milton on the move

City of Milton Transportation Plan

Comprehensive Transportation Plan

Final Report





Prepared for:

City of Milton, GA

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1.0 INTRODUCTION

"Milton is a distinctive community embracing small town life and heritage while preserving our rural character."

- Vision Statement for the Comprehensive Plan and the Comprehensive Transportation Plan

1.1 Project Background

The City of Milton was incorporated in December 2006. This relatively new city was formerly the northern most portion of unincorporated Fulton County, an area that is bounded by the cities of Roswell and Alpharetta to the South, Forsyth County to the East, and Cherokee County to the North and West. Following its incorporation in 2006, the City of Milton adopted Fulton County's *Focus Fulton 2025 Comprehensive Plan* as its interim guiding document for planning and land use issues. The City later began work on developing its own unique Comprehensive Plan, a process that is currently on-going and nearing completion. The *Partial Plan Update to the Milton Comprehensive Plan* was submitted to the Atlanta Regional Commission at the end of 2008, and the final project completion date has been set for the end of 2009. Meanwhile, the City of Milton also began work on developing a full Comprehensive Transportation Plan (CTP), which is to be completed concurrent to the Comprehensive Plan in December 2009. This document is the *Final Report* in the development of the CTP. Preceding this document were the *Inventory of Existing Conditions Report* (April 2009) and the *Needs Assessment Report* (August 2009). Upon the completion of the CTP and Comprehensive Plan, City leadership will use these plans as guides when considering policy and budget decisions. In the midst of a growing metropolitan region, the people of Milton intend to preserve the City's uniquely rural character by managing growth and continuing to provide a fulfilling quality of life for all residents.

1.2 Project Goals and Objectives

Following the development of the project vision statement, goals were developed to further define a direction for the CTP. These goals were developed through discussions with the public and City leadership at the project Kick-Off meeting and the initial meeting of the Transportation Stakeholder Advisory Committee (TSAC).

Goals for Milton's Comprehensive Transportation Plan

1. Improve transportation network system level performance (level of service) with particular emphasis on the impacts of commuter/"cut through" traffic and safety.
2. Maintain and improve mobility and system performance through roadway improvements and alternative transportation improvements with specific consideration of transit investments appropriate to the community vision and multi-use paths serving cyclists, pedestrians, equestrian users, and those with disabilities including wheelchair access.
3. Protect and improve the environment recognizing its contribution to community economic vitality and quality of life.
4. Coordinate transportation investments with the *Milton Comprehensive Plan* and land use policies insuring creation of a "sense of place" (Crabapple Crossroads, Birmingham Crossroads and the Highway 9 area) as well as barrier free connectivity to community assets such as schools, parks, and recreation areas.

5. Leverage regional cooperation and regional solutions to transportation issues, including coordination with surrounding jurisdictions, while maintaining the singularly unique character of the City of Milton.

From each of the goals listed above, specific objectives were formed that would provide precise direction for the transportation plan. These objectives make up the evaluation framework for the project, and should be used to ensure that the CTP recommendations maintain relevance to the critical needs identified at the onset of the planning process. The specific objectives drawn from each goal can be seen in **Table 1-1** below.

Table 1-1: Evaluation Framework, Goals, and Objectives

Goal	Objectives
Improve transportation network system level performance (level of service) with particular emphasis on the impacts of commuter/"cut through" traffic and safety.	• Provide specific paths for through commuters • Improve system for local trips • Improve and preserve existing levels of service • Identify high-accident locations and recommend improvements to achieve better safety • Improve safety for pedestrians and cyclists by upgrading facilities for alternative modes of transportation
Maintain and improve mobility and system performance through roadway improvements and alternative transportation improvements with specific consideration of transit investments appropriate to the community vision and multi-use paths serving cyclists, pedestrians, equestrian users and those with disabilities including wheelchair access.	• Identify bridges in need of maintenance or replacement • Provide maintenance recommendations for the existing roadway network • Identify intersections in need of operational and geometric enhancements to improve system performance • Identify multi-modal enhancements to increase alternative transportation options • Integrate the CTP with the Milton Trail Plan
Protect and improve the environment recognizing its contribution to community economic vitality and quality of life.	• Promote conservation and minimize harmful impacts on the environment • Emphasize preservation of historic places
Coordinate transportation investments with the comprehensive plan and land use policies ensuring creation of a "sense of place" (Crabapple Crossroads, Birmingham Crossroads and the Highway 9 area) as well as barrier free connectivity to community assets such as schools, parks and recreation areas.	• Coordinate with CPAC to achieve an integrated land use vision and plan • Preserve right-of-way for future facility improvements • Preserve historic places • Achieve a barrier-free transportation network
Leverage regional cooperation and regional solutions to transportation issues, including coordination with surrounding jurisdictions, while maintaining the singularly unique character of the City of Milton.	• Coordinate with nearby jurisdictions including Alpharetta, Roswell, Mountain Park, Cherokee County, and Forsyth County to create a continuous and well-thought out network • Coordinate with GDOT, MARTA, GRTA, and ARC

2.0 PUBLIC INVOLVEMENT AND COORDINATION

The Comprehensive Transportation Plan has been strongly guided by public input. Techniques that were used to capitalize on public interaction included focus group meetings, participation in local community activities such as Milton Roundup, implementing a scientifically valid public opinion survey, participation in town hall meetings, hosting a transportation plan kickoff event and design charrette, conducting stakeholder interviews, analyzing public comments received directly by the City, holding meetings with community focus groups, and through regular meetings with a Transportation Stakeholder Advisory Committee (TSAC). The results from the public opinion survey can be seen in **Appendix C**.

In addition, the project team worked closely with City of Milton staff, City Council, special committees, focus groups, and public agencies. A list of some of the public outreach efforts and coordination meetings conducted as part of this project is provided in **Table 2-1** below:

Table 2-1: Public Involvement and Coordination

TSAC Kickoff Meeting and Rural by Design Workshop	January 22, 2009
Pavement Management Kickoff Meeting with Dept. of Public Works	February 9, 2009
Joint Meeting with TSAC and CPAC	February 12, 2009
CPAC Financial Model Agenda Meeting	March 3, 2009
Pavement Management Coordination Meeting with Dept. of Public Works	March 11, 2009
TSAC Meeting	April 16, 2009
City Council Meeting	April 20, 2009
Gravel Roads Town Hall Meeting	April 30, 2009
Presentation to City Council on Pavement Management	May 11, 2009
Milton Disability Awareness Committee Meeting	June 10, 2009
TSAC Meeting	June 18, 2009
Equestrian Meeting	June 30, 2009
Presentation to City Council on the Comprehensive Transportation Plan	July 6, 2009
Crabapple Town Hall Meeting	July 15, 2009
Presentation to City Council on Pavement Management	July 27, 2009
Joint Meeting with TSAC and CPAC	August 17, 2009
Crabapple Charrette	August 24, 2009
Public Opinion Survey	September 2009
Cyclist Meeting	September 16, 2009
TSAC Meeting	September 24, 2009
Crabapple Stakeholders Meeting	October 8, 2009
City Council Work Session	October 12, 2009
Milton Roundup	October 17, 2009
TSAC Meeting and Public Meeting	November 5, 2009
City Council Work Session	November 9, 2009
City Council Work Session	December 14, 2009
Council Adoption of CTP	December 21, 2009
Website and public comments received	Ongoing

3.0 MARKET CONSIDERATIONS

The City of Milton is part of the fastest growing employment and commercial center in the Atlanta region - the North Fulton Superdistrict. The North Fulton Superdistrict contains over 97,000 jobs and ARC is projecting that by 2030 it will grow to 190,000 jobs. North Fulton contains a major concentration of offices and flex space. The area is also a major retail destination with many amenities including a full range of lodging options, hospitals, and a potential future transit connection to the MARTA system. Future growth will only serve to expand the diversity of the area's offerings. Milton lies in the northwest quadrant of this rapidly expanding "edge city" - defined as a vibrant concentration of jobs, retailing, housing, entertainment, and services outside of a traditional urban area.

In the next twenty years, Milton will be impacted greatly by this emerging North Fulton Edge City. With consideration and decisions exercised by City government leadership in partnership with market opportunities, the city can direct and leverage the impacts and benefits of the continued growth of this North Fulton Edge. Milton's choices may include to allow more commercial development, potentially in the southern areas or elsewhere in the City, to gain the financial benefit from the further diversification of its tax base. If Milton makes the decision to discourage significant amounts of future commercial development, this development will likely still occur in adjacent jurisdictions. The result could be continued/increased demand in Milton as a residential location for those who work in the expanding North Fulton job center.

Milton will still see additional commuter traffic originating both from the build-out of Milton's existing residential inventory (with 1,400 permits already approved) and from adjacent growing areas. GA 400 serves as a key transportation facility within the North Fulton area. In addition to the commuter traffic served by this corridor, GA 400 also brings people into North Fulton and the City of Milton as a destination for available shopping, dining, recreation, and entertainment. Milton's decisions regarding future growth – whether to engage and direct such opportunities in desirable areas or to significantly restrict it - will result in the city benefiting from attracting commercial developments which will grow the tax base for the City or may increase over time the tax burden on the residential portions of the tax digest.

4.0 RECOMMENDATIONS

The City of Milton maintains a uniquely rural character within the midst of a sprawling metropolitan region. As noted in the *Needs Assessment Report*, Milton lies within the North Fulton Super District which has been one of the fastest growing office and employment locations during the past decade. According to the Atlanta Regional Commission (ARC), this growth trend is expected to continue over the next twenty years. If Milton is able to manage residential growth within the goals set by the Milton Comprehensive Plan, there will still be over 100 new houses built in Milton every year over the next 20 years (ARC's projection is almost 300 new houses per year in Milton). ARC also predicts that the current employment base will effectively double from nearly 17,000 jobs in 2010 to almost 34,000 jobs in 2030. When faced with the challenge of managing this aggressive development pressure, the public, City Council, Milton staff, and local stakeholders have all expressed a desire to leverage the transportation system to preserve Milton's rural character while also providing transportation mobility and safety for residents within Milton.

This section identifies some key recommendations that will serve to protect the rural character of Milton and also enhance the transportation network within the City. Recommendations have been divided into the following categories:

- Corridor Improvements
- Intersection Improvements
- Additional Safety Considerations
- Equestrian Improvements
- Cyclist Improvements
- Improvements for the Disabled
- Pedestrian Improvements
- Bridge Improvements
- Additional Studies

4.1 Corridor Improvements

A primary concern identified by TSAC members, City Council, and City Staff is the need to manage commuter through traffic from surrounding areas. One way to achieve this goal while still preserving the character of the area is to encourage commuter traffic to use specific corridors, mainly around the outskirts of Milton. The preferred approach includes improvements that draw commuters away from the rural roadways of Milton, coupled with additional improvements that would improve access for residents within Milton.

As discussed in the *Needs Assessment Report*, major roadway projects that would influence travel patterns at a regional level were first developed and tested through the use of ARC's travel demand model. This model incorporates assumptions regarding future land use, population growth, and socioeconomic factors. In developing these assumptions, information was used from both the Milton Comprehensive Plan as well as ARC. In general, ARC is projecting much higher levels of growth for Milton than is shown in the Comprehensive Plan. This is because the City of Milton will likely implement development and land use policies intended to manage and direct this growth. To be conservative in accounting for transportation needs, the travel demand model for this project uses the growth projections from ARC in future scenarios. However, the model was also run using the reduced growth rates identified in the Milton Comprehensive Plan, and no significant differences in future transportation needs were found.

This is most likely due to the strong growth that will still occur in areas adjacent to Milton. Although Milton will most likely limit the amount of growth within the City limits, the surrounding areas will most likely expand as predicted by ARC. Therefore, the results of the modeling analysis are consistent with both ARC's projection as well as the City of Milton's Comprehensive Plan.

Through the use of the travel demand model coordination with TSAC, it was determined that the following recommendations should alleviate much of the congestion internal to the City and will contribute to the long-term preservation of Milton's rural character.

Direct commuter traffic from Cherokee County to State Route 140 /Arnold Mill Road/Hickory Flat Highway to GA 400

Milton should work with regional partners to create a corridor facility that collects traffic from Cherokee County west of the Milton border and carries this traffic efficiently to GA 400. This can be done by accomplishing the following widening projects:

- Widen State Route 140/Arnold Mill Road/Hickory Flat Highway from 2 to 4 lanes from Batesville Road in Cherokee County to Mansell Road (in the City of Roswell)
- Widen Rucker Road/Old Milton Parkway from 2 to 4 lanes from Arnold Mill Road to existing 4-lane segment of Old Milton Parkway (corridor located in the City of Roswell)

These project extents can be seen in **Figure 4-1** on the following page. This widened corridor would be attractive for commuters traveling between Cherokee County and the Cities of Roswell, Alpharetta, and Atlanta. Attracting (or focusing) these commuters will be beneficial for Milton because this will draw many commuters away from other areas in the center of Milton such as Birmingham Crossroads and Crabapple Crossroads.

In addition, this project is believed to be achievable because the widening is already identified as a goal in ARC's Envision6 Long Range Transportation Plan. The widening of State Route 140/Arnold Mill Road (ARC# FN-232A) is programmed to be completed in year 2020. The widening of Rucker Road/Old Milton Parkway is not programmed in ARC. Milton leaders should provide a voice in favor of this widening and become a partner in ensuring its implementation.

Widen State Route 9/Alpharetta Highway/Cumming Highway

State Route 9 is a heavily used corridor and is expected to become more congested as areas grow throughout Metro Atlanta. This facility generally parallels GA 400 and allows vehicles to travel between Forsyth County and the City of Alpharetta. Widening this corridor would free up congested areas and facilitate better access within the region. The extents of this widening recommendation include widening from Hamby Road in Forsyth County to Mayfield Road in the City of Alpharetta as seen in **Figure 4-1**.

As with the widening of Arnold Mill Road, this project is also in ARC's Envision6 Long Range Transportation Plan. The widening of State Route 9/Alpharetta Highway/Cumming highway (ARC# FN-067A, FN-067B, FN-222, FT-001A, FT-001B) is programmed to be completed in year 2030. Thus additional support from the City of Milton could give this project increased momentum.

Widen sections of Holbrook Campground Road, Hopewell Road, and Hamby Road to State Route 9

Through discussions with TSAC, the concept of managing commuter traffic by encouraging these vehicles to use strategic corridors was developed. One strategic corridor that could accommodate this commuter traffic would be a widened Holbrook Campground Road from State Route 20 (in Cherokee County), a portion of Hopewell Road, and Hamby Road to State Route 9 (in Forsyth County). This route can be seen in **Figure 4-1**. This widened corridor, much like Arnold Mill Road or State Route 9,

would be intended to encourage commuter traffic to use specific corridors on the outskirts of Milton and reduce the amount of commuter trips which meander through other areas of the City.

Widen School Drive to a four-lane section between Birmingham Highway and Freemanville Road.
Observation of school operations near Crabapple Crossroads revealed that substantial queues develop during the school AM and PM peak hours. These queues back up onto both Birmingham Highway and Freemanville Road. Widening School Drive will provide much additional storage thereby helping to reduce queues on Birmingham Highway and Freemanville Road. The approximate location of this segment is shown in **Figure 4-1**. This improvement would need to be implemented through coordination with Fulton County Schools as they are the owner of this roadway segment.

Widen Morris Road to four lanes between Webb Road and McGinnis Ferry Road
The proposed interchange at GA-400 and McGinnis Ferry Road appears to be gaining momentum and is supported by Forsyth County representatives as well as representatives from GDOT. While this interchange is likely to be years away from receiving final approval, GDOT is currently in the process of reviewing an interchange feasibility report (IFR) as well as an interchange justification report (IJR) for this location.

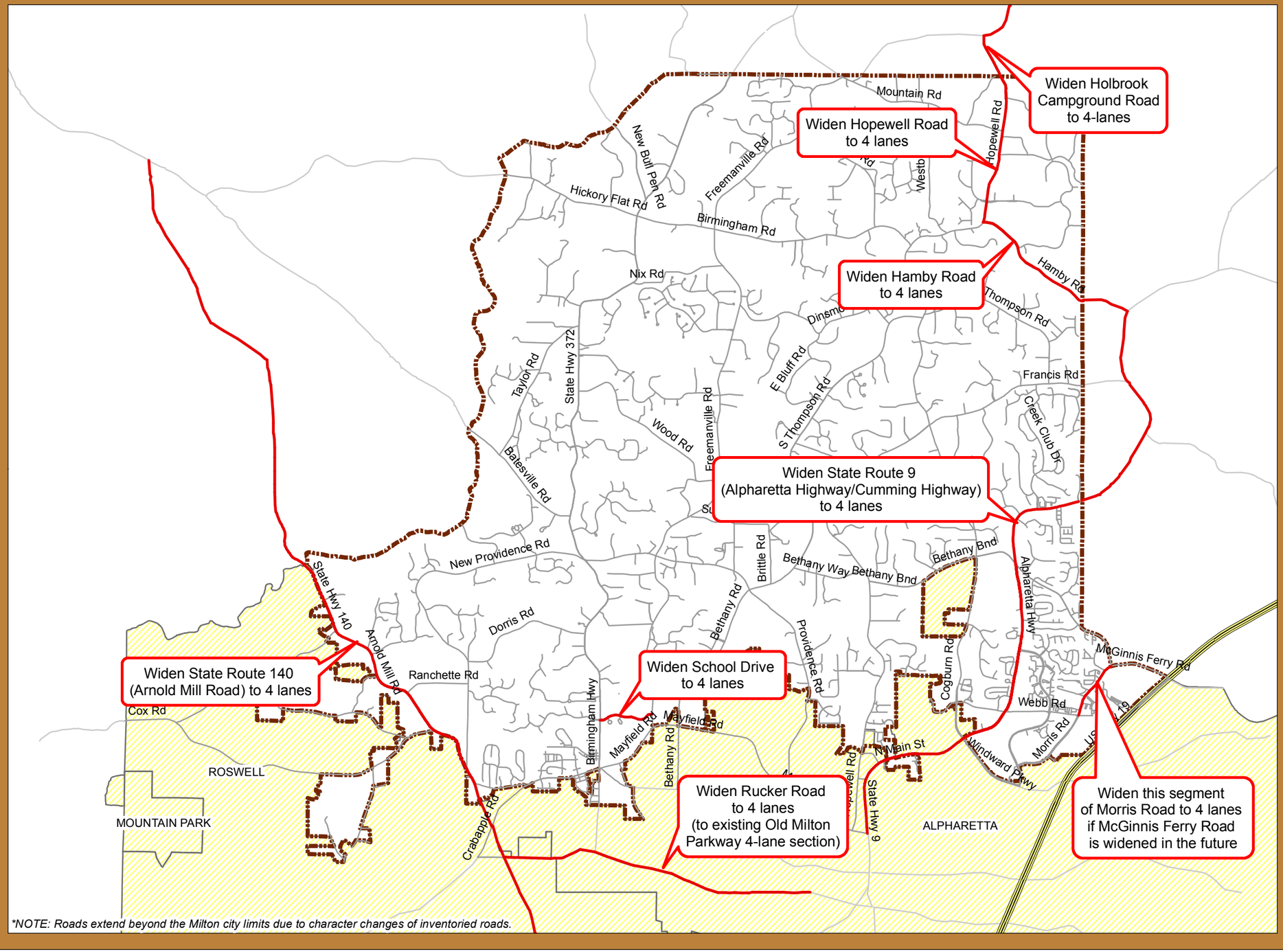
In addition to the McGinnis Ferry Interchange, Forsyth County has also included in its long range transportation a widening project for McGinnis Ferry Road east and west of GA-400. In this case, increased traffic volumes could be expected in this area, and widening the section of Morris Road from 2 to 4 lanes from the existing 4 lane segment at Webb Road to McGinnis Ferry Road at the Forsyth County border would provide additional capacity along this corridor.

Modeling analysis has shown that widening this section of Morris Road is not currently a critical need by itself for regional or local mobility; however, if the McGinnis Ferry interchange is constructed and McGinnis Ferry Road is also widened to four lanes, then widening this section of Morris Road would be a logical improvement. Close coordination with Forsyth County and GDOT will be needed to follow the status of these projects.

Model Analysis of Corridor Improvements
Model analysis showed that the combination of the before mentioned projects (with the exception of the widening of school drive and Morris Road segment which were outside the scale of the analysis) would result in an improvement in the level of service on Batesville Road, Birmingham Highway/SR 372, New Bull Pen Road/Union Hill Road, Thompson Road, Freemanville Road, Cogburn Road, Arnold Mill Road/SR 140, Bethany Road, Hopewell Road, and SR 9 during the AM peak period and/or PM peak period. However, the combination of these projects would also result in a worse level of service on New Providence Road, Mountain Road, Cox Road, and Deerfield Parkway during the AM peak period and/or PM peak period.

The existing conditions model analysis as well as the model results for the implemented improvements can be seen in **Appendix A** of this document.

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

FIGURE 4-1
Corridor Improvements

Legend

- Widen to 4 Lanes
- Expressways
- City of Milton
- Other Streets
- Other Fulton County Cities

N
W E
S

0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 9, 2009

Source: City of Milton

4.2 Recommended Intersection Improvements

This section summarizes results from a review of key intersections in the City of Milton. Major intersections within the City were evaluated for potential improvements. Other intersections were also included in evaluations as a result of the request from the public and City of Milton Staff. Evaluations of potential improvements were made with consideration to public comments, existing transportation impact analyses (TIA's), developments of regional impact studies (DRI's), crash data, and future transportation projects identified in the Regional Transportation Plan. In addition, field observations were conducted in order to document signage, sight distances, and existing traffic operations. Where TIA's and DRI's are referenced, only the existing no-build scenarios have been considered. Turning movement counts and trip generation calculations have not being performed as part of the overall Milton CTP, therefore opinions of improvements are based on existing conditions as observed in the field as well any existing data from previous studies.

It should be noted that while the review of these intersections was thorough and based on available information, Milton should perform a detailed analysis of operations at each location to confirm findings prior to implementing any of the following recommendations. Refer to **Figure 4-2** for an illustration of the recommended intersection improvements by location.

Traditional improvements, such as adding additional turn lanes, and non-traditional intersection improvements, such as installing roundabouts, were both considered and are described in the intersection recommendations listed below. Where both traditional and non-traditional improvement strategies may be appropriate, the list includes both improvement strategies by separating them with an "OR" statement.

4.2.1 Information Regarding Roundabouts

Many of the intersections included in the evaluation are recommended as candidates for roundabout installation. Roundabouts have become a popular way to address congestion and safety issues at intersections; however, roundabouts are not always the most appropriate solution. Each potential roundabout desired for the City should be thoroughly scrutinized prior to selection for implementation. A detailed traffic study will be necessary to determine if certain locations are suitable for installation of a roundabout based on a number of factors. While this assessment did not include an analysis inclusive of specific traffic counts, each location recommended for study should be analyzed using a program such as SIDRA to determine operational characteristics. While capacity of roundabouts is dependent on various design elements, the Federal Highway Administration (FHWA) states that single-lane roundabouts have a total circulating flow capacity of approximately 1,800 vehicles per hour at any given point within the roundabout. Circulating flows can be calculated based on approach traffic volumes. Additionally, GDOT's current design criterion for a single lane roundabout is less than 20,000 vehicles per day.

After determining if a location's traffic volumes lend themselves to accommodating a roundabout, the required laneage and main geometric criteria will be identified. A conceptual level drawing will be developed and used to preliminarily identify major utility conflicts, right-of-way constraints, appropriate approach geometry and signage, and pedestrian/bike/truck accommodation. Public involvement in the form of stakeholder or City Council meetings would also be necessary at these early stages to provide consensus on the project approach and implementation. Also, the size and placement of the roundabout developed in the concept plan may show unacceptable right-of-way impacts.

Modern roundabouts have very specific design criteria (both geometric and signing/pavement marking) which have been developed over a number of years. Roundabouts that do not incorporate these criteria lead to confused and frustrated drivers and in some cases have resulted in the removal of the

roundabout. Modern roundabouts also are a treatment that is new to Georgia drivers – extensive public involvement and education are required to reduce confusion and ensure proper use and acceptance of the roundabout. Additionally, modern roundabouts are different from previous applications called traffic circles. For a traffic circle, circulating traffic yields to entering traffic while for a roundabout, entering traffic yields to circulating traffic (so traffic within the roundabout keeps moving).

4.2.2 Potential Locations for Roundabouts

Birmingham Road & Freemanville Road

- Install a roundabout if volumes do not prohibit (Intersection is currently a 4-way stop)

OR

- Widen shoulders around intersection
- Restripe stop-bars and striping
- Add eastbound right-turn lane and northbound left-turn lane
- Signalize when warranted (recommended in Birmingham Elementary School TIA)

Hopewell Road, Cogburn Road, & Francis Road

- Install a roundabout if volumes do not prohibit (All approaches are currently stop-controlled)

OR

- Widen shoulders around intersection
- Restripe stop-bars and striping
- Add traffic signal and turn lanes as needed when volumes warrant (no traffic counts available)

Freemanville Road & Providence Road (Conceptual-level plans developed by Fulton County for a signal)

- Install a roundabout if volumes do not prohibit (Intersection is currently a four-way stop)

OR

- Widen shoulders around intersection
- Add one or more turn lanes (specifics not known; no counts available)
- Signalize when volumes warrant
- Restripe stop bars
- Add crosswalk across westbound approach connecting sidewalk termini

Bethany Road & Providence Road (Conceptual-level plans developed by Fulton County for a roundabout)

- Install a roundabout if volumes do not prohibit (Intersection is currently a four-way stop)

OR

- Widen shoulders around intersection
- Add one or more turn lanes (specifics not known; no counts available)
- Signalize when volumes warrant
- Restripe stop bars

Birmingham Highway & Birmingham Road/Hickory Flat Road

- Add westbound, eastbound, and southbound left-turn lanes (Birmingham Elementary School TIA)
- Add a traffic signal when volumes warrant (Birmingham Elementary School TIA)

OR

- Install a roundabout if volumes do not prohibit (one or more slip lanes may be needed) (intersection is currently four-way stop)

AND

- Enhance pedestrian facilities by striping crosswalks and constructing raised islands in striped medians.
- Widen shoulders and/or construct curb and gutter around intersection

Hopewell Road & Redd Road

- Reduce speed limit along Hopewell Road from 45 to 35mph
- Add eastbound right-turn lane and northbound left-turn lane (Hopewell Academy TIA)
- Widen shoulders around intersection
  OR
- Add roundabout if volumes do not prohibit (northbound sight distance may be an issue)

4.2.3 Potential New Signal Locations

Birmingham Road & Hopewell Road

- Reduce speed limit along Hopewell Road from 45 to 35mph
- Widen shoulders around intersection
- Install additional northbound and southbound advanced intersection signage and flashing overhead/advanced beacons
- Install radar speed detection signage
- Increase speed enforcement
- Signalize when warranted (crash data may currently meet warrant requirements)
- Roundabout not recommended (Hopewell Road is currently free-flow and sight distance is limited)

Strickland Road & Bethany Bend (North leg of Bethany Bend and Strickland Road are in Forsyth County)

- Realign Strickland Road to 90 degrees with Bethany Bend by relocating intersection to the northwest
- Add a northbound right-turn lane and a southbound left-turn lane along Bethany Bend (Union Hill DRI)
- Add a westbound right-turn lane along Strickland Road (Union Hill DRI)
- Add a traffic signal when/if volumes warrant (Union Hill DRI)

OR

- Current conditions at this location are potentially suitable for a roundabout, however, any future connections to GA 400 at the McGinnis Ferry Road location would likely cause traffic volumes to exceed the capacity of a roundabout.
- Sign southbound approach along Bethany Bend well in advance.

Bethany Bend & Morris Road/McGinnis Ferry Road (Half of north and east legs of Bethany Bend and McGinnis Ferry Road are in Forsyth County)

- Widen Morris/McGinnis Ferry Road from 2 to 4 lanes (Union Hill DRI)
- Add a southbound right-turn lane and a southbound left-turn lane along Bethany Bend (Union Hill DRI)
- Add an eastbound left-turn lane and a westbound right-turn lane along Morris/McGinnis Ferry Road (Union Hill DRI)
- Add a traffic signal (Union Hill DRI)
- Current conditions at this location are potentially suitable for a roundabout, however, any future connections to GA 400 at the McGinnis Ferry Road location would likely cause traffic volumes to exceed the capacity of a roundabout.

Webb Road & Morris Road

- Widen Morris Road from 2 to 4 lanes (Union Hill DRI)
- Add southbound left-turn and right-turn lanes and eastbound left-turn lane (Union Hill DRI)
- Install a traffic signal when volumes warrant (Union Hill DRI)
- Enhance pedestrian facilities by striping crosswalks and constructing raised islands in striped medians.

OR

- Current conditions at this location are potentially suitable for a roundabout, however, any future connections to GA 400 at the McGinnis Ferry Road location would likely cause traffic volumes to exceed the capacity of a roundabout.

Morris Road & Deerfield Parkway

- Install traffic signal when volumes warrant (Union Hill DRI)
- Restripe eastbound approach along the private driveway from a left-turn lane and a shared through/right-turn lane to a shared left-turn/through lane and a right-turn lane
- Roundabout not recommended because this is a 4-lane roadway. Volumes appear to be too high at this intersection.

4.2.4 Other Potential Intersection Improvements

Hopewell Road & Bethany Bend

- Reduce speed limit from 35 to 30mph on this curve along Hopewell Road
- Add northbound radar speed detection signage south of the intersection
- Add a southbound left-turn lane (from Hopewell Academy TIA) (only if/when a signal is installed as this may cause a sight distance issue if done before a signal)
- Add a westbound right-turn lane (from Hopewell Academy TIA)
- Signalize when volumes warrant (Hopewell Academy TIA)
- Widen shoulders around intersection
- Roundabout not recommended due to high speeds and sight-distance

Hopewell Road & Bethany Way

- Reduce speed limit from 35 to 30mph in this curve along Hopewell Road
- Add southbound radar speed detection signage north of the intersection
- Widen shoulders around intersection
- Roundabout not recommended due to high speeds and sight-distance

Bethany Oaks Pointe & Hopewell Road (Subdivision intersection between Bethany Way and Bethany Bend)

- Stripe cross-walk along Subdivision driveway
- Stripe the northbound right-turn lane with right-turn only arrows
- Roundabout not recommended due to high speeds and sight-distance

Cogburn Road & Bethany Bend

- Add eastbound and westbound left-turn lanes (Fulton County High School TIA)
- Add eastbound right-turn lane (Fulton County High School TIA)
- Right turn lanes meet Milton's requirements at all four approaches (Fulton County High School TIA)
- Add protected + permitted left-turn phasing in eastbound and westbound directions

- Consider restricting eastbound right-turns on red (possible sight distance issue)
- Roundabout not recommended because of safety concerns associated with the new high school.

Batesville Road & Taylor Road

- Widen shoulders around intersection
- Reduce southbound speeds along Batesville Road from 45 to 35mph
- Improve sight-distance by modifying grades to the north of the intersection
- Roundabout not recommended due to high speeds and free-flow mainline flow of Batesville Road

Arnold Mill Road/SR 140 & Green Road

- Widen Arnold Mill Road from 2 to 4 lanes
- Stripe the crosswalks at Green Road approach
- Signalize when volumes warrant (distance from New Providence Road intersection meets spacing requirements, no count data/traffic study available, signal probably not warranted)
- Roundabout not recommended due to free-flow along Arnold Mill Rd, future widening of Arnold Mill from 2 to 4 lanes

Alpharetta Highway/ SR 9 & Keyingham Way

- Widen SR 9 from 2 to 4 lanes (Envision6 Regional Transportation Plan)
- Stripe crosswalks across Keyingham Way and SR 9 approaches with appropriate pedestrian advanced signage, provide raised pedestrian median islands across SR 9 when widening occurs (crosswalks across SR 9 should be coupled with pedestrian counts to ensure the demand for this crossing is present)
- Roundabout not recommended due to free-flow along Alpharetta Highway and future widening of Alpharetta Highway from 2 to 4 lanes

Alpharetta Highway/SR 9 & Bethany Bend

- Widen SR 9 from 2 to 4 lanes (RTP)
- Add southbound right-turn lane (First Milton Bank TIA, Union Hill DRI, Fulton County High School TIA)
- Add northbound right-turn lane (First Milton Bank TIA, Union Hill DRI)
- Northbound and westbound right-turn lanes meet Milton's requirements (Fulton County High School TIA)
- Retime signal (Fulton County High School TIA)
- Add an eastbound and westbound through lane along Bethany Bend (Union Hill DRI)
- Lengthen the southbound left-turn lane
- Provide raised pedestrian refuge islands at each intersection approach
- Roundabout not recommended due to high volumes and future widening of SR 9 from 2 to 4 lanes

Hopewell Road & Hamby Road

- Add northbound and southbound "sharp curve" and/or flashing beacons advanced warning signs
- Add northbound and southbound radar speed detection signage
- Widen shoulders around the intersection
- Roundabout not recommended due to sight distance and high speeds

- If widening of Hopewell Road and Hamby Road occurs as recommended, turn lanes should be designed and added in accordance with new intersection configuration/volumes

Arnold Mill Road/SR 140 & Ranchette Road
- Add enforcement to lower speeds along Arnold Mill Road
- Add northbound and southbound radar speed detection signage
- Add yellow chevron alignment signs to warn drivers of the curve
- Add a northbound right-turn lane
- Add a southbound right-turn lane
- Widen shoulders around the intersection

Crabapple Road/Mayfield Road & Birmingham Highway/Broadwell Road (Crabapple Crossroads)*
- Please reference **Section 4.10** of this report which has been prepared as a separate, more in-depth analysis for this specific location.

Alpharetta Highway/SR 9 & Webb Road
- Add enforcement to lower speeds along Alpharetta Highway/SR 9
- Add northbound and southbound radar speed detection signage
- Add "Left Turn Yield On Green" signage for the approaches that do not have a protected left-turn green arrow

4.2.5 Intersections with Significant Improvements in Progress

Birmingham Highway/SR 372 & New Providence Road (Conceptual design underway by City of Milton/GDOT)
- Currently being redesigned by GDOT
- Interim – adjust existing westbound stop sign to point only at westbound approach (currently visible by northbound approach as well)
- Realign intersection so that New Providence Road forms 90 angle with Birmingham Highway. This will remove awkward eastbound and westbound turn lanes and reduce westbound rear end crashes.
- Consider short left-turn lanes along both Birmingham Highway and New Providence Road (need traffic counts)
- Widen shoulders around intersection
- Add northbound radar speed detection signage along Birmingham Highway
- Add traffic signal when volumes warrant
- Roundabout not recommended based on current conditions which include limited sight distance caused by a crest just south of the intersection. The intersection also has the challenges of high speeds along the free-flow Birmingham Highway movement. If sight distance can be improved by earthwork reducing the crest of the hill, a roundabout should be considered.

Arnold Mill/SR 140 & New Providence Road (Conceptual design underway by City of Milton/GDOT)
- Currently being redesigned by GDOT
- Realign New Providence Road to 90 degrees with Arnold Mill Road by relocating to the north (currently being recommended and designed by GDOT)
- Widen shoulders around intersection
- Add traffic signal and turn lanes as needed when volumes warrant (no traffic counts available)
- Roundabout not recommended due to widening from 2 to 4 lanes along Arnold Mill Rd, high traffic volumes, Arnold Mill Rd is currently free-flow

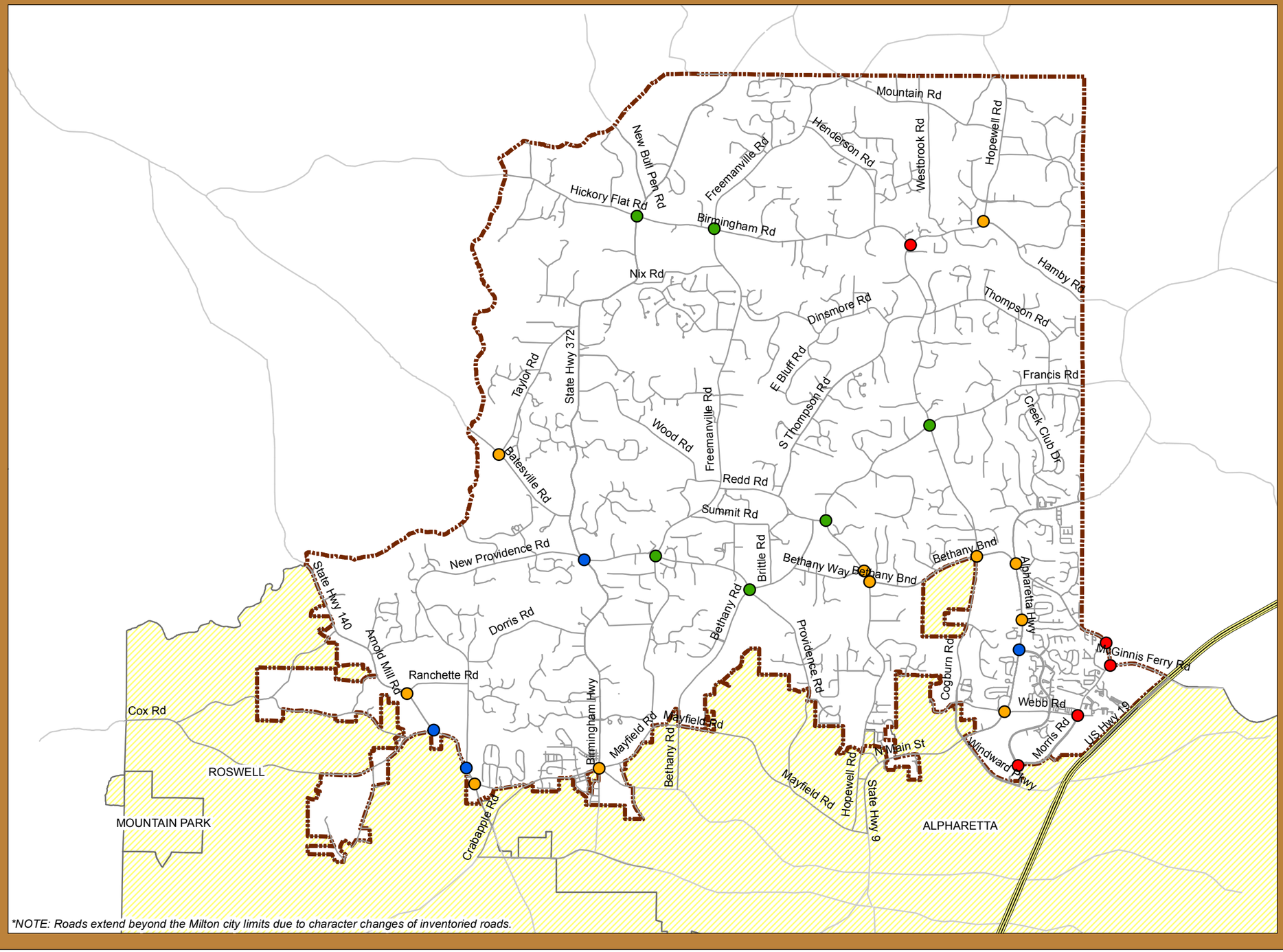
Alpharetta Highway/SR 9 & Deerfield Parkway (Traffic signal installation in progress)

- Widen Alpharetta Highway from 2 to 4 lanes (RTP)
- Install traffic signal with pedestrian enhancements (Deerfield Place DRI)
- Roundabout not recommended based on through movement nature of Alpharetta Highway (high speeds, free-flow conditions) and its impending widening

Arnold Mill Road/SR 140 & Cox Road (Conceptual design underway with GDOT)

- Widen Arnold Mill Road from 2 to 4 lanes (RTP)
- Add separate left-turn and right-turn lanes on Cox Road for vehicles turning onto Arnold Mill Road
- Add northbound left-turn lane along Arnold Mill Road and create long transition taper
- Widen shoulders around intersection
- Restripe lane markings
- Roundabout not recommended due to existing and future traffic volumes and future widening of Arnold Mill from 2 to 4 lanes

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

FIGURE 4-2

Intersection Improvements

Legend

- Potential Roundabout
- Potential New Signal
- Other Laneage/Signage
- Improvements in Progress
- Expressways
- City of Milton
- Other Streets
- Other Fulton County Cities

** Traffic impact studies used to identify these intersections have limited study areas. Other intersections not captured in recent traffic impact studies may also warrant signalization.*

N
W E
S

0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 2, 2009

Source: City of Milton

4.3 Additional Roadway Safety Considerations

There are many rural roadways in Milton that are characterized by rolling hills, frequent turns, and narrow cross-sections. These characteristics can often negatively impact safety by creating reduced sight distances and sharp turns, but they can be very costly to adjust. Based on public comments and input from City staff, the following are some roadways that are specifically perceived as being unsafe:

- North end of Hopewell Road from Thompson Road to The Manor
- Birmingham Highway from Landrum Road to Taylor Road
- Arnold Mill Road from south city limits to Ranchette Road
- Cogburn Road from Bethany Road to Webb Road
- Freemanville Road near the White Columns subdivision
- Freemanville Road curve by the bridge over Cooper Sandy Creek
- Bethany Road south of intersection with Providence Road

Key intersection improvements along these roadways have been addressed by recommendations in the previous section of this report. Regarding the roadways themselves, as a near-term improvement, the City of Milton should consider increased speed limit enforcement through use of regular patrols and speed detection radar signage.

In consideration of costs associated with widening shoulders and realignment, a long-term goal should be to survey the horizontal and vertical alignments of these roadways to identify specific deficiencies and prioritize these improvements as funding becomes available. The City of Milton should evaluate the need for safety improvements on roadway and bridge projects based on a *substantive* evaluation of existing conditions, crash data, traffic volumes and field observation of traffic operations and speed. The intent of this analysis would be to appropriately define design elements on a project-by project basis, and to identify opportunities to apply flexibility that exists in current nominal design standards. This effort would be undertaken on each project in an effort to reduce project costs and impacts to private property and community resources while identifying appropriate solutions to enhance the safety and mobility of motorists in Milton.

4.4 Equestrian Improvements

A major contributor to the character (and likely to the economy) within the City of Milton is the unique pride and interest in equestrian activities. Horses are kept on many of the properties in Milton. The properties range in size from small lots of just a few acres to very large scale professional equestrian operations housing 30 or more horses. The majority of these properties are concentrated in the northwest part of the City, and likewise, any transportation improvements that can be made to accommodate and encourage equestrian activities should be focused in this area. In meeting with members of the equestrian community in Milton, some key recommendations and considerations were developed that would further move the City towards being a horse-friendly destination. Currently, many riders from nearby cities come to Milton to ride horses, and providing additional equestrian amenities would likely increase property values and allow the City to capture additional tax revenue.

Continue development of gravel trails as part of the Milton Trail Plan.
Members of the equestrian community would like to see further development of the Milton Trail Plan, specifically in the northwest portion of Milton near Birmingham Crossroads. Some residents identified the gravel trail section in front of Birmingham Elementary School as being a trail section that works for horses. Some considerations in trail design are:

- Soft gravel and river sand are good surface materials for horses, but asphalt, concrete, and packed gravel are not.
- There should be an adequate buffer between the trail and the roadway (with the trail in front of Birmingham Elementary being an example of the minimum buffer required).
- A fence between the road and the trail is ideal for safety.
- Trails should not be shared with cyclists, as bicycles tend to spook horses. This is also in keeping with requests from many cyclists in Milton. As found in a separate meeting with Milton cyclists, most cyclists prefer to use a paved shoulder or dedicated bike lane in the roadway, and not shared use trails.
- Gravel trails intended for equestrian use should ideally be over 10 feet wide in order to also safely accommodate pedestrians.
- Revise the Milton Trail Plan to include these considerations and also to connect a section of gravel trail along Birmingham Road just east of Birmingham Crossroads.
- Provide adequate signage and striping at crossing locations.

