MARCH

2017

Congestion Management Process

COASTAL REGION MPO

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RESOLUTION

COASTAL REGION METROPOLITAN PLANNING ORGANIZATION

ADOPTION OF CORE MPO 2017
CONGESTION MANAGEMENT PROCESS

WHEREAS, in accordance with the joint Federal Transit Administration - Federal Highway Administration regulations on urban transportation planning (23 CFR Parts 420 and 450, and 49 CFR Part 613), a Congestion Management Process is required to be developed; and

WHEREAS, the Coastal Region Metropolitan Planning Organization (CORE MPO) has been designated by the Governor of Georgia as the Metropolitan Planning Organization for the Savannah urbanized area; and

WHEREAS, the Congestion Management Process is consistent with all plans, goals, and objectives of the Coastal Region Metropolitan Planning Organization; and

WHEREAS, directs the CORE MPO staff and advisory committees to use the information contained herein to inform their development of future plans and programs.

NOW, THEREFORE BE IT RESOLVED, that the Coastal Region Metropolitan Planning Organization adopts the CORE MPO Congestion Management Process as its recommendations.

CERTIFICATION

I hereby certify that the above is a true and correct copy of a Resolution adopted by the Coastal Region Metropolitan Planning Organization Board at a meeting held on March 22, 2017.

Albert J. Scott, Chairman
Coastal Region Metropolitan Planning Organization

Contents

1.0 Executive Summary 1
2.0 Background 1
FAST Act 2
CMP Development 4
Geographic Area 5
Travel Characteristics 7
Regional Commuting Patterns 7
Planning Process 7
3.0 Regional Objectives for Congestion Management 8
4.0 Network 9
5.0 Performance Measures 10
Level of Service (LOS) 11
Travel Time and Reliability 12
Average Travel Time 12
95th Percentile Travel Times 12
Buffer Index 12
6.0 Methodology and Evaluation 13
7.0 Data Collection 14
Travel Time and Speed Data 14
National Performance Management Research Data Set (NPMRDS) 14
I-95 Coalition 15
Georgia Department of Transportation Crash Data 15
Chatham Area Transit Ridership Data 15
Georgia Department of Transportation Traffic Counts 15
Local Agency Traffic Counts 16
Non-Motorized Data 16
Freight Data 17
Origin and Destination Data 17
CORE MPO Travel Demand Model 18
8.0 Existing Conditions 19
Roadway 19
Interstate/Freeway 20

Arterials 20
Collectors 20
Local Roadways 20
Transit 22
Freight 23
Non-Motorized Transportation 23
Existing Pedestrian Facilities 23
Existing Bicycle Facilities or Treatments 24
Bicycle Level of Service 24
Safety 25
9.0 Analysis of Congestion and Mobility Issues 26
Interstate Travel Time Analysis 26
Arterial Travel Time Analysis 30
US 17 30
SR 21 30
SR 204/Abercorn 31
DeRenne Avenue 31
US 80 31
SR 25 31
SR 144 31
Average Travel Time Speeds 35
Bottleneck Locations 42
Origin and Destination Data 42
Level of Service 48
Transit 48
Freight Network Bottlenecks Identified in the CORE MPO Freight Transportation Plan 50
Non-motorized Traffic 54
Pedestrian Trips 54
Bicycle Trips 57
Before-and-After Analysis of the Impact of the Price Street Bike Lane on Bicycle Volumes 58
Savannah Belles Ferry 60
10.0 Congested Corridors 61
Constrained Corridors 62
11.0 Identify and Assess CMP strategies 64

Constrained Corridors 64
Interstate and Principal Arterial Strategies 69
Freight Bottleneck Strategies 75
Develop corridor signal timing on major truck routes – example GDOT Regional Traffic Operations Program (RTOP) 75
Short – Term Freight Infrastructure Improvement Recommendations (Years 0 – 5) 75
Mid – Term Freight Infrastructure Improvement Recommendations (Years 6 – 15) 76
Long – Term Freight Infrastructure Improvement Recommendations (Years 16 – 25) 77
The Thoroughfare Plan 77
Non-Motorized Transportation 78
Transit 79
Savannah Belles Ferry 80
Program and implement CMP strategies 80
12.0 Evaluate Strategy Effectiveness 80
13.0 Next Steps 81
Future CMP Updates 81
Appendix A: Travel Speed Maps 84
Appendix B: Bottleneck Ranking 92
Appendix C: AirSage Data Attributes 97
Appendix D: Origin and Destination Maps 100
Appendix E: CMP 2016 Report Card 111

