Montgomery Metropolitan Planning Organization (MPO)

Congestion Management Process (CMP) 2014 - 2018

May 2014

Prepared by

In cooperation with the Montgomery MPO, MPO Staff and Advisory Committees

MONTGOMERY METROPOLITAN PLANNING ORGANIZATION

Congestion Management Process
FISCAL YEAR 2014
2014-2018

This document is posted at http://www.montgomerympo.org

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Resolution

The Montgomery Metropolitan Planning Organization (MPO) Adopting the Final 2014 Montgomery Congestion Management Plan

WHEREAS, the Montgomery MPO is the organization designated by the Governor of the State of Alabama as being responsible, together with the State of Alabama, for implementing the applicable provisions of amended 23 USC 134, 135 (MAP-21 Sections 1201 and 1202 July 2012); 42 USC 7401 et al; 23 CFR 450 et al; 40 CFR Parts 51 and 93; and

WHEREAS, Moving Ahead for Progress in the 21st Century (MAP-21) continues the Federal Highway Administration requirement from SAFETEA-LU that MPOs must apply the Congestion Management Process in **Transportation Management Areas (TMAs)**; and

WHEREAS, the MPO has identified project areas, regions, corridors, and activity centers in the Greater Montgomery Area where traffic congestion must be addressed; and

WHEREAS, the MPO has produced a **Congestion Management Plan** utilizing effective management and operational practices to mitigate the impacts of congestion on health and safety within affected areas and continue to use all available means to reduce congestion within the Transportation Management Area and projected growth areas of Greater Montgomery; and

WHEREAS, consistent with the above provisions and those of the Montgomery MPO Public Participation Plan, the MPO has properly advertised and reviewed public and agency comments and finding the foregoing satisfactory; now

THEREFORE, BE IT RESOLVED that the Montgomery MPO hereby adopts the Final 2014 Montgomery Congestion Management Plan.

Adopted this the 22nd day of May, 2014.

Date: 5-22-14

Charles Jinright, MPO Chairman

ATTEST:

Date: 5-22-14

Robert E. Smith, MPO Secretary

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Executive Summary

CMP Background

The development and implementation of a Congestion Management Process (CMP) is a requirement of the current surface transportation law. The goal of a CMP is to have a systematic, transparent way for transportation planning agencies to identify and manage congestion and utilize performance measures to direct funding toward projects and strategies that are most effective for addressing congestion.

Regional Planning Objectives

The Montgomery Metropolitan Planning Organization (MPO) developed regional planning goals as part of their 2035 Long Range Transportation Plan (LRTP) and Unified Planning Work Program (UPWP). These goals were utilized to determine the four goals and corresponding objectives developed to establish priorities for the CMP.

Study Network

After discussion with the MPO, the MPO study area was designated as the boundary for the CMP. It was determined that this boundary would include the entire MPO network. The study area includes portions of Montgomery, Elmore, and Autugua Counties, including the cities of Montgomery, Prattville, Wetumpka, Millbrook and Coosada and the towns of Deatsville, Elmore and Pike Road. To effectively concentrate on congested roadways in the study area, roadways functionally classified as minor arterial and above were included in the Montgomery CMP.

Performance Measures

Performance measures are used to determine if the congestion management strategies utilized are both effective in reducing delays and in meeting objectives. Additionally, performance measures are used to identify congested areas for future CMPs. Performance measures were identified that used data accessible by the MPO staff and local agencies. Data used for performance measures is ideally data that is currently being collected by the MPO for other purposes or data that can be quickly obtained using current tools such as the area model.

Data Inventory

Relevant traffic data was collected to identify areas of congestion including volume to capacity (V/C) ratios, daily and peak hour volumes, corridor travel times, and speed data during peak and off-peak periods. The data was summarized and where appropriate, the data was mapped. Additionally, local agencies identified known areas of congestion. Planned project data for the MPO region and an inventory of planned transportation improvements relevant to the congested corridors were reviewed to establish the strategy assessments.

Analysis of Congested Areas

Thresholds for acceptable travel delay and V/C ratios were developed. The corridors and intersections within the study area were reviewed for critical delays or high V/C ratios. The corridors and intersections were then separated into categories: Priority 1, Priority 2 and Ongoing Projects.

Strategy Assessment and Identification

A comprehensive toolbox of congestion relieving strategies was created and evaluated. For each Priority 1 congested corridor or intersection, appropriate mitigation strategies from the toolbox are suggested.

Monitoring

An important element of a CMP is a program to monitor the effectiveness of implementation strategies as well as to identify new congested areas in the region. The monitoring program will provide updates to the performance measures used for the CMP. This will include updating performance measures and comparing the data sets over time.

Conclusion

This CMP provides the MPO and their agency partners with a process to address congestion over the next five years. Overall congestion issues have been documented and specific projects suggested to reduce recurring and non-recurring congestion for 25 corridors or intersections regularly experiencing significant delays. The congestion management strategies developed as part of the CMP should be included for discussion in the next Transportation Improvement Plan (TIP) process and implemented where appropriate. The monitoring program will be an important tool for evaluating the effectiveness of implemented projects and for establishing strategies for the 2019 - 2023 Montgomery MPO Congestion Management Process.

1. CMP Background

1.1 Purpose of CMP

The development and implementation of a Congestion Management Process (CMP) is a requirement of the current surface transportation law, Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012. According to the FHWA, the shift from the term "Congestion Management Systems reflects a substantive shift in perspective and practice to address congestion management through a process that provides for effective management and operations and enhanced linkage to the planning process, and to the environmental review process, based on cooperatively developed travel demand reduction and operational management strategies as well as capacity increases".

A CMP will help the MPO to:

- Identify congestion problem locations;
- Determine the causes of this congestion;
- Develop and evaluate alternative strategies to mitigate congestion; and
- Measure the progress of implemented strategies in reducing congestion.

The goal of a CMP is to have a systematic, transparent way for transportation planning agencies to identify and manage congestion, and to utilize performance measures to direct funding toward projects and strategies that are most effective for addressing congestion. The CMP will be developed based on federal guidelines (Congestion Management Process: A Guidebook, April 2011). Outputs of the CMP will support the MPO's transportation planning process through identification of strategies that promote efficient transportation system management and operation.

1.2 Implementation of the CMP and the Transportation Improvement Plan (TIP)

The congestion management strategies developed as part of the CMP should be included for discussion in the next Transportation Improvement Plan (TIP) process and implemented where appropriate.

According to SAFETEA-LU (Section 6001) "Under the metropolitan planning process, transportation plans and TIPs shall be developed with due consideration of other related planning activities" and "each project shall be consistent with the long-range transportation plan…". The congestion mitigation measures suggested as part of the Congestion Management Process reflect the goals and objectives of the LRTP for the MPO and should be included in future TIP processes.

1.3 MPO Previous Congestion Management Studies

A Congestion Management System Plan, adopted in 2003, as well as a Congestion Management System Plan 2009-2013, adopted in 2009, were prepared for the Montgomery Area.

The purpose of the Congestion Management System Plan (2003) was to identify current and future congestion areas and to devise appropriate strategies to prevent congestion from occurring over time if possible, or to mitigate congestion if a more desirable solution cannot be implemented. This plan targeted identifying congestion problems, determining the causes of the congestion, as well as recommending alternative strategies to mitigate congestion.

The Congestion Management System Plan 2009-2013 conducted by Dr. Michael Anderson "was intended to provide a snapshot of congestion levels in the urbanized area, a look at possible future congestion levels and identification of measures to alleviate congestion in the future". The plan included travel times runs for roughly 320 miles of roadway identified in the Montgomery area. The travel times runs included morning peak, evening peak, and off peak travel time data. A total of four runs were conducted for each of the morning and evening peak periods and two runs were conducted for the off peak periods.

The primary distinction between the implementation of a Congestion Management Process (CMP) rather than System is that it should measure the progress of implemented strategies in reducing congestion. The 2003 Congestion Management System Plan for Montgomery did not address this process.

2. Regional Planning Objectives

2.1 Long Range Plan Goals and Objectives

The MPO developed regional planning goals as part of their 2035 Long Range Transportation Plan (LRTP). These goals provide the direction needed to support the CMP. Each of the goals and their associated performance measures are shown in Table 1 below.

TABLE 1 : MONTGOMERY 2030 LRTP GOALS AND PERFORMANCE MEASURES

LRTP Goal	Performance Measures
Goal 1 – Develop, maintain, and preserve a balanced multimodal transportation system that provides for safe, integrated, and convenient movement of people and goods.	- Transit service coverage within transit-dependent areas - Transit daily operating hours (existing) - Transit ridership (existing) - Number of bicycle and pedestrian-related projects - Average congested roadway speeds - Level-of-Service (LOS) measures (volume to capacity ratios by functional class) - Primary freight corridors in/out of Montgomery region
Goal 2 – Optimize the efficiency, effectiveness, connectivity, safety, and security of the transportation system.	- Per capita vehicle miles traveled (VMT) - Per capita vehicle hours traveled (VHT) - Number of "high crash" locations identified for detailed analysis - Average trip time
Goal 3 – Coordinate the transportation system with existing and future land use and planned development.	- Review transportation system operations and improvements as related to future development plans
Goal 4 – Develop a financially feasible multimodal transportation system to support expansion of the regional economy.	- Projected changes in funding for each mode - Number of businesses located within ¼ mile of public transportation routes - Number of transportation related businesses in the region
Goal 5 – Provide viable travel choices to improve accessibility and mobility, sustain environmental quality, and preserve community values.	- Potential to impact an environmentally sensitive area - Number of historic areas potentially impacted

	- Potential to impact environmental justice communities
Goal 6 – Increase jurisdictional coordination and citizen participation in the transportation planning process to enhance all regional travel opportunities.	- Number of projects that cross city and/or county lines - Number of projects with joint funding from tri-county local jurisdictions - Number of public meetings - Number of survey responses/comments received as part of public involvement process

The purpose of a Congestion Management Process is to measure and identify congestion on the transportation network through the use of data collection, modeling, and analysis so informed decisions can be made for prioritizing projects for the area. Goal 2 supports the purpose of a Congestion Management Plan and should be incorporated as the primary goal for the CMP.

A key element of a sustainable CMP is to use performance measures that can be evaluated using readily available data. The measures for Goal 2 utilize data and modeling output that are readily available to or within the MPO. More information about these measures is included in the next section.

2.2 Unified Planning Work Program Objectives

Along with the LRTP, another document prepared by the MPO that provides insight into the goals for the region is the Unified Planning Work Program (UPWP). Objectives within the UPWP are discussed in relation to the subtask categories. Therefore, objectives from the UPWP that address congestion management are listed below by subtask category. Primary subtask categories of note are Congestion Management and Safety Planning and Monitoring.

2.2.1 SUBTASK 5.6: CONGESTION MANAGEMENT

Objective: *To provide effective management of new and existing transportation facilities through use of travel demand reduction and operational management strategies. Encourage bicycle and pedestrian and transit modes as appropriate. Pursue continued development of the Intelligent Transportation System (ITS) and strategies to reduce Single Occupancy Vehicle (SOV) travel. Come up with ways to effectively advocate and manage congestion overall through adding capacity to highways, transit, freight, travel demand management program encouragement and bicycle and pedestrian facilities, and manage congestion for better air quality.*

Proposed Work: *Continue to implement and monitor the Congestion Management System Plan (CMSP) addressing the specific needs of the MPO study area with transportation project solutions. The MPO Planning Staff will continue to work with local, federal and state officials to further implement ITS projects as needed.*

Low cost congestion-relief projects that eliminate bottlenecks will continue to be the focus, along with better access management by coordinating land use and transportation planning, and coming up with ways to effectively advocate and manage congestion overall through adding capacity to highways, mass transit (bus and rail), freight (water, rail and truck) and bicycle and pedestrian facilities. Also, transportation demand management strategies will be explored and considered. MPO Staff will further market the CommuteSmart Montgomery program to get the maximum number of people registered to the program. MPO Staff will attend training, workshops and conferences as needed.