Install an equestrian trail facility along utility line easements in northwest Milton.
There are several large utility easements that run through the northwest part of Milton that would be ideal locations for riding horses. As noted by the members in the community, these corridors would be attractive to riders because of their separation from roadways and their close proximity to nearby horse farms and Birmingham Park. These utility easements are provided for gas lines maintained by Atlanta Gas Light (AGL) as well as high voltage power lines. The city should facilitate discussions between AGL and other utility providers and adjacent land owners to determine the feasibility of creating these trail corridors. Having an equestrian-focused trail system along these utility lines would be a great asset to the City and would draw many additional riders from nearby areas.

Figure 4-3: Utility easement considered as potential equestrian trail.

Develop equestrian facilities at Birmingham Park.
Birmingham Park is in a great location to accommodate equestrian activities. Some residents expressed interest in providing amenities at Birmingham Park such as horse tie-ups, a water point, hay racks, a log jump, and parking for trailers. Developing these facilities at the park would increase usage of the nearby trail system and would also draw riders from surrounding areas.

Create an official forum for Milton equestrian enthusiasts to exchange information.
Due to the significant focus on equestrian activities and culture, it is recommended that a space on Milton's website be dedicated to information on horses within Milton. The primary function of this page could be educational. The page could provide information on City laws, rules regarding trail use, information on stores and destinations, and also a message board for equestrian advocates in the City.

Look to example cities for additional ideas and policies.
Many residents noted that Milton could benefit from looking to other equestrian-focused cities for additional ideas and policies. Other cities that were noted were:

- Aiken, SC
- Wellington, FL
- Germantown, TN
- Middleburg, VA

4.5 Cyclist Improvements

There is currently a strong population of cyclists that live within the City of Milton. Additionally, due to the scenic nature of Milton's roadways, there are many cyclists who travel through Milton from nearby communities. Based on a meeting with many members cyclist community in Milton, there are some key potential improvements that would encourage additional ridership and increase the safety of riders. It should be noted that the cyclists that were present at the focus group meeting strongly agreed that shared use paths are dangerous for cyclists because of the high speeds of bicycles relative to the speeds of

walkers and runners. Cyclists prefer to ride on the edge of roadway where adequate lane width allows vehicles and cyclists to pass safely.

Create an official forum for sharing information related to cycling in Milton.
Because of the strong demand for cycling activity, Milton should create an additional page on its website for the exchange of cyclist related information. The webpage could contain rules pertaining to cycling for both cyclists and drivers. Also, the site could post contact and schedule information for groups that meet and ride in Milton. The page could have a message board or comment section for residents who wish to share input and ideas. This could also be an avenue for creating a core bicycle advocacy group that could advise Milton staff on public policies and prioritization of projects that would support cycling.

Increase the presence of signage and striping.
Many cyclists expressed the need for educating citizens on rules relating to bicycle usage. This could be done through the website as mentioned above, but also through the use of increased signage. Cyclists are currently allowed to operate on all roadways within the City of Milton. "Share the road signs" should be used to let drivers know that cyclists should be anticipated and accommodated. Also, "sharrows" should be used to increase driver expectancy and to educate drivers on the rights of cyclists to use the roadways. An example of a "sharrow" can be seen in **Figure 4-4** below. Additionally, "bike boxes" should be used at busy intersections to allow cyclists to safely navigate those intersections and avoid conflicts with motorists. An example of a "bike box" can be seen in **Figure 4-4** below. As an applied example, the City of Roswell is currently installing bike boxes and sharrows along some of its more heavily trafficked cycling routes.

Figure 4-4. Bike box (left) and shared use arrows or "sharrows" (right)

Provide more bike racks at locations around the City.
Many Milton cyclists use the bicycles to access stores and destinations around town and have noted that there is a lack of adequate bicycle storage at many of the stores and municipal buildings in Milton. The City should ensure adequate bicycle racks are provided at public buildings such as City Hall, libraries, and schools. Then, the city should consider a policy that requires commercial properties to install racks. This requirement could be expressed as a fraction of required parking (e.g. 1 bicycle storage spot for every 5 parking spaces).

Manage speeds of vehicular traffic.
Many sections of Milton's roadways have limited lane width and sight distance, which can be dangerous for cyclists and drivers. As noted in the previous section on recommendations for roadways, Milton should increase enforcement throughout the city. This could be done through increased ticketing, signage, and speed display signage that flashes drivers their speeds.

Add widened shoulders or bicycle lanes as roadways are reconstructed.
Sections of Morris Road are in need of full reconstruction as noted in the supplemental report *Pavement Management Evaluation and Recommendations*. Because of the large amount of disturbance that will already be occurring during this reconstruction, Milton should take advantage of this opportunity to install bike lanes along this roadway.

Identify and prioritize corridors for long-term widening projects that will include paved shoulders or bicycle lanes.
Many of Milton's rural roadways have been constructed without adequate shoulders. This is dangerous for both cyclists and drivers, especially when sight distance is limited. Recognizing the limited funding for major roadway improvements, Milton should identify long-term goals for shoulder improvements which could include bicycle lanes. Due to the large impact created when bringing road shoulders up to AASHTO standards, the difference in cost between providing a paved shoulder and a full bicycle lane is relatively low. Because of this, it is recommended that bicycle lanes are added to all roadways as shoulder widening occurs. Further study should be conducted to determine which roadways are in most need of shoulder widening and would provide the greatest benefit to users. Some initial routes that have been identified by riders as feeling particularly unsafe are:

- Hopewell Road
- Freemanville Road
- Birmingham Road (especially just east of Birmingham Crossroads)
- Cogburn Road
- Thompson Road from Redd Road to Hopewell Road
- Alpharetta Highway/State Route 9
- Bethany Bend and Bethany Road

Prioritization of these projects, as funds become available, should be discussed with advocates from the cycling community.

Overall, the following are common corridors used by riders in Milton as indentified in the focus group meeting with Milton cyclists:

<u>North/South</u>
Bethany Road/Haygood Road
Freemanville Road
Thompson Road (from Redd to Hopewell)
Hopewell Road
Birmingham Highway/SR 372
Cogburn Road

<u>East/West</u>
Providence Road/New Providence Road
Batesville Road
Thompson Road(Hopewell to Francis)
Dinsmore Road
Birmingham Road
Mountain Road
Longstreet Church
Redd Road
Francis Road
New Bullpen Road

4.6 Improvements for Persons with Disabilities

Several recommendations were developed as a result of meeting with the Milton Disability Awareness Committee.

Include these general considerations for all crosswalk and sidewalk improvements.
Handicap Ramp Design - It is preferred for handicap ramps to point in the direction of the walking path and not into the intersection (at an angle). This can often position the wheelchair landing area to be too close to passing traffic.

Crosswalk Push Buttons - Ensure crosswalk buttons are not too high or too close to the curb which makes them inaccessible to people in wheelchairs.

Surface material – Hard packed gravel is very uncomfortable for people in wheelchairs. Soft gravel surfaces are not traversable at all. Events that are held in fields are often not accessible to people in wheelchairs.

Audible signals – Audible crosswalk signals should be utilized in areas where visually impaired persons are known to reside.

Long crosswalks – If a crosswalk is so long that it requires a pedestrian refuge, these can be very difficult for people in wheelchairs. If a pedestrian refuge is provided, ensure that it is wide enough to provide a safe and comfortable stopping point between cycles.

Create a continuous network of sidewalks in specific areas.
These specific items and areas identified by the Milton Disability Awareness Community should be addressed:

- Missing sidewalk on Webb Road between Cogburn Road and Highway 9. This is a critical link, particularly for students trying to access the schools on Cogburn from the nearby townhomes. This area is not included in the Safe Routes to School grant.
- In the Crabapple Crossroads area, there are several places are missing sidewalks, including around the existing Shell Station and at nearby properties. Also, many of the older buildings in Crabapple are not accessible by wheelchairs.
- Install sidewalk near the existing senior center on Cogburn Road.
- Adjust crosswalk signals to allow more time for disabled pedestrians to at these two intersections:
    - Highway 9 & Bethany Bend
    - Highway 9 & Webb Road

Provide a paratransit service.
Paratransit service is needed for disabled residents in Milton. The current coverage of the MARTA Mobility paratransit service only reaches the southeast corner of Milton and does not meet the needs of many disabled residents in Milton. Initially, the City should perform a feasibility study to determine levels of demand relative to the costs associated with meeting that demand. Please refer to the section on Transit Recommendations included in this report for additional information on paratransit services.

4.7 Pedestrian Improvements

The City of Milton has put in place city-wide policies requiring newly developed land to have sidewalks adjacent to the public roadway. Although this will take years for the network to become fully continuous while properties are redeveloped one-by-one, this is a critical step in providing access for pedestrians and will provide a long-term successful network of pedestrian facilities. Beyond this critical requirement, there are some additional improvements that should be made in order to enhance safety and mobility of Milton's pedestrians.

Capitalize on the Milton Trail Plan and expedite critical sections.
The City of Milton Trail Plan is a well-developed plan to create a connected trail system throughout the City. Currently, the *City of Milton Trail Development Standards Ordinance* (adopted August 2008) requires property owners to install sections of the Trail Plan that cross their property at the time their property is redeveloped. This is a critical step in implementing the Trail Plan. However, because adjacent properties will be developed at different times, for an unknown amount of time, a discontinuous network of trail sections will develop. Wherever feasible, the City of Milton should consider preemptively installing those sections deemed most critical to the Trail Network. These locations could include trail segments near school and commercial centers such as Birmingham Crossroads.

Milton was recently awarded GDOT's Safe Routes to School grant which will provide funding for some of these connections. Once the proposed network and designs of these paths is identified in the design process, Milton should determine if there are additional connections that are critical and expedite these segments.

The *City of Milton Trail Development Standards Ordinance* in its current form does not specify designs for driveway, intersection, and mid-block crossings locations. Perceived safety at crossings is a critical factor affecting trail and sidewalk usage. The ordinance should be revised to include minimum standards at crossing locations.

Paint crosswalks at pedestrian crossing locations.
There are many locations throughout the City where sidewalks end at a commercial driveway or intersecting roadway but there is no striped crosswalk that continues the pedestrian path. Crosswalks are critical for the safety of pedestrians and should be installed wherever sidewalks cross a vehicular path. Recommendations for crosswalk locations have been included with in the previous section on recommended intersection improvements.

4.8 Bridge Improvements

Concurrent to the CTP, the City of Milton is undergoing a separate bridge audit to determine bridge repair and replacement needs. A report summarizing the results of this audit as well as a prioritized list of projects is expected to be published by the Milton Department of Public Works this fall (2009). While results may not be final, preliminary results have been made available for inclusion in this report.

Four bridge repair or replacement projects have been identified as high priorities. These bridges are listed below and can also be seen in **Figure B-1** in **Appendix B**:

Landrum Road over Cooper Sandy Creek tributary
- included in the 2009 short term work program

Cogburn Road over Cooper Sandy Creek
- included in the 2010 work program

Bethany Road over Cooper Sandy Creek
- Currently identified as a long-range GDOT project
- If this project is undertaken by GDOT, Milton will most likely need to provide some level of matching funds

New Providence Road over Cooper Sandy Creek
- Fulton County has recently performed significant repairs on this bridge. The Milton Department of Public Works is currently working with GDOT staff to determine if those repairs are sufficient enough to remove this bridge from the list of high priorities. If the bridge is determined to still be a high priority, then the bridge will need to be replaced (based on a cost-benefit analysis of future repair options).

The entire table of preliminary results inclusive of all bridges in Milton along with bridge fact sheets can be viewed in **Appendix B** of this report.

4.9 Transit Improvements

Because of Milton's low density and rural style of development, a fixed-route transit option (such as a regular bus or rail service) that would connect various destinations within the city would be unlikely to see high levels of ridership, and therefore would not have a very high return on investment. However, there are several forms of transit apart from a fixed-route system that could be beneficial for Milton residents.

Provide a paratransit service.
Limited paratransit service is needed for the City's disabled residents. Many rural and suburban communities around the country have implemented paratransit services to meet the more specific transportation needs of their citizens. Paratransit services are special public transportation options for senior citizens and persons with disabilities. Sometimes these services are offered to the general public as well. Services are usually provided via a small fleet of mini-buses or vans that make specific local trips. Paratransit vehicles do not typically follow set routes or schedules, but rather, are used on an on-call basis within certain operating hours. Paratransit services can be operated by public transit agencies, not-for-profit corporations, and for-profit private companies. By providing more specific demand and response coverage, paratransit can be much more cost effective than regular fixed-route bus services at supporting the needs of disabled residents in rural areas.

As a goal of Lifelong Communities, this service would be most important to the elderly and disabled populations. According to ARC, between 2000 and 2015 the older adult population will double, and by 2030, one out of every five residents will be over the age of 60. Also, the Milton Disability Awareness Committee has specifically described local paratransit service as an important unmet need in Milton. This group has also stressed the need for sidewalk facilities throughout the City and the need to bring several areas to ADA standards. Providing a linkage between key sidewalk and ramp locations will enhance accessibility of a paratransit service.

Focus on improvements for commuter transit.
There are several possible improvements that could make commuting by public transit a more attractive option. One improvement would be to install dedicated bus lanes (or high-occupancy vehicle (HOV) lanes) from the Windward Parkway exit southward along GA 400. Dedicated bus lanes would give a significant time advantage to buses travelling during congested periods. This could be accomplished through regional cooperation, particularly in planning efforts such as the North Fulton Comprehensive Transportation Plan.

Another improvement for commuters trying to access Atlanta would be the addition of an Xpress Bus route that makes a direct connection from the Windward Parkway exit directly into the Perimeter District, Midtown, or Downtown area. Currently, the only Xpress bus route that is near Milton is a direct connection between Cumming, GA and Atlanta.

The Windward Park & Ride Facility could be a feasible location for this service. Those seeking to initiate an Xpress bus service will have the ability to provide input and possibly influence these improvements through participation in the development of the North Fulton Comprehensive Transportation Plan.

4.10 Crabapple Crossroads

The historic Crabapple area of Milton, located near the intersection of Crabapple Road/Mayfield Road and Birmingham Highway/Broadwell Road, is a unique area that includes historic homes and businesses as well as new mixed-use development and civic spaces. Crabapple is rapidly becoming a town center and destination for those within Milton and other North Fulton communities. The Crabapple area is currently constrained, however, due to its location at the intersection of two major roadways, large amounts of commuter traffic, and a need for multimodal transportation enhancements. A detailed study of the Crabapple area was included as part of the overall comprehensive transportation plan for Milton including a traffic study, community charrettes and stakeholder meetings, and urban design recommendations. Initially, the purpose of the study was to determine which roads should be included in a grid network on the southeast side of the intersection in order to relieve the intersection of some of its current congestion. The study has since grown to include transportation recommendations around the entire intersection (in addition to the southeast quadrant). The detailed traffic study and charrette summary are included in the appendix for further reference. A summary of the process and results of the Crabapple work follow.

4.10.1 Existing Conditions Analysis

The initial data collection and existing conditions report for Crabapple began in November 2008. Turning movement counts were collected at eleven intersections in the Crabapple area (with an additional intersection added in October 2009) and five daily tube counts. Preliminary stakeholder interviews were also conducted with some of the residents and business owners in "Old Crabapple" on the southeast quadrant. In order to incorporate the study of Crabapple into the overall CTP, the detailed analysis of Crabapple was postponed until mid-2009 until large-scale recommendations for the City had been considered.

The existing conditions analysis indicated that most intersections currently operate relatively well, except for the main intersection of Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road and a few side street approaches. The main intersection has only an eastbound right-turn lane, which is currently underutilized. Because no left-turn lanes exist on any of the legs, vehicles making left turns must wait for a gap in the opposing traffic. The left-turning vehicles block the travel lanes and cause long queues primarily on the eastbound and southbound approaches in the AM peak period and on the westbound and northbound approaches in the PM peak period. Some of the side street approaches perform poorly as a result of high volumes on the main road and a subsequent lack of gaps in mainline travel. It is sometimes common for side streets to perform less than optimally, but it is not of significant concern if other options are available to drivers.

4.10.2 2030 Future Conditions Analysis

Following the existing conditions analysis, future traffic was added to the current volumes on the roadway. First, local development around the intersection that has yet to be built was added to the roadway network. Second, growth projected from 2010 to 2030 in the ARC travel demand model was applied to the roadway network. The overall CTP recommendations were taken into account when projecting traffic volumes to 2030. Recommendations such as the widening of Arnold Mill Road will help to remove some of the commuter traffic currently traveling along Crabapple Road/Mayfield Road and was appropriately reflected in the growth factors. These levels of growth in traffic then were included in the 2030 traffic analysis.

4.10.3 Crabapple Charrette

On August 24, 2009, the Crabapple Charrette occurred with local community stakeholders. The project team presented the existing conditions analysis, the relevance of the CTP to the Crabapple work, and some preliminary concepts to be considered by the stakeholders. The community members then split into three teams and worked with a facilitator to develop their vision of the future Crabapple. The common themes that emerged are listed below:

Figure 4-5: Public Crabapple Charrette

Bypass of Crossroads Intersection: All groups agreed that a bypass network could be beneficial; however each group drew a slightly different variation. In each concept, the intent was the same, which was to disperse the congestion that is occurring at the core of the area (the main Crabapple intersection) and open up the area to become a more pedestrian friendly, village-style center.

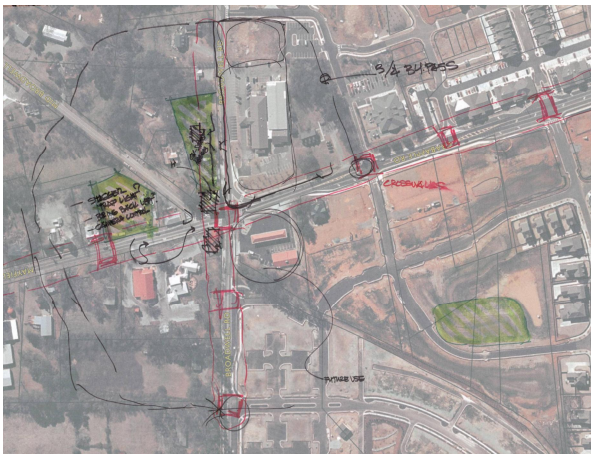


Figure 4-6: Sample Group Vision Concepts from Charrette

Village Center: The groups agreed that Crabapple Crossroads should be guided towards become a village-style town center by focusing on pedestrian safety, walkability, on-street parking is appropriate areas, green space, slower traffic speeds, and architectural design guidelines.

Pedestrian Safety: Residents agreed that pedestrian safety was of critical importance, and should be addressed through use of additional crosswalks, pedestrian signals, high visibility striping, a continuous network of sidewalks, and adequate signage.

Green Space: Every group drew a public green space in some form in order to achieve the "village-like" feel. Two groups sketched a single green space as a community focal point, while one group conceived of multiple green spaces throughout the area.

While the group came to a consensus regarding the above topics, they had differing thoughts on the following subjects: roundabout at the main Crabapple intersection; on-street parking on the main roads, additional connectivity to the schools, and closing the northern piece of Mid-Broadwell Road.

4.10.4 Crabapple Stakeholder Meeting

Following the completion of the Crabapple Charrette, the project team conducted further analysis at and around the Crabapple intersection, taking into consideration the results of the community charrette. On October 8, 2009, the project team returned to the community with some recommended concepts for the Crabapple area.

Figure 4-7: Crabapple Bypass Concept

Bypasses Around Crabapple: The first recommendation was for a system of bypasses around the main intersection, allowing for vehicles to travel around the intersection if beneficial. Some of the bypasses exist to some degree today (on the west side of the intersection) while others would need to be fully constructed (on the east side of the intersection).

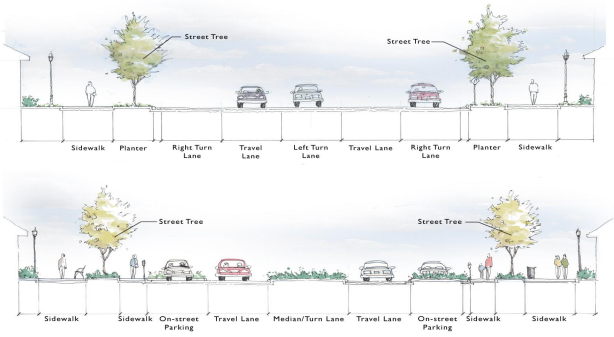


Figure 4-8: Crabapple Road Cross Sections (Existing/Proposed)

Crabapple Road Cross-Section: Crabapple Road currently ranges from three lanes to five lanes between Crabapple Chase Drive and Birmingham Highway. The five-lane section was used to develop an alternate concept for the roadway cross-section. Currently, the five-lane section includes two travel lanes, a left-turn lane, and two right-turn lanes, as can be seen from the cross-section sketch on the top (general representation). The travel lanes and left-turn lanes should be maintained to keep traffic moving efficiently. In addition to a left-turn lane, a median should be considered. In areas where the left-turn lanes exist, the median would only be a couple feet wide. It could then widen to approximately 14 feet in locations where the left-turn lanes do not exist. The median can provide access management (to prevent cars from turning left at every driveway), pedestrian refuge (in conjunction with logically-located crosswalks for pedestrian safety), and aesthetic enhancement. In order to slow traffic turning into and out of the developments on the north and south side of Crabapple Road, the right-turn lanes can be removed and converted to either on-street parking or wider sidewalks. The proposed cross-section is shown below the existing cross-section. In areas where only three to four lanes exist, the on-street parking can be removed and the sidewalk and median width can be reduced. The sample plan view can be seen to the right.

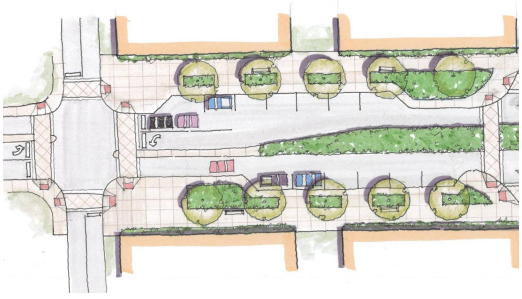


Figure 4-9: Crabapple Road Streetscape Concept

Figure 4-10: Crabapple Crossing Traditional Improvements Concept

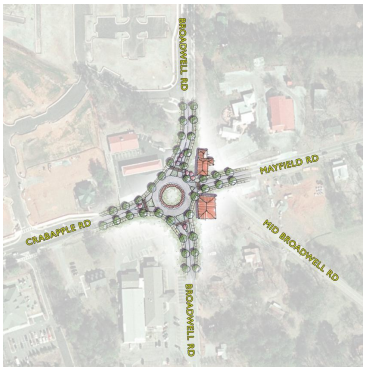


Figure 4-11: Crabapple Crossing Roundabout Concept

Crabapple Intersection: Two concepts were developed preliminarily for the intersection of Crabapple Road/Mayfield Road and Birmingham Highway/Broadwell Road. The first concept is a more traditional intersection that includes turn lanes and medians. The second concept includes a roundabout at the intersection. Both concepts were presented to the public for discussion as a result of interest in a roundabout at the original Crabapple Charrette. Caveats associated with the roundabout in comparison with a traditional intersection include the following:

- Offset alignment of the roundabout to avoid the historic buildings on the east side of the intersection
- More right-of-way impacts to the intersection (likely resulting in significant impact to the gas station on the northwest side of the intersection)
- Less pedestrian friendly due to the location of sidewalks farther outside the intersection
- More susceptible to failure if demand exceeds the maximum volume thresholds

Roundabouts are often excellent alternatives to traditional signalized intersections; however, due to a number of complicating factors at the Crabapple intersection, the roundabout may not be the most appropriate solution.

4.10.5 2030 Future Conditions Analysis Including Recommendations

Following the Crabapple Charrette, Crabapple Stakeholder Meeting, and the Milton Roundup (where public comment was solicited), the final traffic analysis was completed giving consideration to the numerous comments received throughout the public comment period. Transportation recommendations are listed by phase, taking into account priority based on need as well as feasibility.

Phase 1 Recommendations:

The first set of recommendations includes signal-timing enhancements that can be completed in the near future. These recommendations are meant to improve vehicular operations as well as pedestrian safety and ease at the intersection.

- Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road
  - Retime the signal to reallocate some of the green time from the north-south movement to the east-west movement
  - Change the pedestrian timing to activate during each cycle (pedestrian recall) and to show the walk symbol for as long as possible (rest-in-walk)

Phase 2 Recommendations:

The Phase 2 recommendations are focused primarily on geometry improvements to the main Crabapple intersection and on streetscape improvements along Crabapple Road. The operations at the intersection can be impacted significantly by the addition of left-turn lanes on three of the four approaches. Improvements to the streetscape and cross-section of Crabapple Road also have the ability to calm

traffic, provide enhanced crossing locations for pedestrians, and improve the aesthetics of the area. The Phase 2 recommendations are mostly within existing right-of-way (therefore being easier to construct).

- Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road
    - Add a northbound left-turn lane along Broadwell Road
    - Add a temporary southbound left-turn lane along Birmingham Highway (pending implementation of Phase 3 Recommendations)
    - Remove the existing eastbound right-turn lane along Crabapple Road and realign the approach to include an eastbound left-turn lane and shared through-right lane
    - Make the eastbound left-turn phase protected-only (due to geometric constraints)

- Crabapple Road at Itaska Walk
    - Remove the eastbound right-turn lane along Crabapple Road
    - Remove the westbound right-turn lane along Crabapple Road

- Crabapple Road at Marstrow Drive
    - Remove the westbound right-turn lane along Crabapple Road

- Implement the Crabapple Road streetscape concepts including removal of right-turn lanes, construction of a median (with left-turn lanes), crosswalks at key intersections, and wider sidewalks.

Phase 3 Recommendations:
The Phase 3 recommendations include the northern portion of the bypass system and the intersection improvements associated with it. The northern bypass has the ability to divert southbound right- and left-turn traffic from the Crabapple intersection, eastbound left-turn traffic, and westbound right-turn traffic. In addition, the northeastern bypass also has the ability to remove vehicles from the Crabapple intersection that travel along Mid-Broadwell Road to Charlotte Drive and north to Birmingham Highway (as well as the reverse travel pattern). These recommendations will require larger amounts of right-of-way acquisition or improvements through an existing neighborhood, as compared with Phase 2 recommendations. Phase 3 recommendations include the following:

- Construct the northern portion of the bypass system
    - Include a connection from Charlotte Drive to Bentworth Lane on the northeast quadrant
        - Prohibit the southbound left-turn movement from Birmingham Highway to Mayfield Road, directing all such movements to the new bypass system
        - Replace the existing southbound left-turn lane on Birmingham Highway at Mayfield Road with a landscaped median
    - Formalize the connection from Bentworth Lane to Itaska Walk as a bypass on the northwest quadrant
        - The south terminus of the bypass may need to be aligned across from Dunbrody Drive if Phase 4 recommendations advance. If so, the Itaska Walk curb cut would likely be closed (due to proximity to the bypass) and could become a pedestrian plaza.

- Bentworth Lane at Birmingham Highway
  - Signalize the intersection when warranted
  - Add a northbound left-turn lane along Birmingham Highway
  - Add a southbound left-turn lane with permitted/protected phasing along Birmingham Highway
  - Add an eastbound left-turn lane along Bentworth Lane
  - Add a westbound right-turn lane along the new bypass
- Mayfield Road at Charlotte Drive
  - Add a northbound left-turn lane along Charlotte Drive
  - Add a southbound left-turn lane and shared through/right-turn lane along the new bypass
  - Add a westbound left-turn lane with protected/permitted phasing
- Mid-Broadwell Road at Charlotte Drive
  - A roundabout may be considered if no southern bypass is constructed around the Crabapple intersection.
- Crabapple Road at Itaska Walk
  - Signalize the intersection when warranted
  - Add a southbound left-turn lane along Itaska Walk
- Develop a coordinated system of signals including the current signals (Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road and Mayfield Road at Charlotte Drive) and new signals (Bentworth Lane at Birmingham Highway and Crabapple Road at Itaska Walk).

Phase 4 Recommendations:
The final phase of recommendations includes the construction and formalization of the southern bypass system. This bypass has the ability to divert northbound left- and right-turn traffic from the main intersection as well as eastbound right-turn traffic and westbound left-turn traffic. The most significant impact of the southern bypass system is to those currently traveling along Mid-Broadwell Road to Charlotte Drive, and west on Mayfield Road through the main intersection (as well as the reverse travel pattern involving southbound travel along Mid-Broadwell Road). Both portions of the southern bypass would be necessary to truly provide relief. If just the southeastern connection is made, fewer drivers will choose to use an indirect route through the southwestern subdivision, although some will likely make the maneuver. Consideration should be given to the bypass connections to the west of the intersection because they are existing neighborhoods that will experience more traffic on their roadways. In particular, the southwest quadrant of the intersection would likely experience more diverted traffic than the northwest quadrant. The Phase 4 recommendations include the following:

- Dunbrody Drive at Broadwell Road
  - Signalized the intersection when warranted
  - Add a northbound left-turn lane along Broadwell Road
  - Add a westbound left-turn lane and shared through/right-turn lane along the new bypass
- Mid-Broadwell Road at Charlotte Drive

  - Add a northbound shared left-turn/through lane and right-turn lane along the new bypass
  - Add a southbound left-turn lane along Charlotte Drive
  - Add a westbound left-turn lane along Mid-Broadwell Road

- Crabapple Road at Dunbrody Drive
  - Signalize intersection when warranted
  - Add a northbound left-turn lane and shared through/right-turn lane along Dunbrody Drive
    - Projected northbound left-turn movements are anticipated to be heavy during the PM peak period especially. Queuing along the new bypass may be of concern during this time period of the day.
  - Add a southbound left-turn lane and shared through/right-turn lane along the new bypass
  - Add an eastbound left-turn lane along Crabapple Road
  - Add a westbound left-turn lane along Crabapple Road

- Include the intersections of Dunbrody Drive at Broadwell Road and Mid-Broadwell Road at Charlotte Drive to the coordinated signal system discussed in the Phase 3 Recommendations.

As noted previously, the Crabapple area recommendations are divided into phases based on relative need and the feasibility of each of the recommendations. Phase 1 recommendations can be completed in the very short term as they involve changes to signal timing. Phase 2 recommendations involve the main Crabapple intersection and the existing Crabapple Road public right-of-way. The improvements to the intersection are projected to have a significant effect on vehicular operations and pedestrian safety, while the streetscape improvements could provide increased safety to pedestrians and improved aesthetics. Phase 3 and 4 recommendations are more long-term recommendations that require right-of-way acquisition and more significant impacts to existing neighborhoods. Improvements to vehicular operations at the main intersection should be considered in relation to the associated right-of-way costs and impact to neighborhoods.

4.11 Other Studies Included with the CTP

4.11.1 Pavement Management

As part of the Milton Comprehensive Transportation Plan, an in-depth supplemental study was performed on pavement conditions in the City of Milton. This work serves as a follow-up study to the previous pavement evaluation performed by Infrastructure Management Services (IMS) in 2007. This follow-up study was focused primarily on reviewing existing pavement conditions, developing specific maintenance and rehabilitation recommendations, review of anticipated backlog at current funding levels, gravel road maintenance, and a final project list.

Copies of the report *Pavement Management Evaluation and Recommendations* can be obtained from the Department of Public Works and was also included in the Appendix section of the *Needs Assessment Report* for reference.

4.11.2 Access Management

An *Access Management Guide* was produced as part of the CTP effort in order to assist Milton staff in developing an access management plan specific to the City of Milton, which will protect the mobility and safety of Milton's critical corridors. The City has already adopted initial guidelines based on GDOT's *Regulations for Driveway and Encroachment Control* and may wish to further develop this program in an effort to ensure an effective and consistent approach to access management. The *Access Management Guide* includes an informative section on access management purpose and applications, a "toolkit" of best management practices, and a review of Milton's existing access management ordinances with suggested edits and additions.

Roadway mobility and safety are greatly impacted by access points from adjoining commercial and residential properties. The consultant recommends implementing an effective access management plan to guide future development along Milton's important corridors. Many of the properties along Milton's roadways are completely undeveloped and may be significantly altered in the near future. In order for permitting staff to ensure that proper driveway placement occurs as properties develop, Milton should have clear policies in place that guide the site planning process. These policies, as outlined in the more detail in the *Access Management Guide*, should specify requirements such as:

- driveway spacing
- median break spacing
- signal spacing
- corner clearance
- throat depth
- shared access
- access easements
- restricted driveways
- permit review procedures

Also, a pilot study for implementing the policies recommended in the *Access Management Guide* was performed on a one-mile section of the State Route 9 corridor. This pilot study serves as an example of how access management policies can be retrofitted into a mature corridor. The study has recommendations for driveway relocation, interparcel connections, and turning movement considerations. The pilot study is an example of how these kinds of recommendations could be implemented gradually as redevelopment occurs in order to preserve existing mobility as well as address

some existing safety concerns. Final copies of both the *Access Management Guide* and the *State Route 9 Pilot Study* may be obtained from the City of Milton Department of Public Works.

4.11.3 Impact Fees

As part of the Comprehensive Transportation Plan, the *Supplemental Impact Fee Feasibility Study* was developed in an effort to assist City leaders in determining if impact fees are an appropriate funding source for transportation projects. The study determined that there are three types of impact fees that are feasible for implementation:

1. Roads – high revenue potential
2. Parks – moderate revenue potential
3. Fire – low revenue potential

Depending on the rate at which properties are allowed to develop, the combination of these three impact fees could yield as much as $400k annually for the City. Consideration and implementation of impact fees as a tool for Milton is ongoing. More detailed information on the application of these fees can be found in the referenced document. A full copy of the *Supplemental Impact Fee Feasibility Study* has been provided in **Appendix F** of this report.

5.0 IMPLEMENTATION STRATEGY

The Implementation Strategy is intended to provide the tools and direction necessary to take the projects identified in the previous sections of the report into implementation. This section is broken up into three parts:

- Opinion of Probable Cost
- Funding Strategies
- Project Prioritization

Many of the projects identified in the Milton CTP will require coordination with surrounding jurisdictions and multiple agencies including GDOT and ARC. Additionally, in order to successfully obtain funding to implement these projects, Milton will be competing for funds at the State and Federal levels. To be successful, these projects must receive strong momentum and support from the local community. Some key factors that will improve a project's chances of being selected to receive funding and to ensure successful completion include:

- Having a well-thought-out and well articulated purpose and need
- Demonstrating strong community development potential
- Having someone in the community who strongly champions the project
- Local level of resource commitment (matching funds)
- Demonstrating the improvement will benefit more than just Milton

Milton's CTP is being completed in advance of the North Fulton County CTP. Having an approved CTP in place will strongly benefit Milton in its ability to effectively engage in the regional planning process under the North Fulton CTP. Understanding the needs of Milton's residents and having projects identified which will address those needs will give a strong advantage to the City.

Also, as mentioned earlier in this report, Milton lies within a rapidly changing region. While this CTP is intended to be a guide that can be referenced well into the future, it will be important for Milton to periodically revisit this program of projects and ensure that these improvements will still meet the needs of City residents as the region evolves.

5.1 Opinion of Probable Cost

This section provides an opinion of probable cost for both general project types as well as specific projects identified in the recommendations section of this report. The cost opinions for specific projects can also be seen in **Tables 5-1** through **5-5** and are provided to aid in project prioritization and strategy development while the general cost figures are provided as a tool for gauging relative costs for project alternatives. These figures have been developed from prior project experience and comparisons to other recent projects of similar size and scope.

General Cost Figures

The project costs given below include design and construction costs for generalized project types. Anticipated right-of-way and easement costs per square foot are given at the end of this section.

- Roundabout construction at existing 4-way stop: Includes construction of a single-lane roundabout w/ no auxiliary lanes.
    - $1,000,000 to $3,000,000 per intersection

- Turn lane improvements at intersections: Includes roadway widening for additional turn lanes at intersections. Costs can vary greatly depending on number and type of turn lanes, as well as required vehicle storage lengths.
    - $750,000 to $3,000,000 per intersection

- Crosswalks and pedestrian improvements at signalized intersections: Includes high-visibility crosswalk striping, ADA-compliant curb ramps, count-down pedestrian signal heads and minor sidewalk widening in the immediate vicinity of an existing intersection.
    - $50,000 to $250,000 per intersection

- Shoulder improvements for bicycles (widening): Includes widening of existing pavement 2 feet to provide extra shoulder width for on-road bicycle use. Shoulder improvements such as grading and guardrail to provide adequate clear zone for rural roadways are included.
    - $750,000 to $1,500,000 per mile

- On-Road bike lanes (widening): Includes widening of existing pavement 4 to 5 feet to provide for on-road bike lanes. Shoulder improvements such as grading and guardrail to provide adequate clear zone for rural roadways are included.
    - $1,000,000 to $3,000,000 per mile

- On-Road bicycle Striping and Signage: Includes share-the-road signage and shared-use pavement markings (i.e. "sharrows") on existing pavement. Requires adequate existing pavement width to provide for shared use lanes.
    - $50,000 to $100,000 per mile

- Minor Traffic Calming: Includes construction of elements such as speed tables, raised crosswalks, pedestrian refuge islands, center islands, chicanes, speed detection feedback signage and warning signage.
    - $50,000 to $100,000 per mile

- Multi-use paths: Includes minimum 10-foot wide paved multi-use path, either off-road or adjacent to existing roadway (with 5-foot minimum separation). Trail surface may be concrete, asphalt, crushed stone or gravel.
    - $500,000 to $2,000,000 per mile

- New Traffic Signal Installation: Includes installation of a traffic signal at existing stop-controlled intersections. New signal installations may be decorative steel strain poles with signal heads hung from decorative steel mast arms.
    - $100,000 to $250,000 per intersection

- Right-of-Way: Land values in the Milton area are expected to be between $20 and $50 per square foot for fee simple right-of-way. Permanent easements costs are expected to be between $10 and $40 per square foot, while temporary construction easements are expected to be between $5 and $15 per square foot.

Table 5-1: Opinion of Probable Cost for Widening Projects and New Road Connection

Project	Length (Miles)	Construction Cost/Mile	Construction Cost	Right-of-Way	Preliminary Engineering	Total
SR 140 From Batesville Rd to Mansell Rd	11	$4,000,000	$44,000,000	$81,312,000	$5,280,000	$131,000,000
Rucker Rd From Arnold Mill to exist 4-lane section	2.5	$4,000,000	$10,000,000	$18,480,000	$1,200,000	$30,000,000
SR 9 from Hamby Rd to Mayfield Rd	7	$4,000,000	$28,000,000	$51,744,000	$3,360,000	$83,000,000
Hamby Rd From Hopewell Rd to SR 9	1.7	$4,000,000	$6,800,000	$12,566,400	$816,000	$20,000,000
Hopewell Rd/Holbrook/Campground Widening	5	$4,000,000	$20,000,000	$36,960,000	$2,400,000	$59,000,000
Morris Rd From Webb Rd to McGinnis Ferry Rd	0.6	$4,000,000	$2,400,000	$4,435,200	$288,000	$7,000,000
Widen School Drive to allow additional queue capacity	0.5	$2,500,000	$1,250,000	$1,848,000	$150,000	$3,000,000
					Total	$333,000,000

Assumptions:

1. All projects involve widening existing 2-lane rural road to 4 lanes w/ graded shoulders
2. PE costs are 12% of construction costs
3. Right-of-way cost for widening project assumes 40' additional right-of-way width along entire corridor at $35/square foot
4. Right-of-way cost for new location roadway project assumes 80' right-of-way width along entire corridor at $35/square foot

Table 5-2: Opinion of Probable Cost for Key Intersection Improvements

Project	Construction Cost	Right-of-Way	PE	Total
Cogburn Rd at Bethany Bend	$1,500,000	$100,000	$180,000	$1,780,000
Birmingham Rd at Hopewell Rd	$750,000	$50,000	$90,000	$890,000
Arnold Mill Rd/SR 140 at Cox Rd	$2,000,000	$300,000	$240,000	$2,540,000
Alpharetta Hwy (SR9) at Bethany Bend	$2,500,000	$500,000	$300,000	$3,300,000
Hopewell/Cogburn & Francis Road	$1,500,000	$100,000	$180,000	$1,780,000
Hopewell Rd at Bethany Bend	$1,500,000	$250,000	$180,000	$1,930,000
Arnold Mill Rd/SR 140 at Ranchette Rd	$1,500,000	$0	$180,000	$1,680,000
Alpharetta Hwy (SR9) at Webb Rd	$100,000	$0	$12,000	$112,000
Assumptions:			Total	$14,012,000

1. PE cost is 12% of construction cost

Table 5-3: Opinion of Probable Cost for Equestrian Improvements

Project	Construction Cost/Mile	Right-of-Way Cost/Mile	Preliminary Engineering Cost/Mile	Total Cost/Mile
Equestrian Trail	$250,000	$4,620,000	$30,000	$4,900,000

Assumptions:

1. Cost assumes 10' soft gravel trail with 10' separation from roadway
2. PE costs are 12% of construction costs
3. Right-of-way cost assumes 25' additional right-of-way width along entire corridor at $35/square foot

Table 5-4: Opinion of Probable Cost for Improvements Requested by Milton Disability Awareness Committee

Project	Length (Miles)	Construction Cost/Mile	Construction Cost	Right-of-Way	Preliminary Engineering	Total
Webb Road Sidewalk - Cogburn Rd to SR 9	0.2	$750,000	$150,000	$18,000	$18,000	$186,000
Crabapple Crossroads Improvements	1	$750,000	$750,000	$528,000	$90,000	$1,368,000
Cogburn Rd Senior Center Sidewalk Improvements	1	$750,000	$750,000	$528,000	$90,000	$1,368,000
Retime signals for more pedestrian time (3 locations)	N/A	N/A	N/A	N/A	$8,000	$8,000
					Total	$3,428,000

Assumptions:

1. PE costs are 12% of construction costs
2. Right-of-way cost assumes 5' additional right-of-way width along entire corridor at $20/square foot
3. PE cost for retiming signals includes engineer accessing signal cabinet in the field.

Table 5-5: Opinion of Probable Cost for Improvements at Crabapple Crossroads

Project	Construction Cost	Right-of-Way	Preliminary Engineering	Total
Intersection Improvements	$2,500,000	$750,000	$300,000	$3,550,000
Northeast Bypass	$3,000,000	$2,000,000	$360,000	$5,360,000
Northwest Bypass	$4,000,000	$2,500,000	$480,000	$6,980,000
Southeast Bypass	$3,500,000	$2,500,000	$420,000	$6,420,000
Southwest Bypass	$5,000,000	$3,000,000	$600,000	$8,600,000
Crabapple Road Streetscape Enhancements	$1,000,000	$100,000	$120,000	$1,220,000
				$32,130,000

Assumptions:

1. PE cost is 12% of construction cost
2. Streetscape enhancements assume $1000/lf unit cost

5.2 Funding Strategies

The following table shows project recommendations linked to potential funding approaches. Identifying these funding sources is intended to aid in the prioritization of projects based on funding availability as well as to aid in identifying next steps towards implementation.