Tables

Table 1: Means of Commuting 7
Table 2. Congestion Management Process (CMP) Performance Measures 13
Table 3: Miles by Functional Class in the Savannah Area, 2012 19
Table 4: VMT in CORE MPO Planning Area 20
Table 5: Mileage of Existing Sidewalks (each side counted separately) and Shared Use Paths 24
Table 6: Mileage of Existing Bicycle Facilities (in centerline miles) 24
Table 7: Bicycle Level of Service Evaluation Results 25
Table 8: Chatham County Percent of Statewide Fatalities 26
Table 9: Interstate Travel Time Analysis 29
Table 10: Arterial Travel Time Analysis 32
Table 11: Top 20 Bottleneck Locations 43
Table 12: Existing and Future Conditions Congestion Levels – Travel Demand Model Data 48
Table 13: AM Congestion with PM Marginal Congestion 51
Table 14: AM and PM Marginal Congestion 51

Table 15: AM Congestion 51
Table 16: PM Congestion 51
Table 17: Freight Advisory Committee (FAC) Identified Bottleneck Locations 52
Table 18: Most Congested Corridors 61
Table 19: Constrained Corridors 64
Table 20: Congestion Management Strategies – Freeways 65
Table 21: Congestion Management Strategies – Non-Freeways 66
Table 21: Congestion Management Strategies – Non-Freeways (Continued) 67
Table 22: Congestion Management Strategies – Regional 68
Table 23: Congestion Strategies by Corridor Segment 70
Table 24: Short Term Improvements 76
Table 25: Projects Under Construction 76
Table 26: Mid Term Improvements 77
Table 27: Long Term Improvements 77
Table 28: Nonmotorized Transportation Strategies 79
Table 29: 2016 CMP Report Card and Strategy Evaluation 83

Figures

Figure 1. Elements of the Congestion Management Process 3
Figure 2: 2016 – 2017 CMP Update Study Area and Network 6
Figure 3: Total Mobility Plan Goals 8
Figure 4: Level of Service 11
Figure 5. AirSage Data 17
Figure 6. CORE MPO Travel Demand Model Area 18
Figure 7: Functional Classification of Network 21
Figure 8: CAT Bus Routes 22
Figure 9: Percent of Roadway Miles by Functional Class in the Study Area 23
Figure 10: Fatalities for Chatham County and the State of Georgia 25
Figure 11: Fatalities in the CORE MPA Boundary 27
Figure 12: Average Travel Speeds AM Peak October 2015 36
Figure 13: Average Travel Speeds AM Peak April 2016 37
Figure 14: Average Travel Speeds Mid-Day October 2015 38
Figure 15: Average Travel Speeds Mid-Day April 2016 39
Figure 16: Average Travel Speeds PM Peak October 2015 40
Figure 17: Average Travel Speeds PM Peak April 2016 41
Figure 18: Data Collection Zones 44
Figure 19: Morning Home Based Work Trips for a Resident Worker 45
Figure 20: Non Visitor Home Based Other Trips 46
Figure 21: Inbound Commuter Morning Home Based Work Trips 47
Figure 22: Chatham Area Transit Ridership By Route 49
Figure 23: Bottleneck Locations throughout the Study Area 53
Figure 24: Pedestrian Trip Trends in Weekday Evening 55
Figure 25: Pedestrian Trip Trends on Broughton Street in Weekday Evening 55
Figure 26: Pedestrian Trip Trends at Saturday Mid-day 56

Figure 27: Pedestrian Trip Trends on Broughton Street at Saturday Mid-day 56
Figure 28: Bicycle Trip Trends in Weekday Evening 57
Figure 29: Bicycle Trip Trends at Saturday Mid-day 58
Figure 30: The Positive Effect of the Price Street Bike Lane on Bicycle Trips on Three Streets 59
Figure 31: Savannah Belles Ferry Ridership 60

1.0 Executive Summary

The Chatham County – Savannah Metropolitan Planning Commission (MPC) 2016 - 2017 Congestion Management Process (CMP) was conducted to evaluate the conditions of the existing roadway network, prepare recommendations for congestion mitigation measures, and project the future conditions of the primary roads within the Coastal Region Metropolitan Planning Organization (CORE MPO) Metropolitan Planning Area (MPA) which includes all of Chatham County, Richmond Hill in Bryan County, and portions of Effingham County and Bryan County within the 2010 census-defined Savannah Urbanized Area. This information will be used by the MPO primarily to identify congestion and mobility problems and target these areas for improvement.