2.2.2 SUBTASK 5.7: SAFETY PLANNING AND MONITORING

Objective: *To continue to conduct transportation safety planning as part of the MPO planning process, to include, all documents produced. This includes identification of areas that have unacceptably high accident numbers. This may also include intersections and areas with non-standard road alignment, lane widths, pedestrian crossing areas, bicycle issues, transit-related safety problems, truck issues and etc.*

An assessment of appropriate solutions to mitigate these problems will occur. A further objective is to identify potential safety risks that may arise as the result of acts of terrorism and to develop counter measures to prevent unacceptable safety risks to the traveling public and to the components of the transportation facilities and systems.

Products: *Accurate reporting of accidents in the appropriate format to meet qualifications for safety and related funds for transportation projects. Updates to the Congestion Management System Plan and Long Range Transportation Plan as needed. Consideration of freight safety, highway safety, transit safety bicycle and pedestrian safety and security in the transportation planning process will also be a product to be achieved. A well trained and well versed MPO staff.*

Finally, the last applicable objective in the UPWP from SUBTASK 5.8: SPECIAL PROJECTS, CORRIDOR DEVELOPMENT AND DEVELOPMENTS OF REGIONAL IMPACT (DRI) is:

Objectives: *Analysis to assess the impacts of projects of regional significance such as toll bridges, new major travel routes special projects and developments of regional impact as needed.*

Product: *Recommendations on improvements to the road system throughout the MPO study area for congestion relief and mitigation of development impacts will be made. Recommendations will include environmental justice analyses and community impact assessments when and where appropriate as needed.*

Additional goals for consideration come from the subtask categories of General Public Involvement, Environmental Justice Planning and Evaluation and Transportation Improvement Plan (TIP).

2.2.3 SUBTASK 4.1: GENERAL PUBLIC INVOLVEMENT

Objectives: *To involve all interested citizens in the Montgomery MPO study area in the transportation planning process. To give all citizens an opportunity to voice their concerns, preferences and questions concerning transportation projects and plans. To provide transportation relevant data to individuals, corporations and agencies that have contact with groups or people that may be adversely impacted. To inform the public of the availability of transportation data, resources, MPO, TCC and CAC meetings and public involvement meetings as needed and required.*

2.2.4 SUBTASK 4.2: ENVIRONMENTAL JUSTICE PLANNING AND EVALUATION

Objective: *To ensure that no plans, programs, or specific projects disproportionately and adversely impact low income or minority populations and to ensure that the process of planning transportation improvements is structured to include the groups and/or agencies which normally represent their interests and concerns. Further, outreach will be undertaken to involve members of low-income and minority populations in the transportation planning process to the extent possible.*

2.2.5 SUBTASK 5.2: TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

Objectives: *To identify transportation improvement projects recommended for advancement during the program period as a result of the 3-Cs (cooperative, continuous and comprehensive) transportation planning process; and to include realistic estimates of revenues and costs for each project in the TIP period, as well as be financially constrained. Development of the TIP based on projects taken from the long-range transportation plan with other maintenance needs for all jurisdictions of within MPO Study Area into a single, phased, implementation schedule. All of the SAFETEA-LU factors will be used in the development of the TIP. Efforts to increase public involvement in the planning process will be made. The FY-2008-2011 TIP will be maintained and updated as needed and required. A new FY 2011-2014 TIP document will be prepared and adopted by the MPO.*

2.3 CMP Goals and Objectives

Based upon the goals and objectives currently being utilized by the Montgomery MPO as part of the LRTP and the UPWP, the following CMP goals and objectives were created:

<u>Goal 1: To provide effective management of new and existing transportation facilities through use of travel demand reduction and operational management strategies</u>.

Objective 1: Reduce travel times on major routes.

Objective 2: Reduce single occupancy travel and encourage other modes of travel.

Objective 3: Utilize cost-effective, widening and non-widening solutions to improve capacity.

Objective 4: Improve access management along major corridors.

Goal 2: Optimize the safety of the current transportation network.

Objective 1: Identify areas that have an unacceptably high non-recurring congestion due to crashes

Objective 2: Reduce impact from non-reccurring congestion through efficient use of ITS.

Objective 3: Reduce reccurring congestion on corridors through mitigation techniques such as signal timing and capacity improvements.

Objective 4: Reduce number of crashes on system.

Goal 3: Optimize the effectiveness and reliability of the regional transportation network.

Objective 1: Reduce response and clearance times from non-reccurring congestion.

Objective 2: Reduce delays from reccurring congestion on corridors.

Goal 4: Increase multimodal transportation access.

Objective 1: Increase convenience of transit system trips.

Objective 2: Increase safety and convenience of bicycle and pedestrian trips.

3. Study Network

3.1 Geographical Limits

To establish the geographic boundaries for the CMP, a brief discussion was held with the MPO. It was determined that the boundary would include the entire MPO area. This network includes portions of Montgomery, Elmore, and Autauga Counties, including the cities of Montgomery, Prattville, Millbrook and Coosada and the towns of Deatsville, Elmore and Pike Road. Figure 1 shows the Montgomery, MPO study area.

3.2 System Limits - Modes

A CMP can include various modes of transportation. The inclusion of such modes is dependent on their presence, level of use and potential to impact congestion within the geographical area. Although transit is important in Montgomery, it was determined that the current level of usage of the transit system was not high enough for it to be considered as a current congestion management tool. Additionally, Montgomery has a thriving bicycle network. However, the volume of cycles on each route were not deemed to be enough to offset the current congestion issues.

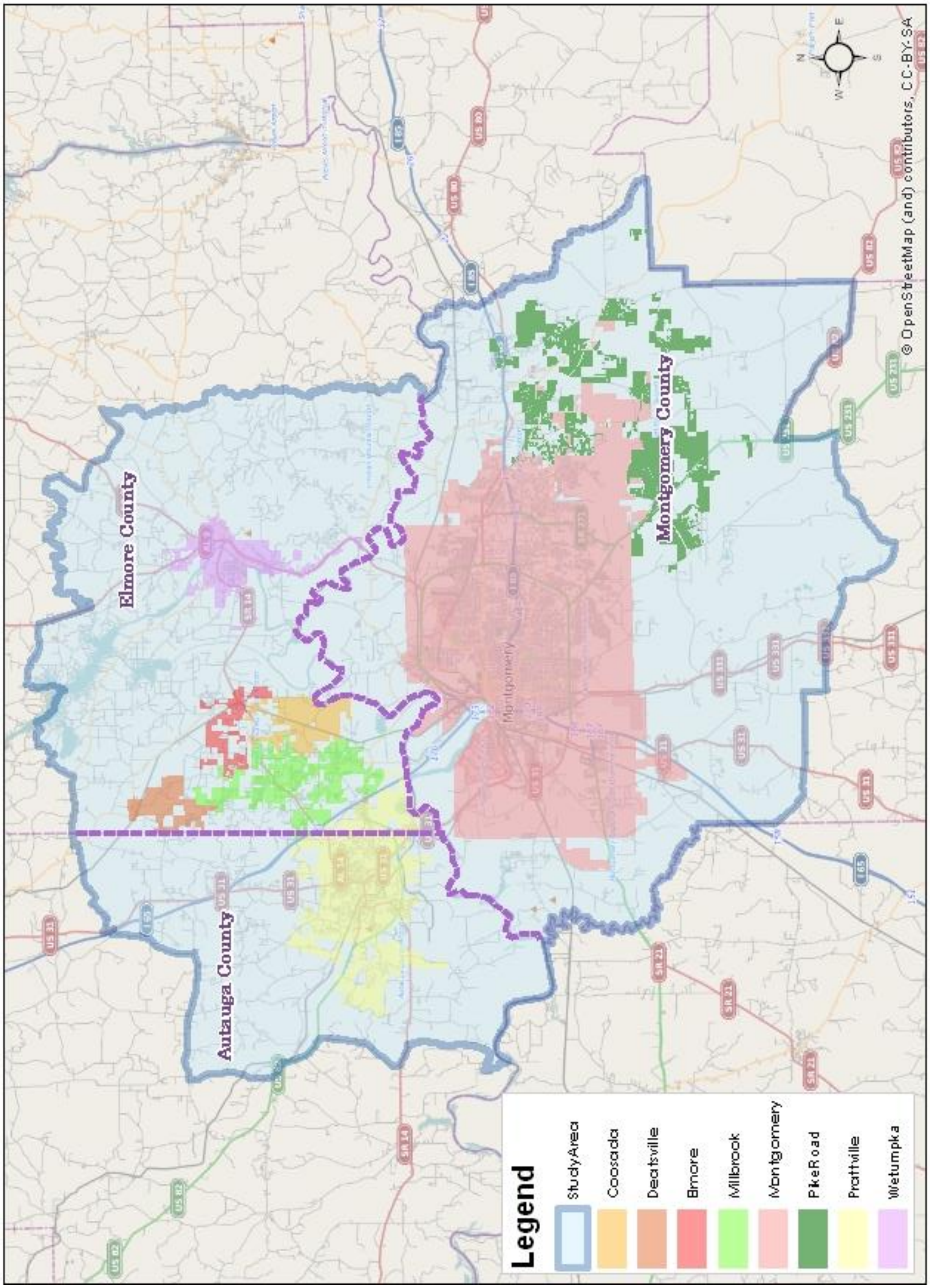
3.3 System Limits - Subset

For the Montgomery CMP, it was determined that only the roadway network would be included. Furthermore, the roadway network was limited to certain functional classifications. These are shown in Table 2. The volume to capacity ratios of these corridors was utilized to identify a subset of roadways to be examined in the travel time and delay study. Additional corridors with recurring or non-recurring congestion identified by local agencies were included in the study.

TABLE 2: MONTGOMERY MPO FUNCTIONAL CLASSIFICATIONS

Used	Functional Classification
✓	Interstate
✓	Freeway/Expressway
✓	Principal Arterial
✓	Minor Arterial
×	Major Collector
×	Minor Collector

FIGURE 1: STUDY AREA



4. Performance Measures

4.1 Data Availability & Purpose

Performance measures were not defined in previous congestion plans. The new CMP suggests performance measures to determine if congestion management strategies are effective in reducing delays, if objectives are being met and whether new congested areas should be included in future congestion management plans. An important element in developing performance measures is the accessibility of the data for the MPO staff. Data used for this purpose ideally includes performance measures that are currently being used by the MPO for other purposes or data that can be quickly obtained using current tools such as the area model. According to the FHWA, the performance measures should serve the following purposes:

- *To characterize existing and anticipated conditions on the regional transportation system;*
- *To track progress toward meeting regional objectives;*
- *To identify specific locations with congestion to address;*
- *To assess congestion mitigation strategies, programs, and projects; and*
- *To communicate system performance, often via visualization, to decision-makers, the public, and MPO member agencies.*

The performance measures should be adequate to answer how the MPO defines and measures congestion. There are two types of congestion - recurring and nonrecurring. Recurring congestion is the type of congestion that commuters face daily. It is directly related to the capacity of the roadways. Non-recurring congestion is typically related to crashes, disabled vehicles, work zones, adverse weather events, planned special events, and similar disturbances to regular traffic flow. Performance measures should also address congestion at both the regional and local level.

4.2 Relationship to Goals and Objectives

The performance measures selected must support the goals and objectives discussed in the previous section. These are repeated in Table 3 with potential performance measures listed next to each objective.