Table 5-6: Funding Strategies

Project Name/Type	Cost				Strategy
	Federal	State	Local	Other	
Widen State Route 140 from Cherokee County border to Rucker Road	x	x	x		Traditional project development approach but with multijurisdictional/cost sharing support. Collaboration can be further detailed through NFCTP.
Widen Rucker Road/Old Milton Road to the existing 4 lane segment	x	x	x		Traditional project development approach but with multijurisdictional/cost sharing support. Collaboration can be further detailed through NFCTP.
Widen State Route 9 from Hamby Road to Forsyth County to Mayfield Rd. in Alpharetta	x	x	x		Traditional project development approach but with multijurisdictional/cost sharing support. Collaboration can be further detailed through NFCTP.
Widen Holbrook Campground Rd./Hopewell Rd from Campground Rd. in Cherokee County to Hamby Rd.	x	x	x		Traditional project development approach but with multijurisdictional/cost sharing support. Collaboration can be further detailed through NFCTP.
Widen School Drive between Crabapple Elementary School and Milton High School (allow additional queue space to clear cars from Birmingham Hwy and Freemanville Rd.	x	x	x		GDOT Operational lump sum
Intersection Improvements (attached)	x	x	x		Traditional project development approach
Recommended roundabouts	x		x		100% Federal safety funding for ROW and CON
Other intersections	x	x	x		Traditional project development

(Table continued from previous page)

Project Name/Type	Cost				Strategy
	Federal	State	Local	Other	
Safety Corridor Improvements					
North end of Hopewell Road from Thompson Road to the Manor Birmingham Highway from Landrum Road to Taylor Road Arnold Mill Road from south city limits to Ranchette Road Cogburn road from Bethany Road to Webb Road Freemanville Road near the White Columns subdivision Freemanville Road curve by the bridge over Cooper Sandy Creek Bethany Road south of intersection with Providence Road					- Request GDOT's consideration for lowering speed limit posting - GOHS grant opportunities as available and applicable - Apply substantive analysis of existing conditions, crash data, and traffic operations to take advantage of flexibility in current nominal design standards in order to reduce costs and property impacts.
Cyclist and pedestrian improvements			x	x	Bikes Belong grant application
Info on City website, increased signage and striping (share the roads, sharrows, bike boxes), bike racks			x		
Bike shoulder friendly improvements included whenever a reconsruction/overlay occurs by adding to each side				x	
Implement Milton Trail Plan, sidewalk recommendations include crosswalks where sidewalks are discontinued)	x	x	x		
Disability Awareness - specific sidewalk/intersection locations)	x	x	x		
Crabapple Crossroads (ped signal timing and missing sidewalks/crosswalks)	x	x	x		
Sidewalk near senior center at Cogburn Rd.	x	x	x		Coordinate through City of Alpharetta

(Table continued from previous page)

Project Name/Type	Cost				Strategy
	Federal	State	Local	Other	
Signal timing on SR 9 & Bethany Rd. & Webb Rd.	x	x	x		
Add sidewalk on Webb Road between Cogburn & SR 9	x	x	x		Potential for MARTA offset funds
Paratransit study	x	x	x		
Bridge improvements (structurally deficient)					
Bethany Road over Cooper Sandy Creek	x	x	x		
New Providence Road over Cooper Sandy Creek	x	x	x		
Cogburn Road over Cooper Sandy Creek	x	x	x		
Landrum Road over Cooper Sandy Creek	x	x	x		
Annual maintenance			x		
GA 400 transit improvements					Recommendation developed thru TPB Concept 6 and NFCTP
Crabapple Crossroads					
Streetscape improvements	x		x		TE grant
Intersection improvements	x	x	x		Traditional project development; Historic resources will likely increase time and cost for a federally assisted project.
Crabapple bypass routes	x		x		HPP earmark
Other – Converting SR9 into Westside				x	LCI application

General funding strategies other than traditional federal approaches and implementation considerations include: future stimulus opportunities, impact fees, identifying project champion, focusing on small group of priorities annually, TE, LCI, local match exceeds requirements, multijurisdictional project advocacy and funding thru NFCTP

5.3 Project Prioritization

5.3.1 Prioritization Methodology

Recommendations included in this report were developed to address the needs identified in earlier phases of the Milton CTP. These recommendations were checked for conformance against the original project goals and objectives (see **Appendix H**) and were then prioritized through multiple rounds of input from Stakeholders, the general public, City staff, and City Council. These discussions of prioritization were informed by traffic data, engineering analysis, model results, and opinions of cost with an emphasis on the local knowledge and experience of TSAC as well as input from the Milton Community.

This prioritization is provided as a starting point in order to pursue funding opportunities and determine feasibility. As these projects move into more detailed analysis and implementation however, this ranking may change in response to unforeseen funding difficulties, project costs, right-of-way constraints, or other challenges that were not revealed during the planning process. Additionally, many of these recommendations will depend on support from surrounding jurisdictions that can be coordinated through the North Fulton Comprehensive Transportation Plan.

5.3.2 Implementation Priorities for Corridor and Intersection Recommendations

Corridor Improvements

The corridor recommendations listed earlier in this report have been organized into high, medium, and low priority groupings:

High Priorities

- Widen State Route 140/Arnold Mill Road/Hickory Flat Highway from 2 to 4 lanes from
- Widen Rucker Road/Old Milton Parkway from 2 to 4 lanes
- Widen State Route 9/Alpharetta Highway

Medium Priorities

- Widen Holbrook Campground Road, Hopewell Road, and Hamby Road
- Widen School Drive to increase queue storage

Lower Priorities

- Widen Morris Road from 2 to 4 lanes

Intersection Improvements

From the intersection improvements listed earlier in this report, the following are the intersection improvements that have been identified as being the highest priorities:

1. Bethany Road & Providence Road (roundabout)
2. Birmingham Road & Hopewell Road
3. Hopewell Road & Bethany Bend/Bethany Way (opposing offset intersections)
4. Cogburn Road & Bethany Bend
5. Freemanville Road & Providence Road and/or Freemanville Road & Birmingham Road (both considered for roundabouts)

Crabapple Crossroads Improvements

The improvements at the Crabapple intersection have been prioritized in the same order as their implementable phases with Phase I being the highest priority improvements and Phase IV being the lowest priority improvements:

Phase I: retime signal at the Crabapple intersection

Phase II: implement geometry, laneage, and signal changes at the Crabapple intersection and implement streetscape improvements along Crabapple Road

Phase III: construct northeast and northwest bypass routes

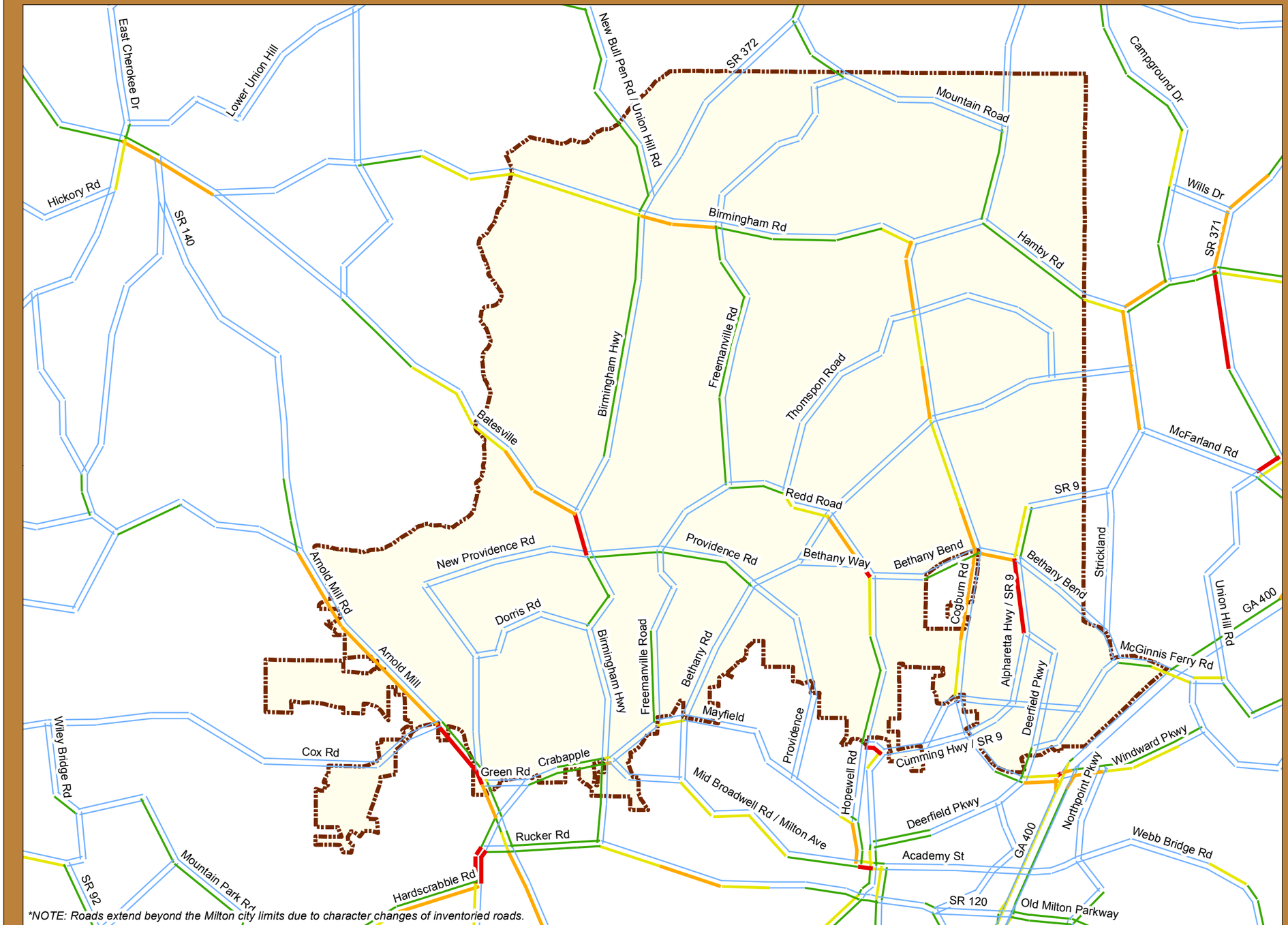
Phase IV: construct southeast and southwest bypass routes

This ordering is primarily based on perceived ease of implementation, with the first phase being the simplest improvement. The Phase II recommendations are advantaged over the bypass recommendations because funding has already been obtained for intersection and streetscape improvements. Also, these intersection improvements will yield significant operational improvements. Finally, the bypass routes in Phases III and IV were prioritized mainly through discussions with TSAC in response to input received from the public. Public comments regarding these bypass routes indicate that the two northern bypasses have strong potential to gain the support of property owners and nearby neighborhoods. However, public comments regarding the southern bypass routes indicate strong opposition to these projects.

APPENDIX A

Travel Demand Model Results for Recommended Roadway Projects

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

2010 E + C

Travel Demand Model
Link Level-of-Service

Legend

AM LOS

- A/B (V/C < 0.5)
- C (V/C = 0.5 - 0.7)
- D (V/C = 0.7 - 0.84)
- E (V/C = 0.84 - 1.00)
- F (V/C > 1.0)

Road Names

- City of Milton

N
W E
S

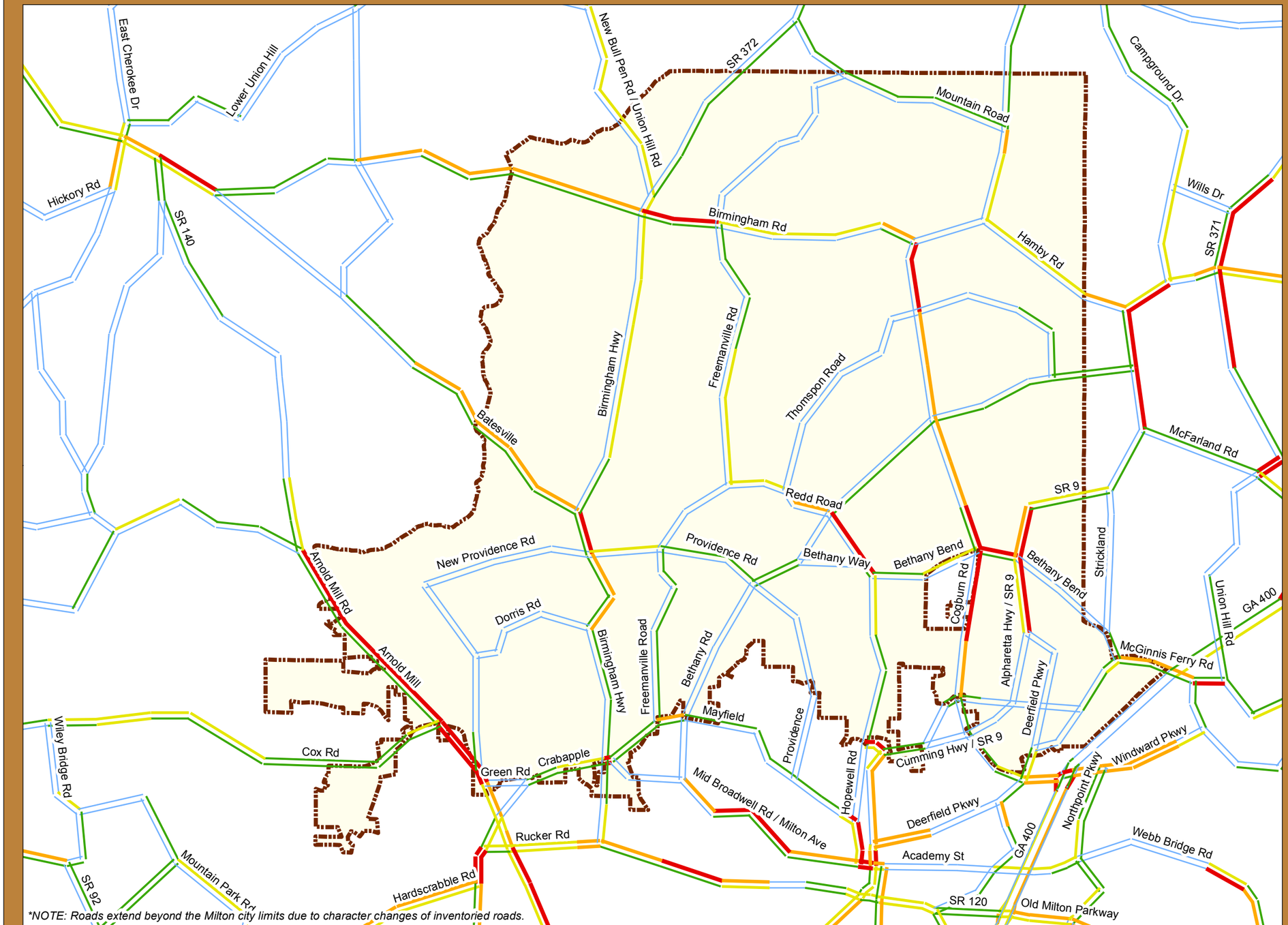
0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: July 6, 2009

Source: ARC, Kimley-Horn

City of Milton Transportation Plan



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2010 E + C

Travel Demand Model
Link Level-of-Service

Legend

PM LOS

- A/B (V/C < 0.5)
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Road Names

- City of Milton

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W E
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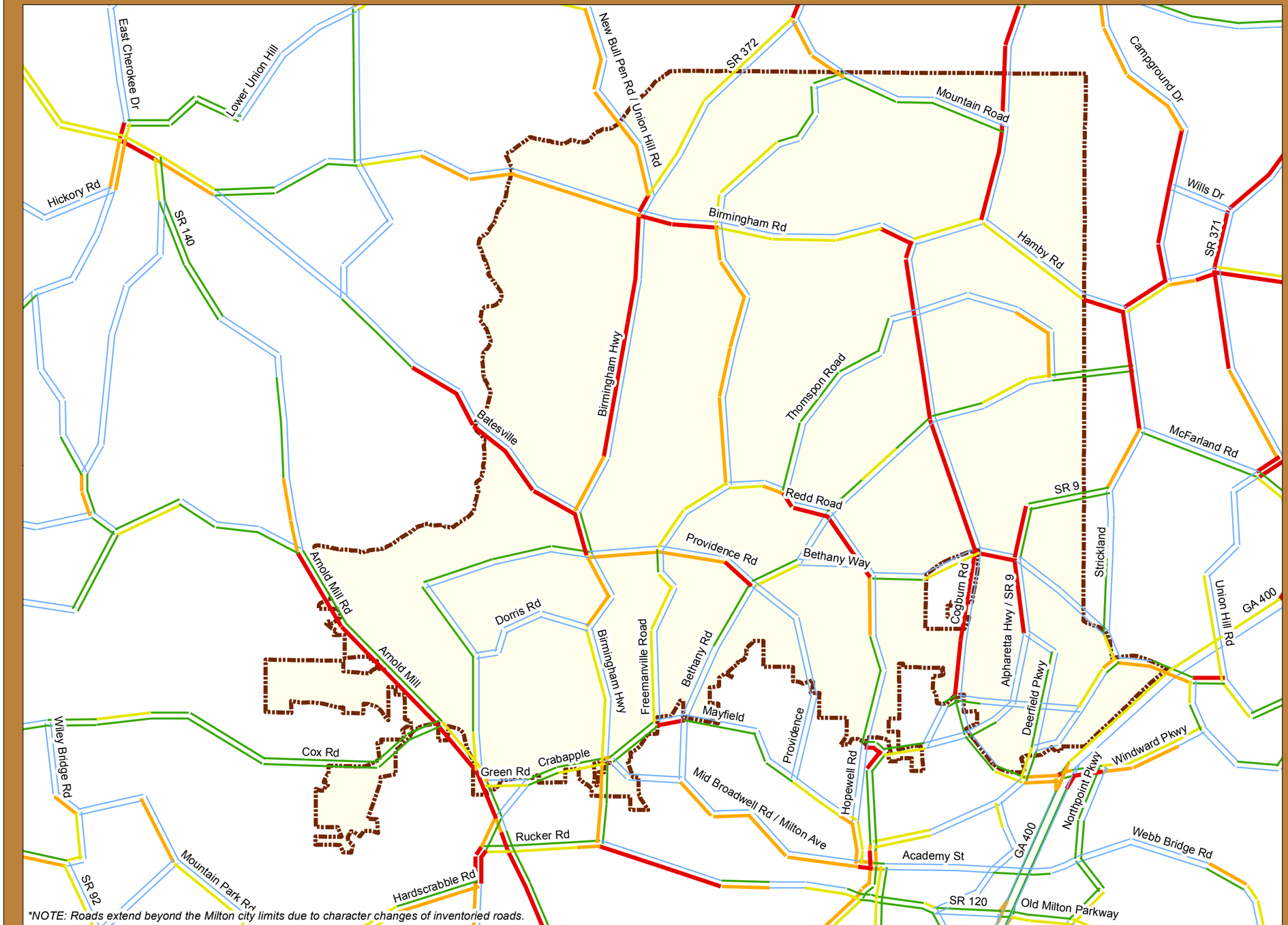
City of Milton Transportation Plan



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2030 E + C

Travel Demand Model
Link Level-of-Service

Legend

AM LOS

- A/B (V/C < 0.5)
- C (V/C = 0.5 - 0.7)
- D (V/C = 0.7 - 0.84)
- E (V/C = 0.84 - 1.00)
- F (V/C > 1.0)

Road Names

- City of Milton

N
W E
S

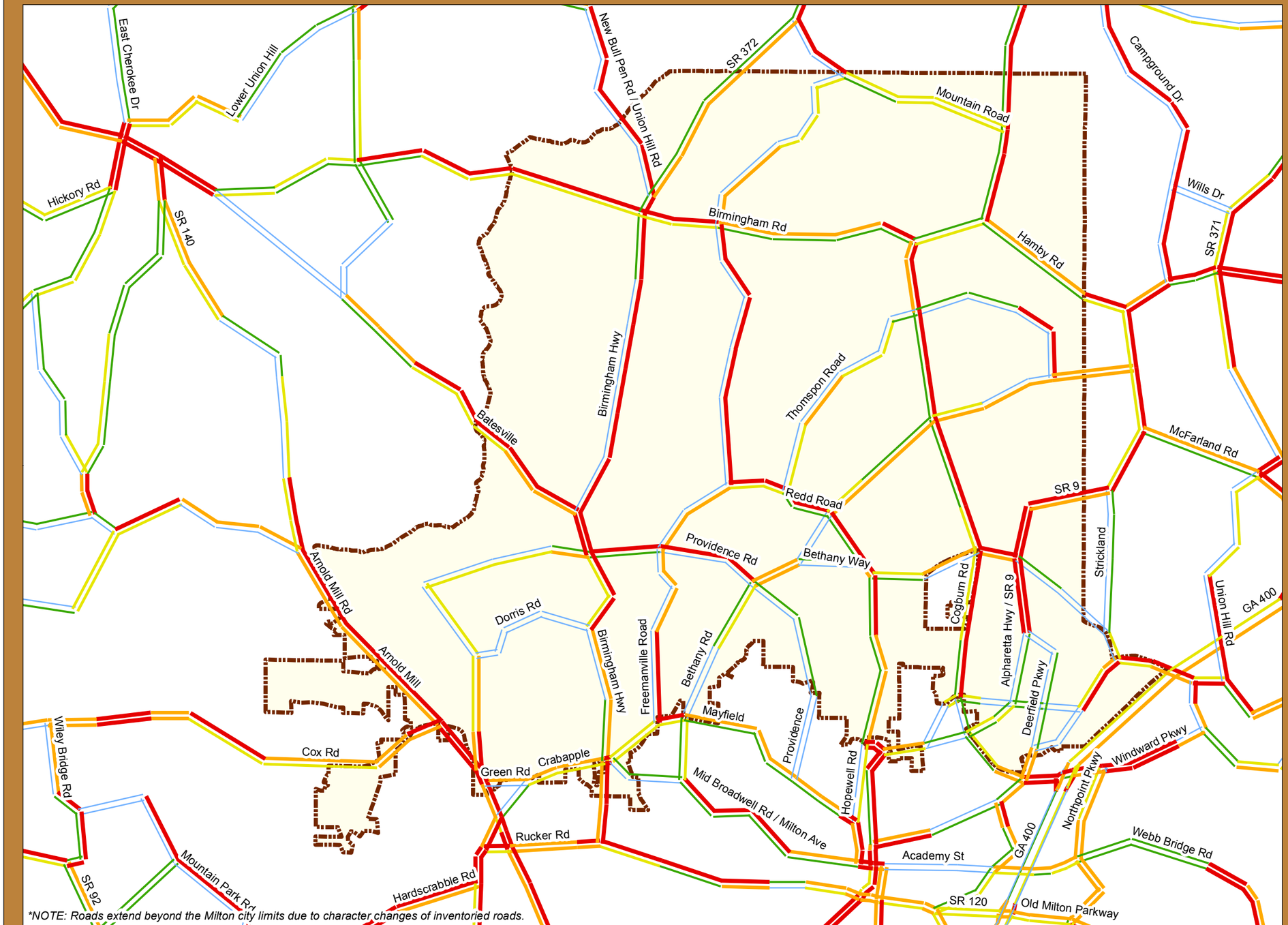
0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: July 6, 2009

Source: ARC, Kimley-Horn

City of Milton Transportation Plan



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2030 E + C

Travel Demand Model
Link Level-of-Service

Legend

PM LOS

- A/B (V/C < 0.5)
- C (V/C = 0.5 - 0.7)
- D (V/C = 0.7 - 0.84)
- E (V/C = 0.84 -1.00)
- F (V/C > 1.0)

Road Names

- City of Milton

N
W E
S

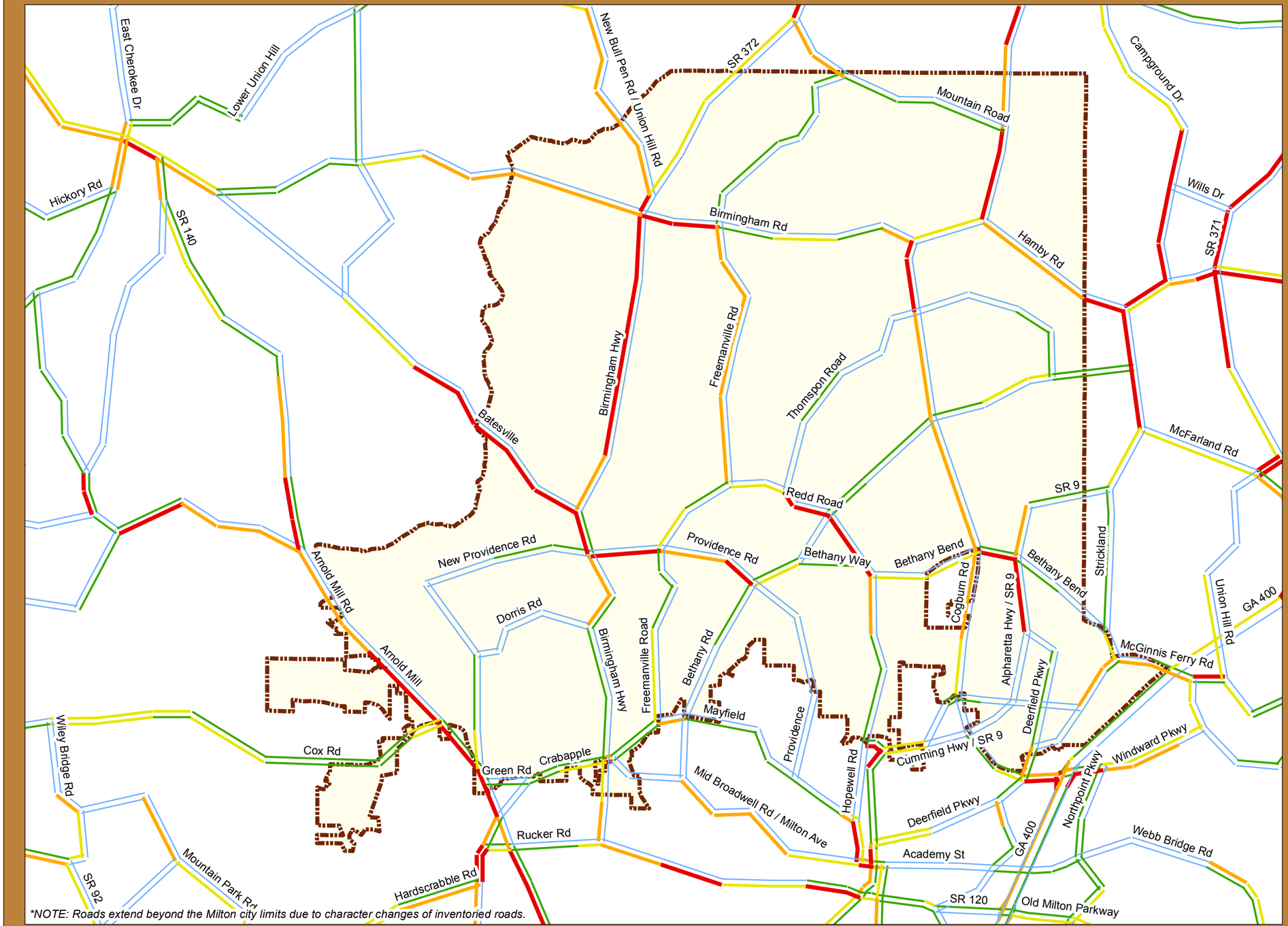
0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: July 6, 2009

Source: ARC, Kimley-Horn

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

Model Analysis of Recommended Roadway Projects

Travel Demand Model
Link Level-of-Service

Legend

AM LOS

- A/B (V/C < 0.5)
- C (V/C = 0.5 - 0.7)
- D (V/C = 0.7 - 0.84)
- E (V/C = 0.84 - 1.00)
- F (V/C > 1.0)

Road Names

- City of Milton

N
W E
S

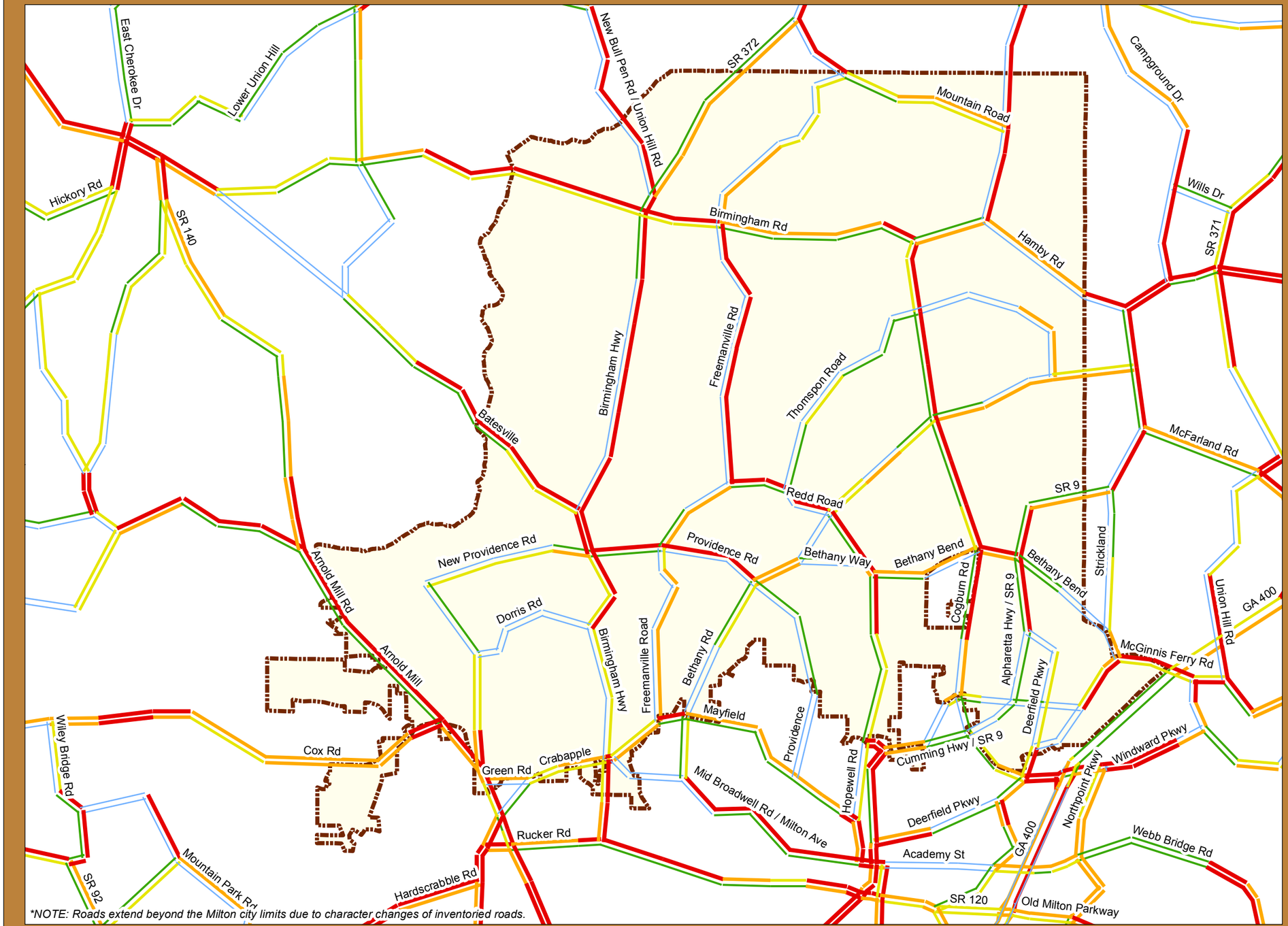
0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 19, 2009

Source: ARC, Kimley-Horn

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

Model Analysis of Recommended Roadway Projects

Travel Demand Model
Link Level-of-Service

Legend

PM LOS

- A/B V/C < 0.5)
- C (V/C = 0.5 - 0.7)
- D (V/C = 0.7 - 0.84)
- E (V/C = 0.84 -1.0
- F (V/C > 1.0

Road Names

- City of Milton

N
W E
S

0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 19, 2009

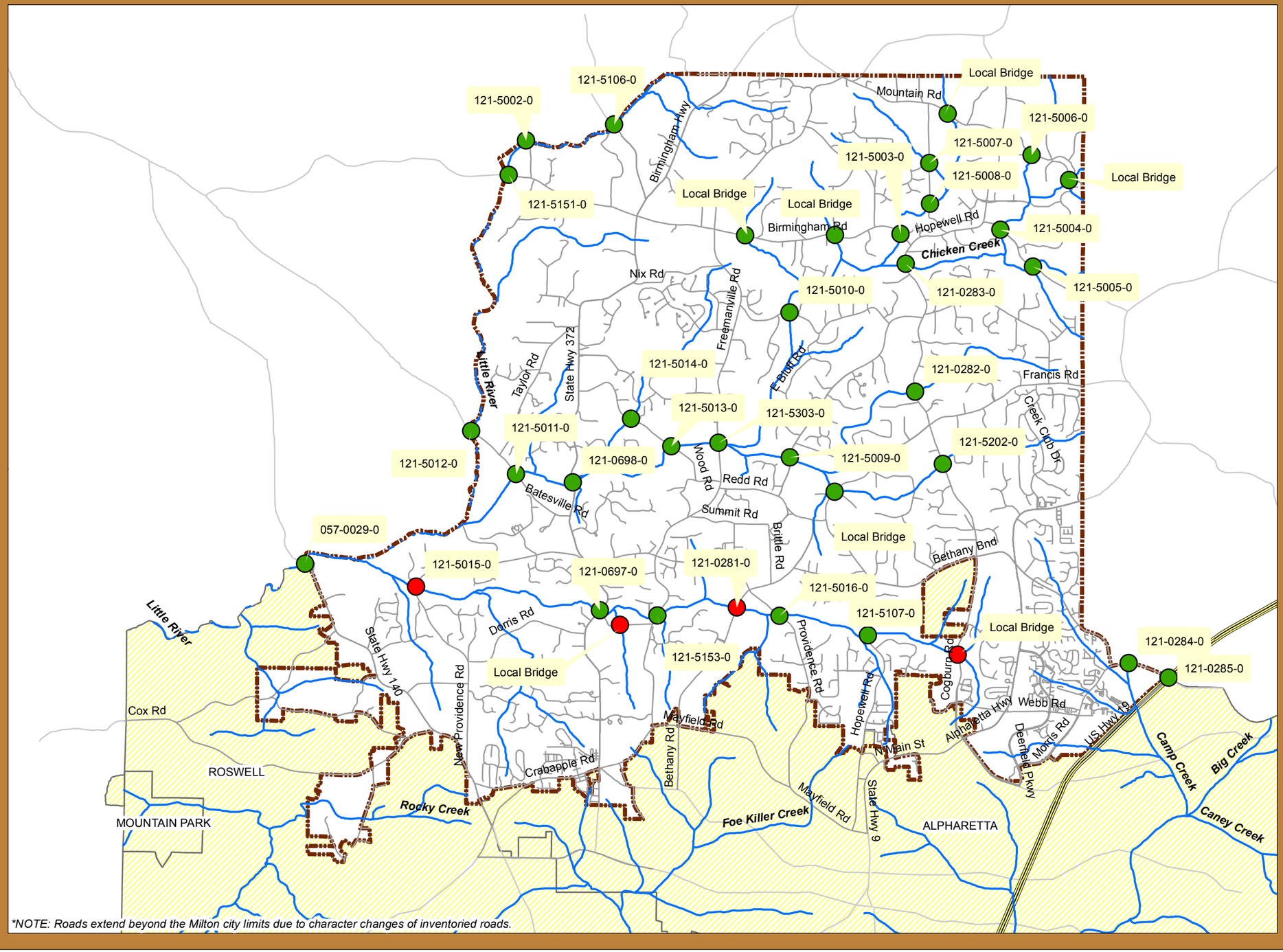
Source: ARC, Kimley-Horn

APPENDIX B

Results from the City of Milton Bridge Audit

(Performed by others)

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

Appendix B
Bridge Improvements

Legend

Bridge Locations

- High Prioirty Repair Projects
- Other Existing Bridges
- Rivers
- Expressways
- City of Milton
- Other Streets
- Other Fulton County Cities

N
W E
S

0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 1, 2009

Source: City of Milton

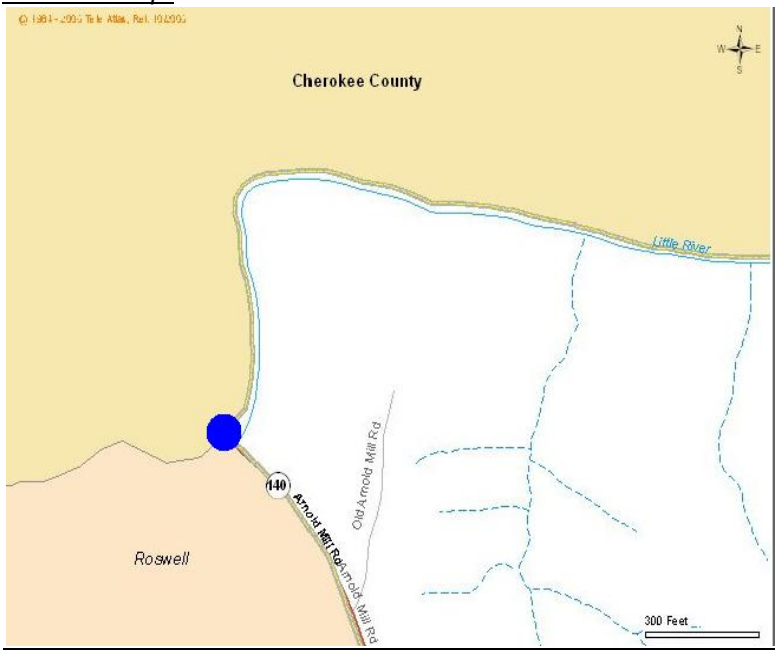
Bridge Audit Results Provided by the City of Milton as of October 21, 2009