> *The study approach is to identify problem areas using multimodal data sources and prepare recommendations to improve the traffic flow on the transportation system as a whole and on specific corridors. The results of this study will be used as factors in prioritizing needed improvements.*

The objective of the Coastal Region Metropolitan Planning Organization (CORE MPO) Congestion Management Process is the application of strategies to improve performance and reliability of the transportation system. The CMP assists regional stakeholders in assessing congestion-related metrics, formulating decisions aimed at relieving congestion, and communicating congestion metrics to public officials and the general public.

The CMP serves several key functions:

- Ensures consistency with the CORE MPO's Metropolitan Transportation Plan (MTP) and other planning processes;
- Provides a "toolbox" of congestion management strategies that can be applied to various improvement needs; and
- Establishes a recommended framework to assess, report and monitor congestion.

2.0 Background

In the early 1990's, the CMP was first introduced as a Congestion Management System (CMS). The CMS was created by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and continued under the successor law, the Transportation Equity Act for the 21st Century (TEA-21) in 1998. In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), introduced a change in nomenclature from Congestion Management System (CMS) to Congestion Management Process (CMP). This change reflects a shift in perspective and practice to address congestion management through a comprehensive process with enhanced linkages to the Metropolitan Planning Organization (MPO) planning process and the environmental review process; as well as cooperatively developed travel demand reduction and operational management strategies, and capacity increases.[1] The subsequent transportation authorization act, Moving Ahead for Progress in the 21st Century (MAP-21), signed into law[2] by President Obama on July 6, 2012, made essentially no change in the requirements for a CMP.

[1] USDOT, FHWA, Office of Planning, Environment, & Realty (HEP), http://www.fhwa.dot.gov/planning/congestion_management_process/

[2] Public Law No: 112-141

Federal regulations require that MPOs with a population over 200,000 be designated as Transportation Management Areas (TMA)[3]. The TMA is required to develop and have in place a process for managing congestion. This CMP must provide recommendations for the effective management of congested facilities and efficient mobility and ensure that all potential alternatives to address congestion have been examined for identified projects that include additional roadway capacity.

With an urbanized area population of 260,677 as defined by the 2010 Census, the CORE MPO is designated as a TMA. As described in federal regulations (23 CFR 450.320) and guidance, the CMP should be a systematic process that "provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities...".

FAST Act

On December 4, 2015, President Obama signed into law the Fixing America's Surface Transportation Act, or "FAST Act." It is the first law enacted in over ten years that provides long-term funding certainty for surface transportation, meaning States and local governments can move forward with critical transportation projects, like new highways and transit lines, with the confidence that they will have a Federal partner over the long term. The FAST Act continues the requirements of a Congestion Management Process which was first introduced as the Congestion Management System in the Intermodal Surface Transportation Efficiency Act of 1991.

The Federal Register established the regulations and expectations of a CMP that applies to those TMA's above 200,000 in population as determined by the 2010 Census. The Register is written in such a way as to provide guidance and minimums, but leaves specifics up to the agency to customize their approach to maximize the local benefits. Those minimums include the requirement that the system needs that are identified through the CMP be considered in preparation of the metropolitan transportation plan. Congestion, for the CMP guidance, is the level at which the transportation system performance is no longer acceptable due to traffic interference.

This regulation leaves it open to the local agency to define what is unacceptable delay or congestion. The register further suggests, "An effective CMP is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs."