TABLE 3: OBJECTIVES AND PERFORMANCE MEASURES

Goal 1: To provide effective management of new and existing transportation facilities through use of travel demand reduction and operational management strategies		
Objectives	**Local Performance Measures**	**Regional Performance Measures**
Reduce travel times on major routes.	Travel Time/Delay on Corridor	Hours of Travel when Volume to Capacity >1.0
Reduce single occupancy travel and encourage other modes of travel.	Transit Usage on Corridor Miles of Sidewalks and Bicycle Lanes	Vehicle Occupancy Rates Transit Crowding
Utilize cost-effective, widening and non-widening solutions to improve capacity.	Volume to Capacity Ratios	Volume to Capacity Ratios
Improve access management along major corridors.	Number of Entrances	Hours of Travel when Volume to Capacity >1.0
Goal 2: Optimize the safety of the current transportation network.		
Identify areas that have an unacceptably high number of non-recurring congestion due to crashes.	Number of Crashes	Number of Crashes
Reduce impact from non-recurring congestion through efficient use of ITS.	Number of Crashes	Number of Crashes
Reduce recurring congestion on corridors through mitigation techniques such as signal timing and capacity improvements.	Intersection Capacity	Hours of Travel when Volume to Capacity >1.0
Reduce number of crashes on system.	Number of Crashes	Number of Crashes
Goal 3: Optimize the effectiveness and reliability of the regional transportation network.		
Reduce response and clearance times from non-recurring congestion.	Response and Clearance Times	Response and Clearance Times
Reduce delays from recurring congestion on corridors.	Travel Time/Delay on Corridor	Hours of Travel when Volume to Capacity >1.0
Goal 4: Increase Multimodal Transportation Access.		
Increase convenience of transit system trips.	Transit Usage on Corridor	Transit Crowding
Increase safety and convenience of bicycle and pedestrian trips.	Miles of Sidewalks and Bicycle Lanes	Miles of Sidewalks and Bicycle Lanes

5. Data Inventory

The performance measures section identified types of data needed to evaluate strategies. A subset of these data types was used to determine locations with recurring or non-recurring congestion. Analysis of these data types is included in the next section where relevant to the project.

5.1 Volume to Capacity Ratios

The MPO model provides volume to capacity ratios (V/C) for the network in the study area. The V/C ratios compare roadway demand or volume against roadway supply or capacity. A V/C of 1.00 indicates that a roadway is operating at capacity and any V/C ratio greater than 1.0 indicates congestion and results in recurring delays.

5.2 Travel Time and Delay Studies

During a time travel and delay study, GPS data on travel times and delays is collected in the field over multiple data runs for various time periods. The data is then mapped and analyzed to pinpoint corridors and intersections experiencing significant time travel delays during peak AM and PM travel times as well as during off-peak travel times.

5.3 Discussions with Local Agencies

Through discussions with local agencies, additional areas of concern were identified. Often, these areas have frequent nonrecurring congestion, congestion during off-peak hours not covered in the travel time and delay studies or congestion is projected as the result of planned developments within the MPO.

5.4 Vehicle Occupancy Rates

Vehicle occupancy rates, or the average number of people occupying a car, indicate areas where single occupancy vehicle (SOV) traffic is adding to congestion on the roadway and will enable the MPO to employ directed strategies to reduce single occupancy vehicles on the roadway.

5.5 Transit Crowding

Transit crowding data can influence individual behavior by encouraging more single occupancy vehicles on the road and therefore heavier reliance on congested roadways. Transit crowding data can help identify areas for expansion of existing public transportation services.

Transit crowding is generally identified using the load factor, a measure of the total capacity utilized on a public transit vehicle. The load factor represents the percentage of seats filled. A load factor of 1.00 means that all seats on the bus are full. A load factor of greater than 1.00

indicates that all seats on the bus are full and there are commuters standing on the bus. A load factor of 1.25 generally indicates a need for increased service.

5.6 Response and Clearance Times

Response and clearance times are regularly collected by emergency responders and can indicate areas of non-recurring traffic congestion. Accurate recording of response and clearance times can allow for more effective management of congestion relief in the event of an accident or other emergency situation.

5.7 Sidewalk and Bicycle Lane Miles

Sidewalk and bicycle lane data indicates areas where sidewalk and bicycle lanes can be expanded or improved to relieve traffic congestion. Sidewalk and bicycle data can indicate areas where congestion management techniques may cause conflict with slower pedestrian and bicycle traffic.

6. Analysis of Congested Areas

Thresholds for acceptable Volume to Capacity (V/C) ratios and travel times and delays were developed. The corridors and intersections within the study area were reviewed for critical delays or high V/C ratios. Additional areas for study were identified by local agencies and included for review. A full list of congested areas identified through these processes is included in Appendix B. These areas are broken down into Priority 1, Priority 2 and Ongoing Projects. Priority 1 projects are addressed in the next section of this report. Priority 2 projects are included for possible future analysis. Ongoing projects are congestion mitigations projects that are either under study, under construction or currently funded.

6.1 Volume to Capacity Ratios

Using volume to capacity (V/C) data provided by the MPO, a list of the most congested corridors was developed. Table 4 below illustrates that of the 3196 miles of road included in the study, approximately 49% have V/C ratios that would typically indicate severe congestion.

TABLE 4: VOLUME TO CAPACITY RATIO

V/C Ratio	Congestion Level	Miles of Roads	Percent of Roads
V/C <= 0.8	No \ low congestion	1121	35.1%
V/C > 0.8 and <= 0.90	Moderate congestion	267	8.4%
V/C > 0.90 and <= 1.0	High Congestion	245	7.7%
V/C > 1.0	Severe Congestion	1563	48.9%
	TOTAL MILES OF ROADS:	3196	

6.2 Travel Times and Delays

Due to the high number of severely congested corridors in the study, only corridors with V/C ratios greater than 1.5 or corridors selected by local agencies were included in the time travel and delay studies. Table 5 lists the corridors included in the time travel and delay studies. Figure 2 shows corridors with high V/C ratios and corridors identified by the MPO for inclusion in the study.

Figure 2: Corridors with high V/C Ratios and Corridors Identified by MPO

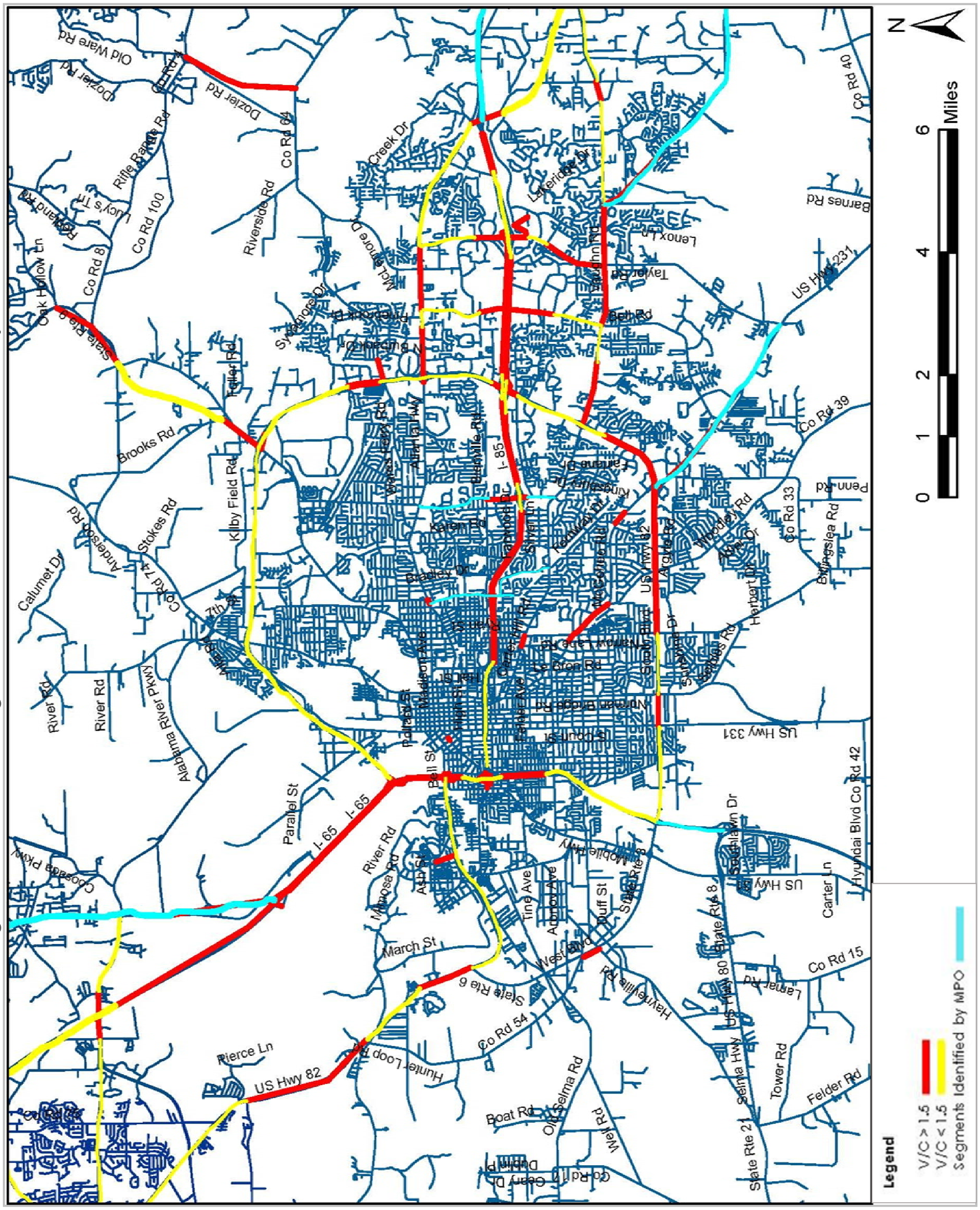


TABLE 5: TRAVEL TIME ROUTES

Segment	From	To	Mileage
Ann St	E 5th Ave	Atlanta Hwy	1.47
Atlanta Hwy	East Blvd	Chantilly Pkwy	4.46
Bell Rd	Atlanta Hwy	Vaughn Rd	2.98
Carter Hill Rd	Vaughn Rd	McGehee Rd	1.06
Chantilly Pkwy	I-85	Vaughn Rd	2.73
Cobbs Ford Rd	I-65	SR-143	1.62
East Blvd	Wetumpka Hwy	Troy Hwy	7.55
I-65	SR-14	W Selma Hwy	13.72
I-85	I-65	Exit #16 (Waugh) / CR-126	15.71
Main St (Prattville)	Memorial Dr	I-65	3.58
Maxwell Blvd	US-31	I-65	3.52
Northern Blvd	I-65	Wetumpka Hwy	6.52
Old Carter Hill Rd	Old Pike Rd	US-231	6.33
Perry Hill Rd	Atlanta Hwy	Harrison Rd	1.13
Perry Hill Rd	Harrison Rd	I-85	0.51
Perry Hill Rd	I-85	Vaughn Rd	0.58
Pike Rd	US-80	Old Pike Rd	6.55
Ray Thorington Rd	Vaughn Rd	Pike Rd	4.37
South Blvd	Troy Hwy	I-65	5.44
SR-14	Main St (Prattville)	SR-143 N	10.5
SR-143	SR-14	I-65	6.74
Taylor Rd	Atlanta Hwy	Vaughn Rd	3.15
US-31	Main St (Prattville)	West Blvd	7.78
US-231 (North)	Northern Blvd	Jasmine Hill Rd	4.08
US-231 (South)	South Blvd	Taylor Rd	3.42
Vaughn Rd	East Blvd	Belser Blvd	8.92
Zelda Rd	Vaughn Rd	Ann St	1.09
TOTAL			135.51

The travel time and delay study was conducted over 135 miles of roadway to pinpoint specific segments within each corridor where traffic moves below the recommended speed during peak AM and PM travel times as well as during off-peak hours. The time periods when data was collected were: peak AM from 7:00 AM – 9:00, off-peak from 9:00AM- 11:00AM and from1:00PM-4:00PM and peak PM from 4:00 PM – 6:00 PM. The routes were driven a minimum of three times in each direction. The data collected during this study as well as an analysis of the data is included in Appendix A.