BridgeID	Road Name	Feature	Between	And	Structure Type	Year Built	Length	Width	Span	Deck	Superstructure	Substructure	Vehicle Protection	Paint System	Date of Inspection	Sufficiency Rating	Bus Route	Utilities	Posted Load Limits	Narrative Description	Recommended Repairs	Estimated Cost for Repairs	Repair/ Replacement Priority
057-0029-0	Arnold Mill Rd (SR 140)	Little River	Old Arnold Mill Rd	Hickory Flat Hwy	Simply Supported	1952	284 FT	32.1 FT	5 Spans	Cast-in-place Concrete	5 - Steel Girders	Concrete Cap and Column	Concrete Railing	Lead Chromat	6/2/2008	39.45	NO	Gas	NO	This state-owned structure is located on the Fulton-Cherokee County line.	N/A	N/A	GDOT Maintenance
121-0281-0	Bethany Rd (CS 1324)	Cooper Sandy Creek	Sulky Way	Providence Rd	Precast Concrete	1951	60 FT	24.1 FT	2 Spans	Precast Panels	7 - Double Tee Precast Panels	Steel/Timber Pile Bents	W-beam Guardrail	None	1/13/2009	27.7	YES	Gas and Telephone	NO	This structure is in poor condition with corrosion of the steel substructure components. Spalls on the bottom of the beams have exposed portions of the reinforcement steel.	The steel piles in the stream	$ 25,000	HIgh
121-0282-0	Hopewell Rd (CR 1323)	Chicken Creek Tributary	N Field Pass	Champions Close	Concrete Box Culvert	1995	27 FT		2 Spans	N/A	Double 8 FT x 8 FT Box Culvert	N/A	None	N/A	11/19/2008	99.07	YES	N/A	NO	The bridge culvert is in good condition but has approximately 0.5 feet of scour damage at the inlet end of barrels #2 and #3.	Scour damage should be	$ -	Low
121-0283-0	Hopewell Rd (CR 1323)	Chicken Creek	Kings Country Ct	Fossil Trce	Simply Supported	1948	41 FT	27.7 FT	1 Span	Cast-in-place Concrete	Steel Beams	Masonry Gravity Wall	Concrete Railing	Lead Chromat	11/19/2008	59.75	YES	Gas and Water	YES	This structure is posted for 20 Tons H-Truck; 19 Tons Type 3 Truck and 28 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4.5	The beams throughout the	$ 10,000	Medium
121-0284-0	McGinnis Ferry Rd (CR	Camp Creek Tributary	Bethany Rd	Whittington Way	Precast Concrete	1954	60 FT	24.2 FT	2 Spans	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell	W-beam Guardrail	Epoxy Mastic	11/4/2008	77.22	YES	Telephone	YES	This bridge is located on the Fulton-Forsyth County line and is posted for 19 Tons H-Truck; 19 Tons Type 3 Truck and 24 Tons Timber Truck. This structure is posted due to overstress	The steel piles throughout the	$ 15,000	Medium
121-0697-0	Birmingham Hwy (SR 372)	Cooper Sandy Creek	Landrum Rd	Tramore Pl	Concrete Box Culvert	1989	29 FT		3 Spans	N/A	Triple 9 FT x 9 FT Box Culvert	N/A	W-beam Guardrail	N/A	11/19/2008	98.72	YES	N/A	NO	This state-owned triple cell reinforced concrete box culvert is in good condition.	N/A	N/A	GDOT Maintenance
121-0698-0	Birmingham Hwy (SR 372)	Chicken Creek Tributary	Batesville Rd	Richmond Glen Dr	Precast Concrete	1989	120 FT	47.2 FT	3 Spans	Precast Deck Panels	6- Precast Stems	Steel Pile Bents	Concrete Jersey	Epoxy Mastic	11/19/2008	74.82	YES	N/A	NO	This state-owned three span precast beam bridge is supported by steel H-pile intermediate bents.	N/A	N/A	GDOT Maintenance
121-5002-0	Clarity Rd (CR 3)	Little River	Hickory Flat Rd	Melt Anderson Rd	Simply Supported	1954	48 FT	14.9 FT	1 Span	Timber Decking	Steel Beams	Concrete filled steel shell	Metal Railing and	Non-Lead Oil	2/12/2009	27.78	NO	N/A	YES	This single-lane structure is located on teh Fulton-Cherokee County line and is posted for 6 Tons due to the low original design capacity of the structure. A replacement structure is	The posting sign on the nothern	$ 3,500	Medium
121-5003-0	Birmingham Rd (CR 4)	Chicken Creek Tributary	Hopewell Rd	Henderson Rd	Precast Concrete	1961	30 FT	24.2 FT	1 Span	Precast Panels	8 - Double Tee Precast Panels	Steel/Timber Soldier Piles	W-beam Guardrail	None	1/9/2009	36.95	YES	Gas and Water	YES	This structure is posted for 10 Tons H-Truck; 10 Tons Type 3 Truck; 13 Tons Timber Truck; 13 Tons HS Truck and 16 Tons Type 3S2 truck. This structure is posted due to the concrete	The steel piles throughout the	$ 25,000	Medium
121-5004-0	Hamby Rd (CR 12)	Chicken Creek Tributary	Watsons Bend	Hopewell Rd	Precast Concrete	1964	60 FT	24.2 FT	2 Spans	Precast Panels	8- Double Tee Precast Panels	Concrete filled steel shell	W-beam Guardrail	Epoxy Mastic	2/12/2009	61.25	YES	N/A	YES	This structure is posted for 19 Tons H-Truck; 19 Tons Type 3 Truck and 23 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4	Clean and cover exposed	$ 2,500	Low
121-5005-0	Hamby Rd (CR 12)	Chicken Creek Tributary	Oakside Dr	Watsons Bend	Precast Concrete	1966	30 FT	24.2 FT	1 Span	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	None	1/8/2009	61.25	YES	N/A	YES	This structure is posted for 18 Tons H-Truck; 18 Tons Type 3 Truck and 23 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4	The exposed foundation piles	$ 3,500	Low
121-5006-0	Longstreet Rd (CR 13)	Chicken Creek Tributary	Land Rd	Wills Rd	Precast Concrete	1964	90 FT	24.2 FT	3 Spans	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	Epoxy Mastic	1/8/2009	62.81	YES	Telephone	NO	This bridge structure is in good condition with no reported structural deficiencies.	Intermediate bent piling	$ 5,000	Low
121-5007-0	Westbrook Rd (CR 18)	Chicken Creek Tributary	Hopewell Rd	Mountain Rd	Precast Concrete	1956	30 FT	18.2 FT	1 Span	Precast Concrete	6 - Double Tee Precast Panels	Masonry Gravity Wall	W-beam Guardrail	N/A	1/8/2009	63.28	YES	N/A	YES*	* load limit sign not required and may be removed per GDOT inspection. This single-lane bridge is in good condition with no serious reported structural defects.	Install advance signage for	$ 1,500	Low
121-5008-0	Westbrook Rd (CR 18)	Chicken Creek Tributary	Hopewell Rd	Mountain Rd	Precast Concrete	1956	30 FT	18.2 FT	1 Span	Precast Concrete	6 - Double Tee Precast Panels	Concrete Gravity Wall	W-beam Guardrail	N/A	1/8/2009	53.11	YES	N/A	YES*	* load limit sign not required and may be removed per GDOT inspection. This single-lane bridge structure is in fair condition. Minor cracking and spalls on the bottom of several	Install advance signage for	$ 3,500	Medium
121-5009-0	Thompson Rd (CR 19)	Chicken Creek Tributary	Nettlebrook Way	N Christophers Run	Precast Concrete	1962	90 FT	24.2 FT	3 Spans	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	Epoxy Mastic	2/12/2009	65.23	YES	Water and Telephone	NO	This structure is in satisfactory condition. There is moderate concrete spalling scattered throughout the precast beam members resulting in exposed and corroded reinforcing	Asphalt wearing surface needs to	$ 5,000	Medium
121-5010-0	Dinsmore Rd (CR 20)	Chicken Creek	N Valleyfield Rd	Highgrove Rd	Precast Concrete	1965	60 FT	36.5 FT	2 Spans	Precast Panels	12- Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	Epoxy Mastic	2/12/2009	82.13	YES	Gas and Water	YES*	* load limit sign not required and may be removed per GDOT inspection. The bridge structure is in satisfactory condition with drift accumulated at bent #2.	Drift accumulation at	$ 1,000	Low
121-5011-0	Batesville Rd (CR 23)	Chicken Creek	Birmingham Hwy	Taylor Rd	Precast Concrete	1962	60 FT	24.2 FT	2 Spans	Precast Panels	9 - Double Tee Precast Panels	Concrete filled steel shell	W-beam Guardrail	None	2/11/2009	63.03	YES	Gas and Telephone	NO	This bridge structure is in satisfactory condition with undermining of the concrete encasements at piles #1 and #3 at bent 2.	The concrete pile	$ 5,000	Low
121-5012-0	Batesville Rd (CR 23)	Little River	Taylor Rd	The Fairway	Precast Concrete	1964	120 FT	27.6 FT	4 Spans	Precast Panels	9 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	None	2/11/2009	60.25	NO	Telephone	YES*	* load limit sign present on north end of bridge only but may be removed per GDOT inspection. This bridge structure is located on the Fulton-Cherokee County line and is in	The concrete spalls on Beam 1	$ 1,500	Low
121-5013-0	Wood Rd (CR 24)	Chicken Creek	Phillips Rd	Birmingham Hwy	Precast Concrete	1961	120 FT	24.7 FT	4 Spans	Precast Concrete	8 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	Epoxy Mastic	1/13/2009	52.09	YES	Telephone	YES*	* load limit sign not required and may be removed per GDOT inspection. This bridge structure is in fair condition with undermining of the pile encasements at bent #3. .	The pile encasements at	$ 7,500	Medium
121-5014-0	Wood Rd (CR 24)	Chicken Creek Tributary	Phillips Rd	Birmingham Hwy	Precast Concrete	1956	30 FT	18.2 FT	1 Span	Precast Concrete	6 - Double Tee Precast Panels	Concrete Gravity Wall	W-beam Guardrail	N/A	2/12/2009	63.28	YES	N/A	NO	This single-lane bridge structure is in satisfactory condition with no reported serious structural defects. There is exposed and corroded reinforcing steel on the end bents due	The old timber pile cut-offs left	$ 2,500	Low
121-5015-0	New Providence	Cooper Sandy Creek	Providence Lake Point	Chadwick Rd	Precast Concrete	1962	90 FT	24.2 FT	3 Spans	Precast Panels	7 - Double Tee Precast Panels	Steel/Timber Pile Bents	Substandard Metail	None	2/11/2009	18.71	YES	Gas, Water and	NO	This bridge structure has undergone a significant rehabilitation of the pile bents and has no reported deficiencies. Currently in fair condition (Sufficiency Rating 18.71 but needs to	Replace substandard	$ 3,500	Medium/High depending on
121-5016-0	Providence Rd (CR 27)	Cooper Sandy Creek	Providence Park Dr	Bethany Rd	Precast Concrete	1962	30 FT	24.2 FT	1 Span	Precast Panels	7 - Double Tee Precast Panels	Steel/Timber Soldier Piles	W-beam Guardrail	Epoxy Mastic	1/13/2009	52.63	YES	City Water	NO*	* At time of inspection, the posting signs were missing. These signs are required and must be replaced. Post this structure for 16 Tons H-Truck; 17 Tons Type 3 Truck and 24 Tons	Secure guardrail anchorages at	$ 1,000	Medium
121-5106-0	New Bullpen Rd/Union Hill	Little River	Birmingham Hwy	Steeplechase Rd	Concrete T-Beam	1939	61 FT	26.7 FT	2 Spans	Cast-in-place Concrete	Concrete T-Beams	Concrete Cap and Column	Concrete Railing	N/A	2/12/2009	48.98	NO	Telephone/ Fiber Optic	NO	This all concrete bridge structure is located on the Fulton-Cherokee County line and is in fair condition with no reported deficiencies.	Install approach guardrail at all	$ 3,500	Medium
121-5107-0	Hopewell Rd (CR 1323)	Cooper Sandy Creek	Hopewell Plantation Dr	Sandy Creek Farm	Corrugated Metal Arch	1953	35 FT		2 Spans	N/A	Double 16' span x 12' rise arch	N/A	W-beam Guardrail	N/A	1/9/2009	91.07	YES	N/A	NO	This arch culvert is in good condition with no reported deficiencies.	None	$ -	Low
121-5151-0	Birmingham Rd (CR 4)	Little River	Roper Rd	Clarity Rd	Precast Concrete	1968	90 FT	24 FT	3 Spans	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell	W-beam Guardrail	Epoxy Mastic	2/12/2009	40.83	NO	Telephone	YES	This structure is located on the Fulton-Cherokee County line and is posted for 10 Tons H-Truck; 12 Tons Type 3 Truck; 15 Tons Timber Truck and 18 Tons Type 3S2 Truck. This	Cracks in asphalt W.S. have been	$ 2,500	Low
121-5153-0	Freemanville Rd (CR 34)	Cooper Sandy Creek	Creek Rd	Freemanwood Ln	Precast Concrete	1960	90 FT	24.2 FT	3 Spans	Precast Panels	8 - Double Tee Precast Panels	Concrete filled steel shell pile	W-beam Guardrail	Epoxy Mastic	2/11/2009	56.24	YES	Gas and Water	YES	This structure is posted for 18 tons H-Truck; 18 Tons Type 3 Truck and 22 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4.5	None	$ -	Low
121-5202-0	Cogburn Rd (CR 37)	Chicken Creek Tributary	Wyndham Farms Dr	Francis Rd	Precast Concrete	1986	30 FT	28.2 FT	1 Span	Precast Panels	7 - Double Tee Precast Panels	Concrete filled steel shell	W-beam Guardrail	None	2/12/2009	58.95	YES	Gas, Water and	NO	This bridge structure is in good condition with no reported serious structural defects. However, there is severe guardail damage at the SW corner.	Repair damaged guardrail	$ 1,000	High
121-5303-0	Freemanville Rd (CR 34)	Chicken Creek	Phillips Rd	Louis Rd	Prestressed Concrete	2004	170 FT	40 FT	3 Spans	Cast-in-place Concrete	Type II & III PSC Beams	Concrete Cap and Column	Jersey Barrier	N/A	unknown	unknown	YES	N/A	YES*	* The load limit sign is no longer required and may be removed per GDOT inspection. This is a new structure constructed in 2004; however, the inventory data is not available on	None	$ -	Low
MLT01	Cogburn Rd (CR 37)	Cooper Sandy Creek	Glaston Way	N Park	Precast Concrete	Unk.	14 FT	23.3 FT	1 Span	Precast Panels	6 - Flat Slab Precast Panels	Timber Soldier Piles &	W Beam Guardrail	N/A	6/24/2009	N/A	YES	N/A	NO	Structure consists of precast concrete flat slab panels with asphalt overlay.The bridge is located on a heavily traveled road and is in fair condition. Deck drain openings have been	For safety reasons, this	$ 850,000	High
MLT02	Landrum Rd	Cooper Sandy Creek Tributary	Birmingham Hwy	Freemanville Rd	Single Span Steel Beam	Unk.	19 FT	14 FT	1 Span	3x10 timber decking with	7 - 12" deep steel beams	Stone Masonry	W Beam Guardrail	None	4/3/2008	N/A	YES	GA Power, Water	YES	This single lane bridge is posted for a weight limit of 3 Tons. Both approach roadways are gravel and exhibit moderate settlement with several deep depressions in the roadway.	Replacement with a	$ 250,000	High
MLT03	Hopewell Rd (CR 1323)	Cooper Sandy Creek	Redd Rd	Saddlesprings Dr.	Triple Cell Concrete Box	Unk.	33 FT	20 FT	3 Spans	N/A	Triple 8 FT x 8 FT Box Culvert	N/A	W Beam Guardrail	N/A	6/24/2009	N/A	YES	N/A	NO	Structure consists of a skewed triple cell 8 ft x 8ft concrete box culvert. Structure is in good condition with only siltation of northern most cell observed.	Remove built up siltation from	$ 1,500	Low
MLT04	Birmingham Rd (CR 4)	Chicken Creek Tributary	Day Rd	Manor Terrace	Precast Concrete	Unk.	23 FT	23.2 FT	1 Span	Precast Panels	6 - Double Tee Precast Panels	Timber Soldier Piles &	W Beam Guardrail	N/A	6/24/2009	N/A	YES	City Water & Atlanta	NO	Structure consists of precast concrete double tee panels with asphalt overlay. Deck drain openings have been paved over with asphalt, water seepage thru cracks in wearing surface	Patch and/or seal asphalt	$ 5,000	Medium
MLT05	Birmingham Rd (CR 4)	Chicken Creek Tributary	Freemanville Rd	Milton Point	Precast Concrete	Unk.	15 FT	23.8 FT	1 Span	Precast Panels	6 - Flat Slab Precast Panels	Steel/Timber Soldier Piles	Pipe Handrail	None	6/24/2009	N/A	YES	City Water & Atlanta	NO	Structure consists of precast concrete flat slab panels with asphalt overlay. Substructure consists of steel piles on a concrete cap. Timber planks are used to retain earth fill at end	Install W-beam guardrail to	$ 7,500	Medium
MLT06	Mountain Rd	Chicken Creek Tributary	Westbrook Rd	Phillips Circle	6 FT Diameter	Unk.	73 FT	6 FT	1 Span	N/A	N/A	N/A	N/A	N/A	6/24/2009	N/A	unknown	City Water and AT&T	NO	This pipe structure is in satisfactory condition with isolated spalls on interior. Three of the pipe segments at the outfall end have settled and separated, causing water to flow down	Pump grout material in	$ 3,500	Low

Arnold Mill Rd (SR 140) Over Little River

Bridge ID 057-0029-0

General

Road: Arnold Mill Rd (SR 140) *Over:* Little River *Between* Old Arnold Mill Rd And Hickory Flat Hwy *Structure Type: Simply Supported Steel Girder* *Year Built: 1952* *Length*: 284 FT *Width*: 32.1 FT *Span*: 5 Spans *Deck*: Cast-in-place Concrete w/Asphalt W.S. *Superstructure*: 5 - Steel Girders *Substructure*: Concrete Cap and Column *Vehicle Protection*: Concrete Railing *Paint System*: Lead Chromate Oil Alkyd System *Posted Load Limits*: NO *Bus Route*:NO *Sufficiency Rating*: 39.45 *Utilities*: Gas *Date of Inspection*: 6/2/2008	*Location Map:* 

Narrative Description

This state-owned structure is located on the Fulton-Cherokee County line.

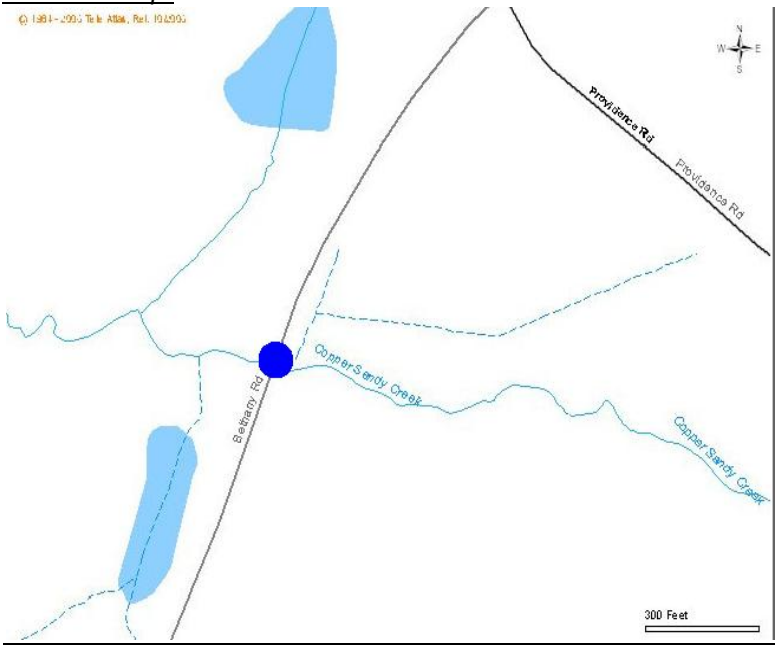
Summary of Findings

Repair Recommendations: N/A	Repair/Replacement Priority: GDOT Maintenance Estimated Cost for Repairs: N/A

Bethany Rd (CS 1324) Over Cooper Sandy Creek

Bridge ID 121-0281-0

General

Road: Bethany Rd (CS 1324) *Over:* Cooper Sandy Creek *Between* Sulky Way And Providence Rd *Structure Type: Precast Concrete* *Year Built: 1951* *Length*: 60 FT *Width*: 24.1 FT *Span*: 2 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 7 - Double Tee Precast Panels *Substructure*: Steel/Timber Pile Bents *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 27.7 *Utilities*: Gas and Telephone *Date of Inspection*: 1/13/2009	*Location Map:* 

Narrative Description

This structure is in poor condition with corrosion of the steel substructure components. Spalls on the bottom of the beams have exposed portions of the reinforcement steel.

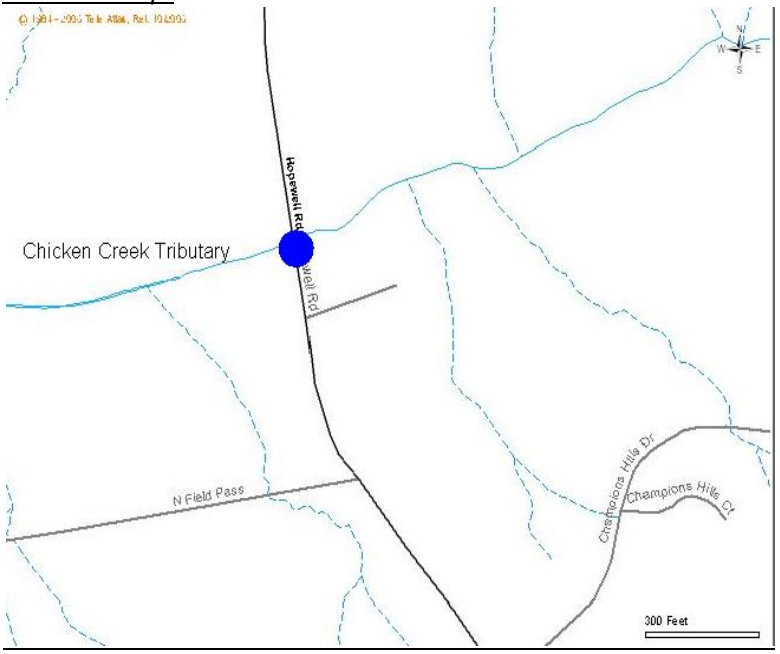
Summary of Findings

Repair Recommendations: The steel piles in the stream channel should be cleaned and painted. Furthermore, these piles should be protected with reinforced concrete encasements extending from points 2 feet below the mud line to a point 2 feet above normal water. Exposed reinforcement on beams should be cleaned and covered to protect it from corrosion. Asphalt W.S. should be patched and sealed. Remove dirt/vegetation from both gutterlines.	Repair/Replacement Priority: HIgh Estimated Cost for Repairs: $25,000

Hopewell Rd (CR 1323) Over Chicken Creek Tributary

Bridge ID 121-0282-0

General

Road: Hopewell Rd (CR 1323) *Over:* Chicken Creek Tributary *Between* N Field Pass And Champions Close *Structure Type: Concrete Box Culvert* *Year Built: 1995* *Length*: 27 FT *Width*: *Span*: 2 Spans *Deck*: N/A *Superstructure*: Double 8 FT x 8 FT Box Culvert *Substructure*: N/A *Vehicle Protection*: None *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 99.07 *Utilities*: N/A *Date of Inspection*: 11/19/2008	*Location Map:* 

Narrative Description

The bridge culvert is in good condition but has approximately 0.5 feet of scour damage at the inlet end of barrels #2 and #3.

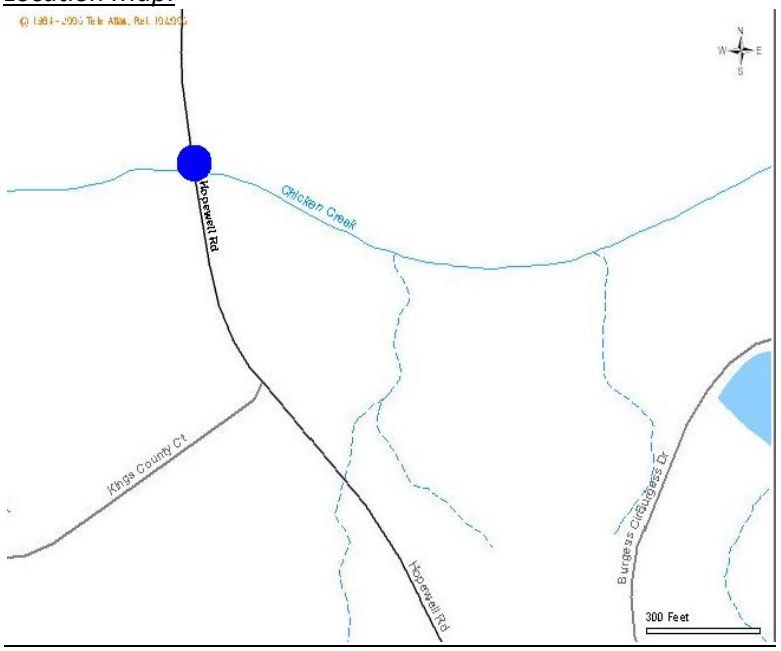
Summary of Findings

Repair Recommendations: Scour damage should be monitored for further signs of degradation.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $-

Hopewell Rd (CR 1323) Over Chicken Creek

Bridge ID 121-0283-0

General

Road: Hopewell Rd (CR 1323) *Over:* Chicken Creek *Between* Kings Country Ct And Fossil Trce *Structure Type: Simply Supported Steel Beam* *Year Built: 1948* *Length*: 41 FT *Width*: 27.7 FT *Span*: 1 Span *Deck*: Cast-in-place Concrete w/Asphalt W.S. *Superstructure*: Steel Beams *Substructure*: Masonry Gravity Wall *Vehicle Protection*: Concrete Railing *Paint System*: Lead Chromate Oil Alkyd System *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: 59.75 *Utilities*: Gas and Water *Date of Inspection*: 11/19/2008	*Location Map:* 

Narrative Description

This structure is posted for 20 Tons H-Truck; 19 Tons Type 3 Truck and 28 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4.5 inch asphalt overlay. Upgrading the load carrying capacity to a point where posting is not required would require removal of this overlay. This bridge structure is in good condition but has corrosion of the steel superstructure. .

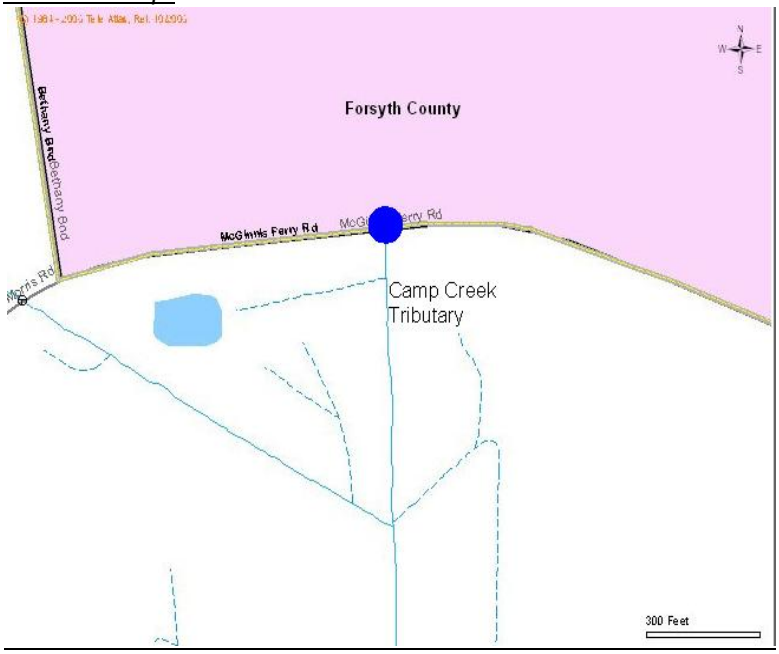
Summary of Findings

Repair Recommendations: The beams throughout the structure should be cleaned and painted. The beaver dam located near the structure should be removed to prevent further accumulation of debris and reduce the possibility of scour	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $10,000

McGinnis Ferry Rd (CR 41) Over Camp Creek Tributary

Bridge ID 121-0284-0

General

Road: McGinnis Ferry Rd (CR 41) *Over:* Camp Creek Tributary *Between* Bethany Rd And Whittington Way *Structure Type: Precast Concrete* *Year Built: 1954* *Length*: 60 FT *Width*: 24.2 FT *Span*: 2 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: 77.22 *Utilities*: Telephone *Date of Inspection*: 11/4/2008	*Location Map:* 

Narrative Description

This bridge is located on the Fulton-Forsyth County line and is posted for 19 Tons H-Truck; 19 Tons Type 3 Truck and 24 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 3.5 inch asphalt overlay. Upgrading the load carrying capacity to a point where posting is not required would require removal of this overlay. The bridge is in fair condition due to condition of beam panels, steel substructure piles and asphalt W.S. The eastern weight limit sign not present and approx. 15 feet of guardrail is missing due to accident on northeast corner.

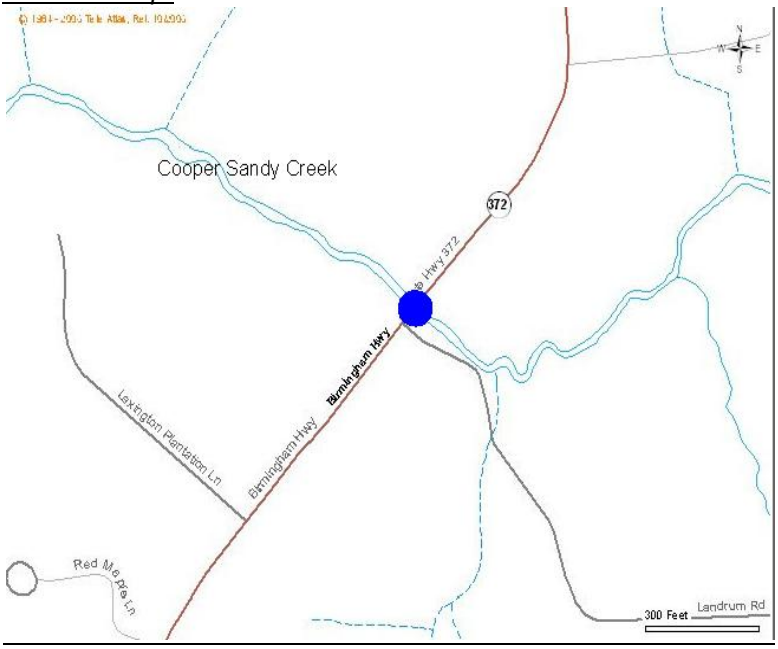
Summary of Findings

Repair Recommendations: The steel piles throughout the structure should be cleaned and painted. The asphalt W.S. should be patched and sealed throughout. The spalled concrete/exposed reinforcing on beam panels should be cleaned and patched throughout. Vegetation growing in the vicinity of the structure should be cut and removed. Replace missing guardrail and weight limit posting sign at east end of bridge.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $15,000

Birmingham Hwy (SR 372) Over Cooper Sandy Creek

Bridge ID 121-0697-0

General

Road: Birmingham Hwy (SR 372) *Over:* Cooper Sandy Creek *Between* Landrum Rd And Tramore Pl *Structure Type: Concrete Box Culvert* *Year Built: 1989* *Length*: 29 FT *Width*: *Span*: 3 Spans *Deck*: N/A *Superstructure*: Triple 9 FT x 9 FT Box Culvert *Substructure*: N/A *Vehicle Protection*: W-beam Guardrail *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 98.72 *Utilities*: N/A *Date of Inspection*: 11/19/2008	*Location Map:* 

Narrative Description

This state-owned triple cell reinforced concrete box culvert is in good condition.

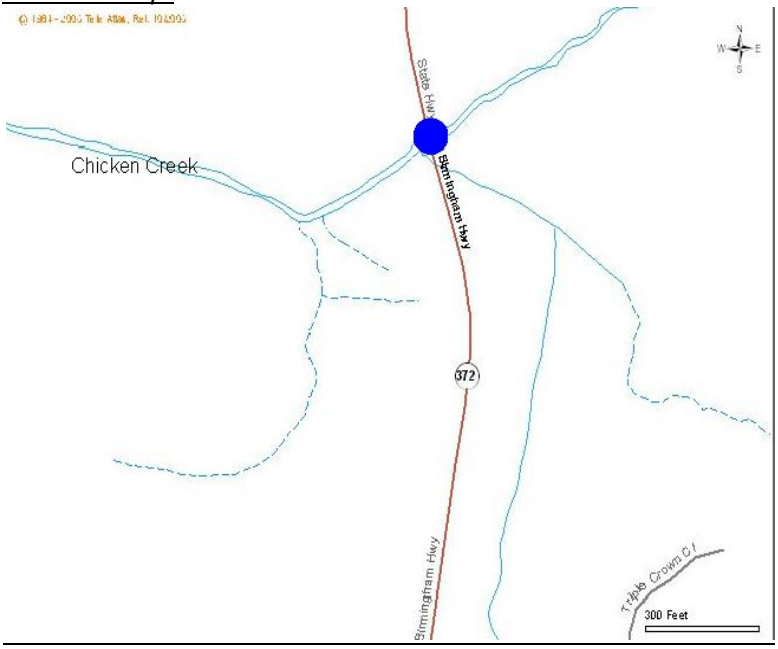
Summary of Findings

Repair Recommendations: N/A	Repair/Replacement Priority: GDOT Maintenance Estimated Cost for Repairs: N/A

Birmingham Hwy (SR 372) Over Chicken Creek Tributary

Bridge ID 121-0698-0

General

Road: Birmingham Hwy (SR 372) *Over:* Chicken Creek Tributary *Between* Batesville Rd And Richmond Glen Dr *Structure Type: Precast Concrete* *Year Built: 1989* *Length*: 120 FT *Width*: 47.2 FT *Span*: 3 Spans *Deck*: Precast Deck Panels *Superstructure*: 6- Precast Stems *Substructure*: Steel Pile Bents *Vehicle Protection*: Concrete Jersey Barrier *Paint System*: Epoxy Mastic *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 74.82 *Utilities*: N/A *Date of Inspection*: 11/19/2008	*Location Map:* 

Narrative Description

This state-owned three span precast beam bridge is supported by steel H-pile intermediate bents.

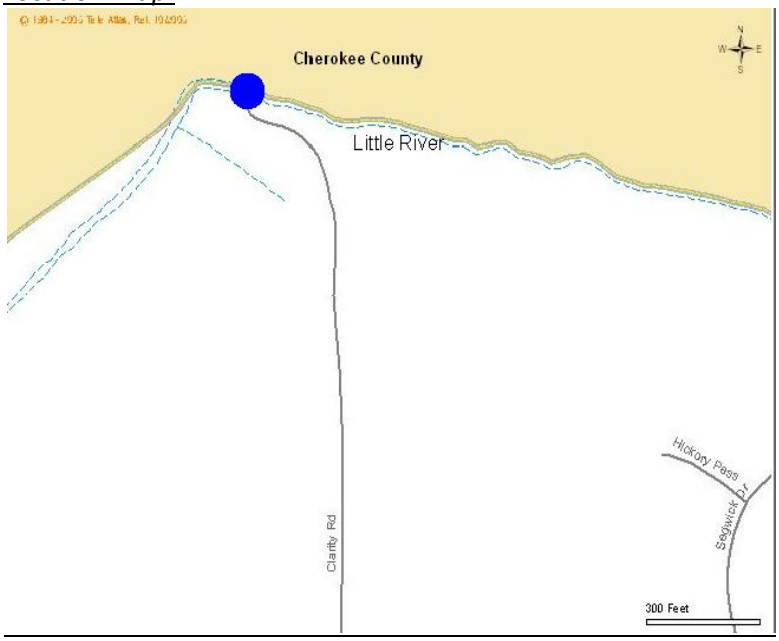
Summary of Findings

Repair Recommendations: N/A	Repair/Replacement Priority: GDOT Maintenance Estimated Cost for Repairs: N/A

Clarity Rd (CR 3) Over Little River

Bridge ID 121-5002-0

General

Road: Clarity Rd (CR 3) *Over:* Little River *Between* Hickory Flat Rd And Melt Anderson Rd *Structure Type: Simply Supported Steel Beam* *Year Built: 1954* *Length*: 48 FT *Width*: 14.9 FT *Span*: 1 Span *Deck*: Timber Decking w/Timber Runners *Superstructure*: Steel Beams *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: Metal Railing and Timber Fencing *Paint System*: Non-Lead Oil Alkyd System (System IV) *Posted Load Limits*: YES *Bus Route*:NO *Sufficiency Rating*: 27.78 *Utilities*: N/A *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This single-lane structure is located on teh Fulton-Cherokee County line and is posted for 6 Tons due to the low original design capacity of the structure. A replacement structure is required to upgrade this structure to a point where posting is no longer required. If the timber runners were re-positioned directly above the beams, this bridge could be upgraded to a 9 ton capacity. This bridge is in fair condition. Fencing at the SE corner is badly damaged (vehicle impact?) and first interior post on east side is loose. At SW corner railing post, screws are loose at base. Minor erosion evident around both corners at north end backwalls of bridge.

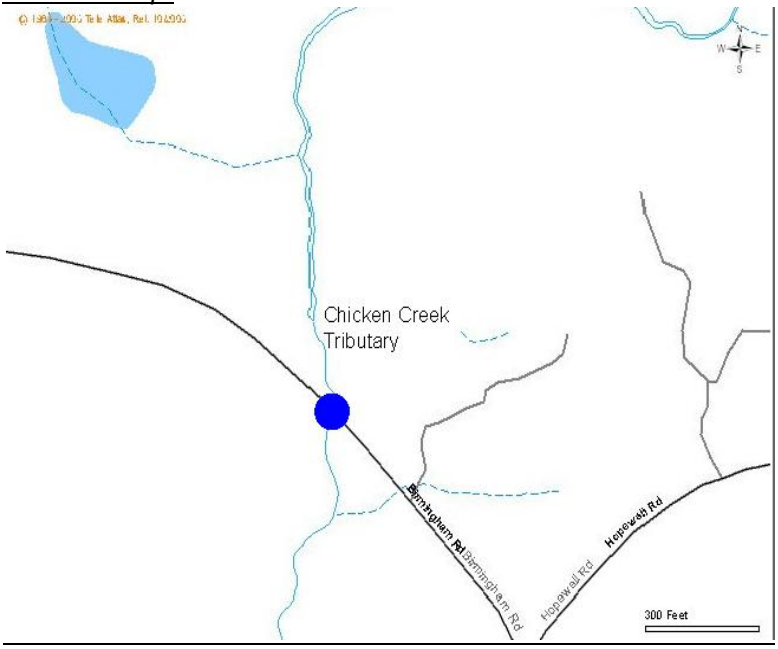
Summary of Findings

Repair Recommendations: The posting sign on the nothern end of the structure is missing. This sign is required and must be replaced. Repair or replace metal rail and timber railing system with W-beam guardrail. Install advance signage warning of single lane bridge ahead and load limited bridge ahead. Future recommendation is to replace bridge and realign south approach to eliminate 90 degree bend.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $3,500

Birmingham Rd (CR 4) Over Chicken Creek Tributary

Bridge ID 121-5003-0

General

Road: Birmingham Rd (CR 4) *Over:* Chicken Creek Tributary *Between* Hopewell Rd And Henderson Rd *Structure Type: Precast Concrete Panels* *Year Built: 1961* *Length*: 30 FT *Width*: 24.2 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Steel/Timber Soldier Piles w/Timber Lagging *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: 36.95 *Utilities*: Gas and Water *Date of Inspection*: 1/9/2009	*Location Map:* 

Narrative Description

This structure is posted for 10 Tons H-Truck; 10 Tons Type 3 Truck; 13 Tons Timber Truck; 13 Tons HS Truck and 16 Tons Type 3S2 truck. This structure is posted due to the concrete deck slabs not being properly bolted together. This bridge structure is in satisfactory condition with corrosion of the steel substructure units. The pre-cast concrete superstructure panels have areas of spalls with exposed reinforced steel on the underside of the deck.

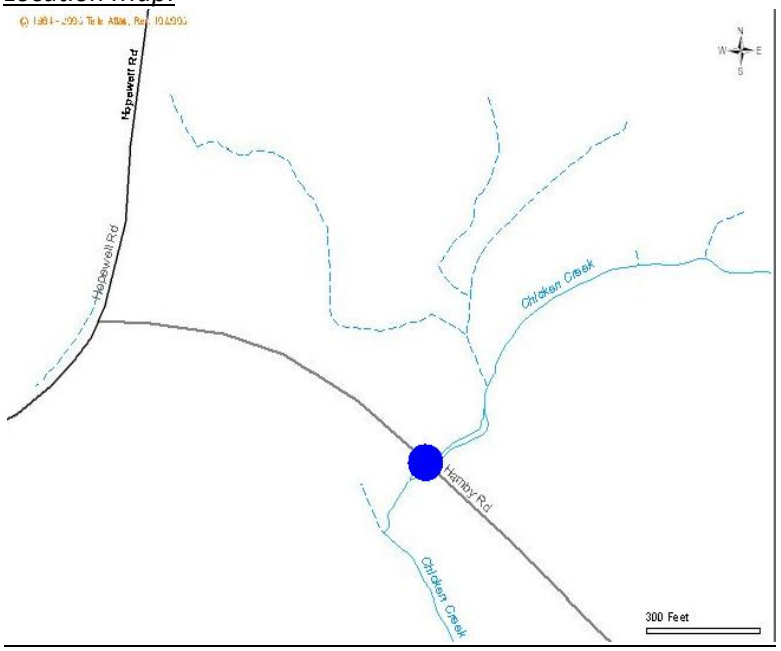
Summary of Findings

Repair Recommendations: The steel piles throughout the structures should be cleaned and painted. Furthermore, these piles should be protected with reinforced concrete encasements extending from points 2 feet below the mud line to a point 2 feet above normal water. The exposed reinforcement steel on the beams should be cleaned and sealed to protect it from corrosion. If the deck slab units are properly bolted together, then this structure could be significantly upgraded.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $25,000

Hamby Rd (CR 12) Over Chicken Creek Tributary

Bridge ID 121-5004-0

General

Road: Hamby Rd (CR 12) *Over:* Chicken Creek Tributary *Between* Watsons Bend And Hopewell Rd *Structure Type: Precast Concrete Panels* *Year Built: 1964* *Length*: 60 FT *Width*: 24.2 FT *Span*: 2 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8- Double Tee Precast Panels *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: 61.25 *Utilities*: N/A *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This structure is posted for 19 Tons H-Truck; 19 Tons Type 3 Truck and 23 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4 inch asphalt overlay. Any upgrade of the load carrying capacity would require removal of this overlay. This bridge structure is in satisfactory condition with no other reported deficiencies except isolated exposed and corroded rebar on underside.

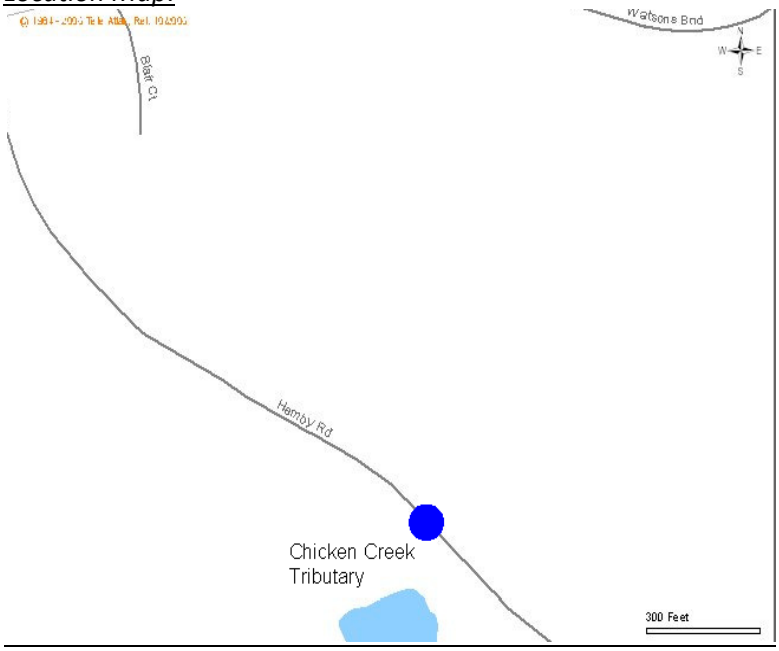
Summary of Findings

Repair Recommendations: Clean and cover exposed reinforcing steel on underside.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $2,500

Hamby Rd (CR 12) Over Chicken Creek Tributary

Bridge ID 121-5005-0

General

Road: Hamby Rd (CR 12) *Over:* Chicken Creek Tributary *Between* Oakside Dr And Watsons Bend *Structure Type: Precast Concrete Panels* *Year Built: 1966* *Length*: 30 FT *Width*: 24.2 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bents *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: 61.25 *Utilities*: N/A *Date of Inspection*: 1/8/2009	*Location Map:* 

Narrative Description

This structure is posted for 18 Tons H-Truck; 18 Tons Type 3 Truck and 23 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4 inch asphalt overlay. Any upgrade of the load carrying capacity would require removal of the asphalt overlay. This bridge structure is in satisfactory condition with the exception of the substructure which is in fair condition. The foundation piles beneath both abutments are exposed.

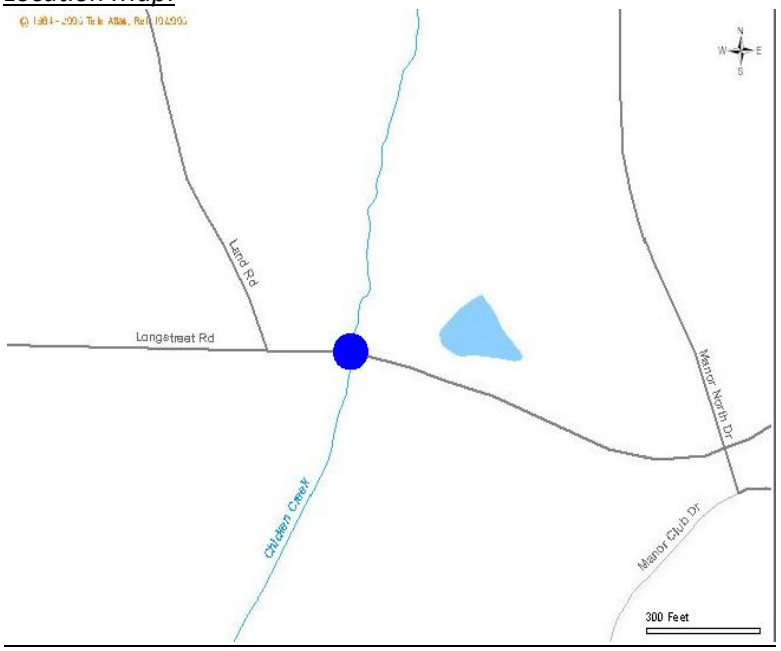
Summary of Findings

Repair Recommendations: The exposed foundation piles at the end bents should be cleaned, painted and covered to protect them from corrosion.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $3,500

Longstreet Rd (CR 13) Over Chicken Creek Tributary

Bridge ID 121-5006-0

General

Road: Longstreet Rd (CR 13) *Over:* Chicken Creek Tributary *Between* Land Rd And Wills Rd *Structure Type: Precast Concrete Panels* *Year Built: 1964* *Length*: 90 FT *Width*: 24.2 FT *Span*: 3 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bents *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 62.81 *Utilities*: Telephone *Date of Inspection*: 1/8/2009	*Location Map:* 

Narrative Description

This bridge structure is in good condition with no reported structural deficiencies.