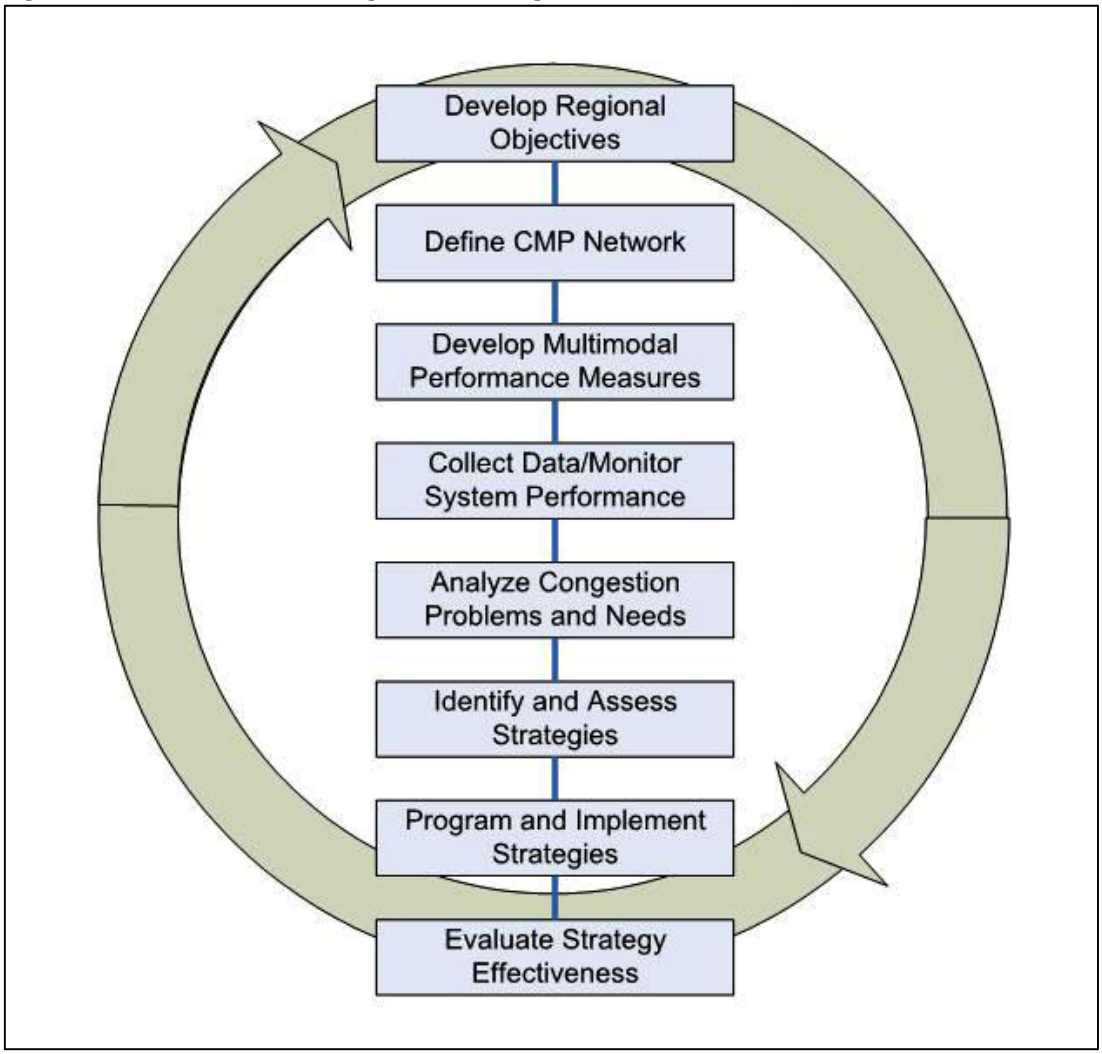
This development process is structured within the framework of the federal legislative and regulatory requirements, including the Federal Highway Administration (FHWA) guidance entitled *Congestion Management Process: A Guidebook, 2011.* The tasks completed as a part of the CORE MPO CMP align with the eight elements outlined within these guidelines which provide a general approach for the development of a CMP. The illustration from the Guidebook shown in Figure 1 demonstrates the elements of the CMP.

[3] In some cases, a UZA represented by a MPO with less than 200,000 residents may also be designated as a TMA, upon request from the State Governor and MPO representatives.