6.3 Discussions with Local Agencies

Through discussions with local agencies, additional areas of concern were identified. Often, these areas have frequent nonrecurring congestion, congestion during off-peak hours not covered in the travel time and delay studies, or congestion is projected as the result of planned developments within the MPO.

From the areas identified in the analysis of congested areas, 25 priority focus areas were identified by MPO staff and local agencies.

7. Strategy Identification and Assessment

7.1 Strategies by Project

A comprehensive toolbox of congestion relieving strategies was created for the CMP (Appendix C). For each congested corridor, the appropriate mitigation strategies were suggested from the toolbox. There are three main categories of strategies:

- Add Capacity/ Physical Improvements
- Use Existing Capacity More Efficiently/ Operational Improvements
- Reduce Demand for Vehicle Travel

The strategies were evaluated in terms of their benefits, costs, implementation time frame and other considerations. A detailed overview of each corridor and intersection including approximate project costs is included in Appendix D**.** Table 6 gives a brief overview of the Priority 1 areas and the recommended strategies in ordered by the highest volume to capacity ratio for each corridor or intersection.

Table 6 : Priority 1 Projects and Recommendations By V/C

	Street Name	From/At	To	V/C	Strategies
1	Taylor Rd	I-85 EB On Ramp (from south)	Eastchase Pkwy	2.67	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Geometric Design Improvements • Access Management • Other • Any improvements recommended in a recent planning study for this project area, if applicable.
2	East Blvd	Carmichael Rd	Monticello Dr	2.30	• Traffic Signal Optimization and Interconnection • Geometric Design Improvement • Any improvements recommended in a recent planning study for this project area, if applicable.
3	East Blvd	Carmichael Rd		2.30	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Any improvements recommended in a recent planning study for this project area, if applicable.
4	East Blvd	WB I-85 Off Ramp		2.29	• Geometric Design Improvements • Any improvements recommended in a recent planning study for this project area, if applicable.
5	Wetumpka Hwy (US-231)	Jasmine Hill Rd	Anderson Rd	2.17	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
6	Cobbs Ford Rd	US-82	I-65	2.17	• Access Management • Traffic Signal Optimization and Interconnection • Growth Management Program • Geometric Design Improvements • Transit and Ridesharing Programs • Any improvements recommended in a recent
7	Wetumpka Hwy (US-231)	Redland Rd		2.17	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
8	E. Main St	US-82	Greystone Way	2.13	• Traffic Signal Optimization and Interconnection • Access Management • Geometric Design Improvements • Growth Management Plan • Transit and Ridesharing Programs • Any improvements recommended in a recent planning study for this project area, if applicable.

TABLE 7 CONT. : PRIORITY 1 PROJECTS AND RECOMMENDATIONS BY V/C

	Street Name	From/At	To	V/C	Strategies
9	Taylor Rd	I-85 Ramps		2.11	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Any improvements recommended in a recent planning study for this project area, if applicable.
10	Troy Hwy (US-231)	Christine Elizabeth Curve/ Virginia Loop Rd		2.04	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
11	South Blvd	Narrow Lane Rd	Troy Hwy (US-231)	2.01	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
12	Atlanta Hwy	S Burbank Dr	East Blvd West Service Rd	1.90	• Traffic Signal Optimization and Interconnection • Access Management • Geometric Design Improvements • Bus Service and Operations Improvements • Transit and Ridesharing Programs • Any improvements recommended in a recent planning study for this project area, if applicable.
13	Chantilly Pkwy (US-80)	I-85		1.87	• Traffic Signal Optimization and Interconnection • Geometric Design Improvements • Any improvements recommended in a recent planning study for this project area, if applicable.
14	Chantilly Pkwy (US-80)	Atlanta Hwy	Eastchase Pkwy	1.87	• Traffic Signal Optimization and Interconnection • Geometric Design Improvements • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
15	South Blvd (US-82)	Woodley Rd		1.81	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
16	SR-14	I-65		1.80	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
17	SR-14	Grandview Rd (CR8/ CR10)		1.70	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Any improvements recommended in a recent planning study for this project area, if applicable.

TABLE 8 CONT. : PRIORITY 1 PROJECTS AND RECOMMENDATIONS BY V/C

	Street Name	From/At	To	V/C	Strategies
18	SR-14	I-65	Grandview Rd	1.70	• Geometric Design Improvements • Any improvements recommended in a recent planning study for this project area, if applicable.
19	Taylor Rd	Halcyon Blvd	Vaughn Rd	1.64	• Geometric Design Improvements • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
20	Perry Hill Rd	Atlanta Hwy	I-85	1.63	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Bus Service and Operations Improvements • Transit and Ridesharing Programs • Any improvements recommended in a recent planning study for this project area, if applicable.
21	Vaughn Rd	Taylor Rd	Halcyon Park Dr	1.63	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
22	Pike Rd	Vaughn Rd		1.58	• Geometric Design Improvements • Signal Timing and Optimization • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
23	SR-14	McQueen Smith Rd		1.54	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
24	Ray Thorington Rd	Pike Rd	Vaughn Rd	1.53	• Geometric Design Improvements • Traffic Signal Optimization and Interconnection • Access Management • Any improvements recommended in a recent planning study for this project area, if applicable.
25	Carter Hill Rd	McGhee Rd	Vaughn Rd	1.45	• Geometric Design Improvements • Access Management • Bus Service and Operations Improvements • Transit and Ridesharing Programs • Non-motorized Improvements • Other • Any improvements recommended in a recent planning study for this project area, if applicable

8. Monitoring Program

8.1 Evaluation of Effectiveness

An important element of a CMP is a program to monitor the effectiveness of implementation strategies, as well as to identify new congested areas in the region. The monitoring program should provide updates to the performance measures used for the CMP. Federal regulation 23CFR 450.32 (c) 6 requires that the CMP include:

> *"Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures. The results of this evaluation shall be provided to decision makers and the public to provide guidance on selection of effective strategies for future implementation. "*

This will include updating count data, travel time data and speed data and comparing the data sets over time.

The MPO should coordinate with local project sponsors to conduct project-level analysis of conditions after the implementation of a congestion mitigation effort. The MPO may provide readily available data for evaluation including V/C counts, while the responsibility for collecting travel time data and evaluating the data to measure the effectiveness of implemented strategies would fall to the local project sponsor. In this scenario, guidance can be provided by the MPO on when an assessment should be done, what measures should be used, how data should be gathered, what methods should be used to analyze the data, and other aspects of evaluation studies. Documentation of the evaluation will be collected by the MPO to inform decision makers and the public as well as to provide guidance during the 2040 Long Range Transportation Plan (LRTP) and Transportation Improvement Plan (TIP) planning processes. See Table 7 for clarification of responsibilities for data collection associated with implementing congestion mitigation projects.

TABLE 9: MONITORING OF PERFORMANCE MEASURES ON PROJECTS

Performance Measures/ Data Collected	Collecting Agency
Travel Time/Delay on Corridor	Local Sponsor
Hours of Travel when Volume to Capacity >1.0	Local Sponsor/ MPO
Transit Usage on Corridor	Local Sponsor/ Transit Agency
Miles of Sidewalks and Bicycle Lanes	Local Sponsor
Vehicle Occupancy Rates	Local Sponsor
Transit Crowding	Local Sponsor/ Transit Agency/ MPO
Volume to Capacity Ratios	Local Sponsor/ MPO
Number of Entrances	Local Sponsor
Number of Crashes	Local Sponsor/ MPO
Intersection Capacity	Local Sponsor
Response and Clearance Times	Local Sponsor/ Local Responders

Federal guidelines also encourage MPOs to conduct system-level performance evaluations to identify and report on the "improvement or degradation of the transportation system." Table 8 provides clarification of responsibilities for data collection associated with this data.

TABLE 10: RESPONSIBILITIES FOR DATA COLLECTION

Performance Measures/ Data Collected	Collecting Agency	Frequency of Collection
Travel Time/Delay on Corridor	MPO	Minimum of every 5 years
Volume to Capacity Ratios		Annually
Number of Crashes		Annually

9. Conclusion

This CMP provides the MPO and their agency partners with a process to address congestion over the next five years. Overall congestion issues have been documented and specific projects suggested to reduce recurring and non-recurring congestion for 25 corridors or intersections regularly experiencing significant delays. The suggested congestion management strategies should be included for discussion in the next Transportation Improvement Plan (TIP) process and implemented where appropriate. The monitoring program will be an important tool for evaluating the effectiveness of implemented projects and for establishing strategies for the 2018 Montgomery MPO congestion management process.

APPENDIX A: TRAVEL TIME AND DELAY STUDIES

Data and Analysis of Corridors

Travel Time and Delay Studies

Due to the large amount of data gathered during the travel time and delay studies, the full printed study is available as a separate document and online at http://www.montgomerympo.org/Documents.html .

APPENDIX B: CONGESTED CORRIDORS/ INTERSECTIONS IDENTIFIED BY STUDY

A full list of Priority1, Priority 2 and Ongoing Projects

Priority 1 Projects

Project No.	Street Name			Jurisdiction	Type	Time and Travel Delays			Non-Recurring Congestion	Volume to Capacity Ratios	
	Main Street	From/At	To			AM	OP	PM		2005 V/C	Highest V/C
1	Taylor Rd	I-85 EB On Ramp (from south)	Eastchase Pkwy	MO						Taylor Rd SB V/C = 0.92 - 2.19; Taylor Rd NB V/C = 1.83 - 2.67	**2.67**
2	East Blvd	Carmichael Rd	Monticello Dr	MO				X	X	1.21 - 2.30	**2.30**
3	East Blvd	Carmichael Rd		MO				X	X	South of Intersection V/C = 1.27/1.28; North of Intersection V/C = 2.14/2.30	**2.30**
4	East Blvd	WB I-85 Off Ramp		MO				X	X	East Blvd = 1.21/2.29 (south of intersection), 1.60/1.67 (north of intersection	**2.29**
5	Wetumpka Hwy (US-231)	Jasmine Hill Rd Rd	Anderson Rd	WE						1.84 - 2.17	**2.17**
6	Cobbs Ford Rd	US-82	I-65	PR/ EC						US-82 to I-65 SB On/Off Ramps = 2.10/2.13; I-65 SB On/Off Ramps to I-65 NB On/Off Ramps = 1.18/2.17	**2.17**
7	Wetumpka Hwy (US-231)	Redland Rd		WE / EC	X	X	X			US-231 = 1.84/1.85 (north), 2.16/2.17 (south); Redland Rd = 1.14/1.15 (east)	**2.17**
8	E. Main St	US-82	Greystone Way	PR	X	X	X	X	X	Greystone Way to McQueen Smith Rd = 1.14/1.20; McQueen Smith Rd to Old Farm Ln = 0.81 - 1.11; Old Farm Ln to I-65 = 0.97 - 2.13	**2.13**
9	Taylor Rd	I-85 Ramps		MO				X	X	I-85 EB On Ramps = 1.38 (from north), 2.11 (from south); I-85 WB Off Ramp = 1.11	**2.11**