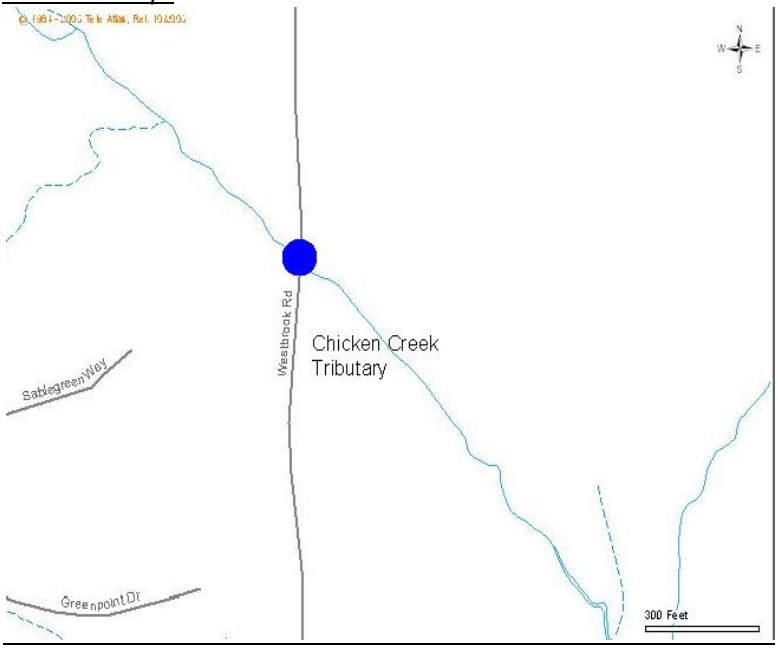
Summary of Findings

Repair Recommendations: Intermediate bent piling should be protected with reinforced concrete encasements extending from 2 feet below mud line to 2 feet above normal water elevation.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $5,000

Westbrook Rd (CR 18) Over Chicken Creek Tributary

Bridge ID 121-5007-0

General

Road: Westbrook Rd (CR 18) *Over:* Chicken Creek Tributary *Between* Hopewell Rd And Mountain Rd *Structure Type: Precast Concrete Panels* *Year Built: 1956* *Length*: 30 FT *Width*: 18.2 FT *Span*: 1 Span *Deck*: Precast Concrete Panels *Superstructure*: 6 - Double Tee Precast Panels *Substructure*: Masonry Gravity Wall *Vehicle Protection*: W-beam Guardrail *Paint System*: N/A *Posted Load Limits*: YES* *Bus Route*:YES *Sufficiency Rating*: 63.28 *Utilities*: N/A *Date of Inspection*: 1/8/2009	*Location Map:* 

Narrative Description

* load limit sign not required and may be removed per GDOT inspection. This single-lane bridge is in good condition with no serious reported structural defects.

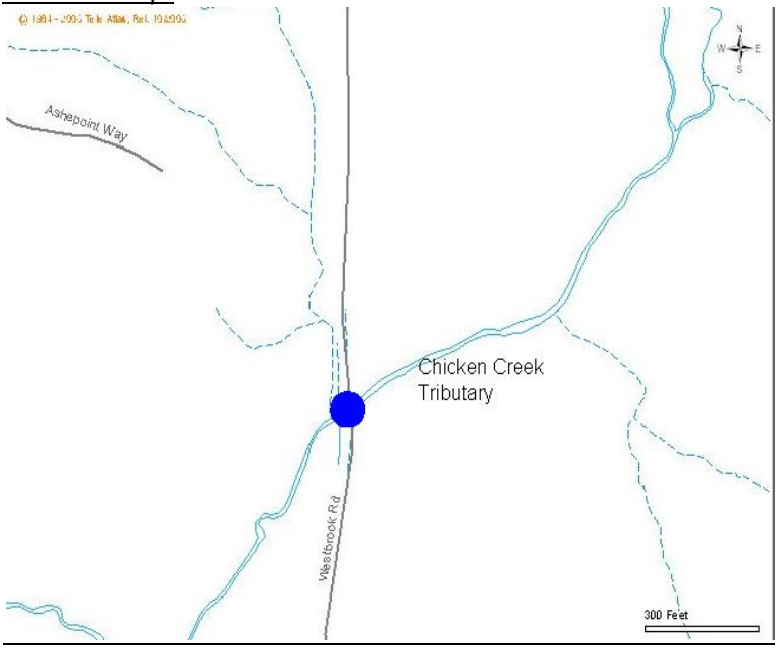
Summary of Findings

Repair Recommendations: Install advance signage for single lane bridge ahead. Repair settled approach roadway (gravel road).	Repair/Replacement Priority: Low Estimated Cost for Repairs: $1,500

Westbrook Rd (CR 18) Over Chicken Creek Tributary

Bridge ID 121-5008-0

General

Road: Westbrook Rd (CR 18) *Over:* Chicken Creek Tributary *Between* Hopewell Rd And Mountain Rd *Structure Type: Precast Concrete Panels* *Year Built: 1956* *Length*: 30 FT *Width*: 18.2 FT *Span*: 1 Span *Deck*: Precast Concrete Panels *Superstructure*: 6 - Double Tee Precast Panels *Substructure*: Concrete Gravity Wall *Vehicle Protection*: W-beam Guardrail *Paint System*: N/A *Posted Load Limits*: YES* *Bus Route*:YES *Sufficiency Rating*: 53.11 *Utilities*: N/A *Date of Inspection*: 1/8/2009	*Location Map:* 

Narrative Description

* load limit sign not required and may be removed per GDOT inspection. This single-lane bridge structure is in fair condition. Minor cracking and spalls on the bottom of several superstructure panels have exposed the reinforcement steel.

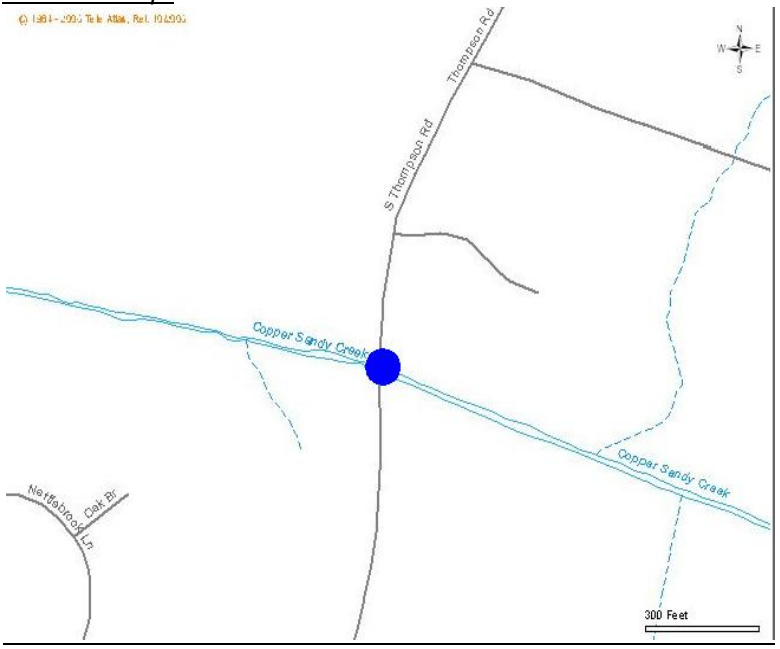
Summary of Findings

Repair Recommendations: Install advance signage for single lane bridge ahead. The concrete spalls on the underside of the panels should be repaired to protect the reinforcement steel from corrosion.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $3,500

Thompson Rd (CR 19) Over Chicken Creek Tributary

Bridge ID 121-5009-0

General

Road: Thompson Rd (CR 19) *Over:* Chicken Creek Tributary *Between* Nettlebrook Way And N Christophers Run *Structure Type: Precast Concrete Panels* *Year Built: 1962* *Length*: 90 FT *Width*: 24.2 FT *Span*: 3 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bents *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 65.23 *Utilities*: Water and Telephone *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This structure is in satisfactory condition. There is moderate concrete spalling scattered throughout the precast beam members resulting in exposed and corroded reinforcing steel. Inadequate patching has failed in several locations. The asphalt wearing surface has significant cracking along bridge end joints and along beam joints.

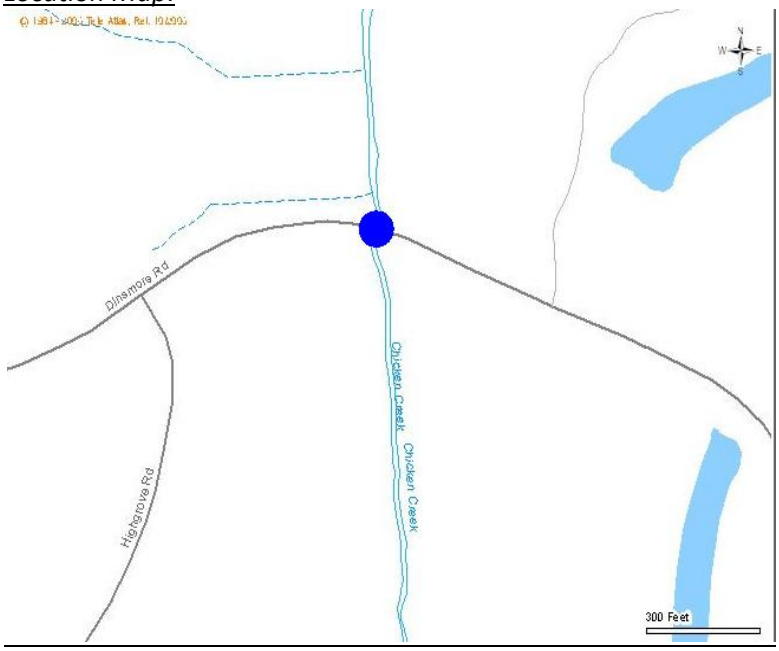
Summary of Findings

Repair Recommendations: Asphalt wearing surface needs to be patched and sealed. Spalling of precast beams needs to be patched, exposed reinforcement needs to be cleaned prior to patching concrete.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $5,000

Dinsmore Rd (CR 20) Over Chicken Creek

Bridge ID 121-5010-0

General

Road: Dinsmore Rd (CR 20) *Over:* Chicken Creek *Between* N Valleyfield Rd And Highgrove Rd *Structure Type: Precast Concrete Panels* *Year Built: 1965* *Length*: 60 FT *Width*: 36.5 FT *Span*: 2 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 12- Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bent *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: YES* *Bus Route*:YES *Sufficiency Rating*: 82.13 *Utilities*: Gas and Water *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

* load limit sign not required and may be removed per GDOT inspection. The bridge structure is in satisfactory condition with drift accumulated at bent #2.

Summary of Findings

Repair Recommendations: Drift accumulation at Bent 2 should be removed to reduce further accumulation and the possibility of scour.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $1,000

Batesville Rd (CR 23) Over Chicken Creek

Bridge ID 121-5011-0

General

Road: Batesville Rd (CR 23) *Over:* Chicken Creek *Between* Birmingham Hwy And Taylor Rd *Structure Type: Precast Concrete Panels* *Year Built: 1962* *Length*: 60 FT *Width*: 24.2 FT *Span*: 2 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 9 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 63.03 *Utilities*: Gas and Telephone *Date of Inspection*: 2/11/2009	*Location Map:* 

Narrative Description

This bridge structure is in satisfactory condition with undermining of the concrete encasements at piles #1 and #3 at bent 2.

Summary of Findings

Repair Recommendations: The concrete pile encasements at Bent 2 should be extended to a point 2 feet below the mud line.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $5,000

Batesville Rd (CR 23) Over Little River

Bridge ID 121-5012-0

General

Road: Batesville Rd (CR 23) *Over:* Little River *Between* Taylor Rd And The Fairway *Structure Type: Precast Concrete Panels* *Year Built: 1964* *Length*: 120 FT *Width*: 27.6 FT *Span*: 4 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 9 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bents *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: YES* *Bus Route*:NO *Sufficiency Rating*: 60.25 *Utilities*: Telephone *Date of Inspection*: 2/11/2009	*Location Map:* 

Narrative Description

* load limit sign present on north end of bridge only but may be removed per GDOT inspection. This bridge structure is located on the Fulton-Cherokee County line and is in satisfactory condition with spalling of the concrete superstructure. Beam #1 in Span#1 is spalled rear of bent#2.

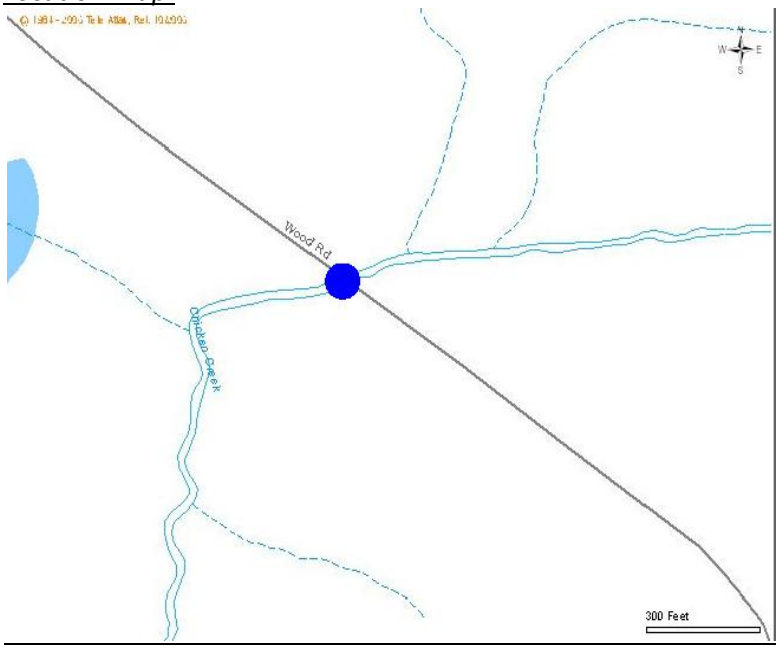
Summary of Findings

Repair Recommendations: The concrete spalls on Beam 1 in the superstructure should be sealed.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $1,500

Wood Rd (CR 24) Over Chicken Creek

Bridge ID 121-5013-0

General

Road: Wood Rd (CR 24) *Over:* Chicken Creek *Between* Phillips Rd And Birmingham Hwy *Structure Type: Precast Concrete Panels* *Year Built: 1961* *Length*: 120 FT *Width*: 24.7 FT *Span*: 4 Spans *Deck*: Precast Concrete Panels *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell pile bents *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: YES* *Bus Route*:YES *Sufficiency Rating*: 52.09 *Utilities*: Telephone *Date of Inspection*: 1/13/2009	*Location Map:* 

Narrative Description

* load limit sign not required and may be removed per GDOT inspection. This bridge structure is in fair condition with undermining of the pile encasements at bent #3. .

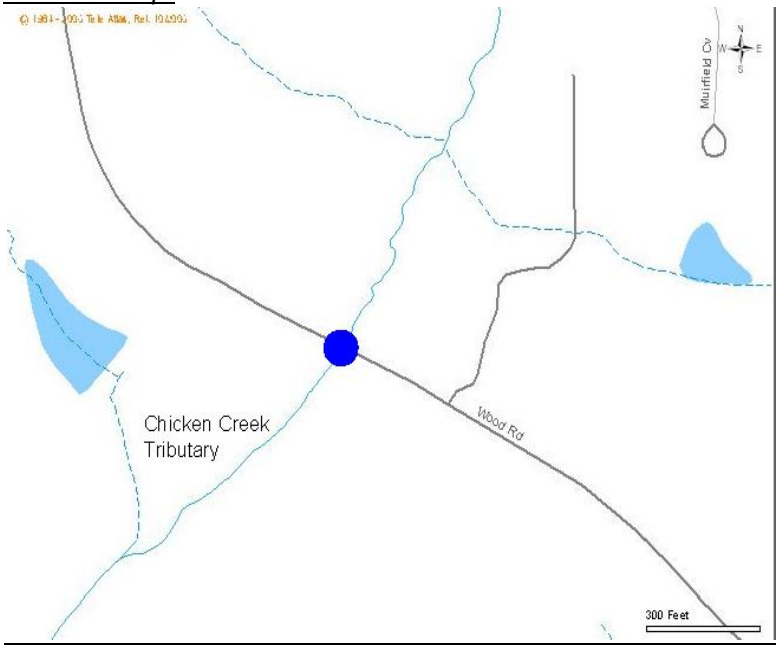
Summary of Findings

Repair Recommendations: The pile encasements at Bent 3 should be extended to a point 2 feet below the mud line. The cracks and spalls in all precast concrete superstructure panels should be sealed to protect the reinforcement steel from corrosion	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $7,500

Wood Rd (CR 24) Over Chicken Creek Tributary

Bridge ID 121-5014-0

General

Road: Wood Rd (CR 24) *Over:* Chicken Creek Tributary *Between* Phillips Rd And Birmingham Hwy *Structure Type: Precast Concrete Panels* *Year Built: 1956* *Length*: 30 FT *Width*: 18.2 FT *Span*: 1 Span *Deck*: Precast Concrete Panels *Superstructure*: 6 - Double Tee Precast Panels *Substructure*: Concrete Gravity Wall *Vehicle Protection*: W-beam Guardrail *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 63.28 *Utilities*: N/A *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This single-lane bridge structure is in satisfactory condition with no reported serious structural defects. There is exposed and corroded reinforcing steel on the end bents due to spalled concrete.

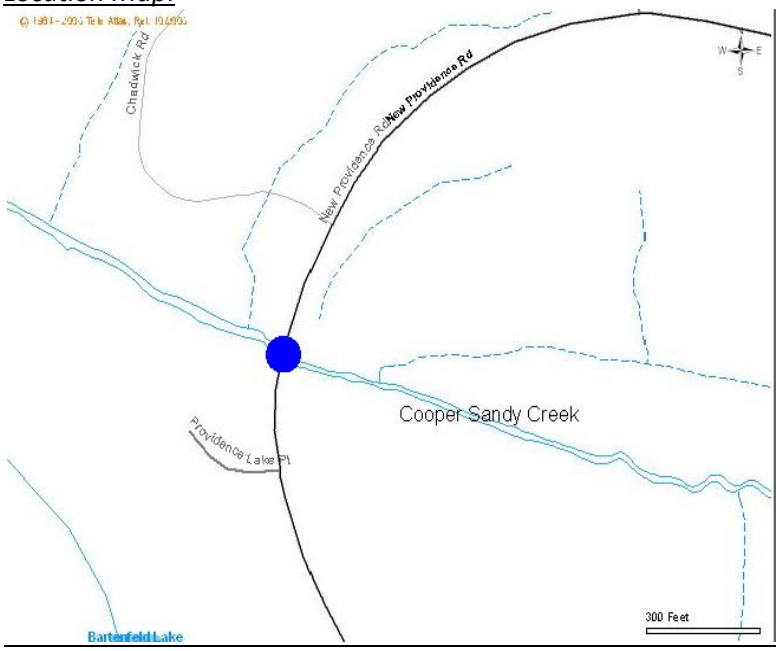
Summary of Findings

Repair Recommendations: The old timber pile cut-offs left in the stream channel should be removed to reduce the potential for drift accumulation. The spalling in the cap at the southern abutment should be sealed. Install advance signage for single lane bridge ahead.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $2,500

New Providence Rd (CR 27) Over Cooper Sandy Creek

Bridge ID 121-5015-0

General

Road: New Providence Rd (CR 27) *Over:* Cooper Sandy Creek *Between* Providence Lake Point And Chadwick Rd *Structure Type: Precast Concrete Panels* *Year Built: 1962* *Length*: 90 FT *Width*: 24.2 FT *Span*: 3 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 7 - Double Tee Precast Panels *Substructure*: Steel/Timber Pile Bents *Vehicle Protection*: Substandard Metail Railing (W-beam sections installed where damaged) *Paint System*: None *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 18.71 *Utilities*: Gas, Water and Telephone *Date of Inspection*: 2/11/2009	*Location Map:* 

Narrative Description

This bridge structure has undergone a significant rehabilitation of the pile bents and has no reported deficiencies. Currently in fair condition (Sufficiency Rating 18.71 but needs to be verified with GDOT based on recent repairs)

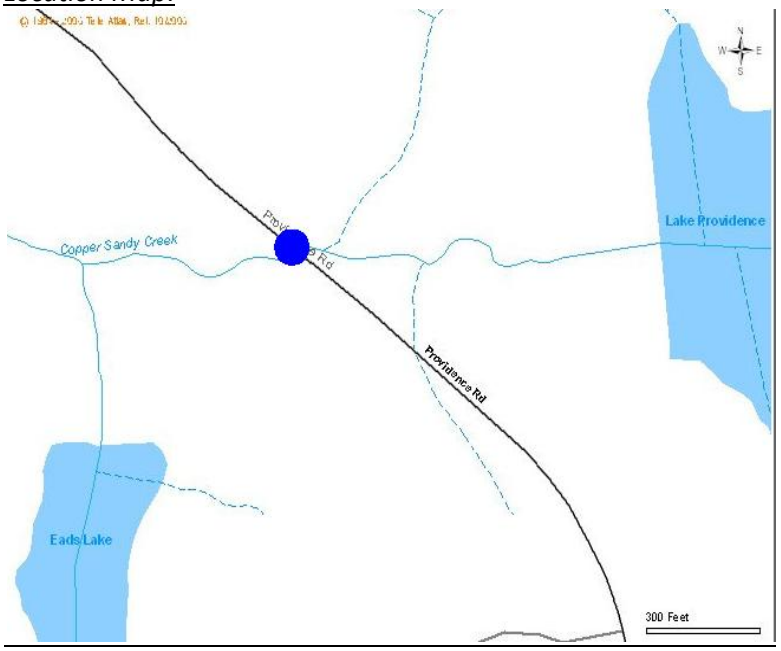
Summary of Findings

Repair Recommendations: Replace substandard railing system with w-beam guardrail.	Repair/Replacement Priority: Medium/High depending on sufficiency rating Estimated Cost for Repairs: $3,500

Providence Rd (CR 27) Over Cooper Sandy Creek

Bridge ID 121-5016-0

General

Road: Providence Rd (CR 27) *Over:* Cooper Sandy Creek *Between* Providence Park Dr And Bethany Rd *Structure Type: Precast Concrete Panels* *Year Built: 1962* *Length*: 30 FT *Width*: 24.2 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 7 - Double Tee Precast Panels *Substructure*: Steel/Timber Soldier Piles w/Timber Lagging *Vehicle Protection*: W-beam Guardrail *Paint System*: Epoxy Mastic *Posted Load Limits*: NO* *Bus Route*:YES *Sufficiency Rating*: 52.63 *Utilities*: City Water *Date of Inspection*: 1/13/2009	*Location Map:* 

Narrative Description

* At time of inspection, the posting signs were missing. These signs are required and must be replaced. Post this structure for 16 Tons H-Truck; 17 Tons Type 3 Truck and 24 Tons Timber Truck. This structure requires posting due to the low original design capacity. A replacement structure is required to upgrade this structure to a point where posting is no longer required. This bridge structure is in fair condition with no reported deficiencies.

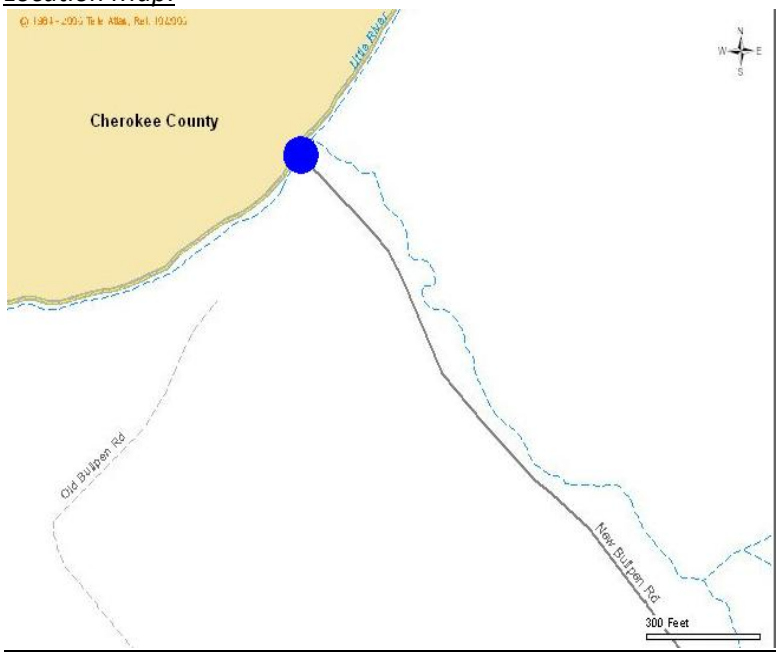
Summary of Findings

Repair Recommendations: Secure guardrail anchorages at NE and SE corners of bridge.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $1,000

New Bullpen Rd/Union Hill Rd (CR 1322) Over Little River

Bridge ID 121-5106-0

General

Road: New Bullpen Rd/Union Hill Rd (CR 1322) *Over:* Little River *Between* Birmingham Hwy And Steeplechase Rd *Structure Type: Concrete T-Beam* *Year Built: 1939* *Length*: 61 FT *Width*: 26.7 FT *Span*: 2 Spans *Deck*: Cast-in-place Concrete w/Asphalt W.S. *Superstructure*: Concrete T-Beams *Substructure*: Concrete Cap and Column *Vehicle Protection*: Concrete Railing *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:NO *Sufficiency Rating*: 48.98 *Utilities*: Telephone/Fiber Optic *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This all concrete bridge structure is located on the Fulton-Cherokee County line and is in fair condition with no reported deficiencies.

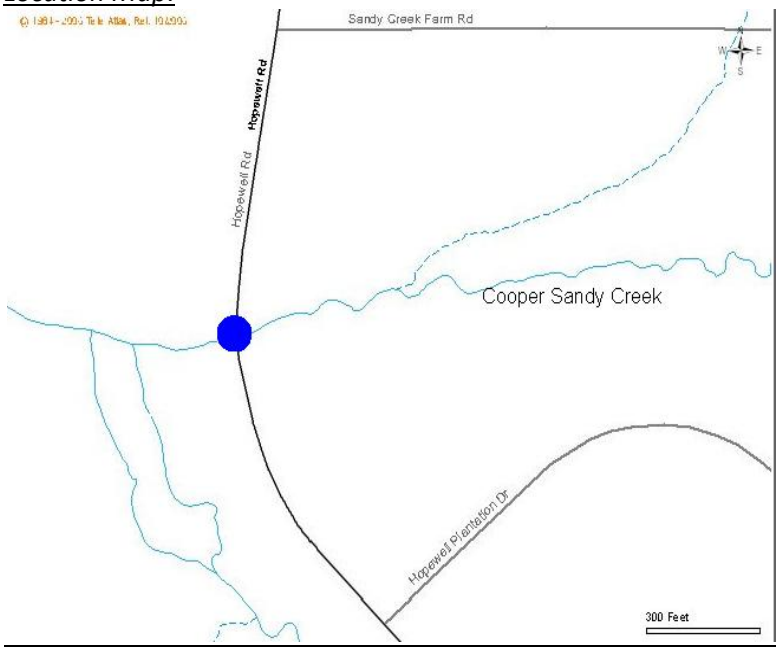
Summary of Findings

Repair Recommendations: Install approach guardrail at all four corners and anchor to bridge endposts.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $3,500

Hopewell Rd (CR 1323) Over Cooper Sandy Creek

Bridge ID 121-5107-0

General

Road: Hopewell Rd (CR 1323) *Over:* Cooper Sandy Creek *Between* Hopewell Plantation Dr And Sandy Creek Farm *Structure Type: Corrugated Metal Arch Culvert with masonry facing* *Year Built: 1953* *Length*: 35 FT *Width*: *Span*: 2 Spans *Deck*: N/A *Superstructure*: Double 16' span x 12' rise arch culvert *Substructure*: N/A *Vehicle Protection*: W-beam Guardrail (west side) *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 91.07 *Utilities*: N/A *Date of Inspection*: 1/9/2009	*Location Map:* 

Narrative Description

This arch culvert is in good condition with no reported deficiencies.

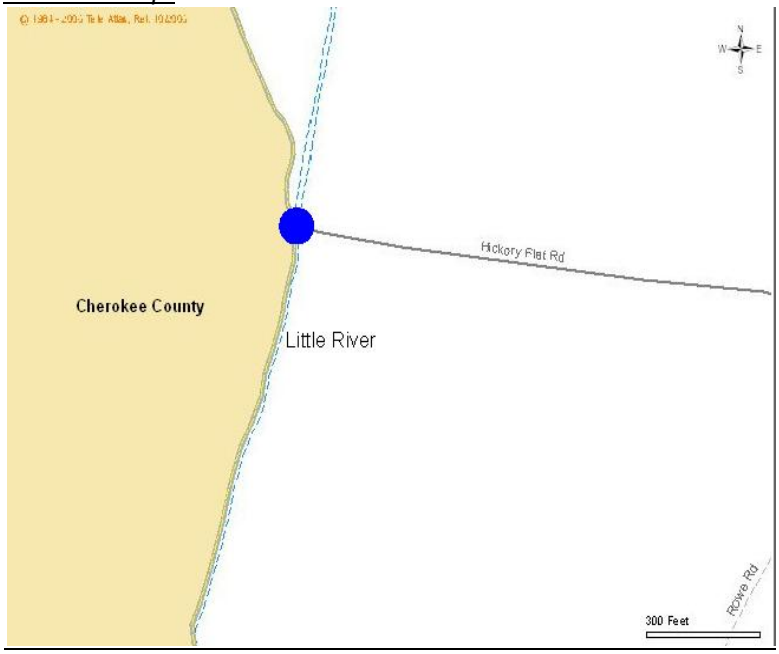
Summary of Findings

Repair Recommendations: None	Repair/Replacement Priority: Low Estimated Cost for Repairs: $-

Birmingham Rd (CR 4) Over Little River

Bridge ID 121-5151-0

General

Road: Birmingham Rd (CR 4) *Over:* Little River *Between* Roper Rd And Clarity Rd *Structure Type: Precast Concrete Panels* *Year Built: 1968* *Length*: 90 FT *Width*: 24 FT *Span*: 3 Spans *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 8 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: W-beam Guardrail (west side) *Paint System*: Epoxy Mastic *Posted Load Limits*: YES *Bus Route*:NO *Sufficiency Rating*: 40.83 *Utilities*: Telephone *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This structure is located on the Fulton-Cherokee County line and is posted for 10 Tons H-Truck; 12 Tons Type 3 Truck; 15 Tons Timber Truck and 18 Tons Type 3S2 Truck. This structure requires posting due to the concrete deck slab panels not being properly bolted together. If the panels were properly bolted and grouted together, this bridge could be upgraded to a point where posting would not be required . This bridge structure is in satisfactory condition with the exception of the substructure units. The concrete encasement at pile#2 of bent#2 has undermined.

Summary of Findings

Repair Recommendations: Cracks in asphalt W.S. have been sealed; however, repair of eroded end slopes beneath bridge due to prior seepage of water thru deck panel joints is recommended. Clear dirt/debris and vegetation from both gutterlines.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $2,500

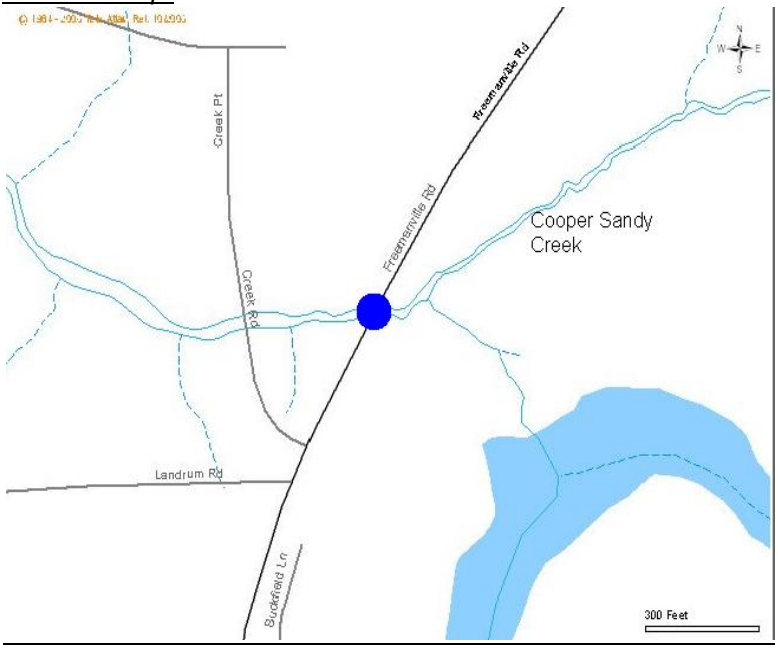
Freemanville Rd (CR 34) Over Cooper Sandy Creek

Bridge ID 121-5153-0

General

Road: Freemanville Rd (CR 34)
Over: Cooper Sandy Creek
Between Creek Rd
And Freemanwood Ln
Structure Type: Precast Concrete Panels
Year Built: 1960
Length: 90 FT
Width: 24.2 FT
Span: 3 Spans
Deck: Precast Panels w/Asphalt W.S.
Superstructure: 8 - Double Tee Precast Panels
Substructure: Concrete filled steel shell pile bents
Vehicle Protection: W-beam Guardrail
Paint System: Epoxy Mastic
Posted Load Limits: YES
Bus Route:YES
Sufficiency Rating: 56.24
Utilities: Gas and Water
Date of Inspection: 2/11/2009

Location Map:



Narrative Description

This structure is posted for 18 tons H-Truck; 18 Tons Type 3 Truck and 22 Tons Timber Truck. This structure is posted due to overstress caused by the extra dead load of the 4.5 inch asphalt overlay. Any upgrade of the load carrying capacity would require removal of this overlay. At the present time, no maintenance repairs are required to maintain this structure at the current rating.

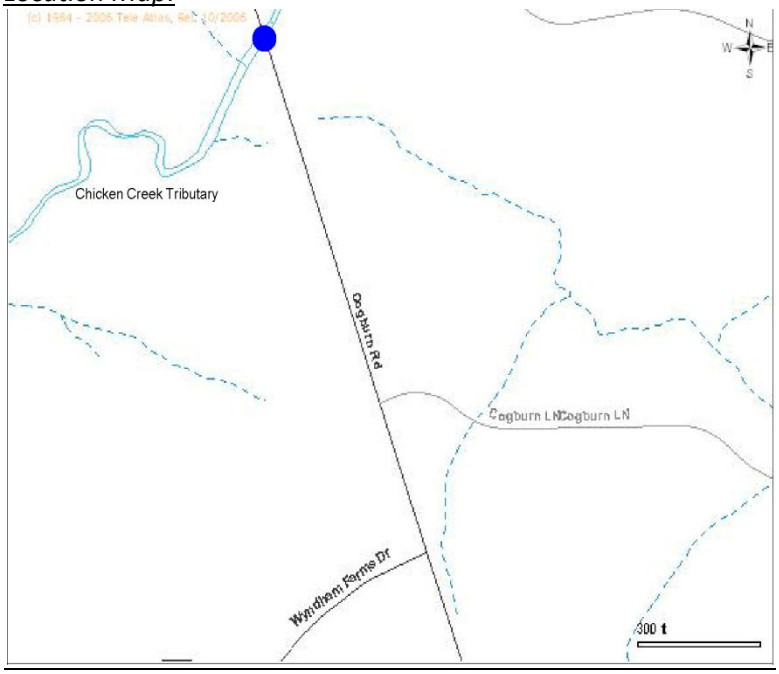
Summary of Findings

Repair Recommendations:	Repair/Replacement Priority: Low
None	Estimated Cost for Repairs: $-

Cogburn Rd (CR 37) Over Chicken Creek Tributary

Bridge ID 121-5202-0

General

Road: Cogburn Rd (CR 37) *Over:* Chicken Creek Tributary *Between* Wyndham Farms Dr And Francis Rd *Structure Type: Precast Concrete Panels* *Year Built: 1986* *Length*: 30 FT *Width*: 28.2 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 7 - Double Tee Precast Panels *Substructure*: Concrete filled steel shell piles *Vehicle Protection*: W-beam Guardrail *Paint System*: None *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: 58.95 *Utilities*: Gas, Water and Telephone *Date of Inspection*: 2/12/2009	*Location Map:* 

Narrative Description

This bridge structure is in good condition with no reported serious structural defects. However, there is severe guardail damage at the SW corner.

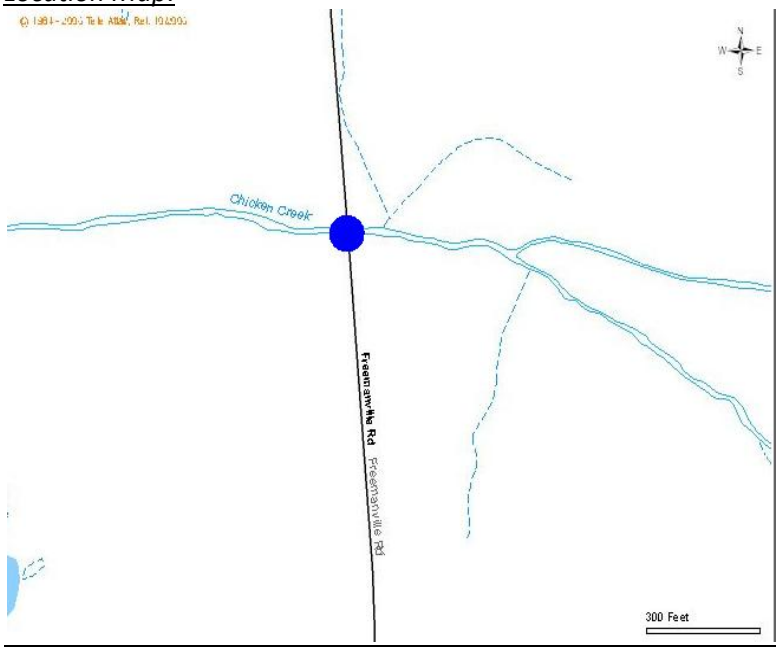
Summary of Findings

Repair Recommendations: Repair damaged guardrail immediately.	Repair/Replacement Priority: High Estimated Cost for Repairs: $1,000

Freemanville Rd (CR 34) Over Chicken Creek

Bridge ID 121-5303-0

General

Road: Freemanville Rd (CR 34) *Over:* Chicken Creek *Between* Phillips Rd And Louis Rd *Structure Type: Prestressed Concrete Beam* *Year Built: 2004* *Length*: 170 FT *Width*: 40 FT *Span*: 3 Spans *Deck*: Cast-in-place Concrete *Superstructure*: Type II & III PSC Beams *Substructure*: Concrete Cap and Column *Vehicle Protection*: Jersey Barrier w/pipe handrail *Paint System*: N/A *Posted Load Limits*: YES* *Bus Route*:YES *Sufficiency Rating*: unknown *Utilities*: N/A *Date of Inspection*: 12:00:00 AM	*Location Map:* 

Narrative Description

* The load limit sign is no longer required and may be removed per GDOT inspection. This is a new structure constructed in 2004; however, the inventory data is not available on GDOT's website.

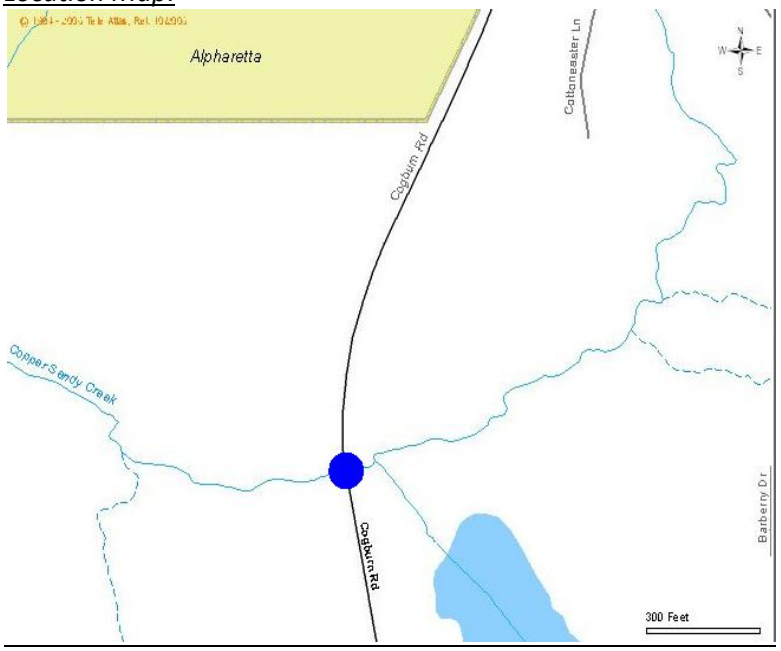
Summary of Findings

Repair Recommendations: None	Repair/Replacement Priority: Low Estimated Cost for Repairs: $-

Cogburn Rd (CR 37) Over Cooper Sandy Creek

Bridge ID MLT01

General

Road: Cogburn Rd (CR 37) *Over:* Cooper Sandy Creek *Between* Glaston Way And N Park *Structure Type: Precast Concrete Panels* *Year Built: 0* *Length*: 14 FT *Width*: 23.3 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 6 - Flat Slab Precast Panels *Substructure*: Timber Soldier Piles & Lagging *Vehicle Protection*: W Beam Guardrail *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: N/A *Utilities*: N/A *Date of Inspection*: 6/24/2009	*Location Map:* 

Narrative Description

Structure consists of precast concrete flat slab panels with asphalt overlay.The bridge is located on a heavily traveled road and is in fair condition. Deck drain openings have been paved over with asphalt. Minor spalls observed along underside of bridge and at curb in SE corner. Guardrail posts missing along west side of bridge making guardrail inadequate for vehicle protection. The timber wingwalls are in fair to poor condition. Three of the four wingwall corner posts have severe rot/decay just above mudline. Both wingwalls on east (upstream) side of bridge have rotated slightly and earth fills have eroded due to inadequate stormwater drainage from road. Some of the timber lagging members have failed due to rot.

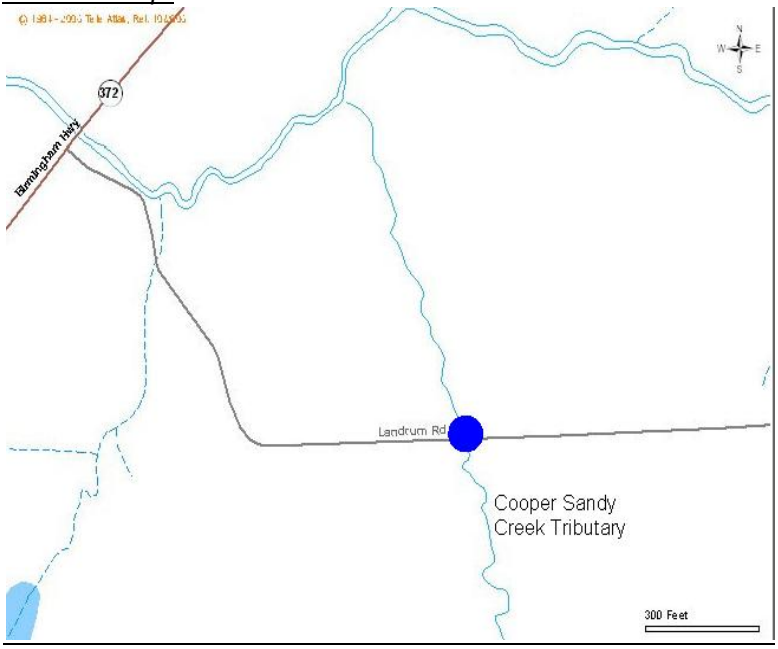
Summary of Findings

Repair Recommendations: For safety reasons, this bridge should be replaced with a wider structure on improved alignment to safely accommodate heavy traffic volumes and turning movements at adjacent school entrances. Provide adequate shoulders and sidewalk on east side.	Repair/Replacement Priority: High Estimated Cost for Repairs: $850,000

Landrum Rd Over Cooper Sandy Creek Tributary

Bridge ID MLT02

General

Road: Landrum Rd *Over:* Cooper Sandy Creek Tributary *Between* Birmingham Hwy And Freemanville Rd *Structure Type: Single Span Steel Beam* *Year Built: 0* *Length*: 19 FT *Width*: 14 FT *Span*: 1 Span *Deck*: 3x10 timber decking with timber curb *Superstructure*: 7 - 12" deep steel beams *Substructure*: Stone Masonry *Vehicle Protection*: W Beam Guardrail *Paint System*: None *Posted Load Limits*: YES *Bus Route*:YES *Sufficiency Rating*: N/A *Utilities*: GA Power, Water *Date of Inspection*: 4/3/2008	*Location Map:* 

Narrative Description

This single lane bridge is posted for a weight limit of 3 Tons. Both approach roadways are gravel and exhibit moderate settlement with several deep depressions in the roadway. Both bridge seats have debris build-up, which indicates failure of the endwalls. The timber deck planks are in good condition. The bridge rail is composed of steel W-beam guardrail nailed to the timber curb which is substandard and loose at several locations. The steel beams have severe rust, exfoliation and section loss. Even though the corrosion levels are severe, there are no signs of excessive deflection, rotation or failure in the steel members. No major defects were identified in the masonry walls, although the east abutment foundation has been undermined by the creek at the south corner.

