

2030 LRTP Update

Appendix E Congestion Management Process



Appendix E – Congestion Management Process

Introduction

Hall County encompasses approximately 394 square miles in northeast Georgia. The 2000 Census found that growth in the area qualified the County as urbanized, leading to the creation of the Gainesville-Hall Metropolitan Planning Organization (GHMPO). Approximately five percent of the County, lying within the Cities of Buford and Braselton and the unincorporated area, is also part of the Atlanta urbanized area. The County is home to six cities - Clermont, Flowery Branch, Gillsville, Lula, Oakwood, and the county seat, Gainesville, and the Cities of Buford and Braselton have annexed into Hall County.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law by the President on August 10, 2005. In a provision similar to the earlier reauthorizations acts, ISTEA and TEA-21, SAFETEA-LU requires metropolitan planning organizations serving a Transportation Management Area (TMA) – metropolitan area with a population in excess of 200,000 – to have a process that provides for effective management and operation” to address congestion management. Previous to SAFETEA-LU, Congestion Management Process (CMP) was referred to as ‘Congestion Management System (CMS).

The GHMPO study area (which includes all of Hall County) does not meet that threshold of the TMA; however, the small portion of the Atlanta Urbanized Area that extends into southern Hall County must comply with CMP requirements. This report addresses the CMP requirements for that 5 percent of the County, not the entire GHMPO boundary.

An effective CMP is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs. The CMP standard methodology uses the transportation demand model for defining congested facilities. The model’s daily volumes are analyzed to identify congested links, facilities and corridors.

Purpose

The primary purpose of a CMP is to develop tools that may be used in the regional planning for prioritization of needs and for decision making.

Federal Regulations consider the CMP a key element of how TMA’s continuously process “information on transportation system performance and on alternative strategies for alleviating congestion” as well as “enhancing the mobility of persons and goods to levels that meet state and local needs”. The regulations also emphasize “efficient and effective use of existing and future transportation facilities” while striving to meet the goals of reduced vehicle demand and improved air quality.

GHMPO is committed to the successful creation and maintenance of a CMP that provides a methodology for identifying and prioritizing regionally significant improvement projects reflective of the SAFETEA-LU. This process will become an operational component of the Long-Range Transportation Plan and the GHMPO will use the CMP as a guide for transportation planning activities directed at preventing, alleviating, and reducing traffic congestion.



Objectives and Methodology

An effective CMP is a process to manage congestion. The process provides information on transportation system performance and strategies for alleviating congestion.

This report utilizes traffic count data that reflects average weekday conditions in the year 2005. The roadways in the Hall Congestion Management Network (CMN) (for only the Atlanta Urbanized Area) were analyzed using the Base Year 2005 Network and 2030 Existing plus Committed (E+C) Network of the GHMPO travel demand model to evaluate congested links, facilities and corridors. The same model and socio-economic assumptions were used in the LRTP as a factor in determining needs.

This is separate and apart from the conformity analysis that will be completed by the Atlanta Regional Commission for the twenty counties that were designated nonattainment under the 8-hour ozone and particulate matter 2.5 standards. A more complete discussion of their methodology and rationale is included in Appendix F.

The Federal Highway Administration (FHWA) defines congestion as the level at which transportation system performance is no longer acceptable due to traffic interference, and this definition is being used in the Hall County CMP. The level of system performance deemed acceptable varies by functional classification of the transportation facility, geographic location, time of day and other characteristics.

To coordinate with the Atlanta CMP 2006 Update, the Volume to Capacity (V/C) Ratio will be used to evaluate roadway congestion in the Atlanta urbanized portion of Hall County. There is an established relationship between V/C ratio and traffic operation, and V/C ratio is a common indicator of congestion. The volume of a facility is the estimated amount of traffic utilizing the facility at a given time. The capacity of a given facility is the amount of traffic the facility has been designed to carry in a given time period at free-flow speed while maintaining safe traveling distance between vehicles.

V/C ratios can be used to illustrate a facility's Level of Service (LOS). The CMP report will use the V/C calculated LOS values outlined in the 2030 LRTP. LOS measures "A" to "F" reflect the roadway's operation; the higher the ratio, the closer the roadway's capacity is to being filled. During the LRTP update process, the LOS values were approved by GDOT as follows:

- LOS A to C ≤ 0.70
- LOS D and E $\geq 0.71 \leq 0.99$
- LOS F ≥ 1.00

LOS definitions qualify traffic conditions in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions and safety. LOS A represents the best operating conditions. Following the LOS guidelines in the Highway Capacity Manual, the criteria are:

- LOS A, B and C indicate conditions where traffic can move relatively freely.