The following steps of the CMP development as published in the FHWA's Congestion Management Process Guidebook[4] include:

- Develop regional objectives for congestion management
- Define CMP network
- Develop multimodal performance measures
- Collect data and monitor system performance
- Analyze congestion problems and needs
- Identify and assess CMP strategies
- Program and implement CMP strategies
- Evaluate strategy effectiveness

Figure 1. Elements of the Congestion Management Process



Source: FHWA

[4] http://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/

CMP Development

CORE MPO developed its first Congestion Management System (CMS) in 2003/2004 under the original CMS requirements prior to the passage of the Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users (SAFETEA-LU). After the passage of SAFETEA-LU, FHWA advised CORE MPO that the existing CMS had exceeded the original CMS requirements at the time it was developed, and that it already met the new SAFETEA-LU requirements for a Congestion Management Process (CMP). FHWA further recommended that the CMS be renamed and recertified by the CORE MPO as a Congestion Management Process. CORE MPO recertified the CMS as a CMP on June 27, 2007.

The CORE MPO CMP seeks to address congestion and improve the transportation network using a streamlined approach. This was accomplished through identified performance measures and tools, as well as goals established in the previous 2004 CMP Report.

The 2004 CMP used travel time runs and GPS data to measure a.m. and p.m. travel speed on all arterials and major collectors in Chatham County, and then Level of Service (LOS) was estimated and a congestion index was defined. The CMP identified problem areas using travel-time, and provided strategies to improve the traffic flow on the transportation system as whole, as well as on specific corridors. Performance measures identified through the CMP process were both quantitative and qualitative, and included:

- Congestion Index;
- Approach Level of Service;
- Preservation of regional mobility through the implementation of alternative access improvements to enhance local mobility;
- Implementation of sustainable development through the incorporation of mixed-use, pedestrian-oriented design that helps to minimize trip length; and
- Promotion of multimodal connectivity through the implementation of transit, bicycle, and pedestrian enhancements.

Key findings of the 2004 CMP included:

- 90% of roadway segments were observed to operate at an acceptable level of service.
- Most congested segments were on roadways that already had planned and/or programmed improvements on the books.
- The next highest portion of congested segments would benefit from improved signal timing optimization and coordination. Of the roadway segments that were congested, 23% and 15% of them would improve to acceptable levels with updated timing in the a.m. and p.m. periods respectively.
- The third large group of congested segments were roadways previously designated as constrained corridors. Capacity improvements on these roads are limited, thus operational improvements should be considered to maximize throughput.

In 2009, the CORE MPO Congestion Management Process (CMP) Update was developed to further evaluate and address congestion in Chatham County focusing on congested hot spots. The CMP Update recommended addressing congestion through an ongoing process involving improving traffic operations and management on existing roads and adding capacity, among other strategies. These strategies have been incorporated into the performance measures identified in this CMP update and will be used to address roadway system performance, land use and development impacts, and freight system service.

Ongoing Congestion Management Process activities since the initial CMP focused on implementation of its recommendations, evaluation of the implemented strategies, development of performance measures, and additional data collection and analysis in certain areas. Specifically, these activities include:

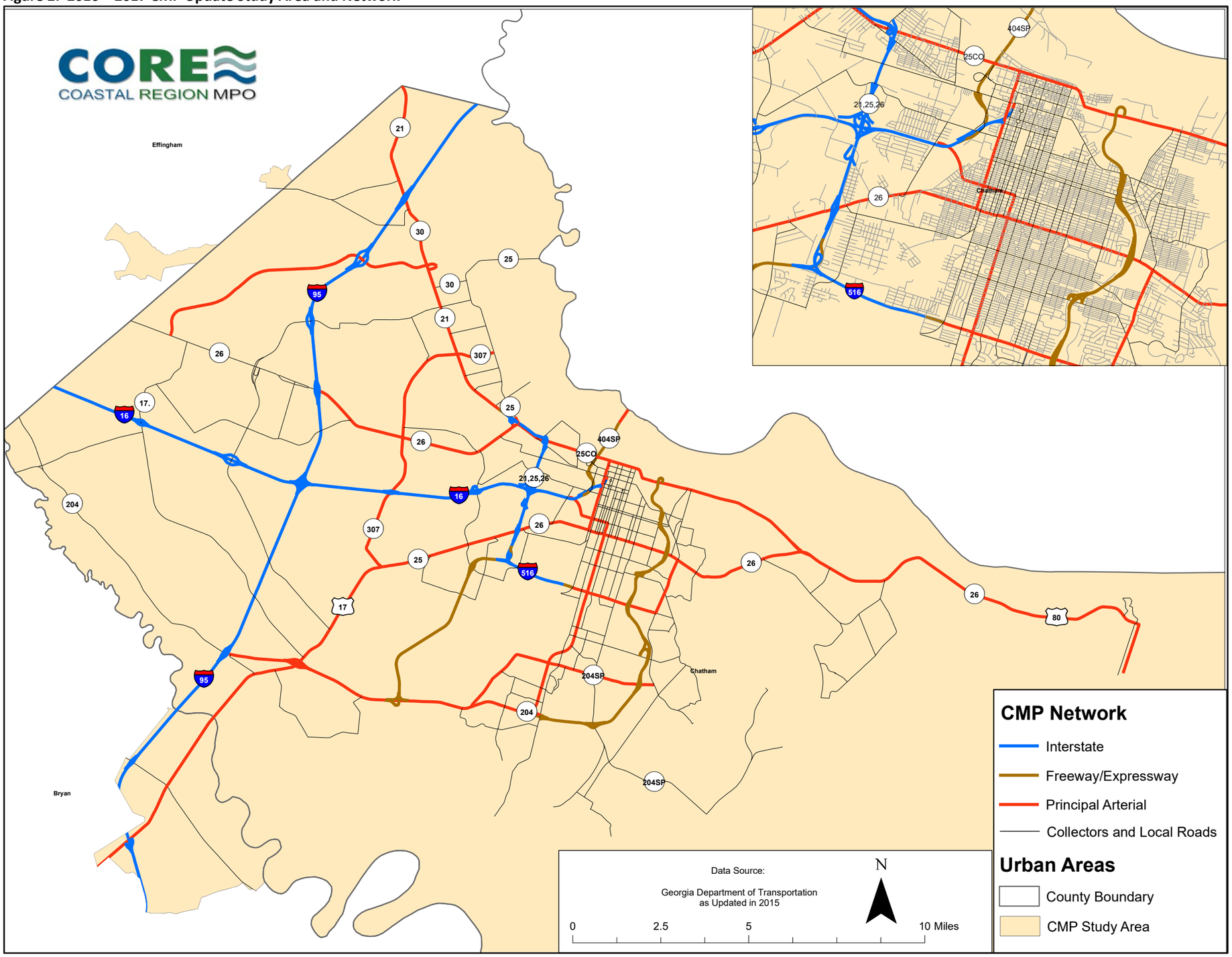
- CMP update to include reliability measures such as travel, buffer and planning time indexes (2016 - 2017)
- Numerous capacity improvements (2004 – 2017)
- Signal retiming and coordination on some of the most congested corridors, including Abercorn Street and DeRenne Avenue (2004 – 2017)
- Focused corridor studies and hot spot analyses (2009 CMP Update; SR 204 Corridor Study (2013); SR 21 Corridor Study (2013); US 80 Corridor Study (2013); Victory Drive Corridor Studies – 2015 to 2016)
- Other congestion related studies supporting MTP and TIP development (SW Chatham Sector Study – 2007; President Street Corridor Study – 2007; Transit Vision Plan – 2012; Park and Ride Study – 2014.)
- Traffic Management Center Study (2016 - 2017)
- Freight Transportation Plan (Freight Network Bottleneck, 2016)
- Report card for the top 20 congestion corridors identified in the 2007 CMP (2016)
- Congestion reduction performance measures development (Freight Transportation Plan – 2016, 2040 Total Mobility Plan – FY 2015, federal webinars and workshops – 2015-2017)

This document focuses on the CMP update that is conducted in 2016 and 2017.

Geographic Area

The 2016 - 2017 CMP update study area includes Chatham County and portions of Bryan and Effingham Counties as seen in Figure 2 below.