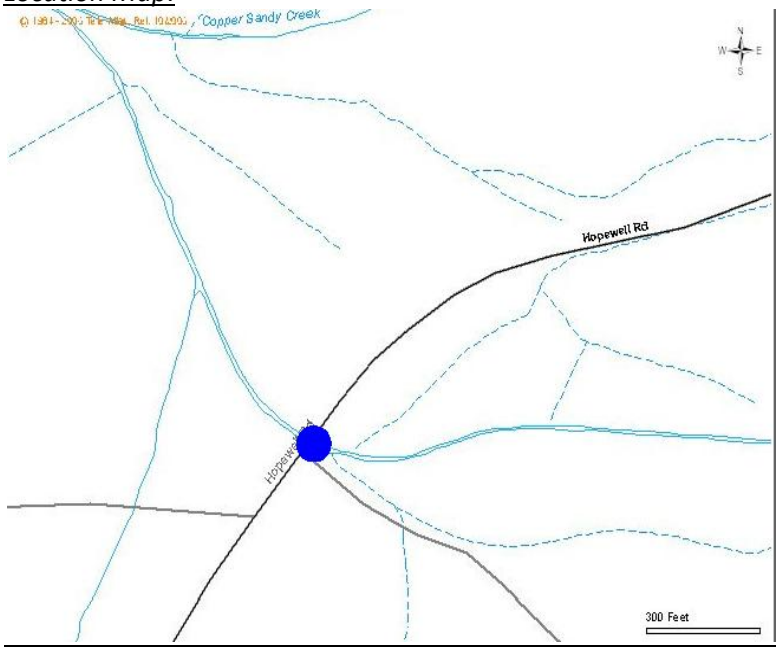
Summary of Findings

Repair Recommendations: Replacement with a prefabricated arch structure	Repair/Replacement Priority: High Estimated Cost for Repairs: $250,000

Hopewell Rd (CR 1323) Over Cooper Sandy Creek

Bridge ID MLT03

General

Road: Hopewell Rd (CR 1323) *Over:* Cooper Sandy Creek *Between* Redd Rd And Saddlesprings Dr. *Structure Type: Triple Cell Concrete Box Culvert* *Year Built: 0* *Length*: 33 FT *Width*: 20 FT *Span*: 3 Spans *Deck*: N/A *Superstructure*: Triple 8 FT x 8 FT Box Culvert *Substructure*: N/A *Vehicle Protection*: W Beam Guardrail *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: N/A *Utilities*: N/A *Date of Inspection*: 6/24/2009	*Location Map:* 

Narrative Description

Structure consists of a skewed triple cell 8 ft x 8ft concrete box culvert. Structure is in good condition with only siltation of northern most cell observed.

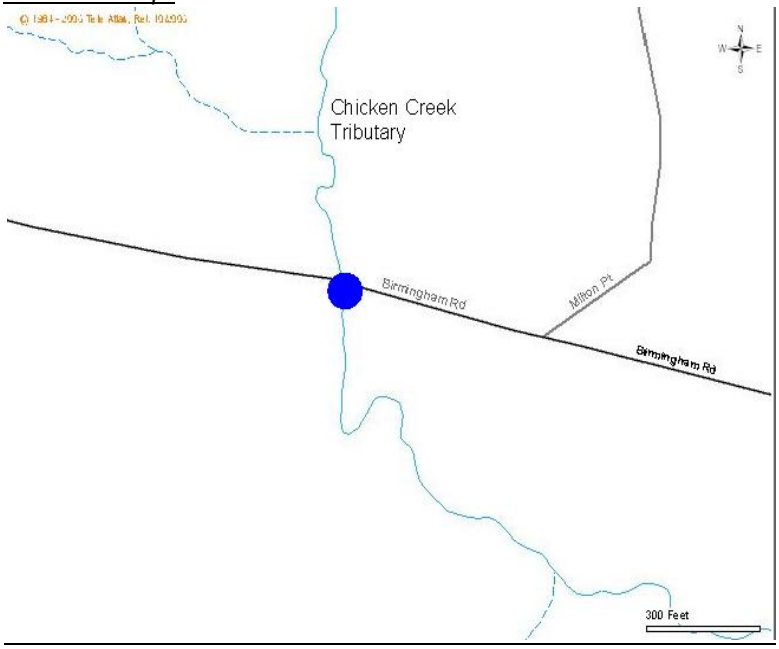
Summary of Findings

Repair Recommendations: Remove built up siltation from northern cell. Clear accumulated debris from south cells.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $1,500

Birmingham Rd (CR 4) Over Chicken Creek Tributary

Bridge ID MLT04

General

Road: Birmingham Rd (CR 4) *Over:* Chicken Creek Tributary *Between* Day Rd And Manor Terrace *Structure Type: Precast Concrete Panels* *Year Built: 0* *Length*: 23 FT *Width*: 23.2 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 6 - Double Tee Precast Panels *Substructure*: Timber Soldier Piles & Lagging *Vehicle Protection*: W Beam Guardrail *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: N/A *Utilities*: City Water & Atlanta Gas *Date of Inspection*: 6/24/2009	*Location Map:* 

Narrative Description

Structure consists of precast concrete double tee panels with asphalt overlay. Deck drain openings have been paved over with asphalt, water seepage thru cracks in wearing surface and down in between panels. Substructure consists of timber piles on a concrete cap. Timber planks are used to retain earth fill at end bents. The bridge is in fair condition. Deflection cracks observed in pavement at both ends of bridge and approach pavement has settled. It appears that the concrete stems have been patched but the patch material has begun peeling off in spots. Anchor bolts supporting guardrail posts have spalled along south side of bridge. Timber sheeting at SE corner has failed, and the SW corner post has failed due to rot. SW wingwall is beginning to fail at mudline.

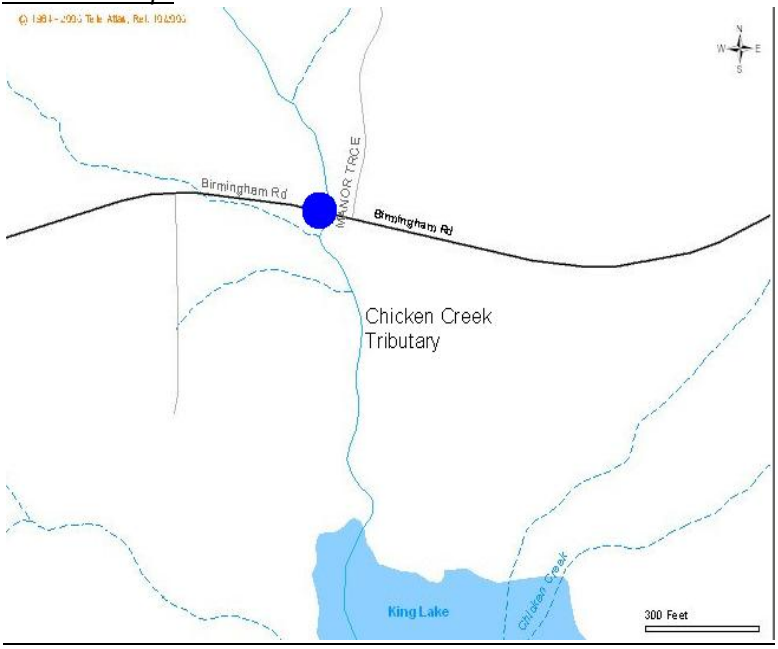
Summary of Findings

Repair Recommendations: Patch and/or seal asphalt wearing surface on bridge deck. Level asphalt approach paving at each end. Closely monitor condition of timber piling & sheeting at ends of bridge and reapir as needed.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $5,000

Birmingham Rd (CR 4) Over Chicken Creek Tributary

Bridge ID MLT05

General

Road: Birmingham Rd (CR 4) *Over:* Chicken Creek Tributary *Between* Freemanville Rd And Milton Point *Structure Type: Precast Concrete Panels* *Year Built: 0* *Length*: 15 FT *Width*: 23.8 FT *Span*: 1 Span *Deck*: Precast Panels w/Asphalt W.S. *Superstructure*: 6 - Flat Slab Precast Panels *Substructure*: Steel/Timber Soldier Piles w/Timber Lagging *Vehicle Protection*: Pipe Handrail *Paint System*: None *Posted Load Limits*: NO *Bus Route*:YES *Sufficiency Rating*: N/A *Utilities*: City Water & Atlanta Gas *Date of Inspection*: 6/24/2009	*Location Map:* 

Narrative Description

Structure consists of precast concrete flat slab panels with asphalt overlay. Substructure consists of steel piles on a concrete cap. Timber planks are used to retain earth fill at end bents. The bridge is in good condition. Deflection cracks observed in pavement at both ends of bridge. It appears that the bridge substructure has been retrofitted since original construction. Original timber piles have been cut off and steel piles installed at each end bent. Some of the timber lagging has rotted and need to be replaced. Existing pipe hand rail is insufficient for vehicle protection.

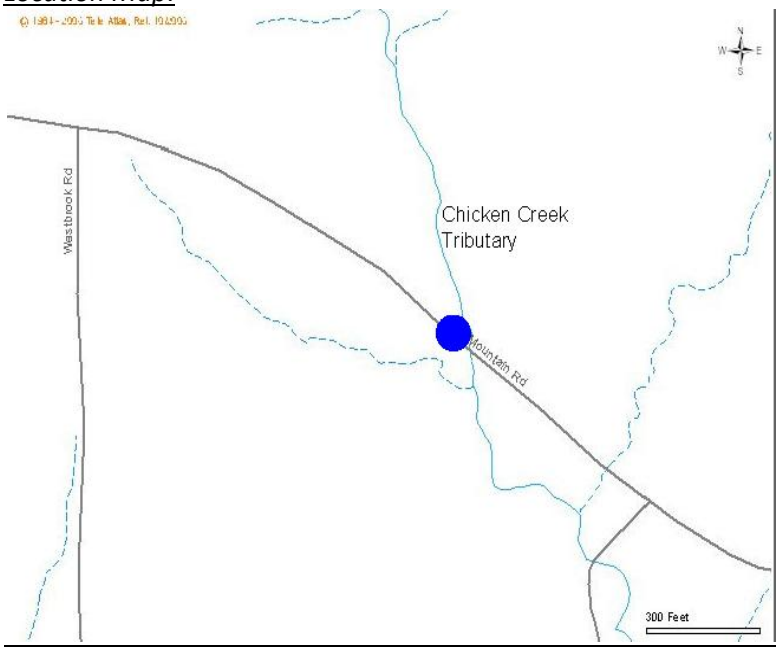
Summary of Findings

Repair Recommendations: Install W-beam guardrail to replace pipe railling. Patch and/or seal asphalt wearing surface on bridge deck. Level asphalt approach paving at each end. Closely monitor condition of timber piling & sheeting material at each end of bridge.	Repair/Replacement Priority: Medium Estimated Cost for Repairs: $7,500

Mountain Rd Over Chicken Creek Tributary

Bridge ID MLT06

General

Road: Mountain Rd *Over:* Chicken Creek Tributary *Between* Westbrook Rd And Phillips Circle *Structure Type: 6 FT Diameter Concrete Pipe* *Year Built: 0* *Length*: 73 FT *Width*: 6 FT *Span*: 1 Span *Deck*: N/A *Superstructure*: N/A *Substructure*: N/A *Vehicle Protection*: N/A *Paint System*: N/A *Posted Load Limits*: NO *Bus Route*:unknown *Sufficiency Rating*: N/A *Utilities*: City Water and AT&T *Date of Inspection*: 6/24/2009	*Location Map:* 

Narrative Description

This pipe structure is in satisfactory condition with isolated spalls on interior. Three of the pipe segments at the outfall end have settled and separated, causing water to flow down through the joint between the segments and underneath the final pipe segment resulting in undermining. Minor spalling observed on exterior of pipe at outfall. Channel erosion and undermining of pipe observed at outfall.

Summary of Findings

Repair Recommendations: Pump grout material in eroded areas at outfall end of pipe and beneath pipe to eliminate voids. Once voids are filled, seal gaps between pipe segments to prevent further undermining, erosion and pipe settlement. Monitor roadway surface above pipe and outfall end of pipe to verify performance of repair.	Repair/Replacement Priority: Low Estimated Cost for Repairs: $3,500

APPENDIX C

Public Opinion Survey Results

The Schapiro Group, Inc.
127 Peachtree Street, NE
Suite 1540
Atlanta, GA 30303

404-584-5215
404-581-0058 fax

schapirogroup.com

TO: Kimley-Horn and Associates, Inc.

FROM: The Schapiro Group, Inc.

DATE: October 13, 2009

RE: City of Milton Telephone Survey Results

Results

- Nearly two-thirds (63%) of respondents report driving between 6 a.m. and 4 p.m. A majority (56%) report that they are typically driving during the evening rush.
- The most common reason for driving during rush periods is the commute to (59%) and from (42%) work, followed by taking children to school or activities.
- Half of the respondents indicate that they drive on SR 9/Cumming Highway often. The other popular roads—Georgia-400, Hopewell Road, and SR 372/Birmingham Highway—are driven on by less than a third of respondents.
- Nearly all Milton residents (91%) drive when they go to destinations in Milton. Few residents walk (8%) or bike (5%) to destinations in the city even somewhat often. However, a majority say that they would walk (60%) or bike (54%) to destinations around town more often if connected trails were in place.
- Very few residents (6%) report owning horses, but those who do would be more likely to ride them if there were connected trails in place.
- Only 8% of residents use public or paratransit services.
- The two most important transportation improvements to Milton residents are traffic improvements (74% "extremely" or "very" important) and road improvements (67%). The least important are equestrian improvements (24%) and public transit improvements (22%). All other tested transportation improvements were considered "extremely" or "very" important by at least half of Milton residents.
- All but one of the specific transportation improvement recommendations also receive a majority of support. The most popular–widening State Route 9—is supported by nearly three-quarters (73%) of residents. The recommendations of widening Arnold Mill Road and connecting it to New Providence Road both receive the support of more than 60% of residents. Widening parts of Hopewell and Hamby Roads is not far behind with 59% support. Installing roundabouts at busy intersections is the least popular recommendation—despite

residents' previously mentioned desire for traffic improvements, including retooling key intersections—but it still receives the support of nearly half (49%) of Milton residents.

- Residents are very favorable toward the idea of developing a a downtown area at Crabapple Crossing, with 78% supporting the proposal, and 52% "strongly" supporting it.

- Milton residents largely favor maintaining the city's rural tradition *and* allowing some development. Half (50%) of residents indicate that they support both, though more than one-third (36%) of residents indicate that Milton should focus solely on maintaining its rural tradition by limiting future development.

Methodology

This memo represents the findings of a scientific telephone survey conducted by The Schapiro Group, Inc. of 200 City of Milton residents (margin of sampling error ±5.5%). The poll was conducted September 9 – 10, 2009. Professional interviewers contacted the respondents by phone and administered a questionnaire that required approximately 9 minutes to complete.

City of Milton Transportation Planning Survey

Hello, my name is _____ from TSG, a Georgia research firm. We're conducting a survey of Milton residents to get opinions on issues affecting your community. This phone number was selected at random. We are not trying to sell you anything and we will not ask you for a contribution or donation. For this study I need to speak to the person in your household age 18 or over who had the most recent birthday who is home at this time.

1. First, do you currently live in the City of Milton?
   - Yes.....100%
   - No.....Terminate
   - Don't know/Refused.....Terminate

For each of the following time periods, please tell me whether or not you are typically driving on major roads or highways in Milton during that time.

2. The morning rush, 6 a.m. – 9 a.m.?
   - Yes.....63%
   - No 37%
   - Don't know/Refused..... 0%

3. During the day between 9 a.m. and 4 p.m.?
   - Yes.....63%
   - No 37%
   - Don't know/Refused..... 0%

4. The evening rush, 4 p.m. – 7 p.m.?
   - Yes.....56%
   - No 44%
   - Don't know/Refused..... 0%

5. During the evening after 7 p.m.?
   - Yes.....39%
   - No 61%
   - Don't know/Refused..... 0%

6. [If "yes" to q2] Which of the following best describes why you are typically driving on major roads or highways in Milton during the morning rush period?
   - To commute to work.....59%
   - As part of my job duties.....5%
   - For errands.....6%
   - For entertainment or leisure..... 1%
   - To take children to school or activities.....25%
   - Something else (do not read).....3%
   - Don't know/Refused..... 0%

7. [If "yes" to q3] Which of the following best describes why you are typically driving on major roads or highways in Milton during the day between 9 am-4 pm?
   - To commute to work....22%
   - As part of my job duties....7%
   - For errands....50%
   - For entertainment or leisure....4%
   - To take children to school or activities....14%
   - Something else (do not read)....3%
   - Don't know/Refused....0%

8. [If "yes" to q4] Which of the following best describes why you are typically driving on major roads or highways in Milton during the evening rush period?
   - To commute to work....42%
   - As part of my job duties....5%
   - For errands....15%
   - For entertainment or leisure....9%
   - To take children to school or activities....24%
   - Something else (do not read)....5%
   - Don't know/Refused....0%

9. [If "yes" to q5] Which of the following best describes why you are typically driving on major roads or highways in Milton in the evenings after 7 pm?
   - To commute to work....9%
   - As part of my job duties....3%
   - For errands....25%
   - For entertainment or leisure....43%
   - To take children to school or activities....16%
   - Something else (do not read)....3%
   - Don't know/Refused....0%

10. Which major roads or highways do you drive on most often in Milton? (do not read options, select all that apply)
   - Georgia-400....31%
   - SR 9/Cumming Highway....50%
   - SR 140/Arnold Mill Road....6%
   - Deerfield Parkway....14%
   - Birmingham Road....12%
   - SR 372/Birmingham Highway....20%
   - Freemanville Road....13%
   - Cogburn Road....11%
   - Hopewell Road....26%
   - Providence Road....10%
   - New Providence Road....4%
   - Bethany Bend/Bethany Way/Bethany Drive....10%
   - None of the above....3%
   - Don't know/Refused....0%

When you are heading to a destination in Milton, how often do you...

11. ...walk there?
    - Very often....2%
    - Somewhat often....6%
    - Not often at all....11%
    - Never....81%
    - Don't know/Refused....0%

12. ...drive there?
    - Very often....91%
    - Somewhat often....5%
    - Not often at all....2%
    - Never....2%
    - Don't know/Refused....0%

13. ...ride a bicycle there?
    - Very often....1%
    - Somewhat often....4%
    - Not often at all....6%
    - Never....89%
    - Don't know/Refused....0%

14. If connected trails were in place, would you be more likely to walk to destinations in Milton?
    - Yes, much more likely....34%
    - Yes, somewhat more likely....26%
    - No....40%
    - Don't know/Refused....0%

15. If connected trails were in place, would you be more likely to ride a bicycle to destinations in Milton?
    - Yes, much more likely....29%
    - Yes, somewhat more likely....25%
    - No....46%
    - Don't know/Refused....0%

16. Do you own any horses?
    - Yes....6%
    - No (skip to q18)....94%
    - Don't know/Refused (skip to q18)....0%

17. If connected trails were in place, would you ride a horse for recreation more often?
    - Yes, much more often....86%
    - Yes, somewhat more often....7%
    - No....7%
    - Don't know/Refused....0%

18. Do you ever use public transportation or paratransit services in Milton?
    - Yes, public transportation only....6%
    - Yes, paratransit only....1%
    - Yes, both....1%
    - No....92%
    - Don't know/Refused....0%

19. (Only asked of those who use public transportation) How often do you use public transportation in Milton?
    - Very often....6%
    - Somewhat often....56%
    - Not often at all....38%
    - Never....0%
    - Don't know/Refused....0%

20. (Only asked of those who use paratransit services) How often do you use paratransit services in Milton?
    - Very often....0%
    - Somewhat often....75%
    - Not often at all....0%
    - Never....25%
    - Don't know/Refused....0%

Now I'm going to read you several transportation improvements city officials are considering, and I'd like you to tell me how important you think each one is. The first/next one is....

[Rotate]

21. Improvements for pedestrians, such as sidewalks and crosswalks
    - Extremely important....27%
    - Very important....32%
    - Somewhat important....28%
    - Not important at all....13%
    - Don't know/Refused....0%

22. Improvements for bicycles, such as bicycle lanes
    - Extremely important....24%
    - Very important....28%
    - Somewhat important....24%
    - Not important at all....23%
    - Don't know/Refused....1%

23. Improvements for individuals with disabilities, such as paratransit services
    - Extremely important....22%
    - Very important....35%
    - Somewhat important....27%
    - Not important at all....13%
    - Don't know/Refused....2%

24. Public transit improvements, such as local bus service or express buses
    - Extremely important....9%
    - Very important....13%
    - Somewhat important....31%
    - Not important at all....46%
    - Don't know/Refused....1%

25. Equestrian improvements, such as trails and stable facilities in the northwest part of Milton
    - Extremely important....8%
    - Very important....16%
    - Somewhat important....24%
    - Not important at all....50%
    - Don't know/Refused....1%

26. Road improvements, such as repaving and fixing potholes
    - Extremely important....27%
    - Very important....40%
    - Somewhat important....24%
    - Not important at all....10%
    - Don't know/Refused....0%

27. Traffic improvements, such as retooling key intersections
    - Extremely important....31%
    - Very important....43%
    - Somewhat important....21%
    - Not important at all....5%
    - Don't know/Refused....0%

28. Connection improvements, such as making it easier to get from one side of town to the other
    - Extremely important....23%
    - Very important....35%
    - Somewhat important....27%
    - Not important at all....15%
    - Don't know/Refused....0%

I'm going to read you several specific transportation improvement suggestions that city officials are considering, and I'd like you to tell me if you support or oppose each one. The first/next one is....

29. Installing roundabouts–or large traffic circles–instead of traffic signals at some busy intersections
    - Strongly support....23%
    - Somewhat support....26%
    - Somewhat oppose....19%
    - Strongly oppose....29%
    - Don't know/Refused....3%

30. Widening Arnold Mill Road to 4 lanes to help decrease traffic caused in part by commuters from Cherokee County
    - Strongly support....33%
    - Somewhat support....31%
    - Somewhat oppose....9%
    - Strongly oppose....14%
    - Don't know/Refused....13%

31. Widening the northern parts of Hopewell Road and Hamby Road to 4 lanes to help decrease traffic caused in part by commuters from north of Milton
    - Strongly support....31%
    - Somewhat support....28%
    - Somewhat oppose....14%
    - Strongly oppose....22%
    - Don't know/Refused....5%

32. Widening State Route 9 by adding 2 more lanes to help decrease traffic
    - Strongly support....50%
    - Somewhat support....23%
    - Somewhat oppose....12%
    - Strongly oppose....12%
    - Don't know/Refused....3%

33. Creating a new 2 lane road that would connect Arnold Mill Road to New Providence Road
    - Strongly support....29%
    - Somewhat support....32%
    - Somewhat oppose....13%
    - Strongly oppose....14%
    - Don't know/Refused....12%

34. Some local leaders are considering developing Crabapple Crossing into a downtown area for Milton that would be the new home of most city government functions, such as city hall and the courthouse, as well as some shopping areas. Based on what you know, would you support or oppose creating a downtown area at Crabapple Crossing?
    - Strongly support....52%
    - Somewhat support....26%
    - Somewhat oppose....7%
    - Strongly oppose....11%
    - Don't know/Refused....4%

35. In your opinion, should the City of Milton....
    - ...maintain its rural tradition by limiting future development....36%
    - ...develop more like other nearby cities....8%
    - ...maintain its rural tradition, but allow development in certain areas....50%
    - Both (do not read)....3%
    - Neither (do not read)....3%
    - Don't know/Refused....1%

36. Finally, which city council district do you live in? If you're not sure, just say so.
    - 1 (Karen Thurman)....4%
    - 2 (Julie Zahner Bailey)....18%
    - 3 (William C. Lusk)....3%
    - 4 (Burt Hewitt)....1%
    - 5 (Tina D'Aversa)....6%
    - 6 (Alan Tart)....2%
    - Not sure....65%
    - Refused....0%

APPENDIX D

Milton Roundup Summary and Additional Comments

As part of the CTP public outreach strategy, members of the project team recently attended The Milton Round Up - an annual community fair with an average attendance estimated at around 2000 people. The event was held on the lawn of Milton High School on Saturday November 17, 2009 from noon until 6:00 pm. A booth was set up for the CTP where maps displayed improvements being considered as part of the plan. The maps depicted roadway segments and intersections where improvements are proposed as well as the potential streetscape enhancements and bypass routes at Crabapple. Additionally, a comment form was provided to record input from the public.

Unfortunately, inclement weather most likely affected the turn-out for the Round Up, and but it did not keep project staff from speaking to those in attendance. Interested residents approached the displays, spoke with staff, asked questions, and offered both verbal and written comments.

Comments recorded on comments cards at the Roundup

- Need fix at Providence and Birmingham ASAP
- Need Arnold Mill/SR 140 Widened ASAP
- Provide incentives to ride school buses. Too many drop-offs!
- Love Hopewell Road Widening.
- Love roundabout at Birmingham and Freemanville.
- Love widening of SR 9.
- Please consider a light at Providence Oaks St. and Providence Road. It is a high speed area around a blind curve.
- No roundabout at Bethany Bend & Cogburn Road. You will have a new High School at SE corner, and already have Kings Ridge adjacent to it.
- Need to do something at 4 way stop at Birmingham and Freemanville.
- Stop light would be great at Birmingham at Birmingham Hwy near Publix village.
- Hopewell needs to be widened and guard rails installed. We are not driving horse and buggies anymore! Rolled my Suburban on this road with two kids in the car.
- 4 lane all of Rucker Road / Old Milton Parkway
- Increase the amount of time for the traffic light from Charlotte Drive coming into Mayfield (at least in the am)
- Would like to discuss the potential by-pass road being looked at for Crabapple Station on Dunwoody Drive. Live in Crabapple Station, and do not want this bypass going through our neighborhood.
- Do not like the roundabout for downtown.
- Roundabout @ Milton Crossroads would be good.

Comment submitted by email after the event

- In the new transportation plan, am very concerned about putting a busy road through my neighborhood and in front of my house. When we bought our house, we believed we were in a neighborhood, not on main street. Our house is currently about 6 feet from the street...how will that work with "250 cars" at peak hours passing by? Our neighborhood will be divided into two sections. When we bought our house, and currently, we walk to surrounding businesses, but now, we will have to cross a busy street just to go somewhere. This will decrease the value of our property - is that what the City of Milton wants?

Comment submitted at public meeting on Thursday November 11, 2009

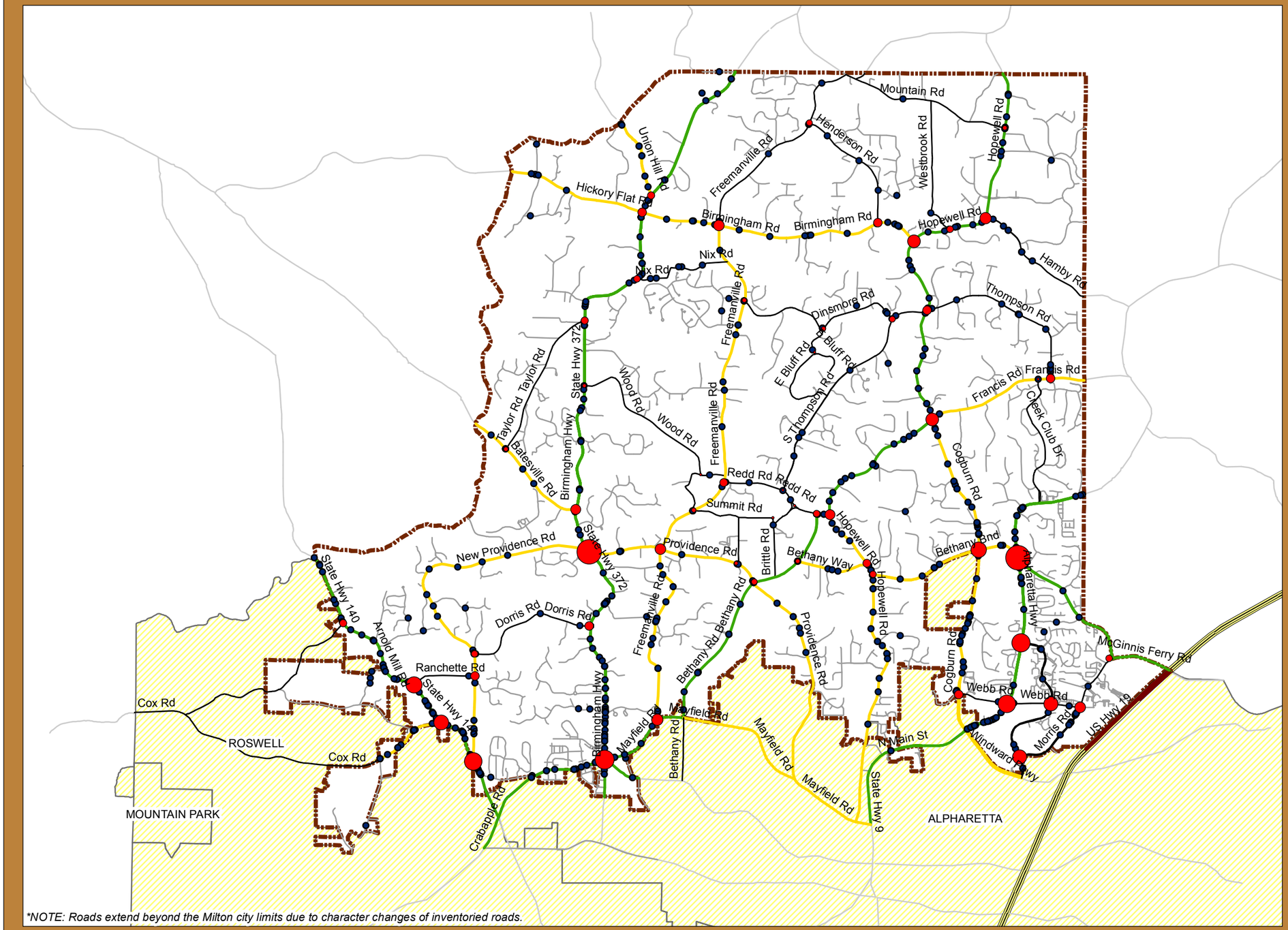
- The first intersection improvement (lighted intersection) must be at the intersection of New Providence Road and Arnold Mill road (at the fire station). This is long overdue. It was originally scheduled for July 2007 by Fulton County. I attended all those meetings held years ago by Fulton County representatives and the engineering firm scheduled to do the work. The meetings were at Crabapple Crossing Elementary. This intersection is dangerous particularly at rush hour. I usually slow to a crawl traveling on Arnold Mill to provide those at the intersection an opportunity to get out. It doesn't matter that there's been a lack of accidents. Maybe this speaks well of those who use the intersection. Don't simply widen the road to four lanes. We'll never get out. It will be worse. People will drive even faster. I still can't believe all the intersection lights that have gone up yet one intersection looks the same as it always has. I'm tired of the delay. When you finish with this intersection THEN you can use my tax money for whatever you want.

APPENDIX E

Updated Crash Data

Additional crash data has been obtained from GDOT since the publication of the *Existing Conditions Report*. The crash locations maps has been revised to show crashes for the years 2006 to 2008 (previous map showed 2005 to 2007). Also, data for additional crashes were obtained for 2006 and 2007 that were not included in the crash data from Fulton County.

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

Appendix E
Crash Locations
(2006 - 2008)

Legend

Crashes at Intersections

- 1
- 10
- 100

Individual Crash Locations

Roadway Functional Classification

- UrbanFreeway
- Minor Arterial
- Collector
- Local Road
- Expressways
- Other Streets
- City of Milton
- Other Fulton County Cities

N
W E
S

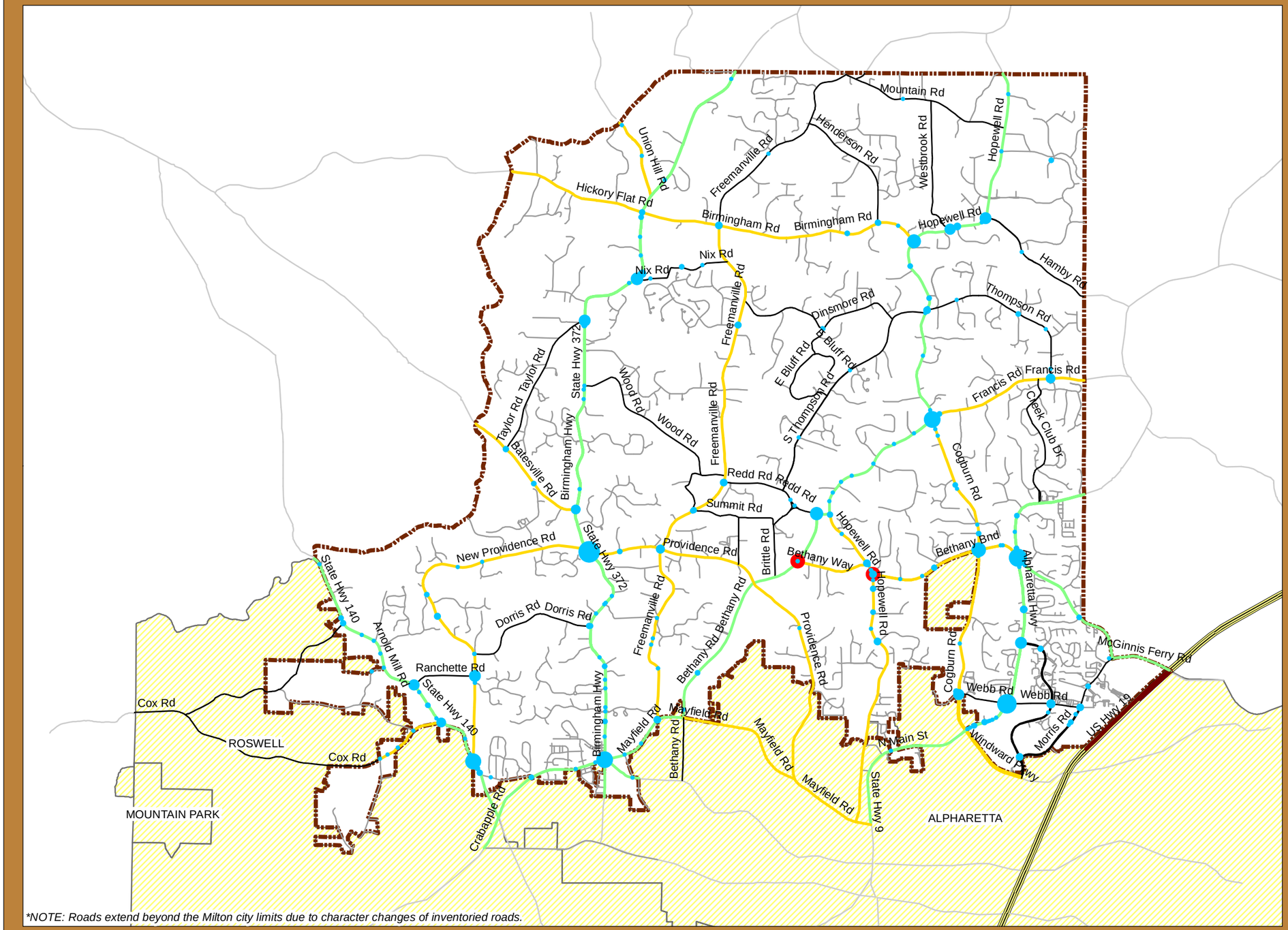
0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 2, 2009

Source: City of Milton, GDOT

City of Milton Transportation Plan



*NOTE: Roads extend beyond the Milton city limits due to character changes of inventoried roads.

Appendix E

Injury and Fatality Locations
(2006 - 2008)

Legend

Fatalities

- 1

Injury Locations

- 1
- 5
- 10

Roadway Functional Classification

- UrbanFreeway
- Minor Arterial
- Collector
- Local Road
- Expressways
- City of Milton
- Other Streets
- Other Fulton County Cities

2

0 0.25 0.5 1 1.5 Miles

Prepared by: Kimley-Horn and Associates, Inc.

Date: November 2, 2009

Source: City of Milton, GDOT

APPENDIX E: Crash, Injury, and Fatality Data

Eleven (11) Intersections with Most Crashes: Years 2006-2008 City of Milton		
Intersection	Number of Crashes	Improvement In Progress?
Birmingham Highway (SR 372) at New Providence Road	75	Yes
Alpharetta Highway (SR 9) at Bethany Road	73	
Birmingham Highway (SR 372) at Crabapple Road	43	
Alpharetta Highway (SR 9) at Deerfield Parkway	42	Yes
Arnold Mill Road (SR 140) at New Providence Road	38	Yes
Alpharetta Highway (SR 9) at Webb Road	37	
Arnold Mill Road (SR 140) at Ranchette Road	33	
Cogburn Road at Bethany Road	29	
Arnold Mill Road (SR 140) at Cox Road	27	Yes
Deerfield Parkway at Morris Road	25	
Deerfield Parkway at Webb Road	25	

Ten (10) Intersections with Most Injuries: Years 2006-2008 City of Milton		
Intersection	Number of Injuries	Improvement In Progress?
Birmingham Highway (SR 372) at New Providence Road	24	Yes
Alpharetta Highway (SR 9) at Webb Road	20	
Alpharetta Highway (SR 9) at Bethany Road	17	
Birmingham Highway (SR 372) at Crabapple Road	15	
Hopewell Road at Cogburn Road/Francis Road	15	
Arnold Mill Road (SR 140) at New Providence Road	13	Yes
Cogburn Road at Bethany Road	11	
Birmingham Road at Hopewell Road	10	
Redd Road at Haygood Road	9	
Birmingham Highway (SR 372) at Nix Road	8	

Intersections with Fatalities: Years 2006-2008 City of Milton		
Intersection	Number of Injuries	Improvement In Progress?
Bethany Road at Haygood Road	1	
Hopewell Road at Bethany Bend	1	

Source: Georgia Department of Transportation

APPENDIX F

Supplemental Impact Fee Feasibility Study

Comprehensive Transportation Plan
Supplemental Impact Fee Feasibility Study

Prepared for:
City of Milton, GA

Prepared by:

duncan associates

Kimley-Horn and Associates, Inc.

September 2009

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Prepared by Duncan Associates
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1.0 EXECUTIVE SUMMARY

As part of the City of Milton Transportation Plan process, the City has expressed an interest in exploring potential funding sources for planned transportation improvements. This study provides an analysis of impact fees as a potential funding source for capacity-expanding transportation improvements. In addition to transportation impact fees, this study presents an analysis of other facility needs and how impact fees could fund other growth-related improvements allowable under Georgia's impact fee enabling act. Whether to impose impact fees on new development is a policy decision. Based on the findings in this study, impact fees would be feasible for roads, parks and fire facilities. In the event that the City decides to proceed with impact fees, they should be considered in the following priority order.

Table 1. Rank Order of Facilities for Impact Fees

Facility Type	Reason for Ranking
1. Roads	Greatest need for improvement funding; high revenue potential
2. Parks	Need for improvement funding; moderate revenue potential
3. Fire	Need for additional equipment; low revenue potential

All of the impact fees could be developed city-wide. Based on typical impact fees in Georgia and housing permit data for Milton, the revenue analysis shows that a road impact fee could generate approximately $200,000 annually, while all three fees could generate about $400,000 annually.

2.0 INTRODUCTION

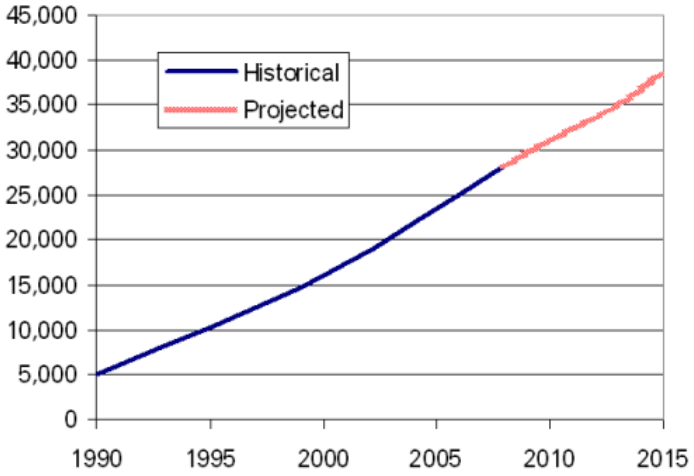
Figure 1. Milton Location Map

The purpose of this project is to assist the City of Milton in the preparation of an impact fee program. The City has expressed interest in potentially developing impact fees, and this study analyzes the potential development of impact fees for facilities allowable under Georgia's impact fee enabling act. These facilities include roads, transportation, water, wastewater, parks, drainage, fire and police. This study provides the City with initial "policy directions" to consider before pursuing a full impact fee study. The purpose of the report is to provide background information and guidance to the City in deciding whether and how to proceed with the development of an impact fee program in subsequent studies. This study also presents a review the legal framework for impact fees in Georgia, local data and potential fees.

2.1 Growth Context

The City of Milton is located in central Georgia, about 30 miles north of downtown Atlanta (see Figure 1). The City was incorporated in 2006 from unincorporated land in the northern portion of Fulton County.

Figure 2. Milton Population, 1990-2015



The City wishes to retain its low-density rural character; nevertheless, the potential for future growth will create demand for new infrastructure and facilities in order to maintain acceptable levels of service. While incorporated in 2006, the area within the current city limits has grown rapidly from 5,125 residents in 1990 to an

estimated 28,126 residents in 2008.[1] During this decade, the average annual growth rate has been approximately 9 percent. As shown in Figure 2, the population is projected to continue increasing at approximately 5 percent annually through 2015.

2.2 What are Impact Fees?

Impact fees, also called "development fees" or "development impact fees," are one of the most direct ways for local governments to require new developments to pay a larger portion of the costs they impose on the community. In the absence of impact fees, communities often utilize traditional "negotiated" developer exactions; however, such exactions are prohibited in Georgia under the State's impact fee act. Impact fees provide an opportunity for communities to fund infrastructure through charges that are assessed on new development based on a standard formula based on objective characteristics, such as the number of dwelling units constructed or vehicle trips generated. The fees are one-time, up-front charges, with the payment usually made at the time of building permit issuance. Essentially, impact fees require that each developer of a new residential or commercial project pay its pro-rata share of the cost of new infrastructure facilities required to serve that development.

2.3 Average Fee Amounts

National average impact fees from an on-going survey conducted by the consultant are summarized in Table 2 below. The full survey includes 279 jurisdictions. However, California jurisdictions tend to have significantly higher fees than the rest of the country. Consequently, the average fees shown below exclude California jurisdictions.