- LOS D - Vehicle speed begins to decline slightly with increasing flows. Speed and freedom of movement are severely restricted.
- LOS E - Describes conditions where traffic volumes are at or close to capacity, resulting in serious delays.
- LOS F - Breakdown in vehicular flow. Condition exists when the flow rate exceeds roadway capacity. LOS F is used to describe conditions at a bottleneck or breakdown as well as the condition of traffic downstream from that point.

Roadways described as “regionally significant” in the model networks that are in the Hall CMN were evaluated. The volume to capacity (V/C) ratios were used as the initial system performance measure in the CMS development process. Table 1 provides the V/C thresholds used to define congestion in this CMS.

**Table E-1 –
Congestion Thresholds**

	Freeways		Regionally Strategic Arterial System	Other Arterials & Regionally Significant Roadways
	HOV	Others		
Area Type	Volume to Capacity (V/C) Ratios			
Urban	1.0	1.0	1.0	1.0
Suburban	1.0	1.0	1.0	0.8
Exurban/Rural	1.0	1.0	1.0	0.8

Source: Atlanta Regional CMS 2003 Update

The V/C ratio is not the only measure to identify congestion. The Atlanta Regional Commission (ARC) in their 2006 CMP ranked facilities by analyzing duration of daily congestion. Ranking facilities by duration of congestion was not used in Hall County for this report. If the CMP area broadens to include additional facilities, then future CMP updates may include such ranking for facilities in Hall County.



Gainesville-Hall CMP Network

While entire Hall County is included in the GHMPO study area, approximately 5 percent of the County is part of the Atlanta urbanized area (depicted in Figure 2) and is subject to the CMP requirement. Based upon a review of functional classifications and traffic volumes, SR 13/Atlanta Highway (Major Collector), McEver Road (Minor Arterial), and SR 347/Friendship Road (Minor Collector) are the only regionally significant roadways that are part of the CMP. As mentioned earlier, V/C ratios were applied to identify the congested links. After congested links were identified, congested facilities and corridors were identified.

CMP in Non-Attainment Areas

There are special rules for the use of a region's CMP when it is in non-attainment status for carbon monoxide and/or ozone. The federal government has provided the following guidelines for the use of a CMS when a single-occupancy vehicle (SOV) capacity expansion is proposed (per Title 23 Section 500.109 (c) of the Code of Federal Regulations):

"In a TMA designated as non-attainment for carbon monoxide and/or ozone, the CMS shall provide an appropriate analysis of all reasonable (including multimodal) travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOVs (adding general purpose lanes to an existing highway or constructing a new highway) is proposed ... If the analysis demonstrates that ... additional SOV capacity is warranted, then the CMS shall identify all reasonable strategies to manage the SOV facility effectively ... Other travel demand reduction and operational management strategies appropriate for the corridor, but not appropriate for incorporation into the SOV facility itself shall also be identified through the CMS."

Thus, there are three points to consider:

1. Before an SOV capacity expansion can be recommended for construction, all other reasonable options must be considered. These options can be evaluated based on the performance measures used in the CMP.
2. After any improvement has been implemented, the CMP can monitor the operation of the improvement and evaluate its effectiveness.
3. Concurrent with the SOV capacity expansion, the CMP can be used to identify complementary strategies to reduce travel demand and enhance mobility in the corridor.