Priority 1 Projects

Project No.	Street Name: Main Street	Street Name: From/At	Street Name: To	Jurisdiction	Type	Time and Travel Delays: AM	Time and Travel Delays: OP	Time and Travel Delays: PM	Non-Recurring Congestion	Volume to Capacity Ratios: 2005 V/C	Volume to Capacity Ratios: Highest V/C
10	Troy Hwy (US-231)	Christine Elizabeth Curve/ Virginia Loop Rd		MO				X	X	US-231 = 1.47 (north of Virginia Loop), 2.02/2.04 (south of Virginia Loop)	**2.04**
11	South Blvd	Narrow Lane Rd	Troy Hwy (US-231)	MO			X			1.51 - 2.01	**2.01**
12	Atlanta Hwy	S Burbank Dr	East Blvd West Service Rd	MO						1.24 - 1.90	**1.90**
13	Chantilly Pkwy (US-80)	I-85		MO				X		Chantilly Pkwy = 1.54 (north), 1.87 (at), 1.70 (south)	**1.87**
14	Chantilly Pkwy (US-80)	Atlanta Hwy	Eastchase Pkwy	MO					X	1.35 - 1.87	**1.87**
15	South Blvd (US-82)	Woodley Rd		MO				X	X	Southern Blvd = 1.80/1.81 (west of intersection), 1.70/1.76 (east of intersection); Woodley Rd = 1.36 (north of intersection), 1.23 (at intersection), 0.99 (south of intersection)	**1.81**
16	SR-14	I-65		MI/ PR/ EC				X	X	SR 14 = 1.68/1.70 (east), 1.37/1.80 (at), 1.62/1.63 (west)	**1.80**
17	SR-14	Grandview Rd (CR8/ CR10)		MI/ EC				X	X	SR 14 = 1.15/1.16 (east), 1.68/1.70 (west); Grandview Rd = 1.03/1.08 (north), 1.05/1.06 (south)	**1.70**
18	SR-14	I-65	Grandview Rd	EC	X		X			1.68 - 1.70	**1.70**
19	Taylor Rd	Halcyon Blvd	Vaughn Rd	MO		X	X			1.50 - 1.64	**1.64**
20	Perry Hill Rd	Atlanta Hwy	I-85	MO				X	X	1.11 - 1.63	**1.63**

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Priority 1 Projects

Project No.	Street Name			Jurisdiction	Type	Time and Travel Delays			Non-Recurring Congestion	Volume to Capacity Ratios	
	Main Street	From/At	To			AM	OP	PM		2005 V/C	Highest V/C
21	Vaughn Rd	Taylor Rd	Halcyon Park Dr	MO	X	X	X			1.59 - 1.63	**1.63**
22	Pike Rd	Vaughn Rd		PI	X	X	X			Vaughn Rd = 1.56/1.58 (west/east of intersection); Pike Rd = 1.02/1.23 (south/north of intersection)	**1.58**
23	SR-14	McQueen Smith Rd		PR	X	X	X			SR 14 = 1.52/1.54 (east), 1.13/1.15 (west); McQueen Smith Rd = 0.86/0.88	**1.54**
24	Ray Thorington Rd	Pike Rd	Vaughn Rd	MO / PI	X	X	X			1.53 (north of Park crossing); 0.32 (south on Park Crossing)	**1.53**
25	Carter Hill Rd	McGhee Rd	Vaughn Rd	MO	X	X	X			1.12 - 1.45	**1.45**

Priority 2 Projects

Project No.	Street Name			Jurisdiction	Type	Time and Travel Delays			Non-Recurring Congestion	Volume to Capacity Ratios	
	Main Street	From/At	To			AM	OP	PM		2005 V/C	Highest V/C
1	Northern Blvd	I-65 NB ramp	Northern Blvd	MO	S	X	X	X		I-65 NB On Ramp = 1.95; I-65 SB Off Ramp = 1.98; I-65 SB On Ramp = 1.04; I-65 NB Off Ramp = 0.96; Northern Blvd = 1.06 (EB), 1.08 (WB)	**1.98**
2	US-31	Hunter Loop Rd		MO	I	X		X		US-31 = 1.86/1.89 (north), 1.38/1.47 (south); Hunter Loop = 0.80/1.05 (west)	**1.89**
3	Wetumpka Hwy (US-231)	Northern Blvd		MO	I	X		X		US-231 = 1.76/1.85 (north), 1.34/1.76 (at), 1.10/1.14 (south); Northern Blvd = 1.36 (east WB), 1.30 (east EB), 1.03 (west WB), 1.05 (east EB)	**1.85**
4	Vaughn Rd	East Blvd	The Meadows Apartments	MO	S	X	X	X		1.75 - 1.83	**1.83**
5	East Blvd	Troy Hwy	Vaughn Rd	MO	S	X	X	X		1.20 - 1.79	**1.79**
6	Vaughn Rd	Bell Rd		MO	I	X	X	X		1.11/1.13 (south); Vaughn Rd =	**1.79**
7	Troy Hwy (US-231)	Bell Rd		MO	I	X	X	X		1.18/1.20 (south); Bell Rd = 1.17 (east)	**1.71**
8	I-65	Just North of Bell St		MO	S				X	I-65 SB = 1.58; I-65 NB = 1.63	**1.63**
9	Atlanta Hwy	Bell Rd	S Burbank Dr	MO	S					1.26 - 1.61	**1.61**

Priority 2 Projects

Project No.	Street Name			Jurisdiction	Type	Time and Travel Delays			Non-Recurring Congestion	Volume to Capacity Ratios	
	Main Street	From/At	To			AM	OP	PM		2005 V/C	Highest V/C
10	Taylor Rd	I-85	Atlanta Hwy	MO	S	X				0.97 - 1.58	**1.58**
11	EastChase Pkwy	Taylor Rd	Berryhill Rd	MO	S					1.44 - 1.52	**1.52**
12	South Blvd	South Court St		MO	I	X		X		South Blvd = 1.47 / 1.51 (east of intersection), 1.29 /1.41 (west of intersection)	**1.51**
13	Ann St	East 3rd St	Cherry St	MO	S	X	X	X		0.96 - 1.46	**1.46**
14	East Blvd	Monticello Dr	Atlanta Hwy	MO	S				X	1.23 - 1.46	**1.46**
15	I-65	Just South of W Fairview Ave		MO	S				X	I-65 SB = 1.26/0.42; I-65 NB = 1.35/1.45	**1.45**
16	US-31	US-82		PR	I	X	X	X		US-31 = 1.00/1.03 (north), 0.94/0.98 (south); US-82 = 1.45 (west), 0.73/0.75 (east)	**1.45**
17	Bell Rd	Vaughn Rd	Eastwood Glen Pl	MO	S	X	X	X		1.14 - 1.39	**1.39**
18	SR-143	Cobbs Ford Rd		MI/ EC	I	X		X		1.15/1.17 (north); Cobbs Ford Rd = 1.19/1.34 (east),	**1.34**
19	East Blvd	Woodmere Blvd		MO	I				X	South of Intersection V/C = 1.28/1.31; North of Intersection V/C = 1.27/1.28	**1.31**
20	East Blvd	Vaughn Rd		MO	I				X	intersection), 1.14/1.27 (west of intersection), 1.75/1.83 (east of intersection);	**1.27**
21	Bell Rd	Bell Gables	Atlanta Hwy	MO	S	X	X	X		1.03 - 1.23	**1.23**
22	Pike Rd	US-80		MO	I	X	X	X		Vaughn Rd = 0.79/0.68 (west/east of intersection); Pike Rd = 1.22/0.76 (south/north of intersection)	**1.22**

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Priority 2 Projects

Project No.	Street Name			Jurisdiction	Type	Time and Travel Delays			Non-Recurring Congestion	Volume to Capacity Ratios	
	Main Street	From/At	To			AM	OP	PM		2005 V/C	Highest V/C
23	E. Main St/ Cobbs Ford Rd	Greystone Way/ Sheila Blvd		PR	I				X	E Main St = 1.14/1.20 (east of intersection), 0.95/1.02 (west of intersection)	**1.20**
24	Troy Hwy (US-231)	Taylor Rd		MO	I	X	X	X		US-231 = 1.18/1.20 (north), 1.13/1.16 (south); Taylor Rd = 1.09/1.15 (east)	**1.20**
25	SR-14	East Main St	Edgewood Ave	PR	S	X	X	X		1.15 - 1.20	**1.20**
26	SR-14	Browns Rd	Main St (SR-143)	MI	S		X	X		1.18 - 1.19	**1.19**
27	SR-143	Grandview Rd		MI	I	X		X		SR143 = 1.15/1.17 (south), 0.91/0.93 (north); Grandview Rd = 0.35/0.40 (west)	**1.17**
28	SR-143	Coosada Rd		MI	I	X		X		SR143 = 0.91/0.93 (south), 0.95/1.03 (north); Coosada Rd = 1.07/1.13 (east), 0.80 (west)	**1.13**
29	Northern Blvd	Coliseum Blvd/ Alabama River Pkwy		MO	I	X		X		Northern Blvd = 1.02/1.05 (east of intersection), 0.59/0.69 (west of intersection)	**1.05**
30	Northern Blvd	Jackson Ferry Rd		MO	I	X	X	X		Northern Blvd = 0.95/1.04 (west), 0.76/0.81 (east); Jackson Ferry = 0.65	**1.04**
31	SR-143	Old Mill Rd	Browns Rd	MI	S	X		X		1.04 (north of Chapman); 0.87 (south of Chapman)	**1.04**
32	E. Main St	South Memorial Dr		PR	I				X	0.86 - 0.96	**0.96**
33	I-65	Just South of W Jeff Davis Ave		MO	S				X	I-65 SB = 0.88; I-65 NB = 0.96	**0.96**
34	E. Main St	Memorial Dr	Spencer St	PR	S	X	X	X		0.86 - 0.92	**0.92**
35	US-31	East Main St	Stonewall Dr	PR	S	X	X	X		0.84 - 0.87	**0.87**
36	Troy Hwy (US-231)	Park Towne Way	East Blvd	MO	S	X	X	X			**n/a**

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On-Going Projects

Project No.	Street Name			Jurisdiction	Time and Travel Delays			Non-Recurring Congestion	Notes
	Main Street	From/At	To		AM	OP	PM		
1	Bell St	Day St		MO	X	X	X		Proposed new Maxwell AFB gate on Birmingham Hwy.
2	Birmingham Hwy	West Blvd		MO	X		X		Proposed new Maxwell AFB gate on Birmingham Hwy.
3	Maxwell Blvd	Bell St		MO	X	X	X		Proposed new Maxwell AFB gate on Birmingham Hwy.
4	Perry Hill Rd	Carmichael Rd		MO				X	Current construction to reconfigure the I-65 interchange at Perry Hill Rd.
5	SR-143	SR-14		MI	X		X	X	Proposed re-alignment of SR-14.
6	US-31	Hunter Loop Rd		MO	X		X		Proposed new Maxwell AFB gate on Birmingham Hwy.
7	Zelda Rd	Zelda Ct	Vaughn Rd	MO	X	X	X		Proposed project to widen Zelda Rd to 5-lanes.

APPENDIX A: TRAVEL TIME AND DELAY STUDIES

Data and Analysis of Corridors

Travel Time and Delay Studies

Due to the large amount of data gathered during the travel time and delay studies, the full printed study is available as a separate document and online at http://www.montgomerympo.org/Documents.html .