Table 2. Average National Impact Fees (Excluding California)

Facility	# of Juris-dictions	Single-Family (unit)	Multi-Family (unit)	Retail (1000 sf)	Office (1000 sf)	Industry (1000 sf)
Roads	196	$2,609	$1,742	$4,577	$2,738	$1,648
Drain	36	$1,084	$639	$1,106	$927	$1,080
Parks	172	$1,696	$1,296	$620	$574	$573
Library	58	$337	$254	n/a	n/a	n/a
Fire	122	$394	$313	$387	$320	$235
Police	87	$285	$224	$411	$242	$153
General Government	48	$507	$412	$505	$432	$296
Schools	102	$4,634	$2,587	n/a	n/a	n/a
Other	45	$565	$402	$1,186	$1,539	$597
Avg. Non-Utility Fee*	234	$6,209	$4,081	$4,820	$3,161	$1,980
Water	111	$2,892	$1,348	$1,058	$1,064	$1,050
Sewer	114	$2,576	$1,206	$1,623	$1,603	$1,599
Avg. Total Fee*	241	$8,598	$5,132	$5,733	$4,209	$3,096

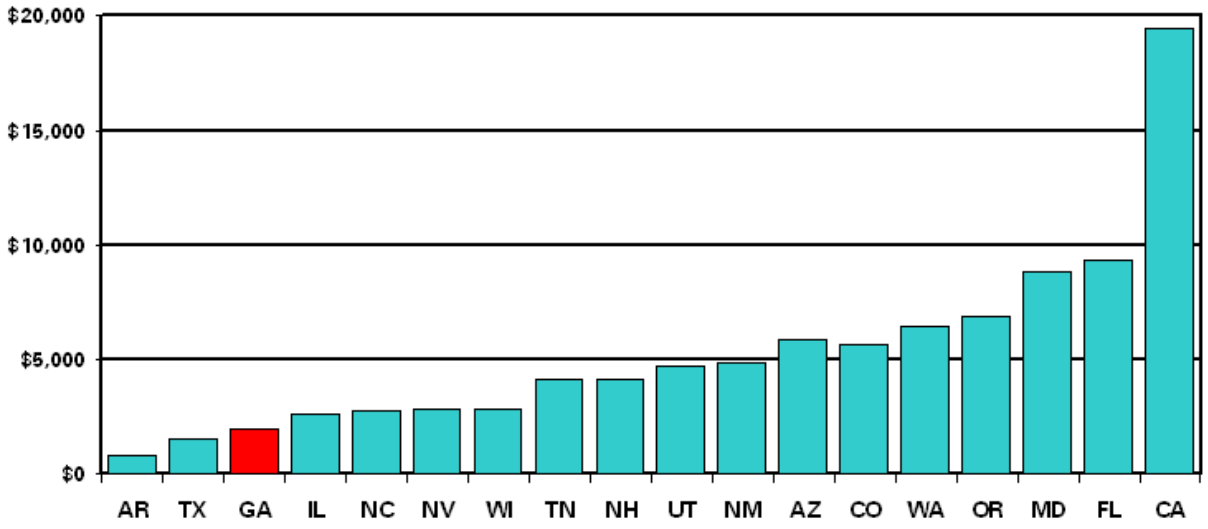
*Average of total fees actually charged, not sum of average fees by type

Source: Duncan Associates, telephone and internet survey, August 2009; where fees vary by land use characteristics, the following assumptions were made: single-family detached—three bedroom, 2,000 sq. ft. house on 10,000 sq. ft. lot and value of $200,000; multi-family—two bedroom, 1,000 sq. ft. with 7 2" water meters (2 for irrigation) per 240-unit apartment complex, density of 12 units/acre and value of $100,000/unit; nonresidential—100,000 sq. ft. building with 3" water meter and 0.15 FAR (0.25 for office).

[1] Population estimates based on Kimley-Horn and Associates, Inc., *Comprehensive Transportation Plan, Inventory of Existing Conditions Report*, April 2009, Table 3-2.

As can be seen from Figure 3, impact fees in Georgia are among the lowest in the nation.[2]

Figure 3. Average Non-Utility Impact Fee per Single-Family Unit, 2008



Included in the national survey data are seven Georgia communities. The impact fees for single-family, multi-family, retail and office land use types in Georgia communities are presented in the following tables. The survey data includes neighboring communities of Alpharetta and Roswell, as well as other Atlanta area municipalities and counties. It should be noted that none of the Georgia communities in the survey have water, wastewater or stormwater drainage impact fees.

Table 3. Georgia Impact Fee Survey, Single-Family Unit

Jurisdiction	Roads	Parks	Library	Fire	Police	Total
Canton	$1,813	$1,054		$385	$94	$3,346
Cherokee Co.*	$590	$283	$281	$539	$260	$1,953
Forsyth Co.		$686	$116	$228		$1,030
Alpharetta	$1,131	$545		$264		$1,940
Atlanta	$987	$410		$114	$33	$1,544
Roswell	$162	$1,303		$533		$1,998
Average	$937	$714	$199	$344	$129	$1,969

* fees actually assessed at only 10% of amount shown

Source: Duncan Associates, telephone and internet survey, August 2009; where fees vary by area, the average was taken, where fees vary by land use characteristics, single-family assumes three bedroom, 2,000 sq. ft. house.

[2] Duncan Associates, *National Impact Fee Survey: 2008*, October 2008, available at www.impactfees.com

Table 4. Georgia Impact Fee Survey, Multi-Family Unit

Jurisdiction	Roads	Parks	Library	Fire	Police	Total
Canton	$906	$527		$193	$47	$1,673
Cherokee Co.*	$413	$284	$281	$539	$260	$1,777
Forsyth Co.		$343	$58	$114		$515
Alpharetta	$1,123	$396		$203		$1,722
Atlanta	$470	$285		$79	$23	$857
Roswell	$110	$1,303		$362		$1,775
Average	$604	$523	$170	$248	$110	$1,387

* fees actually assessed at only 10% of amount shown
Source: Duncan Associates, telephone and internet survey, August 2009; where fees vary by area, the average was taken, where fees vary by land use characteristics, multi-family assumes two bedroom, 1,000 sq. ft..

Table 5. Georgia Impact Fee Survey, 1,000 sq. ft. of Retail

Jurisdiction	Roads	Parks	Library	Fire	Police	Total
Canton	$2,256	$173	n/a	$173	$43	$2,645
Cherokee Co.*	$845		n/a	$325	$168	$1,338
Forsyth Co.			n/a	$216		$216
Alpharetta	$4,166	$14	n/a	$244		$4,424
Atlanta	$1,189	$584	n/a	$163	$47	$1,983
Roswell	$426		n/a	$310		$736
Average	$1,776	$257	n/a	$239	$86	$1,890

* fees actually assessed at only 10% of amount shown
Source: Duncan Associates, telephone and internet survey, August 2009; where fees vary by area, the average was taken, where fees vary by land use characteristics, assumes 100,000 sq. ft. building.

Table 6. Georgia Impact Fee Survey, 1,000 sq. ft. of Office

Jurisdiction	Roads	Parks	Library	Fire	Police	Total
Canton	$989	$173	n/a	$173	$43	$1,378
Cherokee Co.*	$631		n/a	$646	$334	$1,611
Forsyth Co.			n/a	$86		$86
Alpharetta	$1,211	$14	n/a	$198		$1,423
Atlanta	$1,608	$241	n/a	$67	$19	$1,935
Roswell	$280		n/a	$617		$897
Average	$944	$143	n/a	$298	$132	$1,222

* fees actually assessed at only 10% of amount shown
Source: Duncan Associates, telephone and internet survey, August 2009; where fees vary by area, the average was taken, where fees vary by land use characteristics, assumes 100,000 sq. ft. building.

Several Georgia jurisdictions not included in the survey have taken the rather unusual approach of adopting impact fees not for individual facilities, but for a group of facilities. Henry County, for example, has adopted a fee of $1,662 per single-family unit for "public facilities," defined as roads, parks, libraries and public safety (fire, EMS and police). Hall County and the City of McDonough have taken a similar approach.

3.0 LEGAL FRAMEWORK

Impact fees were pioneered by local governments in the absence of explicit state enabling legislation. Consequently, such fees were originally defended as an exercise of local government's broad "police power" to protect the health, safety and welfare of the community. The courts gradually developed guidelines for constitutionally valid impact fees, based on a "rational nexus" that must exist between the regulatory fee or exaction and the activity that is being regulated. The state acts have tended to embody the constitutional standards that have been developed by the courts. In some other states, such as Maryland, Tennessee and North Carolina, impact fees are authorized for individual jurisdictions through special acts of the legislature. In states without impact fee acts, the authority of cities and counties to adopt impact fees pursuant to home rule authority is sufficiently broad to include the adoption of proportionate share impact fees. In states that have adopted enabling acts, local governments often lacked the authority to enact impact fees independent of the state legislature and, as a result, are subject to the restrictions, limitations and rigidities imposed by the legislation.

Key Provisions of Georgia Act

- Eligible Facilities: roads, water, sewer, stormwater, parks, fire, police and library facilities.
- Adopted Level of Service Standards Required
- Developer exactions prohibited
- Impact fee ordinance must be adopted with a fee schedule and be based on a proportionate share formula
- Ordinance must be preceded by development of a capital plan, level of service standards and establishment of an advisory committee
- Impact fees must be used to expand capacity
- Eligible Expenditures: planning, design and engineering, land acquisition and related costs, interest payments, and administrative fees

In 1990, the Georgia Legislature passed the *Development Impact Fee Act* (House Bill 796). The Act amended Title 36 of the Official Code of Georgia Annotated (O.C.G.A) to add *Chapter 71: Development Impact Fees*. The purpose of the *Act* was to provide minimum standards for impact fee ordinances adopted by municipalities and counties. This section provides a summary of the Georgia *Development Impact Fee Act* and its implications for the development of impact fees in the City of Milton.

3.1 Eligible Facilities

One of the most important things that most enabling acts do is restrict the types of facilities for which impact fees may be imposed. The types of major facilities that are eligible for impact fees under the *Development Impact Fee Act* include roads, water, sewer, stormwater, parks, fire, police and library facilities.

3.2 Development Exactions

The *Development Impact Fee Act* prohibits municipalities from imposing exaction requirements for system improvements, other than impact fees developed in compliance with the Act. As a result, Georgia municipalities may not require dedication of rights-of-way or other developer contributions

as a condition of development approval, other than for local streets or strictly project-related improvements.

The Act defines "development exaction" as "the payment, dedication, or contribution of goods, services, land, or money" required as a condition of rezoning or other development approval. Development exaction practices that qualify under the Act as "project improvements" are not restricted by the Act, and local governments may continue to require such site-related improvements.

"Project improvements" are facilities that primarily serve the occupants or users of a project and provide only incidental service or capacity to the public at large. Clearly, local governments can continue to require construction and dedication of local streets within a development project. In certain cases, local governments can continue to require off-site improvements as well, provided that their primary function is to serve the project. For example, installation of a traffic signal or added turn lane at the intersection of an abutting major thoroughfare and the entrance road to a development could be considered a project improvement. However, no improvement included in a city or county capital improvement plan may be considered a project improvement.

As a result, impact fees are the only mechanism by which local governments may exact developer contributions for system improvements. "System improvements" are defined as "capital improvements that are public facilities and are designed to provide service to the community at large." A "capital improvement" is defined as "an improvement with a useful life of ten years or more, by new construction or other action, which increases the service capacity of a public facility."

3.3 Calculation of Fees

The *Development Impact Fee Act* requires that impact fees not exceed a "proportionate fair share" of the cost of system improvements, defined as that portion of system improvement costs that are "reasonably related to the service demands and needs of the project." In order to ensure compliance with this general criteria, the Act establishes the following more specific requirements.

- *Level of service.* The calculation of impact fees must be based on levels of service that are adopted in the local jurisdiction's comprehensive plan and that are applicable to existing development as well as new development. The level of service should be based on sound planning and should apply uniformly within each service area.

- *Improvement costs.* The calculation of impact fees must be based on "actual system improvement costs or reasonable estimates of such costs." Obviously, basing the impact fees on inflated or unrealistically high estimates of the cost of improvements would violate the proportionate fair share criteria.

- *Revenue credits.* The calculation of impact fees must provide credits for the present value of future revenues "that will be generated by new development and that will be available to pay for system improvements."

3.4 Planning Requirements

Only counties and municipalities that have adopted a comprehensive plan containing a capital improvements element pursuant to statutory requirements may enact an impact fee ordinance. These planning requirements must be met by the City prior to adoption of an impact fee ordinance. The City of Milton, established in 2006, currently operates under the Fulton County's *Focus Fulton 2025 Comprehensive Plan*, originally adopted by the Fulton County Board of Commissioners in November 2005 and adopted by the City of Milton in November 2006. The City of Milton is currently preparing a comprehensive plan and capital improvements element.

Local comprehensive plans must contain, at a minimum, implementation provisions and the following six elements: population, economic development, natural and historic resources, community facilities, housing and land use. The capital improvements element must identify the system improvement needs anticipated during the planning horizon (minimum of five years) established in the comprehensive plan and must include a schedule of capital improvements to meet those needs, with a description of the anticipated funding source for each improvement.

The comprehensive plan must specify the level of service for the facility on which the impact fees are based. If the level of service is to vary by service area, the boundaries of these service areas must also be identified in the comprehensive plan. If the local government desires to exempt certain types of development projects from impact fees in order to encourage affordable housing or economic development, the comprehensive plan must include a policy statement supporting such exemptions.

A minimum of two public hearings are required prior to the submittal of a comprehensive plan to the regional development center for review. One public hearing is required prior to the development of the plan "to inform the public on the purpose of the plan, the process to be followed in the preparation of the plan, and to elicit community input on community needs and issues." Another public hearing must be held prior to the submittal of the plan to the regional development center.

3.5 Impact Fee Ordinance Requirements

To assess impact fees, a city must first adopt an ordinance. The ordinance must be preceded by the development of a capital plan and level of service standards for the types of facilities for which the impact fees are to be imposed. An impact fee ordinance must contain a fee schedule, based on a proportionate fair share formula that specifies the impact fee for various land uses per unit of development. For example, the fee schedule should specify the impact fee for each dwelling unit in an apartment project, or for each 1,000 square feet of gross floor area in a shopping center project. One fee schedule may apply to the local government's entire jurisdiction, or there may be different fee schedules applicable to service areas within the jurisdiction. Payment of the impact fee according to the adopted fee schedule constitutes "full and complete payment of a project's proportionate share of system improvement costs," and no other contributions toward system improvements may be required.

These provisions provide guidelines for implementing and administering the impact fee. The ordinance provisions include the following requirements:

- *Individual Assessments.* The ordinance must allow a developer the option of an "individual assessment" of the impact fee for a particular project. Applicants who believe that their proposed developments are unique in their traffic impacts, and that these impacts will be substantially less than would be indicated by using the adopted fee schedules, must be able to request an individual assessment of the impact fee.

- *Fee Certification.* The ordinances must include a process whereby a developer may receive a certification of the impact fee for a particular project based on the fee schedule or individual assessment. This provision is designed to provide a degree of certainty for developers by fixing the impact fee for a period of 180 days from the date of certification. It could also be used to establish an expiration date for individual assessments to ensure that the cost and other data used in the individual assessment do not become outdated.

- *Appeals.* The impact fee ordinance needs to provide for appeals of administrative determinations of the impact fee for a particular development project. The appeal may be to the governing body or another body designated in the impact fee ordinance. A developer may pay an impact fee under protest in order to obtain development approval, while retaining the right to appeal and the right to any refund deemed illegally collected. The impact fee ordinance may also provide an option for resolution of conflicts over the amount of the impact fee through binding arbitration.

- *Construction Credits and Reimbursements.* The *Act* requires credits or reimbursements for previous impact fee payments or in-kind contributions. In the event that impact fees are paid but the building permit is later abandoned, credit equal to the present value of the previous impact fee payment must be applied against subsequent impact fee assessments on the same parcel of land. This provision makes clear that the feepayer for an aborted development project is not entitled to a refund, and the credit for that previous impact fee payment "runs with the land."

- *Exemptions.* The Act allows for exemptions from payment of impact fees for all or part of particular development projects that are determined to create "extraordinary economic development and employment growth or affordable housing." As with any system in which government collects revenues, various groups sometimes seek exemptions from local impact fees. Here the legislature has taken from the County the problem of having to respond to many of those requests by specifying clearly the only two classes of activities that can be granted exemptions.

- *Collection of Fees.* Payment of impact fees cannot be required prior to the building permit stage of the development process. This means that impact fees may not be required prior to zoning, subdivision, or site plan approval, but may be required prior to issuance of a building permit or certificate of occupancy.

Prior to the adoption of an impact fee ordinance, the *Act* requires the establishment of a Development Impact Fee Advisory Committee. The committee must consist of five to ten members appointed by the local governing body, with at least 40 percent of the membership

representing the development, building, or real estate industries. An existing appointed body meeting these criteria can serve as the Development Impact Fee Advisory Committee. However, the committee is strictly advisory, and no action by the committee is required prior to the adoption of an impact fee ordinance.

The local governing body must hold two "duly noticed" public hearings on the proposed impact fee ordinance prior to adoption. The second hearing must be held at least two weeks after the first hearing.

3.6 Accounting and Expenditure Requirements

Impact fees collected must be deposited into a separate interest-bearing account and spent only for the type of improvements for which they were collected. Interest earned on these accounts shall be spent for the same purposes as the impact fees themselves. Any funds not spent within six years must be refunded to the fee-payer.

As noted above, impact fees may only be spent on "system improvements," as opposed to "project improvements." Eligible system improvements costs include the following: planning; design and engineering; land acquisition and related legal and administrative costs; interest payments on bonds used to finance capital improvements; and an administrative fee of up to three percent of total costs. Impact fee funds are limited to capital improvements that expand system capacity, and may not be spent on maintenance, personnel training or other operating costs.

4.0 POLICY ISSUES

This section discusses several major policy issues:

- Level of service;
- Whether to develop different fee schedules by geographic areas;
- The types of facilities for which impact fees should be developed;
- How to phase-in the fees.

4.1 Level of Service

Levels of service used to calculate impact fees must be adopted in the comprehensive plan. The *Development Impact Fee Act* defines "level of service" as a "measure of the relationship between service capacity and service demand for public facilities."

The concept of level of service is of key importance in developing a defensible impact fee. A fundamental principle of impact fee analysis is that new development should not be held to a higher standard of service than existing development that is sharing the same facilities. The most common approach in impact fee analysis is to base the fees on the existing level of service.

If the level of service that is adopted is higher than the existing level of service, then the issue of existing deficiencies must be addressed. The Act requires that, within each service area, the level of service must be the same for existing and new development. The intent of this provision is to ensure that new development is not required to pay for a higher level of service than existing development within the same service area. Furthermore, the Act restricts the use of impact fee revenues to "system improvements that create additional service available to serve new growth and development." These provisions make clear that impact fee revenues cannot be used to raise the level of service for existing development.

If the level of service that is adopted is below the existing level of service, the question of excess capacity will arise. The Georgia act makes clear that impact fee funds can be used to retire bonds that have been issued to finance previous capital improvements that created excess capacity. If the excess capacity has already been paid for, the jurisdiction can recoup the cost through impact fees and return the money to the general fund.

4.2 Geographic Areas

There are two kinds of geographic areas in impact fee systems: service areas and benefit districts. A service area, also sometimes called an assessment district, is an area that is served by a defined group of capital facilities and is subject to a uniform impact fee schedule. A benefit district is an area within which fees collected are earmarked to be spent. An important element of preparing an impact fee system is the division of the municipality into service areas for each type of facility. A service area is a geographic area, designated on the basis of sound planning or engineering principles, in which a

defined set of public facilities provide service to development within the area. A single service area encompassing the entire jurisdiction may be designated, or the jurisdiction may be divided into more than one service area. Service areas may vary for different types of facilities.

For present purposes, it is more important to determine the feasibility of creating multiple service areas within the City, since each service area requires its own impact fee analysis. If the City were to pursue impact fees, the service areas can be subdivided into benefit districts without affecting the impact fee calculations. The *Development Impact Fee Act* states that "impact fees shall be calculated and imposed on the basis of service areas." If the City desires to have different impact fee schedules that apply to sub-areas within the City, based on different levels of service, the fee schedules would have to apply to service areas defined in the comprehensive plan. Impact fee schedules could also differ because of the different cost of providing the same level of service to different service areas.

Service areas are also important in controlling the expenditure of impact fee revenues. Impact fee revenues must be spent on capital improvements located in the service area in which they were collected. The delineation of service areas is a critical element in the planning process. A poorly-drawn service area might include the corridor for a major road but not include much area that is likely to develop; similarly, without proper planning, a particular service area might include a lot of new development but no major roads. If service areas are drawn to be too small, there may never be enough money in the fund for any major improvements; on the other hand, if a service area is too large, some transportation improvements may be so far from the new development that it is difficult to show reasonable benefit to the fee-paying development, thus creating both legal and political problems.

Because of the city's relatively small size, the levels of service for facilities are not expected to differ significantly by geographic area. In addition, the creation of separate service areas may make it very difficult to accumulate sufficient funds in any one service area account to undertake any major capital improvement projects. A balance must be stuck between the need to show reasonable benefit to new development and the need for flexibility in the use of impact fee revenues. Therefore, it is recommended that impact fees be calculated city-wide.

4.3 Types of Facilities

The major policy decision facing the City is which types of impact fees to develop. This analysis explores the feasibility of developing impact fees for eligible facilities under the *Development Impact Fee Act*, including roads, water, sewer, stormwater drainage, parks, fire, police and library facilities.

Roads

One of the most costly impacts of new development is on the road system. A road impact fee system must clearly identify the major road system that is to be expanded with the impact fees in order to accommodate traffic resulting from land development. The major road system in the City consists of State roads (SR 9, SR 140 and SR 372) and major City roads. An inventory of the City's existing major road network, including a functional classification map, were prepared as part of the *City of Milton Transportation Plan* and could serve as a basis for developing a road impact fee.

The City has historically funded road improvements through the general fund budget and a mix of State and Federal aid. No significant capacity improvements have been made since the City incorporated. However, current planned projects use the High Priority Project Earmark for North Fulton County, which includes 80 percent federal funding and a 20 percent local match.

The major City roads that function as arterials or collectors are entirely the responsibility of the City and should be included in the impact fee major road system. In addition, the road impact fee could include State and County roads within the City limits that are part of the major road system, since the City funds growth-related improvements to such roads either directly or indirectly (through motor fuel tax or other highway user fees generated by Milton residents and businesses). Since the major road system is designed to move traffic from one part of the city to another, road impact fees should be developed at the city-wide level.

The *Transportation Plan* currently being developed reportedly will not identify very many traditional capacity-expanding improvements, such as new roads or road widening projects, that would be attributable to anticipated growth. However, it will identify a number of "operational" improvements, such as intersection improvements and the installation of signal timing equipment, that will improve traffic flow. These types of improvements expand the capacity of the roadway system to accommodate additional traffic, and are therefore eligible for impact fee funding. Consequently, it appears that there will be sufficient information to develop a road impact fee for the City.

Parks

The City currently provides several parks and recreation facilities for its residents. The City of Milton owns two public parks and plans to acquire another former Fulton County park as soon as environmental remediation and indemnification is complete. The City's existing parks include Bell Memorial Park and Birmingham Park. Bell Memorial Park includes 14 acres of developed park land with a baseball facility. Birmingham Park is a 203-acre park that was acquired in 2004; the park has a development plan that calls for equestrian and pedestrian trails, picnic pavilions, sports fields and courts, a skate plaza, a mountain bike trail and natural areas. Milton has also developed and adopted a *Milton Trail System Plan*, which will be used to install bike/pedestrian alternative pathways in the future. The City has funded park and recreational trail improvements through the general fund and grants. The City has a reasonable existing level of service, as well as planned improvement needs. It would be feasible to develop a park impact fee based on the existing level of service.

Fire Protection

The City provides fire protection services out of three existing fire stations and an additional fire truck is housed out of a fire station in neighboring Alpharetta. The stations are located on Arnold Mill Road, Thompson Road and Hickory Flat Road. The City is planning on adding a new reserve pumper/tanker and would like to replace station #42 on Thompson Road. Typically, constructing a replacement fire station would not be eligible for impact fee funding. However, if the new station is larger than the existing station or otherwise increases the City's fire service capacity, the portion of the cost attributable to the added capacity could be funded with impact fees. An impact fee could help fund the acquisition of new equipment and potentially a portion of the station replacement.

Because equipment may be dispatched from stations other than the closest one if the nearest station is already responding to a call, fire protection facilities operate as an integrated system. Consequently, fire impact fees should be assessed and spent on a city-wide basis.

The City could charge a fire impact fee based on the existing level of service. It would not be feasible to develop an ambulance impact fee, because the City does not currently provide that service directly and does not own the equipment or facilities.

Police

The City of Milton Police Department is currently housed with the City Hall in a leased facility. Incarceration is handled by the Fulton County Sheriff and the dispatch functions are shared with the City of Alpharetta. The Police Department has 21 patrol vehicles through which it provides city-wide patrol and protective services. Current planned improvements include the acquisition of additional patrol cars. There are currently no planned facilities.

Police facilities tend to be centrally located, and service is provided by officers patrolling in vehicles. Consequently, the entire jurisdiction is the appropriate service area for both assessment and collection of police impact fees.

The major obstacle to the development of police impact fees is the absence of an existing level of service. Since the existing police station is in a leased building, the City has not made any capital investment in the facility on behalf of existing residents. An unlike fire-fighting apparatus, police patrol cars seldom achieve a 10-year useful life, and therefore do not meet the Act's definition of a capital improvement. For these reasons, a police impact fee is not feasible at this time.

Library

The City of Milton does not currently have a library facility. The City is part of the Atlanta-Fulton County Library System service area. The Library System is currently exploring potential sites for a branch library facility to serve the City of Milton. However, since the system is county-wide and there is no existing level of service, a city-wide library impact fee is not feasible.

Water

The City's treated water is currently provided by the Atlanta Fulton County Water Treatment Plan that has a current capacity of 90 MGD, which is equally divided between Fulton County and the City of Atlanta. Recent assessments of the plant's capacity have found that there is minimal capacity to allow an increase in the water supply for the City of Milton. However, the Fulton County Public Works Department has prepared a two-phase Capital Improvement Program to increase water treatment capacity and build additional water infrastructure designed to meet forecasted demand for North Fulton including Milton. Areas of the City without public water service rely on wells for water supply and typically develop at a lower density. Since the expansion of water treatment and delivery is provided by Fulton County, the implementation of a water impact fee within the City of Milton is not necessary at this time unless the City participates in funding the planned improvements.

Wastewater

Existing policies have been identified to maintain most wastewater treatment services within the City using septic tanks and there are no plans for extensions of sewer lines to serve any additional areas of the City. The City's current land use plans and development policies encourage low-density residential development that meet the Fulton County Health Department regulations for residential septic that require one acre of usable land within the majority of the City of Milton land area. Currently, only a small area of the City of Milton is served by the Fulton County wastewater collection and treatment facilities. Since the City does not have any plans to extend wastewater lines or provide treatment, there is no need for a wastewater impact fee at this time.

Stormwater Drainage

The City's current stormwater drainage infrastructure was developed in reaction to flooding events and localized stormwater issues. The City is currently exploring development of a stormwater utility, and has provided funding in the five-year capital improvement plan for a feasibility study that will address how a stormwater utility could effectively pay for the new costs associated with a stormwater program. A stormwater utility fee is a user fee similar to a water or wastewater fee, and is typically included on the monthly utility bill. Unlike an impact fee, a utility fee is charged to all existing development, and can be used for either capital or operating expenses. A stormwater utility fee could help fund remedies to existing drainage problems as well as on-going maintenance costs. The studies required to develop a stormwater utility fee would be much simpler and less expensive than those required to support a stormwater drainage impact fee. An impact fee could be used to supplement a stormwater utility fee; however, a drainage master plan is generally necessary in order to develop a drainage impact fee.

4.4 Revenue Potential

Another consideration regarding the types of impact fees to develop is the amount of revenue that each could potentially generate. The potential revenue that could be generated annually by various impact fees can be estimated based on national average impact fees from our recent survey and annual growth projections.

As shown in Table 7, residential building permit data indicate that over the last four years the City has issued permits for an average of 149 single-family detached homes per year. The City's multi-family residential development has primarily consisted of town-home style dwellings and has averaged 108 units per year. Data on nonresidential development is not available, but such development has been minimal since the City's incorporation.

Table 7. City of Milton Permit Data, 2005-2008

Year	Single-Family	Town-Homes
2005	150	192
2006	187	78
2007	171	82
2008	89	80
Average	**149**	**108**

Source: Kimley Horn and Associates, Inc., *City of Milton Comprehensive Transportation Plan*, April 2009, Tables 3-18 and 3-20.

Despite the recent slowdown in the local and national housing market, the revenue analysis utilizes the four-year average single-family and multi-family permit data in calculating the revenue potential, in order to provide a better long-term perspective. Multiplying the annual growth projections by the average Georgia impact fees yields estimates of potential annual impact fee revenues by type of facility presented in Table 8. If all of three of the fees deemed to be feasible were implemented, the impact fees could potentially generate about $446,000 annually. These revenue estimates do not include any fees from nonresidential development, and are intended to be rough orders of magnitude only.

The analysis reveals that road impact fees have the greatest revenue potential, and could potentially generate in the neighborhood of $200,000 annually. The next largest potential revenue generator is park fees, in the neighborhood of $160,000 annually. On the third tier are fire fees, at around $80,000 annually.

Table 8. Potential Annual Impact Fee Revenue

Facility Type	Single-Family	Multi-Family	Total
Roads	$139,553	$65,275	$204,828
Parks	$106,312	$56,484	$162,796
Fire	$51,231	$26,820	$78,051
Total	**$297,096**	**$148,579**	**$445,675**

Source: Potential revenue is Georgia average impact fees from Table 3 and Table 4 multiplied by average building permit data from Table 7.

4.5 Phase-In

The decision about which fees to implement does not have to be made all at once. In fact, many communities phase-in fees over a period of time, in order to allow developers an opportunity to complete projects already underway and to take future fees into account in their financial planning. In general, it makes more sense to implement one fee at the full amount than to adopt all possible fees at some small percentage of the full cost.

If the City decides to pursue impact fees, the consultant recommends that the City begin with road impact fees. The road impact fee should be implemented at close to 100 percent as soon as possible,

because revenues may be needed to reimburse developers for improvements. Perhaps the cleanest way to do this is to have the fees take effect 3-6 months after ordinance adoption. This gives developers and builders time to incorporate the fees into their financial planning, without committing the City to reimbursements that it cannot afford.

After the road impact fees have been in place for six months to a year, the City might then consider charging a park impact fee at close to the full cost. Again, the ordinance should be adopted 3-6 months prior to the effective date of the fees. If additional fees are desired, the City could then consider implementing fire fees in similar fashion.

Of course, a phase-in is not mandatory. Judging from the review of existing levels of service and the City's planned improvements, as well as the fee amounts typically charged in Georgia, it is unlikely that the fees will be very significant compared to other development costs. Under these circumstances, an initial three months of grace time between fee adoption and actual imposition of the fees may be sufficient.

5.0 APPENDIX A: GEORGIA IMPACT FEE ENABLING ACT

GEORGIA CODE, TITLE 36, CHAPTER 71

[with underline/strike-out amendments made by HB 232, which became effective on July 1, 2007]

36-71-1. Short title; legislative findings and intent

(a) This chapter shall be known and may be cited as the "Georgia Development Impact Fee Act."

(b) The General Assembly finds that an equitable program for planning and financing public facilities needed to serve new growth and development is necessary in order to promote and accommodate orderly growth and development and to protect the public health, safety, and general welfare of the citizens of the State of Georgia. It is the intent of this chapter to:

(1) Ensure that adequate public facilities are available to serve new growth and development;

(2) Promote orderly growth and development by establishing uniform standards by which municipalities and counties may require that new growth and development pay a proportionate share of the cost of new public facilities needed to serve new growth and development;

(3) Establish minimum standards for the adoption of development impact fee ordinances by municipalities and counties; and

(4) Ensure that new growth and development is required to pay no more than its proportionate share of the cost of public facilities needed to serve new growth and development and to prevent duplicate and ad hoc development exactions.

36-71-2. Definitions

As used in this chapter, the term:

(1) "Capital improvement" means an improvement with a useful life of ten years or more, by new construction or other action, which increases the service capacity of a public facility.

(2) "Capital improvements element" means a component of a comprehensive plan adopted pursuant to Chapter 70 of this title which sets out projected needs for system improvements during a planning horizon established in the comprehensive plan, a schedule of capital improvements that will meet the anticipated need for system improvements, and a description of anticipated funding sources for each required improvement.

(3) "Comprehensive plan" has the same meaning as provided for in Chapter 70 of this title.

(4) "Developer" means any person or legal entity undertaking development.

(5) "Development" means any construction or expansion of a building, structure, or use, any change in use of a building or structure, or any change in the use of land, any of which creates additional demand and need for public facilities.

(6) "Development approval" means any written authorization from a municipality or county which authorizes the commencement of construction.

(7) "Development exaction" means a requirement attached to a development approval or other municipal or county action approving or authorizing a particular development project, including but not limited to a rezoning, which requirement compels the payment, dedication, or contribution of goods, services, land, or money as a condition of approval.

(8) "Development impact fee" means a payment of money imposed upon development as a condition of development approval to pay for a proportionate share of the cost of system improvements needed to serve new growth and development.

(9) "Encumber" means to legally obligate by contract or otherwise commit to use by appropriation or other official act of a municipality or county.

(10) "Feepayor" means that person who pays a development impact fee or his successor in interest where the right or entitlement to any refund of previously paid development impact fees which is required by this chapter has been expressly transferred or assigned to the successor in interest. In the absence of an express transfer or assignment of the right or entitlement to any refund of previously paid development impact fees, the right or entitlement shall be deemed "not to run with the land."

(11) "Governmental entity" means any water authority, water and sewer authority, or water or waste-water authority created by or pursuant to an Act of the General Assembly of Georgia.

(12) "Level of service" means a measure of the relationship between service capacity and service demand for public facilities in terms of demand to capacity ratios, the comfort and convenience of use or service of public facilities, or both.

(13) "Present value" means the current value of past, present, or future payments, contributions or dedications of goods, services, materials, construction, or money.

(14) "Project" means a particular development on an identified parcel of land.

(15) "Project improvements" means site improvements and facilities that are planned and designed to provide service for a particular development project and that are necessary for the use and convenience of the occupants or users of the project and are not system improvements. The character of the improvement shall control a determination of whether an improvement is a project improvement or system improvement and the physical location of the improvement on site or off

site shall not be considered determinative of whether an improvement is a project improvement or a system improvement. If an improvement or facility provides or will provide more than incidental service or facilities capacity to persons other than users or occupants of a particular project, the improvement or facility is a system improvement and shall not be considered a project improvement. No improvement or facility included in a plan for public facilities approved by the governing body of the municipality or county shall be considered a project improvement.

(16) "Proportionate share" means that portion of the cost of system improvements which is reasonably related to the service demands and needs of the project within the defined service area.

(17) "Public facilities" means:

(A) Water supply production, treatment, and distribution facilities;
(B) Waste-water collection, treatment, and disposal facilities;
(C) Roads, streets, and bridges, including rights of way, traffic signals, landscaping, and any local components of state or federal highways;
(D) Storm-water collection, retention, detention, treatment, and disposal facilities, flood control facilities, and bank and shore protection and enhancement improvements;
(E) Parks, open space, and recreation areas and related facilities;
(F) Public safety facilities, including police, fire, emergency medical, and rescue facilities; and
(G) Libraries and related facilities.

(18) "Service area" means a geographic area defined by a municipality, county, or intergovernmental agreement in which a defined set of public facilities provide service to development within the area. Service areas shall be designated on the basis of sound planning or engineering principles or both.

(19) "System improvement costs" means costs incurred to provide additional public facilities capacity needed to serve new growth and development for planning, design and construction, land acquisition, land improvement, design and engineering related thereto, including the cost of constructing or reconstructing system improvements or facility expansions, including but not limited to the construction contract price, surveying and engineering fees, related land acquisition costs (including land purchases, court awards and costs, attorneys' fees, and expert witness fees), and expenses incurred for qualified staff or any qualified engineer, planner, architect, landscape architect, or financial consultant for preparing or updating the capital improvement element, and administrative costs, provided that such administrative costs shall not exceed 3 percent of the total amount of the costs. Projected interest charges and other finance costs may be included if the impact fees are to be used for the payment of principal and interest on bonds, notes, or other financial obligations issued by or on behalf of the municipality or county to finance the capital improvements element but such costs do not include routine and periodic maintenance expenditures, personnel training, and other operating costs.

(20) "System improvements" means capital improvements that are public facilities and are designed to provide service to the community at large, in contrast to "project improvements."

36-71-3. Imposition of development impact fees

(a) Municipalities and counties which have adopted a comprehensive plan containing a capital improvements element are authorized to impose by ordinance development impact fees as a condition of development approval on all development pursuant to and in accordance with the provisions of this chapter. After the transition period provided in this chapter, development exactions for other than project improvements shall be imposed by municipalities and counties only by way of development impact fees imposed pursuant to and in accordance with the provisions of this chapter.

(b) Notwithstanding any other provision of this chapter, that portion of a project for which a valid building permit has been issued prior to the effective date of a municipal or county development impact fee ordinance shall not be subject to development impact fees so long as the building permit remains valid and construction is commenced and is pursued according to the terms of the permit.

(c) Payment of a development impact fee shall be deemed to be in compliance with any municipal or county requirement for the provision of adequate public facilities or services in regard to the system improvements for which the development impact fee was paid.

36-71-4. Calculation of fees

(a) A development impact fee shall not exceed a proportionate share of the cost of system improvements, as defined in this chapter.

(b) Development impact fees shall be calculated and imposed on the basis of service areas.

(c) Development impact fees shall be calculated on the basis of levels of service for public facilities that are adopted in the municipal or county comprehensive plan that are applicable to existing development as well as the new growth and development.

(d) A municipal or county development impact fee ordinance shall provide that development impact fees shall be collected not earlier in the development process than the issuance of a building permit authorizing construction of a building or structure; provided, however, that development impact fees for public facilities described in subparagraph (D) of paragraph (17) of Code Section 36-71-2 may be collected at the time of a development approval that authorizes site construction or improvement which requires public facilities described in subparagraph (D) of paragraph (17) of Code Section 36-71-2.

(e) A municipal or county development impact fee ordinance shall include a schedule of impact fees specifying the development impact fee for various land uses per unit of development on a service area by service area basis. The ordinance shall provide that a developer shall have the right to elect to pay a project ´s proportionate share of system improvement costs by payment of development impact fees according to the fee schedule as full and complete payment of the development project ´s proportionate share of system improvement costs.

(f) A municipal or county development impact fee ordinance shall be adopted in accordance with the procedural requirements of Code Section 36-71-6.

(g) A municipal or county development impact fee ordinance shall include a provision permitting individual assessments of development impact fees at the option of applicants for development approval under guidelines established in the ordinance.

(h) A municipal or county development impact fee ordinance shall provide for a process whereby a developer may receive a certification of the development impact fee schedule or individual assessment for a particular project, which shall establish the development impact fee for a period of 180 days from the date of certification.

(i) A municipal or county development impact fee ordinance shall include a provision for credits in accordance with the requirements of Code Section 36-71-7.

(j) A municipal or county development impact fee ordinance shall include a provision prohibiting the expenditure of development impact fees except in accordance with the requirements of Code Section 36-71-8.

(k) A municipal or county development impact fee ordinance may provide for the imposition of a development impact fee for system improvement costs previously incurred by a municipality or county to the extent that new growth and development will be served by the previously constructed system improvements.

(l) A municipal or county development impact fee ordinance may exempt all or part of particular development projects from development impact fees if:

(1) Such projects are determined to create extraordinary economic development and employment growth or affordable housing;

(2) The public policy which supports the exemption is contained in the municipality's or county's comprehensive plan; and

(3) The exempt development project's proportionate share of the system improvement is funded through a revenue source other than development impact fees.

(m) A municipal or county development impact fee ordinance shall provide that development impact fees shall only be spent for the category of system improvements for which the fees were collected and in the service area in which the project for which the fees were paid is located.

(n) A municipal or county development impact fee ordinance shall provide that, in the event a building permit is abandoned, credit shall be given for the present value of the development impact fee against future development impact fees for the same parcel of land.

(o) A municipal or county development impact fee ordinance shall provide for a refund of development impact fees in accordance with the requirements of Code Section 36-71-9.

(p) A municipal or county development impact fee ordinance shall provide for appeals from administrative determinations regarding development impact fees in accordance with the requirements of Code Section 36-71-10.

(q) Development impact fees shall be based on actual system improvement costs or reasonable estimates of such costs.

(r) Development impact fees shall be calculated on a basis which is net of credits for the present value of revenues that will be generated by new growth and development based on historical funding patterns and that are anticipated to be available to pay for system improvements, including taxes, assessments, user fees, and intergovernmental transfers.

36-71-5. Development Impact Fee Advisory Committee

(a) Prior to the adoption of a development impact fee ordinance, a municipality or county adopting an impact fee program shall establish a Development Impact Fee Advisory Committee.

(b) Such committee shall be composed of not less than five nor more than ten members appointed by the governing authority of the municipality or county and at least ~~40~~ 50 percent of the membership shall be representatives from the development, building, or real estate industries. An existing planning commission or other existing committee that meets these requirements may serve as the Development Impact Fee Advisory Committee.

(c) The Development Impact Fee Advisory Committee shall serve in an advisory capacity to assist and advise the governing body of the municipality or county with regard to the adoption of a development impact fee ordinance. In that the committee is advisory, no action of the committee shall be considered a necessary prerequisite for municipal or county action in regard to adoption of an ordinance.

36-71-6. Hearings on proposed fee ordinance

Prior to the adoption of an ordinance imposing a development impact fee pursuant to this chapter, the governing body of a municipality or county shall cause two duly noticed public hearings to be held in regard to the proposed ordinance. The second hearing shall be held at least two weeks after the first hearing.

36-71-7. Credit for present value of construction accepted by municipality or county from developer

(a) In the calculation of development impact fees for a particular project, credit shall be given for the present value of any construction of improvements or contribution or dedication of land or money

required or accepted by a municipality or county from a developer or his predecessor in title or interest for system improvements of the category for which the development impact fee is being collected. Credits shall not be given for project improvements. (b) In the event that a developer enters into an agreement with a county or municipality to construct, fund, or contribute system improvements such that the amount of the credit created by such construction, funding, or contribution is in excess of the development impact fees which would otherwise have been paid for the development project, the developer shall be reimbursed for such excess construction, funding, or contribution from development impact fees paid by other development located in the service area which is benefited by such improvements.

36-71-8. Deposit and expenditure of fees; annual report

(a) An ordinance imposing development impact fees shall provide that all development impact fee funds shall be maintained in one or more interest-bearing accounts. Accounting records shall be maintained for each category of system improvements and the service area in which the fees are collected. Interest earned on development impact fees shall be considered funds of the account on which it is earned and shall be subject to all restrictions placed on the use of development impact fees under the provisions of this chapter. The accounting records shall include the following information:

(1) The accounting records to be maintained shall specify the address of each property which paid development impact fees, the amount of fees paid in each category in which fees were collected, and the date that such fees were paid; and

(2) As to any exemptions granted, the accounting records to be maintained shall specify the address of each property for which exemptions were granted, the reason for which such exemption was granted, and the revenue source from which the exempt development's proportionate share of the system improvements is to be paid.

(b) Expenditures of development impact fees shall be made only for the category of system improvements and in the service area for which the development impact fee was imposed as shown by the capital improvements element and as authorized by this chapter. Development impact fees shall not be used to pay for any purpose that does not involve system improvements that create additional service available to serve new growth and development.