Congestion Identification

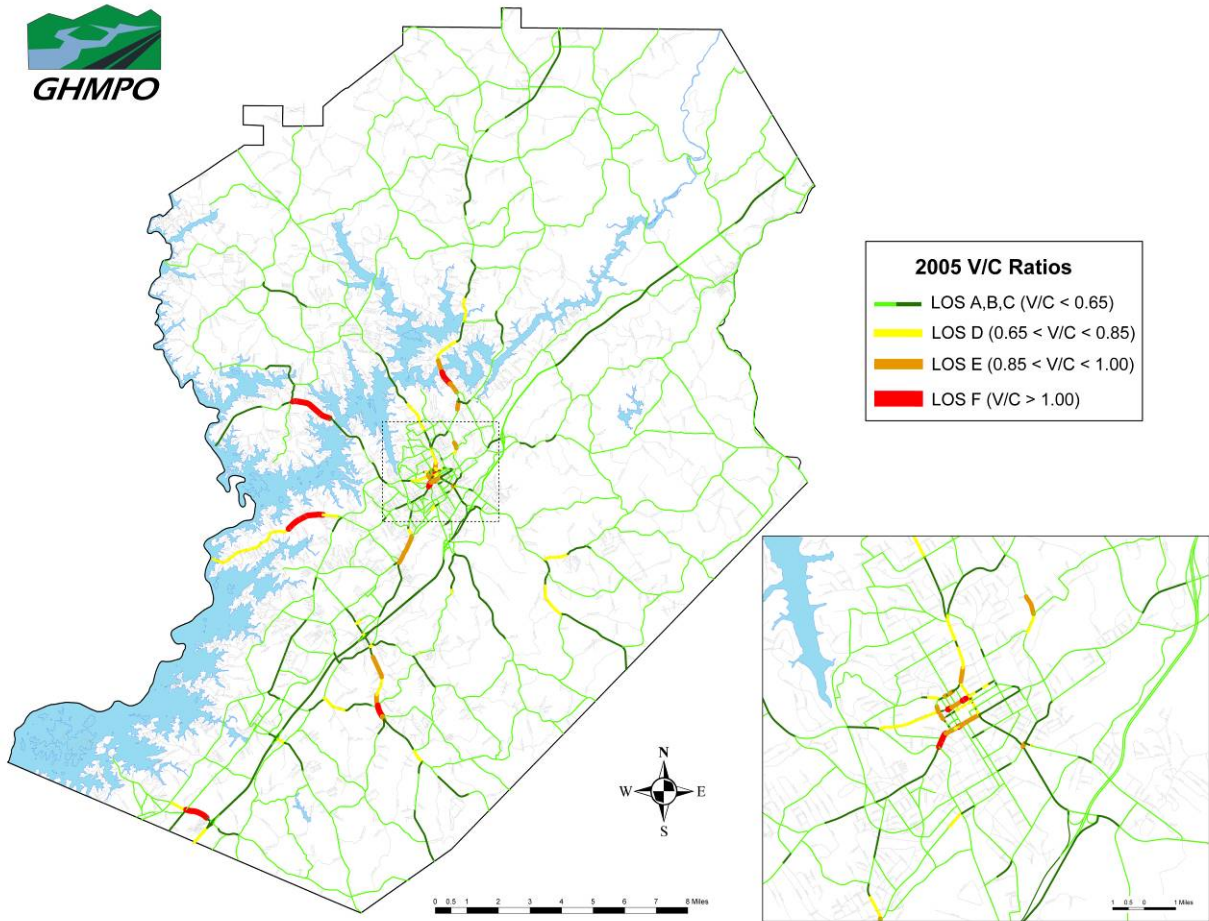
Figure E-1 shows the year 2005 congested links in Hall County. Using the definition of congestion identified in Table 1, a list of congested roadway sections are as follows:

V/C Ratio > 1.0

- SR 347/Friendship Road, between SR 13/Atlanta Highway and I-985

Figure E-1 –
Hall County 2005 Congested Links

2005 Volume/Capacity Ratios for Hall County



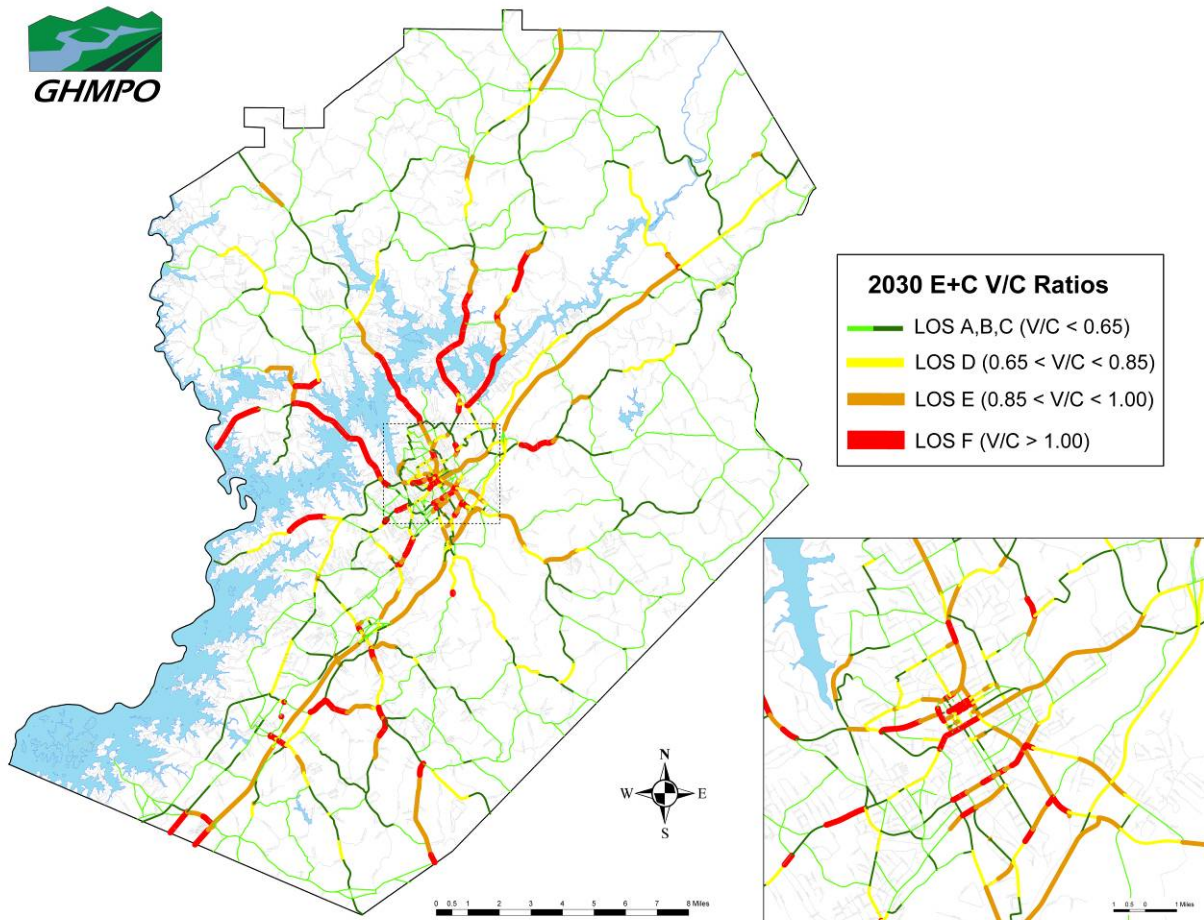
The 2030 E+C analysis forecasts congested conditions likely to occur with near term programmed transportation improvement projects in place. The results of this analysis is presented in Figure E-2.

V/C Ratio > 1.0

- McEver Road from Gwinnett County Line to the urbanized boundary
- SR 13/ Atlanta Highway from Gwinnett County line to the urbanized boundary

**Figure E-2 –
Hall County 2030 Congested Links**

2030 Existing+Committed V/C Ratios for Hall County





Transit, Bicycle and Pedestrian

Transit does not serve the CMP study area, but as transit options are explored, the GHMPO will continue to evaluate transit alternatives that can provide congestion relief. In addition to roadway corridor congestion information, the future CMP should support efforts to monitor public transit and alternative transportation. The intention is to collect transit, bicycle and pedestrian data to measure trends in alternative transportation and facility usage. The GHMPO will continue their efforts to encourage data collection and to be a clearinghouse for such information. Methods to evaluate performance of bicycles and pedestrians at a regional level as of yet have not been addressed by the MPO, and currently, no transit services or bicycle routes traverse through the urbanized area in Hall County. The impact of bicycle and pedestrian travel on the transportation network has not been quantified but will be considered qualitatively in future CMP analyses.

Identify Candidate Congestion-Reduction Projects

Several congestion-reduction strategies were reviewed for implementation. Candidate congestion reduction projects included Transportation System Management (TSM), Travel Demand Management (TDM), and Intelligent Transportation Systems (ITS) strategies, transit service projects, and highway improvement projects.

Congestion Mitigation Strategies

Federal regulations cite that “consideration needs to be given to strategies that reduce SOV (single-occupancy vehicle) travel and improve existing transportation system efficiency.” The intent is to find strategies to reduce SOV demand before adding extra lanes or new roads become necessary. The same regulations detail five categories of traditional and nontraditional congestion management strategies that could be considered. The categories are Transportation Demand Management (TDM) measures, traffic operational improvements, public transportation improvements, Intelligent Transportation System (ITS) technologies and, where necessary, additional system capacity. Below are individual congestion management strategies, however some measures may not be appropriate for the urbanized portion of Hall County and the GHMPO will coordinate all mitigation strategies with the ARC.