APPENDIX C: CONGESTION RELIEF TOOLBOX

Strategies for Congestion Management

Congestion Relief Toolbox

A. Add Capacity/ Physical Improvements				
Strategy	**Description**	**Benefit/ Negative Externalities**	**Cost***	**Timeframe****
New Roads and Roadway Widening	Construction of new freeways or arterials; adding lanes or shoulders to existing freeways or arterials.	• traditional method to improve capacity • however, increase in capacity may lead to "induced demand"	High	Mid to Long-term
New Toll Roads	Construction of new roads that are tolled.	• potential for greater long-term congestion if tolls can be increased in response to growing demand • can divert traffic to roadways with less capacity	High but will generate revenue	Mid to Long-term
HOV lanes- new construction	Constructing new lanes for high-occupancy vehicles (HOV), high occupancy/ toll (HOT), or Express Toll usage;	• can increase overall throughput of roadway • can reduce total vehicle miles traveled • increases total capacity	High	Mid to Long-term
HOV lanes –conversion of existing roadways	Converting general purpose lanes to HOV and; or converting HOV to HOT or Express Toll lanes.	• can increase overall throughput of roadway • can reduce total vehicle miles traveled	Low to medium	Short-term
Geometric Design Improvements/ Intersection Improvements	This includes widening to provide shoulders, additional turn lanes at intersections, improved sight lines, auxiliary lanes to improve merging and diverging, round-abouts and construction of bus pull-outs.	• reduction in delay • increase in capacity	Low to Medium	Mid to Long-term

Access Management	Reconstructing roadways and establishing local street and driveway design standards to limit access for midblock turning movements and meet minimum intersection spacing guidelines. Access management includes policies, design criteria, and facilities that minimize the number of driveways and intersecting roads accessing a main thoroughfare, including parallel service roads, shared driveways, median barriers, left turn restrictions and curb cut limitations.	• improved travel speeds	Low to Medium	Mid to Long-term
Street Connectivity	Providing a connected local street network to remove traffic loads from arterials as an alternative to disconnected local street system containing cul-de-sacs and circuitous or discontinuous routing patterns.	• reduces vehicle trip lengths • reduces traffic loads on arterials • supports pedestrian and bicycle travel • can increase congestion if not implemented along with access management and compact development strategies	Low or Cost Savings	Long Term

B. Use Existing Capacity More Efficiently/ Operational Improvements

Strategy	**Description**	**Benefit/ Negative Externalities**	**Cost***	**Timeframe****
Traffic Signal Optimization and interconnection	Retiming signals to reduce intersection delay; coordinating control of traffic signals along a corridor or network.	• increases in travel speeds • reductions in delay • reductions in vehicle stops	Low	Short-term
Centralized, Actuated control systems	Retiming signals to reduce intersection delay; coordinating control of traffic signals along a corridor or network.	• increases in travel speeds • reductions in delay • reductions in vehicle stops	Medium	Mid-term

Changeable lane assignment/ Reversible Streets	Reversible freeway or arterial lanes, time restricted-use lanes, peak period use of shoulder	• limited research • results can be significant in areas where traffic flow is highly unbalanced	Low to medium	Short-term
Congestion Pricing –increase tolls	Proactively managing demand and available highway capacity by dynamically adjusting the toll paid by users or varying tolls by time of day.	• reductions in delay experienced are similar to those of large-scale roadway expansion • highly dependent on pricing scheme	Low- revenue generating	Mid-term
Loading Zone Management	Establishment and management of on-street and/or off-street loading areas to reduce impacts of loading vehicles on traffic flow.	• can reduce traffic impacts of loading and unloading	Low	Mid-term
Incident Management	Identifying incidents more quickly, improving response times, and managing incident scenes more effectively.	• reduces unexpected or non-recurring congestion	Low to Medium	Short-term
Work Zone Management	Reducing the amount of time work zones need to be used and moving traffic more effectively through work zones, particularly at peak times.	• reductions in vehicle delay • increases in throughput and/or travel speeds	Low	Short-term
Dynamic Messaging/ Traveler Information	Provide travelers with real time information on roadway conditions, where incidents have occurred and congestion has formed to optimize trip and route decisions.	• can reduce delay by redirecting traffic to less congested roadways • results are strategy and context specific • largely dependent on the availability of alternative routes	Low to Medium	Short-term

C. Reduce Demand for Vehicle Travel

Strategy	Description	Benefit/ Negative Externalities	Cost *	Timeframe**
Land Use	Land use patterns to improve travel efficiency and reduce vehicle travel, including infill, mixed-use, higher densities, compact/walkable neighborhoods, transit-oriented development, pedestrian design, and parking management.	• reduces vehicle miles traveled • can support mode-shifting to mass transit, walk and bicycle • can improve overall accessibility	Low or Cost Saving	Long-Term
Freight Demand Management	Truck tolls, lane restrictions, delivery restrictions, intermodal facility, and access improvements to reduce total or peak-period truck traffic and/or shift freight traffic to other modes.	• often more effective when implemented as part of larger initiative • encourages reduced trips by increasing productivity per trip	Low	Short-Term
Non-Motorized Improvements	Bicycle and pedestrian improvements, including bike lanes, bike parking, shared-use paths, sidewalks, pedestrian crossings, traffic calming, and pedestrian amenities to encourage non-motorized travel.	• reduces vehicle miles traveled • can influence individual behaviors • in some cases, improvements can be at odds with congestion management	Low to Medium	Long-Term
Bus Service and Operations Improvements	Transit capacity or service enhancements to attract new riders including new fixed-guideway service, express/premium bus, new routes, higher frequencies, transit priority operations (bus-only lanes, signal priority, queue jumping), reduced fares, flex service, expanded park-and-ride, and traveler information.	• project and context specific • depends on nature of service improvements, number of new riders attracted, prior mode of riders and congestion offsets • reductions in vehicle miles traveled • can reduce travel times	High	Long-term

Transit and Ridesharing Programs	Programs intended to reduce commuting vehicle travel, including transportation management associations (TMAs), alternative mode information, transit subsidies, ridesharing/ride matching programs and incentives, vanpools, parking pricing or cash-out, telecommuting, alternative work schedules, guaranteed ride home, and worksite bicycle facilities.	• decrease in single occupancy vehicle trips • decrease vehicle miles traveled • is more effective when financial incentive offered to use program	Low to Medium	Short-Term
Telecommuting/ Alternative Work Hours	Programs intended to reduce commuting vehicle travel, including transportation management associations (TMAs), alternative mode information, transit subsidies, ridesharing/ride matching programs and incentives, vanpools, parking pricing or cash-out, telecommuting, alternative work schedules, guaranteed ride home, and worksite bicycle facilities.	• reduces vehicle miles traveled	Low to Medium	Short-Term

Source: NCHRP 20-24A, Task 63: Effective Strategies for Congestion Management

*Cost- Explanation of Chart

The cost rating is based on the following metrics:

- **High –** Typically major construction projects, other major infrastructure costs (e.g., area wide intelligent transportation systems), or costly services (e.g. ,transit operations) – ranging in the tens of millions per mile or per location covered, and the hundreds of millions for area wide applications;
- **Medium –** Modest infrastructure improvements (e.g., lane additions at intersections, more modest intelligent transportation systems or operational costs) – in the range of approximately $1 to $10 million per mile or per location covered, and the tens of millions for area wide applications;
- **Low –** Operations strategies (e.g., changing signal timing), minor construction, or strategies that primarily incur administrative/programmatic costs (e.g., land use policies) – typically less than $1 million per mile or per location covered, and the low millions for area wide applications.

Operating costs are noted where they are significant compared to capital costs. Social costs and benefits are not considered in this rating. However, some strategies (e.g., tolling) may be net revenue generators from a public sector perspective, and are noted as such.

**Timeframe-explanation of chart

- **Short-term** – less than five years;
- **Mid-term** – roughly five to 20 years; and
- **Long-term** – greater than 20 year timeframe.

APPENDIX D: IMPLEMENTATION PROJECTS

Proposed projects to support congestion relief for the Montgomery MPO Study Area

1. Taylor Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from I-85 Eastbound On Ramp to Eastchase Parkway

This segment of Taylor Road has high volume to capacity ratios (0.92 – 2.19 southbound on Taylor Road and 1.83 – 2.67 northbound on Taylor Road). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Taylor Road may include:

- Geometric Design Improvements (Study Need For Additional Left/Right Lanes and Thru Lanes) ($100,000-$200,000)**
- Traffic Signal Optimization and Interconnection (Upgrade) ($20,000-$40,000)
- Geometric Design Improvements (Consider Unconventional Intersection Geometric Designs - Median U-Turns, Superstreet, Etc.) ($200,000-$1,500,000)
- Geometric Design Improvements (Study Reconfiguring I-85 Ramp Terminal, Consider Dual On Ramp Lanes) ($100,000-$200,000)
- Access Management (Utilize Best Practices) ($20,000-$40,000)
- Other (Increase Visibility of Berryhill as Access Point to Shopping at East Chase) ($30,000-$100,000)

Construction Cost Range**

From	To
$500,000	$15,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

2. East Boulevard

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from Carmichael Road to Monticello Drive

This segment of East Boulevard has a high volume to capacity ratio (1.21 – 2.30) and a high incidence of non-recurring congestion. This segment is experiencing severe congestion and may need additional capacity.

Proposed Implementation Strategies

Improvements to this segment of East Boulevard may include:

- Traffic Signal Optimization and Interconnection ($20,000-$50,000)**
- Geometric Improvement (Additional Lanes in Both Directions) ($400,000-$7,000,000)
- Geometric Design Improvements (Consider a Slip Lane Southbound North of Intersection for Access to Frontage Road) ($300,000-$5,000,000)
- Geometric Design Improvements (Consider Eliminating Frontage Roads Near Intersection) ($280,000-$3,000,000)

Construction Cost Range**

From	To
$1,000,000	$15,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

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3. East Boulevard

Intersection with Carmichael Road

This intersection with East Boulevard has a high volume to capacity ratio (2.14 - 2.30 north of intersection, 1.27 - 1.28 south of intersection) and a high incidence of non-recurring congestion. This intersection experiences severe congestion indicating the potential need for additional capacity.

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Proposed Implementation Strategies

Improvements to the intersection at East Boulevard may include:

- Geometric Design Improvements (Study Grade Separated , Tight Diamond Interchange) ($300,000-$7,000,000)**
- Geometric Design Improvements (Study Unconventional Intersection Design) ($300,000-$4,000,000)
- Traffic Signal Optimization and Interconnection (Analyze Whether Separating Left/Thru Lane into Two Lanes Would Improve Level of Services at Intersection) ($60,000-$100,000)
- Geometric Design Improvements (Additional Lanes in Both Directions) ($340,000-$4,000,000)

Construction Cost Range**

From	To
$1,000,000	$15,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

4. East Boulevard

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Intersection with Westbound I-85 Off Ramp

This intersection of East Boulevard has a high volume to capacity ratio (1.21 - 2.29 on East Blvd south of intersection and 1.60 - 1.67 north of intersection). This intersection has severe congestion and may need additional capacity.

Proposed Implementation Strategies

Improvements to the intersection at East Boulevard may include:

- Geometric Design Improvements (Reconfigure Ramp Terminal, Consider Dual Rights) ($375,000-$1,500,000)**
- Geometric Design Improvements (Study Unconventional Intersection Design) ($375,000-$1,500,000)

Construction Cost Range**

From	To
$750,000	$3,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

5. Wetumpka Highway (US-231)

Source: Google Maps

Segment from Jasmine Hill Road and Anderson Road

This segment of the Wetumpka Highway has high volume to capacity ratios (1.84 – 2.17) and experiences non-recurring congestion. This segment is experiencing extreme congestion and may need additional capacity.

Proposed Implementation Strategies

Improvements to this segment of the Wetumpka Highway may include:

- Geometric Design Improvements (Study Need for Additional Lane from Jasmine Hill to Anderson) ($100,000-$200,000)**
- Geometric Design Improvements (Intersection Improvements at Redland Road and Jasmine Hill) ($100,000-$2,000,000)
- Geometric Design Improvements (Intersection Improvements at Anderson Road) ($100,000-$2,000,000)
- Geometric Design Improvements (Study Need for Geometric Improvements and/or Additional Lane at Redland Road Intersection) ($100,000-$2,000,000)
- Traffic Signal Optimization and Interconnection (Redland Road and Jasmine Hill) ($30,000-$40,000)
- Access Management (Install Raised Median with Turn Lanes from Jasmine Hill to Anderson) ($50,000-$100,000)

Construction Cost Range**

From	To
$500,000	$6,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

6. Cobbs Ford Road

Source: Google Maps

Segment from US 82 to I-65

This segment of Cobbs Ford Road has a high volume to capacity ratio(2.10 - 2.13 from US-82 to I-65 SB On/Off Ramps, 1.18-2.17 at the I-65 SB On Ramps to I-65 NB On/Off Ramps). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Cobbs Ford Road may include:

- Access Management (Remove Median Openings, Create More Right-In/Right Out Driveways and Utilize Backage Roads) ($160,000-$200,000)**
- Traffic Signal Optimization and Interconnection (Improve US-82 Intersection/Signal Optimization, Optimize Through Movement During Peak Periods) ($20,000-$50,000)
- Growth Management Program ($10,000-$30,000)
- Geometric Design Improvements (Connect Highland Ridge Drive to Rocky Mt Road) ($300,000-$2,000,000)
- Transit and Ridesharing Programs ($10,000-$40,000)

Construction Cost Range**

From	To
$500,000	$2,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

7. Wetumpka Highway (US-231)

Intersection with Redland Road

This intersection on Wetumpka Highway has high travel times during peak AM and PM periods as well as during off peak hours and high volume to capacity ratios (1.14 - 1.15 east of intersection, 1.84 - 1.85 north of intersection, and 2.16 - 2.17 south of intersection). This indicates severe congestion and the potential need for additional capacity.