(c) (1) Development impact fees, collected for roads, streets, bridges, including rights of way, traffic signals, landscaping, or any local components of state or federal highways, shall be expended to fund, in whole or in part, system improvement projects: (A) That have been identified in the capital improvements element of the municipality's comprehensive development plan; and(B) That are chosen by a municipality after consideration of the following factors: (i) The proximity of the proposed system improvements to developments within the service area which have generated development impact fees collected for roads, streets, bridges, including rights of way, traffic signals, landscaping, or any local components of state or federal highways; and (ii) The proposed system improvements which will have the greatest effect on level of service for roads, streets, bridges, including rights of way, traffic

signals, landscaping, or any local components of state or federal highways impacted by the developments which have paid such impact fees.

(2) Where the expenditure of development impact fees paid by a development is allocated to system improvements in the general area of such development, through an agreement between the municipality and the developer and such agreement is approved by the governing body, the analysis required by subparagraph (B) of paragraph (1) of this subsection shall not be applicable.

(3) The provisions of this subsection shall only apply to municipalities that have more than 140,000 parcels of land.

(d) (1) As part of its annual audit process, a municipality or county shall prepare an annual report describing the amount of any development impact fees collected, encumbered, and used during the preceding year by category of public facility and service area.

(2) In municipalities that have more than 140,000 parcels of land, the portion of the annual report relating to development impact fees collected for roads, streets, bridges, including rights of way, traffic signals, landscaping, or any local components of state or federal highways shall be referred to such municipality's most recently constituted Development Impact Fee Advisory Committee which shall report to the governing body of such municipality any perceived inequities in the expenditure of impact fees collected for roads, streets, bridges, including rights of way, traffic signals, landscaping, or any local components of state or federal highways.

36-71-9. Refunds

Any municipality or county which adopts a development impact fee ordinance shall provide for refunds in accordance with the following provisions:

(1) Upon the request of an owner of property on which a development impact fee has been paid, a municipality or county shall refund the development impact fee if capacity is available and service is denied or if the municipality or county, after collecting the fee when service is not available, has failed to encumber the development impact fee or commence construction within six years after the date that the fee was collected. In determining whether development impact fees have been encumbered, development impact fees shall be considered encumbered on a first-in, first-out (FIFO) basis;

(2) When the right to a refund exists due to a failure to encumber development impact fees, the municipality or county shall provide written notice of entitlement to a refund to the feepayor who paid the development impact fee at the address shown on the application for development approval or to a successor in interest who has given notice to the municipality or county of a transfer or assignment of the right or entitlement to a refund and who has provided a mailing address. Such notice shall also be published within 30 days after the expiration of the six-year period after the date

that the development impact fees were collected and shall contain the heading "Notice of Entitlement to Development Impact Fee Refund";

(3) An application for a refund shall be made within one year of the time such refund becomes payable under paragraph (1) or (2) of this Code section or within one year of publication of the notice of entitlement to a refund under this Code section, whichever is later;

(4) A refund shall include a refund of a pro rata share of interest actually earned on the unused or excess development impact fee collected;

(5) All refunds shall be made to the feepayor within 60 days after it is determined by a municipality or county that a sufficient proof of claim for a refund has been made; and

(6) The feepayor shall have standing to sue for a refund under the provisions of this chapter if there has been a timely application for a refund and the refund has been denied or has not been made within one year of submission of the application for refund to the collecting municipality or county.

36-71-10. Appeal of fee determination; arbitration

(a) A municipality or county which adopts a development impact fee ordinance shall provide for administrative appeals to the governing body or such other body as designated in the ordinance of a determination of the development impact fees for a particular project.

(b) A developer may pay a development impact fee under protest in order to obtain a development approval or building permit, as the case may be. A developer making such payment shall not be stopped from exercising the right of appeal provided by this chapter, nor shall such developer be stopped from receiving a refund of any amount deemed to have been illegally collected.

(c) A municipality or county development impact fee ordinance may provide for the resolution of disputes over the development impact fee by binding arbitration through the American Arbitration Association or otherwise.

36-71-11. Intergovernmental agreements

Municipalities and counties which are jointly affected by development are authorized to enter into intergovernmental agreements with each other, with authorities, or with the state for the purpose of developing joint plans for capital improvements or for the purpose of agreeing to collect and expend development impact fees for system improvements, or both, provided that such agreement complies with any applicable state laws.

36-71-12. Existing municipal and county laws to be brought into conformance with chapter

This chapter shall not repeal any existing laws authorizing a municipality or county to impose fees or require contributions or property dedications for capital improvements; provided, however, that all

local ordinances or resolutions imposing development exactions for system improvements on April 4, 1990, shall be brought into conformance with this chapter no later than November 30, 1992.

36-71-13. Construction of reasonable project improvements; private agreements between property owners or developers and municipalities and counties; hook-up or connection fees for water or sewer service; applicability of chapter to water authorities

(a) Nothing in this chapter shall prevent a municipality or county from requiring a developer to construct reasonable project improvements in conjunction with a development project.

(b) Nothing in this chapter shall be construed to prevent or prohibit private agreements between property owners or developers and municipalities, counties, or other governmental entities in regard to the construction or installation of system improvements and providing for credits or reimbursements for system improvement costs incurred by a developer including interproject transfers of credits or providing for reimbursement for project improvement costs which are used or shared by more than one development project.

(c) Nothing in this chapter shall limit a municipality, county, or other governmental entity which provides water or sewer service from collecting a proportionate share of the capital cost of water or sewer facilities by way of hook-up or connection fees as a condition of water or sewer service to new or existing users, provided that the development impact fee ordinance of a municipality or county or other governmental entity that collects development impact fees pursuant to this chapter shall include a provision for credit for such hook-up or connection fees collected by the municipality or county to the extent that such hook-up or connection fee is collected to pay for system improvements. Imposition of such hook-up or connection fees by any governmental entity to pay for system improvements either existing or new shall be consistent with the capital improvement element of the comprehensive plan and shall be subject to the approval of each county, municipality, or combination thereof which appoints the governing body of such entity. The adoption, imposition, collection, and expenditure of such fees for system improvements by any governmental entity shall be subject to the same procedures applicable to the adoption, imposition, collection, and expenditure of development impact fees by a county.

(d) Nothing in this chapter shall apply to a water authority created by Act of the General Assembly, as long as such authority is not established as a political subdivision of the State of Georgia but instead acts subject to the approval of a county governing authority.

APPENDIX G

Crabapple Crossroads Transportation Technical Analysis

Transportation Analysis

Crabapple Crossroads
Milton, Georgia

Prepared for:
The City of Milton

January 2009
019031000

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Executive Summary

The purpose of this report was to summarize the results of the transportation inventory and analysis of a portion of the Crabapple Crossroads Community. The intent of the study was to understand the traffic patterns and operations around the intersection of Crabapple Road/Mayfield Road at Broadwell Road/Birmingham Highway and to make recommendations for improving traffic conditions in the area, particularly by adding a more enhanced grid network around the intersection.

Turning movement counts were collected at twelve intersections at and around the primary intersection. Queuing on all legs of the main intersection was observed during peak travel periods, and five 24-hour tube counts were conducted to understand hourly fluctuations in volume. Additionally, zoning conditions for related properties were reviewed in conjunction with stakeholder interviews.

The results of the detailed intersection analysis for the existing conditions indicate that the main intersection of Crabapple Road/Mayfield Road at Broadwell Road/Birmingham Highway is currently operating at a Level of Service F during the AM peak hour and E in the PM peak hour. Maintaining existing timings and geometries with the future 2030 volumes, analyses indicated that the intersection is expected to operate at a Level of Service F in the AM and PM peak hours; therefore, operational improvements are recommended to improve the intersection operations.

A menu of options was developed and analyzed including 1) signal timing improvements, 2) turn lane additions at the Crabapple Road/Mayfield Road and Birmingham Highway/Broadwell Road intersection as well as streetscape improvements along Crabapple Road, 3) a bypass system to the north of Crabapple Road and associated improvements, and 4) a bypass system to the south of Crabapple Road and associated improvements.

1.0 Introduction

Results from the 2007 Crabapple Crossroads Community Plan Update indicated a need for more connectivity and a better grid network in the vicinity of the intersection of Crabapple Road/Mayfield Road at Broadwell Road/Birmingham Highway on the south side of the City of Milton in the Crabapple Community. According to this study, the enhanced roadway network could provide more travel options to drivers and could provide relief to some intersections that are currently over capacity.

Kimley-Horn and Associates, Inc. was retained to provide an analysis of the existing and projected future traffic operations at the primary Crabapple Crossroads intersection (the intersection of Crabapple Road/Mayfield Road and Broadwell Road/Birmingham Highway) as well as several adjacent intersections. In addition, Kimley-Horn assessed the impact of additional roadway connections between existing properties. **Figure 1** shows an aerial view of the study area.

This study includes an analysis of the existing and future (2030) conditions surrounding the Crabapple Crossroads intersection, supported by an extensive data collection effort and informed by stakeholder input in the Crabapple Charrette and Stakeholder meeting. Given the analysis and public input, a menu of options has been provided for consideration by the staff and City council representatives.

2.0 Study Area

2.1 Study Network Determination

The following intersections were included in the study network:

1. Birmingham Highway at Bentworth Lane (Unsignalized)
2. Birmingham Highway at Branyan Trail (Unsignalized)
3. Broadwell Road/Birmingham Highway at Crabapple Road/Mayfield Road (Signalized)
4. Broadwell Road at Marstrow Drive (Unsignalized)
5. Broadwell Road at Dorsland Way (Unsignalized)
6. Broadwell Road at Dunbrody Drive (Unsignalized)
7. Crabapple Road at Dunbrody Avenue (Unsignalized)
8. Crabapple Road at Lecoma Trace/Marstrow Drive (Unsignalized)
9. Mayfield Road at Charlotte Drive (Signalized)
10. Mid-Broadwell Road at Charlotte Drive (Unsignalized)
11. Mayfield Road at Mid-Broadwell Road (Unsignalized)
12. Crabapple Road at Itaska Walk (Unsignalized)

Each of the referenced intersections was analyzed for the Existing Conditions and the projected 2030 Future Conditions. The intersection of Crabapple Road at Itaska Walk was incorporated in the study in October 2009 following preliminary analysis and observations as well as development of conceptual recommendations.

3.0 Existing 2008 Traffic Conditions

3.1 Existing Roadways

Table 1 summarizes roadways included in the study area of the traffic impact analysis. Only two of the roadways, Broadwell Road/Birmingham Highway and Crabapple Road/Mayfield Road are minor arterials as classified by GDOT. All other roadways are local roads with fairly limited connectivity. The lack of other collectors and arterials in the area results in the majority of traffic being funneled to these two roadways.

Table 1
Existing Roadway Characteristics

Roadway	Road Type	Number of Lanes	Speed Limit (MPH)	GDOT Functional Classification
Broadwell Road / Birmingham Highway	Two-Way, Undivided	2	35	Urban Minor Arterial
Crabapple Road / Mayfield Road	Two-Way, Undivided	2	45	Urban Minor Arterial
Bentworth Lane	Two-Way, Undivided	2	25	Urban Local Street
Branyan Trail	Two-Way, Undivided	2	25	Urban Local Street
Itaska Walk	Two-Way, Undivided	2	25	Urban Local Street
Marstrow Drive	Two-Way, Undivided	2	25	Urban Local Street
Dorsland Way	Two-Way, Undivided	2	25	Urban Local Street
Dunbrody Drive	Two-Way, Undivided	2	25	Urban Local Street
Charlotte Drive	Two-Way, Undivided	2	35	Urban Local Street
Mid-Broadwell Road	Two-Way, Undivided	2	35	Urban Local Street

Birmingham Highway

Mayfair Road

Charlotte Drive

Mid-Broadwell Road

Crabapple Road

Itasha Walk

Dunbrody Drive

Marstrow Drive

Broadwell Road

Dorsland Way

Dunbrody Way

NOT TO SCALE

Figure 1

Aerial

Crabapple Crossroads

Kimley-Horn and Associates, Inc.

3.2 Traffic Data Collection

Weekday peak hour turning movement counts were conducted on Tuesday, November 11, 2008 at nine (9) unsignalized intersections and two (2) signalized intersections during the AM and PM peak periods. Crabapple Road at Itaska Walk was counted on Thursday, October 22, 2009 during the AM and PM peak periods. The AM counts were conducted between 7:00 AM and 9:00 AM, and the PM counts were conducted between 4:30 PM and 6:30 PM. The weekday morning and afternoon peak hours varied between the twelve (12) intersections and are listed below in **Table 2**. Additionally, five 24-hour counts were conducted on November 11, 2008. These count stations were located on all five legs of the main Crabapple cluster of intersections: Broadwell Road, Birmingham Highway, Crabapple Road, Mayfield Road, and Mid-Broadwell Road.

Table 2
Intersection Turning Movement Count Summary

	Intersection	Control	AM Peak Hour	PM Peak Hour
1	Birmingham Highway at Bentworth Lane	Unsignalized	7:30 – 8:30	5:30 – 6:30
2	Birmingham Highway at Branyan Trail	Unsignalized	7:30 – 8:30	5:15 – 6:15
3	Broadwell Road/Birmingham Highway at Crabapple Road/ Mayfield Road	Signalized	7:30 – 8:30	5:00 – 6:00
4	Broadwell Road at Marstrow Drive	Unsignalized	7:30 – 8:30	5:00 – 6:00
5	Broadwell Road at Dorsland Way	Unsignalized	7:45 – 8:45	5:00 – 6:00
6	Broadwell Road at Dunbrody Drive	Unsignalized	7:45 – 8:45	5:00 – 6:00
7	Crabapple Road at Dunbrody Avenue	Unsignalized	8:00 – 9:00	5:00 – 6:00
8	Crabapple Road at Lecoma Trace/Marstrow Drive	Unsignalized	7:15 – 8:15	5:00 – 6:00
9	Mayfield Road at Charlotte Drive	Signalized	7:30 – 8:30	5:00 – 6:00
10	Mid-Broadwell Road at Charlotte Drive	Unsignalized	7:30 – 8:30	5:00 – 6:00
11	Mayfield Road at Mid-Broadwell Road	Unsignalized	7:30 – 8:30	5:00 – 6:00
12	Crabapple Road at Itaska Walk	Unsignalized	8:00 – 9:00	5:15 – 6:15

All traffic count data is included in the Appendix.

3.3 Queue Observations

Queue observations were performed at each approach to the intersection of Crabapple Road/Mayfield Road and Birmingham Highway/Broadwell Road. The observations were conducted during the AM and PM peak periods, from 7:00 – 9:00 AM and from 4:30 – 6:30 PM, respectively. Average queue lengths for each approach were as shown in **Table 3**:

Table 3
Average Queue Length

Approach	AM Peak Hour	PM Peak Hour
Northbound	8 cars	17 cars
Southbound	22 cars	11 cars
Eastbound	44 cars	17 cars
Westbound	15 cars	35 cars

The most significant queues occurred in the southbound and eastbound directions in the morning, with predominant queues in the westbound direction during the evening. In all directions, the lack of left-turn lanes leads to much of the queuing because left-turning vehicles block all through/right-turning traffic while waiting for a gap in the opposing direction.

4.0 Future Traffic Conditions

4.1 2010 Conditions

The 2010 Conditions were developed by adding projected local development trips to the existing roadway volumes. Trips associated with projects that are approved and not yet built or are currently unoccupied were estimated using equations provided in the *ITE Trip Generation Manual, Eighth Edition (2008).* Project traffic associated with the following three developments in the Crabapple area (as provided by the City of Milton staff) were added to the network to develop projected 2010 future volumes:

Crabapple Crossroads Development
- Located north of Crabapple Road, west of Birmingham Highway
- Currently contains 27 single family homes and 5 townhomes
- 105 single family homes, 40 townhomes, and 40,000 SF of commercial space to be built

Braeburn Development
- Located along Bentworth Lane, west of Birmingham Highway
- 45 single family homes, 54 townhomes, and 50,000 SF of commercial space to be built

Bruce Harris Development
- Located north of Mayfield Road at Charlotte Drive
- 12,000 SF of office space and 3,000 SF of commercial space to be built

Mixed-use vehicle trip reductions were applied to the gross trips generated according to *ITE* methodology. Mixed-use trips, or internal trips, refer to those which travel between office, retail and residential land uses within a development. It was determined that 15.67% of the daily and 16.35% of the PM peak hour trips would be contained within the three aforementioned developments. The internal trips were not added to the network. Mode reductions can be assumed if trips are believed to occur by nodes other than automobiles; however, no mode reductions were assumed for this analysis.

In addition to the mixed-use reductions, pass-by trips are expected to be associated with the retail portions of the development. Pass-by trips refer to those drivers that are attracted to the development while travelling on their normal daily pattern. Pass-by vehicle trip reductions were taken for the proposed retail uses at 34% daily and 34% PM peak hour rates in accordance with ITE methodology.

The adjusted net (with mixed-use and pass-by reductions applied) trips generated and analyzed in this report are listed below in **Table 4**.

Table 4
Approved Projects in the Crabapple Crossroads Area
Trip Generation

	Daily Traffic		AM Peak Hour		PM Peak Hour	
	Enter	**Exit**	**Enter**	**Exit**	**Enter**	**Exit**
Single-Family Detached - 150 D.U.	755	755	29	86	95	56
Residential Condominium/Townhouse - 94 D.U.	305	305	8	41	38	19
General Office Building - 12,000 S.F.	130	130	30	4	3	15
Shopping Center - 93,000 S.F.	3,239	3,239	90	58	297	309
Gross Project Trips	**4,430**	**4,430**	**157**	**189**	**433**	**399**
Mixed-Use Reduction	*-694*	*-694*	*-0*	*-0*	*-68*	*-68*
Pass-By Reduction	*-1,158*	*-1,158*	*-0*	*-0*	*-104*	*-104*
Net New Trips	**2,578**	**2,578**	**157**	**189**	**261**	**227**

These new trips were distributed onto the roadway network based upon expected travel behavior.

4.2 2030 Conditions

The trips associated with future development around Crabapple were added to the existing traffic to develop the 2010 Conditions, as stated in the previous section. This traffic is considered to be the future 2010 traffic volumes, since the developments in the area are expected to be built out by this time.

The Crabapple analysis has been completed in conjunction with the overall Milton Comprehensive Transportation Plan. Some of the primary corridor enhancements (particularly the widening of Arnold Mill Road) are intended to funnel traffic from outside Milton away from areas such as Crabapple. The ARC travel demand model was used to test these corridor improvements. Growth between the 2010 and 2030 travel demand models was used to forecast growth at the intersections around the Crabapple area. The additional growth from the travel demand model is the basis for the 2030 Conditions.

5.0 Zoning Conditions

The City of Milton's existing zoning conditions were researched within the Crabapple Crossroads study area. The zoning research included review of the current zoning map, existing and future land use maps, zoning cases and their conditions, and the City's standards and regulations.

Zoning cases within the Crabapple Crossroads study area were reviewed to determine if rights-of-way along public roads, easements, or greenspace requirements were placed on properties within the study area that should be considered during the development of concepts for the study network. For each zoning case, a stipulation was included for the property owner to dedicate and reserve various amounts right-of-way along the entire property frontage along public roadways as well as construction easements for right-of-way improvements.

6.0 Stakeholder Interviews

In support of data collection efforts and existing conditions analysis, Kimley-Horn staff conducted field and telephone interviews with a number of Crabapple Crossroads residents and businesses. Kimley-Horn drafted a letter that the city distributed making the residents aware of the opportunity for input and met with stakeholders that were available for the meeting. Several key themes emerged from these discussions:

1. Desire to maintain the community and historic character of Crabapple Crossroads
2. Traffic problem is with through traffic (through-north of the area) and school traffic
3. General opposition to a grid street network through the southeast quadrant

In addition to individual stakeholder interviews, a Crabapple Charrette and Crabapple Stakeholder Meeting were conducted to gather input from and to present preliminary recommendations to stakeholders. Results from the Charrette and Stakeholder Meeting can be found in the Recommendations document of the CTP as well as the Appendix.

7.0 Analysis

7.1 Detailed Intersection Analysis

Level of Service (LOS) is used to describe the operating characteristics of a road segment or intersection in relation to its capacity. LOS is defined as a qualitative measure that describes operational conditions and motorists' perceptions within a traffic stream. The Highway Capacity Manual defines six Levels of Service,

LOS A through LOS F, with A being the best and F being the worst. **Table 5** illustrates LOS thresholds for unsignalized and signalized intersections. Level of Service analyses were conducted at all intersections within the study network using Synchro Professional, Version 6.0.

Table 5
Level of Service Criteria
Unsignalized and Signalized Intersections

Unsignalized Intersections		Signalized Intersections	
Level-of-Service	**Average Control Delay (sec/veh)**	**Level-of-Service**	**Average Control Delay (sec/veh)**
A	≤ 10	A	≤ 10
B	> 10 and ≤ 15	B	> 10 and ≤ 20
C	> 15 and ≤ 25	C	> 20 and ≤ 35
D	> 25 and ≤ 35	D	> 35 and ≤ 55
E	> 35 and ≤ 50	E	> 55 and ≤ 80
F	> 50	F	> 80

Source: 2000 Highway Capacity Manual

Level of Service for signalized intersections is reported for the intersection as a whole. One or more movements at an intersection may experience a low LOS, while the intersection as a whole may operate at the LOS standard.

Level of Service for unsignalized intersections, with stop control on the minor street only, is reported for the side street approach. Poor Levels of Service for side street approaches are common, as vehicles may experience delay in turning onto a major roadway.

7.2 Existing 2008 Conditions

The observed existing peak hour traffic volumes (as well as pedestrian volumes and heavy vehicle factors) were input in *Synchro 6.0*, along with the existing traffic signal cycle lengths, splits, and offsets, and an Existing Conditions analysis was performed. Existing traffic volumes are provided in **Figure 2**. The results are displayed below in **Table 6**.

Table 6
Existing 2008 Intersection Levels of Service
(delay in seconds)

	Intersection	Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
1	Birmingham Highway at Bentworth Lane	EB Stop	D	C
2	Birmingham Highway at Branyan Trail	EB Stop	B	B
3	Broadwell Road/Birmingham Highway at Crabapple Road/ Mayfield Road	Signal	F (85.1)	E (66.9)
4	Broadwell Road at Marstrow Drive	EB Stop	B	B
5	Broadwell Road at Dorsland Way	EB Stop	B	B
6	Broadwell Road at Dunbrody Drive	EB Stop	B	B
7	Crabapple Road at Dunbrody Avenue	NB Stop	B	B
8	Crabapple Road at Lecoma Trace/Marstrow Drive	NB/SB Stop	C / C	D / C
9	Mayfield Road at Charlotte Drive	Signal	C (26.6)	D (40.2)
10	Mid-Broadwell Road at Charlotte Drive	SB Stop	E	B
11	Mayfield Road at Mid-Broadwell Road	NB Stop	B	B
12	Crabapple Road at Itaska Walk	NB/SB Stop	F / C	F / D

Most intersections currently operate at LOS D or better, except for the main intersection of Crabapple Road/Mayfield Road at Broadwell Road/Birmingham Highway and a few side street approaches. The inefficiency of the main intersection is primarily due to the high volume of left-turning movements that occur on every leg of the intersection as well as the opposing through volumes.

In its current configuration, the main intersection has only one turn lane, serving the eastbound right-turn movement. All left-turn movements, from every approach, must wait for a gap in the opposing traffic. The waiting cars then block the intersection, and long queues develop. These queues primarily manifest themselves on the eastbound and southbound approaches in the AM peak period and on the westbound approach in the PM peak period as depicted in Table 3.

Delay at side streets is fairly common in cases when a high volume of traffic exists along the main line. The situation is worsened in this case by the long queues that develop as a result of the inefficiency described above. The queues extend beyond adjacent intersections, leaving few gaps for cars entering from the nearby side streets.

Figure 2

Existing 2008 Conditions

Crabapple Crossroads

Kimley-Horn and Associates, Inc.

7.3 Future 2030 Conditions

The projected future peak hour traffic volumes (as well as pedestrian volumes and heavy vehicle factors) were input in *Synchro 6.0*, along with the existing traffic signal cycle lengths, splits, and offsets, and Future 2030 Conditions analysis was performed. The results are displayed below in **Table 7**.

Table 7
Future 2030 Intersection Levels of Service
(delay in seconds)

Intersection		Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
1	Birmingham Highway at Bentworth Lane	EB Stop	F	F
2	Birmingham Highway at Branyan Trail	EB Stop	C	B
3	Broadwell Road/Birmingham Highway at Crabapple Road/ Mayfield Road	Signal	F (503.7)	F (197.7)
4	Broadwell Road at Marstrow Drive	EB Stop	C	B
5	Broadwell Road at Dorsland Way	EB Stop	C	C
6	Broadwell Road at Dunbrody Drive	EB Stop	C	B
7	Crabapple Road at Dunbrody Avenue	NB Stop	C	B
8	Crabapple Road at Lecoma Trace/Marstrow Drive	NB/SB Stop	F / F	F / F
9	Mayfield Road at Charlotte Drive	Signal	B (18.8)	C (25.3)
10	Mid-Broadwell Road at Charlotte Drive	SB Stop	E	B
11	Mayfield Road at Mid-Broadwell Road	NB Stop	B	B
12	Crabapple Road at Itaska Walk	NB/SB Stop	F / E	F / F

As shown in Table 7, maintaining existing roadway geometry and signal timing, and adding both general background traffic growth as well as the traffic associated with the approved developments in the area causes five of the study intersections to be projected to operate below the operational standards during at least one peak hour scenario for the Future 2030 Conditions.

Various options were explored to improve the operations at the main Crabapple intersection and some of the surrounding intersections. The improvements are listed in phases due to varying levels of impact and feasibility. Those listed first are the easiest to implement in the short term, while those listed last require right-of-way, community buy-in, and potentially more study.

Phase 1 Recommendations:

The first set of recommendations includes signal-timing enhancements that can be completed in the near future. These recommendations are meant to improve vehicular operations as well as pedestrian safety and ease at the intersection.

- Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road
    - Retime the signal to reallocate some of the green time from the north-south movement to the east-west movement
    - Change the pedestrian timing to activate during each cycle (pedestrian recall) and to show the walk symbol for as long as possible (rest-in-walk)

Phase 2 Recommendations:

The Phase 2 recommendations are focused primarily on geometry improvements to the main Crabapple intersection and on streetscape improvements along Crabapple Road. The operations at the intersection can be impacted significantly by the addition of left-turn lanes on three of the four approaches. Improvements to the streetscape and cross-section of Crabapple Road also have the ability to calm traffic, provide enhanced crossing locations for pedestrians, and improve the aesthetics of the area. The Phase 2 recommendations are mostly within existing right-of-way (therefore being easier to construct).

- Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road
    - Add a northbound left-turn lane along Broadwell Road
    - Add a temporary southbound left-turn lane along Birmingham Highway (pending implementation of Phase 3 Recommendations)
    - Remove the existing eastbound right-turn lane along Crabapple Road and realign the approach to include an eastbound left-turn lane and shared through-right lane
    - Make the eastbound left-turn phase protected-only (due to geometric constraints)

- Crabapple Road at Itaska Walk
    - Remove the eastbound right-turn lane along Crabapple Road
    - Remove the westbound right-turn lane along Crabapple Road

- Crabapple Road at Marstrow Drive
    - Remove the westbound right-turn lane along Crabapple Road

- Implement the Crabapple Road streetscape concepts including removal of right-turn lanes, construction of a median (with left-turn lanes), crosswalks at key intersections, and wider sidewalks.

Phase 3 Recommendations:

The Phase 3 recommendations include the northern portion of the bypass system and the intersection improvements associated with it. The northern bypass has the ability to divert southbound right- and left-turn traffic from the Crabapple intersection, eastbound left-turn traffic, and westbound right-turn traffic. In addition, the northeastern bypass also has the ability to remove vehicles from the Crabapple intersection that travel along Mid-Broadwell Road to Charlotte Drive and north to Birmingham Highway (as well as the reverse travel pattern). These recommendations will require larger amounts of right-of-way acquisition or improvements through an existing neighborhood, as compared with Phase 2 recommendations. Phase 3 recommendations include the following:

- Construct the northern portion of the bypass system

  - Include a connection from Charlotte Drive to Bentworth Lane on the northeast quadrant
    - Prohibit the southbound left-turn movement from Birmingham Highway to Mayfield Road, directing all such movements to the new bypass system
    - Replace the existing southbound left-turn lane on Birmingham Highway at Mayfield Road with a landscaped median
  - Formalize the connection from Bentworth Lane to Itaska Walk as a bypass on the northwest quadrant
    - The south terminus of the bypass may need to be aligned across from Dunbrody Drive if Phase 4 recommendations advance. If so, the Itaska Walk curb cut would likely be closed (due to proximity to the bypass) and could become a pedestrian plaza.

- Bentworth Lane at Birmingham Highway
  - Signalize the intersection when warranted
  - Add a northbound left-turn lane along Birmingham Highway
  - Add a southbound left-turn lane with permitted/protected phasing along Birmingham Highway
  - Add an eastbound left-turn lane along Bentworth Lane
  - Add a westbound right-turn lane and shared through/left-turn lane along the new bypass

- Mayfield Road at Charlotte Drive
  - Add a northbound left-turn lane along Charlotte Drive
  - Add a southbound left-turn lane and shared through/right-turn lane along the new bypass
  - Add a westbound left-turn lane with protected/permitted phasing

- Mid-Broadwell Road at Charlotte Drive
  - A roundabout may be considered if no southern bypass is constructed around the Crabapple intersection.

- Crabapple Road at Itaska Walk
  - Signalize the intersection when warranted
  - Add a southbound left-turn lane along Itaska Walk

- Develop a coordinated system of signals including the current signals (Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road and Mayfield Road at Charlotte Drive) and new signals (Bentworth Lane at Birmingham Highway and Crabapple Road at Itaska Walk).

Phase 4 Recommendations:

The final phase of recommendations includes the construction and formalization of the southern bypass system. This bypass has the ability to divert northbound left- and right-turn traffic from the main intersection as well as eastbound right-turn traffic and westbound left-turn traffic. The most significant impact of the southern bypass system is to those currently traveling along Mid-Broadwell Road to Charlotte Drive, and west on Mayfield Road through the main intersection (as well as the reverse travel pattern involving southbound travel along Mid-Broadwell Road). Both portions of the southern bypass would be necessary to truly provide relief. If just the southeastern connection is made, fewer drivers will choose to use an indirect route through the southwestern subdivision, although some will likely make the maneuver. Consideration should be given to the bypass connections to the west of the intersection because they are existing neighborhoods that will experience more traffic on their roadways. In particular, the southwest

quadrant of the intersection would likely experience more diverted traffic than the northwest quadrant. The Phase 4 recommendations include the following:

- Dunbrody Drive at Broadwell Road
  - Signalized the intersection when warranted
  - Add a northbound left-turn lane along Broadwell Road
  - Add a westbound left-turn lane and shared through/right-turn lane along the new bypass
- Mid-Broadwell Road at Charlotte Drive
  - Add a northbound shared left-turn/through lane and right-turn lane along the new bypass
  - Add a southbound left-turn lane along Charlotte Drive
  - Add a westbound left-turn lane along Mid-Broadwell Road
- Crabapple Road at Dunbrody Drive
  - Signalize intersection when warranted
  - Add a northbound left-turn lane and shared through/right-turn lane along Dunbrody Drive
    - Projected northbound left-turn movements are anticipated to be heavy during the PM peak period especially. Queuing along the new bypass may be of concern during this time period of the day.
  - Add a southbound left-turn lane and shared through/right-turn lane along the new bypass
  - Add an eastbound left-turn lane along Crabapple Road
  - Add a westbound left-turn lane along Crabapple Road
- Include the intersections of Dunbrody Drive at Broadwell Road and Mid-Broadwell Road at Charlotte Drive to the coordinated signal system discussed in the Phase 3 Recommendations.

Two primary scenarios were tested, Option 1 and Option 2. Option 1 includes Phases 1, 2, and 3 because these are the minimum recommendations proposed by the project team. Option 2 includes all recommendations in Option 1 as well as the Phase 4 recommendations. The projected results associated with the options are included below in **Table 8** and **Table 9,** respectively. **Figure 3** depicts Option 2 with its associated traffic volumes.

Table 8
Future 2030 Intersection Levels of Service – Option 1
(delay in seconds)

Intersection		Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
1	Birmingham Highway at Bentworth Lane	Signal	C (27.5)	C (22.7)
2	Birmingham Highway at Branyan Trail	EB Stop	B	B
3	Broadwell Road/Birmingham Highway at Crabapple Road/Mayfield Road	Signal	D (51.6)	D (48.8)
4	Broadwell Road at Marstrow Drive	EB Stop	C	B
5	Broadwell Road at Dorsland Way	EB Stop	C	C
6	Broadwell Road at Dunbrody Drive	EB Stop	C	B
7	Crabapple Road at Dunbrody Avenue	NB Stop	B	B

Figure 3

Future 2030 Conditions

Crabapple Crossroads

Kimley-Horn and Associates, Inc.

NOT TO SCALE

Bentworth Lane

Branyan Trail

Birmingham Highway

Broadwell Road

Dorsland Way

Dunbrody Drive

Crabapple Road

Mayfield Road

Mid-Broadwell Road

Charlotte Drive

Marstrow Drive

Dunbrody Avenue

Itaska Walk

Provide connection to Crabapple Road

Provide connection to Mayfield Road

Provide connection to Crabapple Road

Provide connection to Mid-Broadwell Road

Remove existing right-turn lane

Remove existing right-turn lane

Remove existing right-turn lane

Prohibit southbound left-turns

Remove exclusive eastbound right-turn lane

212 (201)
(189) 297

147 (106)
(95) 198

79 (273)
(71) 136

68 (190)
(53) 149

446 (721)
(425) 607
(21) 32

LEGEND

- Existing Roadway Laneage
- Long Range Improvement
- Proposed Traffic Signal
- Existing Traffic Signal
- XX AM Peak Hour Traffic Volumes
- (XX) PM Peak Hour Traffic Volumes

Table 8
Future 2030 Intersection Levels of Service – Option 1
(delay in seconds)

	Intersection	Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
8	Crabapple Road at Lecoma Trace/Marstrow Drive	NB/SB Stop	F / F	F / F
9	Mayfield Road at Charlotte Drive	Signal	C (25.5)	C (28.1)
10	Mid-Broadwell Road at Charlotte Drive	SB Stop	F	B
11	Mayfield Road at Mid-Broadwell Road	NB Stop	B	B
12	Crabapple Road at Itaska Walk	Signal	B (13.2)	B (18.9)

The roadway improvements in Option 1 have the ability to improve three of the five intersections to an acceptable Level of Service. The most significant improvement is at the intersection of Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road where the delay decreased from over 500 seconds in the AM peak hour and almost 200 seconds in the PM peak hour to approximately 50 seconds of delay during each of the peak periods. Signalization of Birmingham Highway at Bentworth Lane and Crabapple Road at Itaska Walk also improve the operations of the side street movements so the overall intersections work at acceptable levels. Some of the other side street approaches improve in Level of Service as a result of the improvements at the main intersection as well. The reduction in queues along the mainline roadways allows drivers on side streets to enter the roadway quicker and more efficiently.

Table 9
Future 2030 Intersection Levels of Service – Option 2
(delay in seconds)

	Intersection	Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
1	Birmingham Highway at Bentworth Lane	Signal	C (26.3)	C (25.2)
2	Birmingham Highway at Branyan Trail	EB Stop	B	B
3	Broadwell Road/Birmingham Highway at Crabapple Road/Mayfield Road	Signal	D (42.7)	C (25.4)
4	Broadwell Road at Marstrow Drive	EB Stop	C	B
5	Broadwell Road at Dorsland Way	EB Stop	C	C
6	Broadwell Road at Dunbrody Drive	Signal	B (15.7)	B (16.0)
7	Crabapple Road at Dunbrody Avenue	NB Stop	B	B

Table 9
Future 2030 Intersection Levels of Service – Option 2
(delay in seconds)

	Intersection	Control	AM Peak Hour LOS (sec)	PM Peak Hour LOS (sec)
8	Crabapple Road at Lecoma Trace/Marstrow Drive	NB/SB Stop	E / F	F / F
9	Mayfield Road at Charlotte Drive	Signal	C (23.3)	C (23.1)
10	Mid-Broadwell Road at Charlotte Drive	Signal	C (25.6)	B (17.0)
11	Mayfield Road at Mid-Broadwell Road	NB Stop	B	B
12	Crabapple Road at Itaska Walk	Signal	B (17.5)	C (28.6)

The final phase of roadway recommendations included in Option 2 is likely to be the most difficult to implement due to right-of-way acquisition needs and the potential impacts to an existing neighborhood. From a transportation perspective, the final phase is the optimal solution because it diverts the most traffic from the main intersection, which allows the network to work more efficiently. The costs associated with Option 2 as compared to Option 1 are higher; however the transportation impact to the main intersection is also greater.

8.0 Conclusions

The potential recommendations at and around the intersection of Crabapple Road/Mayfield Road at Birmingham Highway/Broadwell Road are prioritized based on impact, feasibility, and cost. Phase 1 recommendations can be implemented in the near future as a result of the low cost and minimal effort associated with them. Phase 2 recommendations are critical to the improvement of operations at the intersection and can be completed with minimal right-of-way impacts. The Crabapple Streetscape project will also provide great benefit to the pedestrian community around Crabapple. Phase 3 recommendations include two important bypass links, in particular the new northeast connection between Bentworth Lane and Charlotte Drive. While these improvements may be more costly than those in Phase 2, they also provide significant benefit to the overall system operations and should be completed if deemed feasible. The fourth and final phase includes the southern bypass roadway system (for a completed bypass system). While the quadrant bypasses can be constructed separately, the most significant congestion relief to the intersection is realized with the construction of both southern bypasses.

APPENDIX H

Goals and Objectives Matrix

Milton Goals and Objectives Matrix

Projects	Goal #1: Improve transportation network system level performance (level of service) with particular emphasis on the impacts of commuter/"cut through" traffic and safety.					Goal #2: Maintain and improve mobility and system performance through roadway improvements and alternative transportation improvements with specific consideration of transit investments appropriate to the community vision and multi-use paths serving cyclists, pedestrians, equestrian users and those with disabilities including wheelchair access.					Goal #3: Protect and improve the environment recognizing its contribution to community economic vitality and quality of life.		Goal #4: Coordinate transportation investments with the comprehensive plan and land use policies ensuring creation of a "sense of place" (Crabapple Crossroads, Birmingham Crossroads and the Highway 9 area) as well as barrier free connectivity to community assets such as schools, parks and recreation areas.				Goal #5: Leverage regional cooperation and regional solutions to transportation issues, including coordination with surrounding jurisdictions, while maintaining the singularly unique character of the City of Milton.	
	Provide specific paths for commuters	Improve system for local trips	Improve and preserve existing levels of service	Identify high-accident locations and recommend improvements to achieve better safety	Improve safety for pedestrians and cyclists by upgrading facilities for alternative modes of transportation	Identify bridges in need of maintenance or replacement	Provide maintenance recommendations for the existing roadway network	Identify intersections in need of operational and geometric enhancements to improve system performance	Identify multi-modal enhancements to increase alternative transportation options	Integrate the CTP with the Milton Trail Plan	Promote conservation and minimize harmful impacts on the environment	Emphasize preservation of historic places	Coordinate with CPAC to achieve an integrated land use vision and plan	Preserve right-of-way for future facility improvements	Preserve historic places	Achieve a barrier-free transportation network	Coordinate with nearby jurisdictions including Alpharetta, Roswell, Mountain Park, Cherokee County, and Forsyth County to create a continuous and well-thought out network	Coordinate with GDOT, MARTA, GRTA, and ARC
Roadway Capacity Projects																		
Widen Arnold Mill Rd	X	X	X									X		X	X		X	X
Widen Rucker Road/Old Milton Parkway	X	X	X									X		X	X		X	X
Widen State Route 9	X	X	X									X		X	X		X	X
Widen Holbrook/Hopewell/Hamby	X	X	X									X		X	X		X	X
Widen School drive	X	X	X									X		X	X		X	X
Widen Morris Road segment	X	X	X									X		X	X		X	X
Intersection Improvements																		
Specific interection improvements	X	X	X	X				X				X		X	X			
Imroving corridors percieved as being unsafe																		
Identify and improve specific Corridors		X		X										X				
Equestrian Improvements																		
Trail installation along roadways in NW Milton					X				X	X	X	X	X		X	X		
Install trail along utility easements in NW Milton					X				X	X	X		X			X		
Equestrian facilities at Birmingham Park					X				X	X	X		X			X		
Information page on City's website					X				X	X	X		X			X		
Cyclist Improvements																		
Information page on City's website					X				X		X							
Increased signage and striping					X				X		X							
Additional bike racks around the City					X				X		X							
lanes with other raodway improvement projects					X				X		X	X		X	X			

Milton Goals and Objectives Matrix (Continued)

Projects	Goal #1: Improve transportation network system level performance (level of service) with particular emphasis on the impacts of commuter/"cut through" traffic and safety.					Goal #2: Maintain and improve mobility and system performance through roadway improvements and alternative transportation improvements with specific consideration of transit investments appropriate to the community vision and multi-use paths serving cyclists, pedestrians, equestrian users and those with disabilities including wheelchair access.					Goal #3: Protect and improve the environment recognizing its contribution to community economic vitality and quality of life.		Goal #4: Coordinate transportation investments with the comprehensive plan and land use policies ensuring creation of a "sense of place" (Crabapple Crossroads, Birmingham Crossroads and the Highway 9 area) as well as barrier free connectivity to community assets such as schools, parks and recreation areas.				Goal #5: Leverage regional cooperation and regional solutions to transportation issues, including coordination with surrounding jurisdictions, while maintaining the singularly unique character of the City of Milton.	
	Provide specific paths for commuters	Improve system for local trips	Improve and preserve existing levels of service	Identify high-accident locations and recommend improvements to achieve better safety	Improve safety for pedestrians and cyclists by upgrading facilities for alternative modes of transportation	Identify bridges in need of maintenance or replacement	Provide maintenance recommendations for the existing roadway network	Identify intersections in need of operational and geometric enhancements to improve system performance	Identify multi-modal enhancements to increase alternative transportation options	Integrate the CTP with the Milton Trail Plan	Promote conservation and minimize harmful impacts on the environment	Emphasize preservation of historic places	Coordinate with CPAC to achieve an integrated land use vision and plan	Preserve right-of-way for future facility improvements	Preserve historic places	Achieve a barrier-free transportation network	Coordinate with nearby jurisdictions including Alpharetta, Roswell, Mountain Park, Cherokee County, and Forsyth County to create a continuous and well-thought out network	Coordinate with GDOT, MARTA, GRTA, and ARC
Milton Disabilitiy Awareness Improvements																		
Improve access at specific locations					X													
Improvements for Pedestrians																		
Expedite Milton Trail Plan					X				X		X		X			X		
Crosswalks at intersections					X				X		X		X			X		
Bridge Improvements																		
Repair high prioirity bridges						X												X
$50k						X												X
Transit Improvements																		
Paratransit Service					X				X		X							X
Managed lanes along GA-400					X				X		X							X
Crabapple Crossroads																		
Signal timing	X	X	X					X										
Intersection Improvements	X	X	X					X				X		X	X			
Bypass routes	X	X	X					X				X		X	X			
Other Studies																		
Access management		X	X										X					
Pavement Management							X											
Impact Fees													X					