Transportation Demand Management (TDM) Measures

- Growth Management and Activity Center Strategies
 - o Promote infill, compact and mixed-use development
 - o Enforce growth boundaries and limit rural growth areas
 - o Develop standards
- Congestion Pricing
 - o Parking fees
 - o Price preference to car- and van-poolers



- Ridesharing Programs
 - o Carpool/vanpool and transit initiatives
 - o HOV priority systems
 - o Employer trip reduction programs
 - o Guaranteed ride home program
 - o Park and ride facilities
- Alternative Work Strategies
 - o Telecommuting
 - o Flexible work hours
 - o Telework
- Shuttle Services
 - o Demand–response transit
 - o Express service
- Nonmotorized Transportation Planning
 - o Traffic calming
 - o Streetscape
 - o Safety education
 - o Transit oriented development
 - o Improved sidewalks, paths, and bike lanes

Traffic Operational Improvements

- Traffic Signal Improvements
 - o Signal re-timing
 - o Vehicle detection
 - o Highway/railroad signal coordination
- Roadway Geometrics Improvements
 - o Bottleneck alleviations
 - o Turn lane additions at intersections
 - o Re-striping/lane modifications
- Turn Restrictions
 - o Time of day restrictions on turning movements
- Access Management Techniques
 - o Driveway management
 - o Median management
 - o Frontage roads
- High Occupancy Vehicle Lanes



Public Transportation Improvements

- Public Transit Capital Improvements
 - o Fleet expansion
 - o Transit support facilities
 - o Improved intermodal connectors

Intelligent Transportation System Technologies

- Incident Management
 - o Incident detection and surveillance
 - o Incidence response units
- Advanced Traveler Information
 - o Dynamic message signs
 - o Highway advisory radio
- Advanced Traffic Management Centers
 - o Traffic management center
 - o Traffic signal coordination

Additional System Capacity

- Additional freeway lanes
- Additional roadway lanes
- New roadway construction
- Interchanges

Implementation Strategy

Many of the objectives or specific strategies listed above are projects or part of projects that are either already programmed by the Georgia Department of Transportation (GDOT) or are being considered in the future. Many existing projects and programs contribute to congestion mitigation measures. As a starting point for congestion management planning, it was important to re-evaluate previous initiatives and evaluate current projects for general aspects that may affect congestion and identify new studies targeted towards specific aspects of congestion management. The following two tables summarize the evaluation of congestion mitigation strategies along each corridor.



**Table E-2 -
Congestion Mitigation Strategies - SR347/Friendship Road**

Strategy	Applicability	Remarks
Transportation Demand Management Measures	No	The low density residential development pattern and an absence of major employers or employment centers does not support programs such as alternative work strategies and ridesharing.
Traffic Operational Improvements	Partial	Traffic operational improvements will improve access on and off the facility, but would not significantly reduce overall congestion levels through the corridor.
Public Transportation Improvements	No	The absence of a public transit system in this area does not allow for these measures. The lower density development existent and projected does not support traditional fixed route – fixed schedule (including express commuter service) within the corridor.
ITS Technologies	No	ITS improvements alone will not improve congestion on facility, however, any appropriate ITS technology (variable message signs, signal system interconnects, etc) will be examined further by GDOT during project concept development.
Additional System Capacity	Yes	The widening of this facility is the only strategy that will significantly reduce projected “no-build” congestion on this facility.

**Table E-3 -
Congestion Mitigation Strategies – SR13/Atlanta Highway**

Strategy	Applicability	Remarks
Transportation Demand Management Measures	No	The low density residential development pattern and an absence of major employers or employment centers does not support programs such as alternative work strategies and ridesharing.
Traffic Operational Improvements	Partial	Traffic operational improvements will improve access on and off the facility, but would not significantly reduce overall congestion levels through the corridor.
Public Transportation Improvements	No	The absence of a public transit system in this area does not allow for these measures. The lower density development existent and projected does not support traditional fixed route – fixed schedule (including express commuter service) within the corridor.
ITS Technologies	No	ITS improvements alone will not improve congestion on facility, however, any appropriate ITS technology (variable message signs, signal system interconnects, etc) will be examined further by GDOT during project concept development.
Additional System Capacity	Yes	The widening of this facility is the only strategy that will significantly reduce projected “no-build” congestion on this facility.

As noted earlier, congestion-reduction strategies were reviewed for implementation but none were found to be appropriate for these corridors because they would not satisfactorily reduce congestion levels on SR 347/Friendship Road, and SR 13/Burford Highway. The analysis supports the proposal to widen these roadways, and each of the projects listed above are identified in the 2030 LRTP Update.



CMP Monitoring Program

An important component to the CMP is evaluating the efficiency and effectiveness of implemented actions. The monitoring of the CMP network, through use of performance measures is intended to be a continual process. This monitoring will help to identify locations needing congestion mitigation and assist with long-range transportation planning needs. Data management and coordination with the ARC will be necessary for monitoring the CMP in the Atlanta urbanized portion of Hall County. GHMPO staff will strive to update the existing information and acquire new data as it becomes available and coordinate all efforts with ARC staff.