Source: Google Maps

Proposed Implementation Strategies

Improvements to the intersection at Wetumpka Highway may include:

- Geometric Design Improvements (Study Need for Additional Lanes) ($100,000-$200,000)**
- Geometric Design Improvements (Intersection Improvements) ($100,000-$2,000,000)
- Traffic Signal Optimization and Interconnection ($30,000-$40,000)
- Access Management (Utilize Best Practices) ($30,000-$40,000)

Construction Cost Range**

From	To
$250,000	$2,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

8. East Main Street

Source: Google Maps

Segment from US-82 to Greystone Way

This segment of Greystone Way has high travel times during peak AM and PM periods as well as during off peak hours. Volume to capacity ratios are high (1.14/1.20 from Greystone Way to McQueen Smith Rd, 0.81 - 1.11 from McQueen Smith Rd to Old Farm Lane, 0.97 - 2.13 from Old Farm Ln to I-65). This indicates severe congestion and the potential need for additional capacity. In addition, the corridor experiences non-recurring congestion.

Proposed Implementation Strategies

Improvements to this segment of Greystone Way may include:

- Traffic Signal Optimization and Interconnection ($20,000-$60,000)**
- Access Management (Median Replacement of Two-Way Left Turn Lanes, Consolidate Driveways, Convert Entrances to Right-in/Right-Out Only) ($60,000-$200,000)
- Geometric Design Improvements (Intersection Improvements, Additional Right Turn Lanes at Driveways) ($400,000-$5,000,000)
- Growth Management Plan ($10,000-$30,000)
- Transit and Ridesharing Programs ($10,000-$40,000)

Construction Cost Range**

From	To
$500,000	$5,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

9. Taylor Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Interchange with I-85 Ramps

This interchange with Taylor Road has high volume to capacity ratios (1.38 eastbound on-ramp from north, 2.11 eastbound on-ramp from south, and 1.11 westbound off-ramp). This indicates severe congestion and the potential need for additional capacity. It also has a high incidence of non-recurring congestion.

Proposed Implementation Strategies

Improvements to the interchange at Taylor Road may include:

- Geometric Design Improvements (Study Ramp Configurations, Possible Geometric Improvements) ($100,000-$1,000,000)**
- Traffic Signal Optimization and Interconnection (with Adjacent Intersections on Taylor Road) ($40,000-$60,000)
- Geometric Design Improvements (Study Uncoventional Interchange Design Modifications such as Diverging Diamond, Single Point Urban, Etc.) ($300,000-$15,000,000)
- Geometric Design Improvements (Study Adding Additional Lanes Through The Interchange) ($200,000-$4,000,000)

Construction Cost Range**

From	To
$500,000	$15,000,000

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**Construction Cost Ranges are estimates and intended for planning purposes only.

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10. Troy Highway (US-231)

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Intersection with Christine Elizabeth Curve/Virginia Loop Road

This intersection on Troy Highway has high volume to capacity ratios (1.47 north of intersection, 2.02/2.04 south of intersection) indicating severe congestion and the need for additional capacity. It also has a high incidence of non-recurring congestion.

Proposed Implementation Strategies

Improvements to the intersection at Troy Highway may include:

- Geometric Design Improvements (Study Intersection Improvements/Realignment) ($250,000-$3,000,000)**
- Traffic Signal Optimization and Interconnection ($20,000-$50,000)
- Access Management (Driveway Consolidation, Improvements to or Removal of Service Road) ($20,000-$50,000)

Construction Cost Range**

From	To
$250,000	$3,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

11. South Boulevard

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from Narrow Lane Road to Troy Highway (US 231)

This segment of South Boulevard has high travel times during peak AM and PM periods as well as during off peak hours and a high volume to capacity ratio (1.51 – 2.0) indicating severe congestion and the potential need for added capacity.

Proposed Implementation Strategies

Improvements to this segment of Southern Boulevard may include:

- Geometric Design Improvements (Study Need for Additional Lanes) ($100,000-$200,000)**
- Geometric Design Improvements (Unconventional Geometric Design Improvements - Median U-turns, Superstreet, Etc.) ($440,000-$5,000,000)
- Geometric Design Improvements (Frontage Road Extensions) ($300,000-$500,000)
- Traffic Signal Optimization and Interconnection (Upgrades) ($20,000-$40,000)
- Access Management (Reduce Median Openings, Driveway Consolidation) ($50,000-$500,000)
- Geometric Design Improvements (Intersection Study at Morrow Drive, Duel Left Turns at Morrow Eastbound to Northbound) ($100,000-$200,000)
- Access Management (Utilize Best Practices) ($40,000-$60,000)

Construction Cost Range**

From	To
$750,000	$6,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

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12. Atlanta Highway

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from South Burbank Drive to East Blvd West Service Road

This segment of Atlanta Highway has high travel times during the peak AM and PM periods as well as during off peak hours. Volume to capacity ratios are 1.26 - 1.61 indicating severe congestion and potentially the need for additional capacity.

Proposed Implementation Strategies*

Improvements to this segment of Atlanta Highway may include:

- Traffic Signal Optimization and Interconnection ($20,000-$50,000)**
- Access Management (Driveway Consolidation, Median Closures) ($60,000-$500,000)
- Geometric Design Improvements (Improvements to Turning Movements at East and West Service Roads) ($200,000-$700,000)
- Geometric Design Improvements (Additional Lanes in Both Directions) ($1,000,000-$5,000,000)
- Bus Service and Operations Improvements ($20,000-$60,000)
- Transit and Ridesharing Programs ($10,000-$40,000)

Construction Cost Range**

From	To
$750,000	$5,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

13. Chantilly Parkway

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Interchange with I-85

This interchange on Chantilly Parkway has a high incidence of non-recurring congestion and high volume to capacity ratios (1.54 north of interchange, 1.87 at interchange, and 1.70 south of interchange). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to the interchange on Chantilly Parkway may include:

- Traffic Signal Optimization and Interconnection ($20,000-$60,000)**
- Geometric Design Improvements (Consider Unconventional Interchange Design Alternatives) ($2,000,000-$10,000,000)
- Geometric Design Improvements (Additional Lanes, Improved Geometrics) ($400,000-$2,000,000)

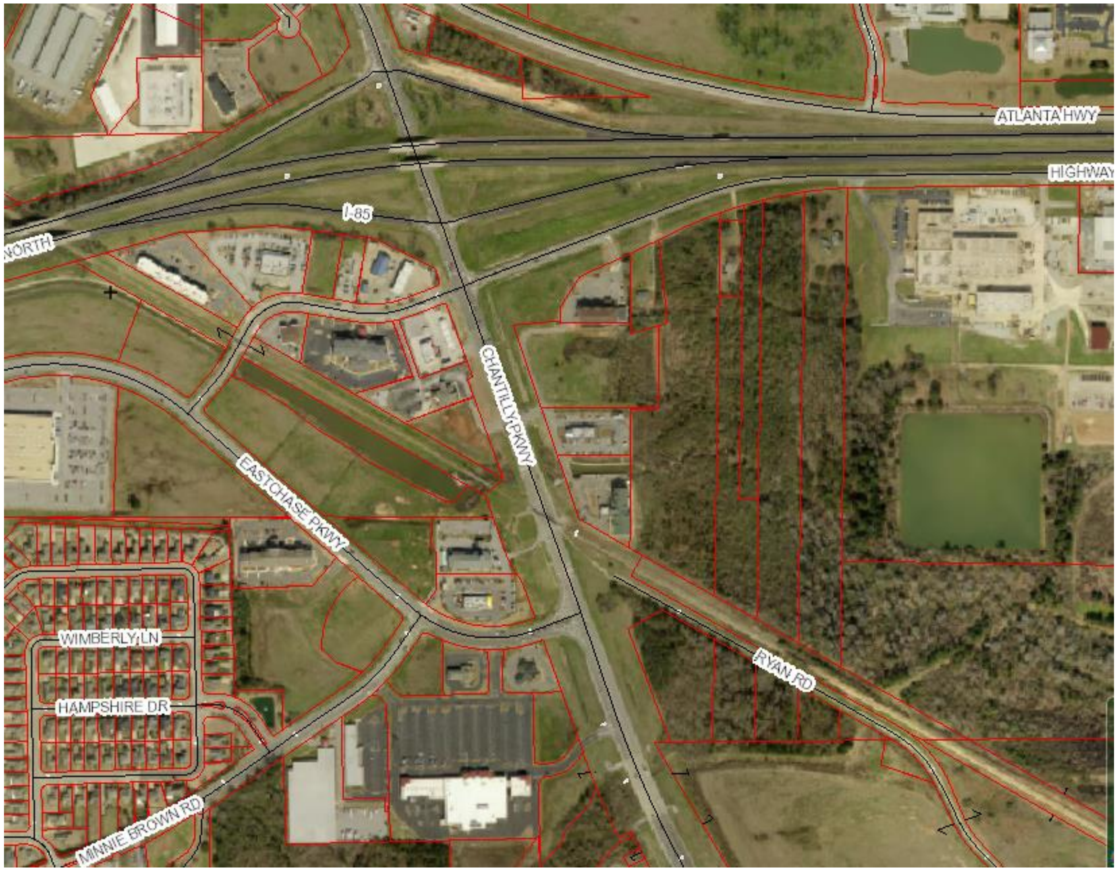
Construction Cost Range**

From	To
$750,000	$10,000,000

*All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.

**Construction Cost Ranges are estimates and intended for planning purposes only.

14. Chantilly Parkway- US-80



Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from Atlanta Highway to Eastchase Parkway

This segment of Chantilly Parkway has a high Volume to capacity ratio (1.35-1.87). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Chantilly Parkway may include:

- Traffic Signal Optimization and Interconnection ($20,000-$60,000)**
- Geometric Design Improvements (Consider Interchange Ramp Terminal Intersection Designs Such as Roundabouts, Diverging Diamond, Etc.) ($1,000,000-$5,000,000)
- Geometric Design Improvements (Additional Lanes Would Help, But May Require Interchange Reconstruction) ($5,000,000-$14,000,000)
- Geometric Design Improvements (Lanes Could Be Added South of the Interchange and at Eastchase Intersection) ($500,000-$1,000,000)
- Geometric Design Improvements (Consider Adding Right Turn Lanes onto Boyd Cooper Parkway) ($200,000-$400,000)
- Access Management (For Existing And Future Developments At The Interchange) ($20,000-$60,000)

Construction Cost Range**

From	To
$1,000,000	$20,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

15. South Boulevard

Intersection with Woodley Road

This intersection on Southern Boulevard has a high volume to capacity ratio(1.70 - 1.76 east of intersection, 1.80 - 1.81 west of Intersection, 1.36 north of intersection, 1.23 at intersection, and .99 south of intersection). This indicates severe congestion and the potential need for additional capacity. It also experiences a high incidence of non-recurring congestion.