Figure 2: 2016 – 2017 CMP Update Study Area and Network



Travel Characteristics

The Savannah area has a warm climate, flat terrain, and strong grid pattern, which is conducive to workers utilizing a variety of modes in traveling to their places of employment, although driving alone is still the mode choice of many workers. The City of Savannah and Chatham County are continuing to invest in bicycle and pedestrian infrastructure to ensure the safety of the users and to provide network connectivity.

The US Census American Fact Finder estimates that in 2015 in the City of Savannah, 70% of workers drove to work alone and 80% of the workers in Chatham County drove alone to work, as compared to 80% in the State of Georgia and 76% in the US (see Table 1). Carpooling rates in Savannah were higher than either the State of Georgia or the United States as a whole. The City of Savannah also exhibits a high percentage of walking (3.8%) and biking (2.2%).

Table 1: Means of Commuting

Means of Commuting (2015 American Fact Finder Estimates)

Location	Drive Alone	Carpool	Transit	Walk	Bike	Work From Home	Other*
Savannah	70%	12%	6%	4%	2%	3%	3%
Chatham County	80%	9%	2%	3%	1%	4%	1%
Bryan County	84%	9%	0%	2%	1%	2%	3%
Effingham County	86%	9%	2%	1%	0%	4%	1%
Georgia	80%	10%	2%	2%	2%	5%	1%
United States	76%	10%	5%	3%	1%	4%	1%

*Includes taxi, motorcycle, other means

Source: United State Census Bureau, American Fact Finder

Regional Commuting Patterns

Chatham County and the City of Savannah are regional hubs for employment, shopping, recreation, medical services, education, and other economic generators. Many residents of neighboring counties commute into Chatham County for work each day, greatly impacting the traffic patterns and overall efficiency of the transportation network. Within Chatham County, about 93.6% of Chatham County's working residents work in Chatham County based on the 2013 Georgia Department of Labor data.

The neighboring counties of Bryan and Effingham have approximately 51.6% and 57.9% of their working residents respectively commuting into Chatham County for work each day. Other nearby counties also experience a significant out-commuting pattern. Liberty and Bulloch Counties both have approximately 11% of their working population working in Chatham County and those workers have a typical commute time of about one hour each way. Jasper County, SC, just across the Savannah River, has about 10% of its working population commuting into Chatham County for work each day.

Planning Process

The CORE MPO CMP was developed through a collaborative effort and provides a means to achieve the region's vision and goals in coordination with other planning efforts. The CMP is a dynamic tool that serves as a mechanism for implementing strategies to achieve regional mobility, livability, emissions reduction, and the integration of transportation and land use.

The collaborative development of the CORE MPO CMP was completed in conjunction with the Chatham Area Transit Authority (CAT) within the framework of the overall goals and objectives of the MPO and the CMP. Input and guidance was also provided by the CORE MPO Technical Coordinating Committee (TCC) and the CORE MPO Board.

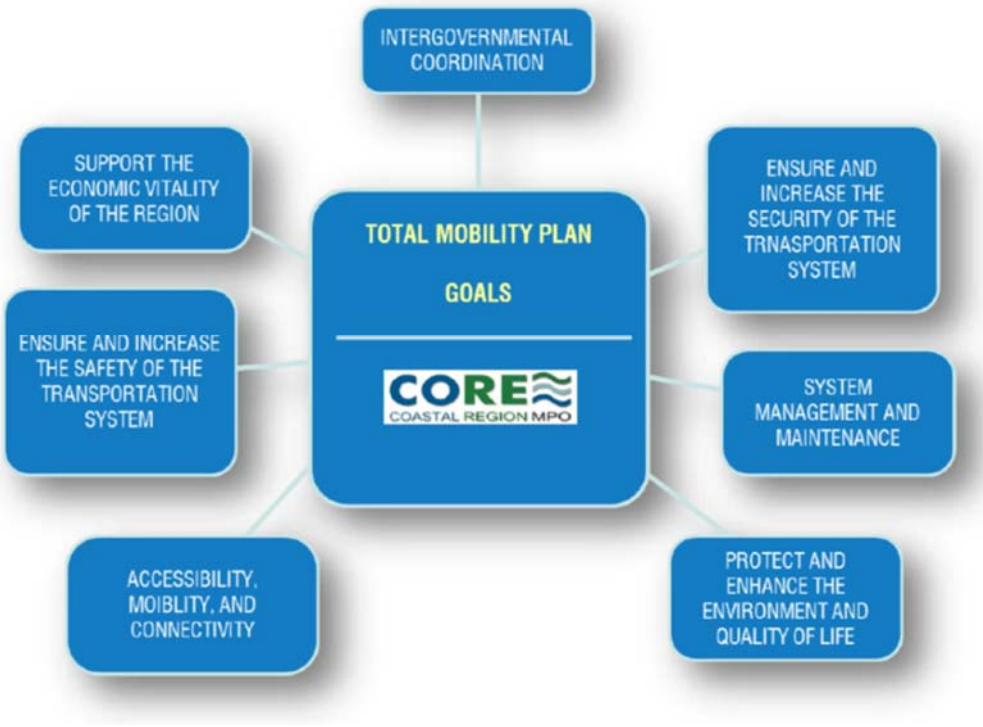
3.0 Regional Objectives for Congestion Management

