (Lake Joy)

North Peach Park is a public facility owned by Peach County. While it is publicly owned and a formal lease agreement is likely unnecessary, it is still important to work with the County to ensure use of the parking during weekday daytime hours is agreeable.

The remaining three sites are on private property and as such should be only used with a mutually agreed-upon site access agreement. While optimally the site access agreement would allow complimentary use of the sites for a limited amount of parking (30-50 spaces), it is not uncommon for property owners to require some sort of payment for the use of their property and wear and tear on the pavement. Payment may be in the form of a traditional lease amount per space or could be negotiated as a trade for advertising or some other sort of reimbursement.

Operations and Maintenance Facility

Until a service provider has been selected, the cost of a vehicle operations and maintenance facility is still largely an unknown. If an established provider is selected, such as MTA or MGCAA, the facility may already exist. In either of these cases, it may be a matter of minor expansion to accommodate the addition of vehicles for Warner Robins service. On the other hand, if a new facility is required, the capital cost outlay would be in the millions if building on an undeveloped site.

To help control these costs, turnkey or near turnkey sites should be considered. Former car dealerships and rental car facilities often have the basic infrastructure in place to serve as a transit operating and maintenance facility. The only needs may be to adjust service bay doors and install larger capacity vehicle lifts. As a recent example, the operations and maintenance facility for Liberty County Transit is located at a former car dealership the contractor is leasing. Another option is to investigate City or County maintenance facilities as well as Houston County Schools' school bus maintenance facility. Both are accustomed to maintaining trucks, buses and/or other heavy-duty vehicles and could very well prove to be a cost-effective option for contracting the entire maintenance operation.

It is assumed for the initial service options that maintenance, storage, and fueling functions could be accommodated at an existing fleet maintenance facility owned by the local government, or, if service is contracted out, at a facility provided by the contractor. It is important to note, however, that if a service contractor had to acquire or expand a maintenance facility, facility costs would be passed on in the contractor's hourly rates.

Eventually, however, local officials may determine that construction of an operations and maintenance facility is necessary. The construction cost of an operations and maintenance facility can vary significantly, depending on the location and size. Order-of-magnitude capital costs for new operations and maintenance facilities range from \$200,000 to \$500,000 per vehicle. Applying the number of estimated vehicles required for the two initial service options, estimated costs for an operations and maintenance facility for the separate paratransit service option range from \$3.4 million to \$8.5 million, while the flex route paratransit option ranges from \$3.2 million to \$8.0 million.

Miscellaneous Costs

The proposed initial transit service options for the Warner Robins metropolitan planning area would also require the procurement of a number of additional items, as described below.

Bus-Related Equipment

Typically, revenue vehicle unit costs do not include ancillary equipment such as fare boxes, destination signs and radios. An additional order-of-magnitude cost of about \$10,000 to \$15,000 per bus should be added for each local and paratransit vehicle. Applying the number of estimated vehicles required for the two initial service options, estimated costs for bus-related equipment for the separate paratransit service option range from \$170,000 to \$255,000, while the flex route paratransit option ranges from \$160,000 to \$240,000.

Tools and Equipment

Likewise, revenue vehicle unit costs do not include special tools and equipment needed to maintain the buses. An order-of-magnitude cost estimate for these maintenance items is \$50,000. If a service contractor is used to operate and maintain the vehicles, these costs would likely be passed on in the contractor's hourly rates.

Computer Related Costs

A transit system has extensive reporting requirements. Annual operations and budget reports would have to be provided to the state and federal governments. Order-of-magnitude costs of \$40,000 for the separate paratransit service option and \$50,000 for the flex route paratransit option. The flex route paratransit option costs are assumed to be higher to allow for greater dispatching capabilities to accommodate flexible routing.

Start-up Marketing Program

A system start-up requires a highly visible marketing program to inform the public about the transit services that will be provided. The marketing program may include system maps and signs, passenger timetables, radio and television advertisements, informational meetings, and other media campaigns. An order-of-magnitude cost of \$50,000 is estimated for this program.