Proposed Implementation Strategies

Improvements to the intersection at Southern Boulevard may include:

- Geometric Design Improvements (Study Unconventional Intersection Design Options) ($250,000-$4,000,000)**
- Geometric Design Improvements (Study Ultimate Grade Separation, Urban Interchange Design) ($450,000-$6,000,000)
- Traffic Signal Optimization and Interconnection ($40,000-$60,000)
- Access Management (Utilize Best Practices/Intersection-Interchange Area Development Guidelines) ($60,000-$90,000)

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Construction Cost Range**

From	To
$750,000	$10,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

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16. State Route 14

Interchange with I-65

This interchange on State Route 14 has high volume to capacity ratios (1.68 - 1.70 east of intersection, 1.62 - 1.63 west of intersection, and 1.37 - 1.80 at the intersection). This indicates severe congestion and the potential need for additional capacity. It also has a high incidence of non-recurring congestion.

Source: Google Maps

Proposed Implementation Strategies

Improvements to the interchange on State Route 14 may include:

- Geometric Design Improvements (Study Unconventional Intersection Design Options) ($125,000-$1,500,000)**
- Geometric Design Improvements (Study Need for Additional Lanes) ($125,000-$1,500,000)
- Traffic Signal Optimization and Interconnection ($30,000-$60,000)
- Access Management (Interchange Area Development Guidelines) ($30,000-$60,000)

Construction Cost Range**

From	To
$250,000	$3,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

17. State Route 14

Source: Google Maps

Intersection with Grandview Road (CR8/CR10)

This intersection of State Route 14 has a high volume to capacity ratios (1.15 – 1.16 east of intersection, 1.68 - 1.70 west of Intersection, 1.03 - 1.08 north of intersection, 1.05 - 1.06 south of intersection). It also has a high incidence of non-recurring congestion. This intersection experiences severe congestion and additional capacity may be needed.

Proposed Implementation Strategies

Improvements to the intersection at State Route 14 may include:

- Geometric Design Improvements (Study Intersection Improvement Options Including More Conventional Right Turn Lane on Grandview Road and Separation of Thru and Left Lanes on Grandview Road) ($150,000-$1,000,000)**
- Geometric Design Improvements (Additional Lanes Westbound to I-65) ($100,000-$1,000,000)
- Traffic Signal Optimization and Interconnection (Study Need for Signalization) ($20,000-$40,000)

Construction Cost Range**

From	To
$250,000	$2,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

18. State Route 14

Source: Google Maps

Segment from I-65 to Grandview Road

This segment of State Route 14 has high travel times during peak AM and PM periods and high volume to capacity ratios (1.68 - 1.70). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of State Route 14 may include:

- Geometric Design Improvements (Study Need for Additional Eastbound Thru Lane) ($100,000-$2,000,000)**
- Geometric Design Improvements (Intersection Improvements and Signalization of Camp Grandview and Grandview Road Intersections) ($500,000-$3,000,000)

Construction Cost Range**

From	To
$250,000	$3,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

19. Taylor Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from Halcyon Boulevard to Vaughn Road

This segment of Taylor Road has high travel times during peak PM period and the off peak and high volume to capacity ratios (1.50-1.64), indicating severe congestion and the possible need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Taylor Road may include:

- Geometric Design Improvements (Study Need For Additional Left/Right Lanes) ($400,000-$1,000,000)**
- Access Management (Study Closing Some Median Openings, Convert Existing Driveways to Right-in/Right-Out Only) ($60,000-$500,000)
- Geometric Design Improvements (Unconventional Intersection Geometric Designs - Median U-Turns, Superstreet, Etc.) ($500,000-$4,000,000)
- Access Management (Utilize Best Practices) ($20,000-$40,000)

Construction Cost Range**

From	To
$500,000	$4,000,000

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20. Perry Hill Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from Atlanta Highway to I-85

This segment of Perry Hill Road has a high volume to capacity ratio (1.11-1.63) and a high incidence of non-recurring congestion. This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Perry Hill Road may include:

- Geometric Design Improvements (Additional Lanes, Especially North of Harrison Road, More Right Turn Lanes into Businesses) ($60,000-$4,000,000)**
- Traffic Signal Optimization and Interconnection ($60,000-$100,000)
- Access Management (Implement Best Practices where Feasible) ($60,000-$500,000)
- Bus Service and Operations Improvements ($20,000-$60,000)
- Transit and Ridesharing Programs ($10,000-$40,000)

Construction Cost Range**

From	To
$750,000	$4,000,000

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21. Vaughn Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment Taylor Road to Halcyon Park Drive

This segment of Vaughn Road has high travel times during peak AM and PM periods as well as during off peak hours. It also has a high volume to capacity ratio (1.59 - 1.63). This indicates severe congestion and the potential need for additional capacity.

Proposed Implementation Strategies

Improvements to this segment of Vaughn Road may include:

- Geometric Design Improvements (Add Eastbound Lane) ($250,000-$2,000,000)**
- Traffic Signal Optimization and Interconnection ($20,000-$30,000)
- Access Management (Install Raised Median with Turn Lanes, Eliminate Bi-directional Turning Movements) ($40,000-$200,000)
- Geometric Design Improvements (Improved Entrances to Festival Plaza) ($40,000-$200,000)

Construction Cost Range**

From	To
$250,000	$2,000,000

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22. Pike Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Intersection with Vaughn Road

This intersection on Pike Road has a high travel times in the AM and PM peaks and off peak. It also experiences high volume to capacity ratios (1.56 - 1.58 on Vaughn Road west/east of intersection and 1.02 – 1.23 on Pike Road south/north of intersection).

Proposed Implementation Strategies

Improvements to this intersection may include:

- Geometric Design Improvements (Study Need For Additional Turn Lanes and/ or Through Lanes at Intersection) ($200,000-$750,000)**
- Signal Timing and Optimization ($25,000-$50,000)
- Access Management (Intersection Area Development Guidelines) ($25,000-$50,000)

Construction Cost Range**

From	To
$250,000	$750,000

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23. State Route 14

Intersection with McQueen Smith Road

This intersection on State Route 14 has high travel times during peak AM and PM periods as well as during off peak hours and high volume to capacity ratios (1.52 - 1.54 east of intersection and 1.13 - 1.15 west of intersection).

Source: Google Maps

Proposed Implementation Strategies

Improvements to the intersection at State Route 14 may include

- Geometric Design Improvements (Study Unconventional Intersection Design Options) ($250,000-$2,000,000)**
- Traffic Signal Optimization and Interconnection ($20,000-$40,000)
- Access Management (Convert Entrances to Right-In/Right-Out Only near Intersection) ($30,000-$100,000)

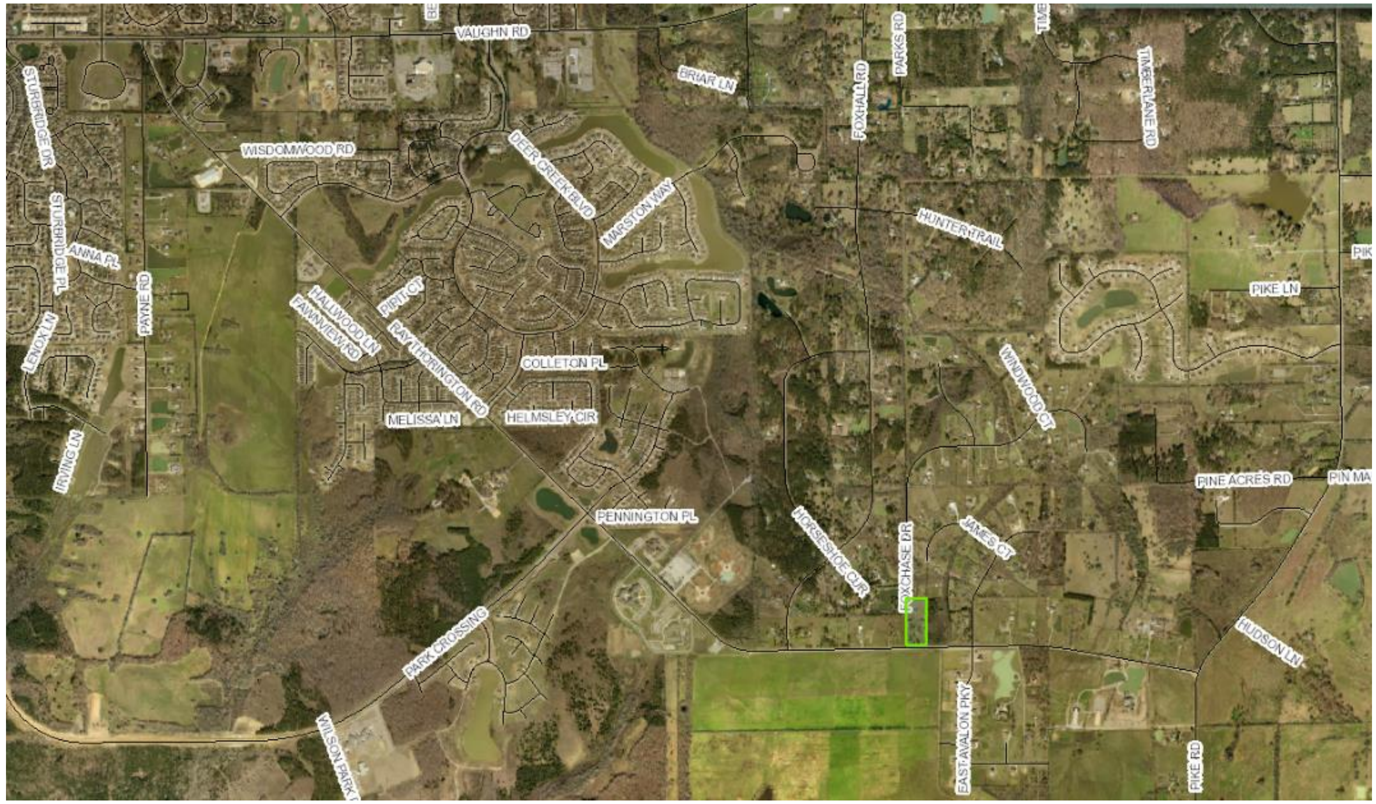
Construction Cost Range**

From	To
$250,000	$2,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

24. Ray Thorington Road



Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment Pike Road to Vaughn Road

This segment of Ray Thorington Road has high travel times during peak AM and PM periods as well as during off peak hours and a high volume to capacity ratio (1.53 north of Park Crossing).

Proposed Implementation Strategies

Improvements to this segment of Ray Thorington Road may include:

- Geometric Design Improvements (Intersection improvements and Signal Optimization at Vaughn Road and Park Crossing) ($200,000-$1,500,000)**
- Traffic Signal Optimization and Interconnection(Study Need for Signalizing Deer Creek Crossing, Deercreek Lane and Hallwood Drive) ($30,000-$60,000)
- Geometric Design Improvements (Consider Additional Lanes from Foxhall Road to Vaughn Road) ($250,000-$4,500,000)
- Access Management (Use Best Practices Where Possible) ($20,000-$60,000)

Construction Cost Range**	
From	**To**
$500,000	$4,500,000

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25. Carter Hill Road

Source: http://isv.kcsgis.com/al.montgomery_revenue/

Segment from McGehee Road to Vaughn Road

This segment of Carter Hill Road has high travel times during peak AM and PM periods as well as during off peak hours. Volume to capacity ratios are 1.12 - 1.45 indicating severe congestion and potentially the need for additional capacity.

Proposed Implementation Strategies*

Improvements to this segment of Carter Hill Road may include:

- Geometric Design Improvements (Additional Lanes for Entire Segment in Both Directions with Center Turn Lane) ($1,000,000-$4,000,000)**
- Access Management (Where Possible) ($60,000-$1,000,000)
- Bus Service and Operations Improvements ($20,000-$60,000)
- Transit and Ridesharing Programs ($10,000-$40,000)
- Non-motorized Improvements (Sidewalks to Schools) ($20,000-$60,000)
- Other (Evaluate Efficiency of School Drop-off/ Pick-ups) ($10,000-$30,000)

Construction Cost Range**

From	To
$500,000	$4,000,000

***All previous and ongoing engineering and planning studies should be evaluated/ consulted prior to funding and implementation of a congestion mitigation strategy.**

****Construction Cost Ranges are estimates and intended for planning purposes only.**

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