Appendix A

Detailed Operating Statistics

Average Weekday Service

Separate Paratransit Service Option

Route ID	Route Description	Service Frequency				Daily Trips	Peak Period		One-Way Distance (Miles)	Average Weekday		Bus Requirements			
		AM Peak Period	Midday Period	PM Peak Period	Eve. Period		Time (Min.)	Cycle Time		Rev. Hrs.	Rev. Miles	AM Peak Period	Midday Period	PM Peak Period	Eve. Period
BROWN	EXPRESS SERVICE Byron-Centerville-RAFB	30	n/a	30	n/a	16	31	60	10.3	16.0	164.8	2.00	0.00	2.00	0.00
PURPLE	Perry-Lake Joy-RAFB	30	n/a	30	n/a	16	51	90	17.0	24.0	272.0	3.00	0.00	3.00	0.00
	LOCAL SERVICE														
RED	Watson Boulevard	60	60	60	60	28	23	60	5.8	14.0	162.4	1.00	1.00	1.00	1.00
GREEN	South Houston Lake Road	60	60	60	60	28	26	60	7.5	14.0	210.0	1.00	1.00	1.00	1.00
BLUE	Russell Parkway	60	60	60	60	28	22	60	6.3	14.0	176.4	1.00	1.00	1.00	1.00
ORANGE	Davis Drive	60	60	60	60	28	26	60	7.5	14.0	210.0	1.00	1.00	1.00	1.00
	FLEX ROUTE SERVICE														
PINK	Perry Flex Bus	120	120	120	120	15	41	120	11.7	15.0	175.5	1.00	1.00	1.00	1.00
TOTALS						127		360		71.0	934.3	5.00	5.00	5.00	5.00

Note: **BROWN** and **PURPLE** layover time is inclusive of deadhead time back to start of peak directional trip. **PINK** layover time is inclusive of deviation time and miles.

Flex Route Paratransit Option

Route ID	Route Description	Service Frequency				Daily Trips	Peak Period		One-Way Distance (Miles)	Average Weekday		Bus Requirements			
		AM Peak Period	Midday Period	PM Peak Period	Eve. Period		Time (Min.)	Cycle Time		Rev. Hrs.	Rev. Miles	AM Peak Period	Midday Period	PM Peak Period	Eve. Period
BROWN	EXPRESS SERVICE Byron-Centerville-RAFB	30	n/a	30	n/a	16	31	60	10.3	16.0	164.8	2.00	0.00	2.00	0.00
PURPLE	Perry-Lake Joy-RAFB	30	n/a	30	n/a	16	51	90	17.0	24.0	272.0	3.00	0.00	3.00	0.00
	LOCAL SERVICE														
RED	Watson Boulevard	60	60	60	60	28	30.5	90	7.3	21.0	204.4	1.50	1.50	1.50	1.50
GREEN	South Houston Lake Road	60	60	60	60	28	33.5	90	9.0	21.0	252.0	1.50	1.50	1.50	1.50
BLUE	Russell Parkway	60	60	60	60	28	29.5	90	7.8	21.0	218.4	1.50	1.50	1.50	1.50
ORANGE	Davis Drive	60	60	60	60	28	33.5	90	9.0	21.0	252.0	1.50	1.50	1.50	1.50
	FLEX ROUTE SERVICE														
PINK	Perry Flex Bus	120	120	120	120	15	41	120	11.7	15.0	175.5	1.00	1.00	1.00	1.00
TOTALS						127		480		99.0	1102.3	7.00	7.00	7.00	7.00

Note: **BROWN** and **PURPLE** layover time is inclusive of deadhead time back to start of peak directional trip. **RED**, **GREEN**, **BLUE**, **ORANGE** and **PINK** layover time is inclusive of deviation time and miles.