The starting point for the CMP is the development of regional objectives for congestion management. These objectives draw from the regional vision and goals that are articulated in the MPO's 2040 MTP. Congestion management objectives define what the region wants to achieve regarding congestion management, and are an essential part of an objectives-driven, performance-based approach to planning for operations. Congestion management objectives serve as one of the primary points of connection between the CMP and the MTP, and will serve as a basis for defining the direction of the CMP and performance measures that are used.

The goals that CORE MPO identified as part of the 2040 MTP update (see Figure 3) form the framework for the identification of the goals for the CMP. The CORE MPO goals include:

- Support Economic Vitality
- Ensure and Increase Safety
- Ensure and Increase Security
- Accessibility, Mobility and Connectivity
- Protect and Enhance the Environment and Quality of Life
- System Management and Maintenance
- Intergovernmental Coordination

Figure 3: Total Mobility Plan Goals



The CMP addresses the goals of the MTP and includes objectives specific to the CMP development. The ten objectives are:

Objectives:

- Develop congestion management measures.
- Reduce non-recurring congestion duration.
- Evaluate travel time reliability to the 95th percentile.
- Consider the full range of congestion management strategies.
- Improve the reliability and resiliency of the transportation network through the implementation of these strategies.
- Consider low-cost, system efficiency and demand management solutions before capacity
- Achieve acceptable approach Level of Service (LOS) D.
- Preserve regional mobility through the implementation of alternative access improvements to enhance local mobility.
- Implement sustainable development through the incorporation of mixed-use, pedestrian-oriented design that helps to minimize trip length.
- Promote multimodal connectivity through the implementation of transit, bicycle, and pedestrian enhancements.

These objectives are influenced by national, state and regional planning processes and requirements. From a national perspective, these objectives are consistent with the intent of the latest transportation legislation and related regulations guiding statewide and regional planning processes. From a regional perspective, these objectives are consistent with the CORE MPO's overall and Metropolitan Transportation Plan (MTP) goals. Finally, the CMP objectives address the multimodal nature of transportation, as well as the need to address both recurring and non-recurring congestion. With the understanding of the dynamic nature of congestion at the national, state, regional and local levels, the CORE MPO will continue to periodically review the process and make further refinements needed to address changing conditions.

4.0 Network

The purpose of the CMP is it to monitor and relieve traffic congestion throughout the MPO region. As part of the CMP process, a roadway network needs to be defined for the study area. Previous CMP efforts for the CORE MPO were contained within the boundary of Chatham County, but with the 2010 Census, the CORE MPO region has expanded to include portions of Effingham County and Bryan County within the Savannah Urbanized Area, as well as the city of Richmond Hill. The CMP update includes an expanded network to reflect these regional boundary changes.

Fundamentally, the CMP network must include those areas that meet the regionally identified definition of 'congested' and represent the area for data collection and monitoring activities. Multimodal transportation elements are important factors for addressing congestion in any urban area. Elements of a multimodal network include:

- Freeways or interstate highways
- Arterial roadways (primarily Principal Arterials although minor arterials often support other elements of the multimodal network for example non-motorized strategies are more likely to be located on a minor arterial or collector versus a principal arterial.)
- Transit services
- Bicycle networks
- Pedestrian networks
- Freight networks
- Ferry System

Although the CMP has traditionally focused primarily on the road network, the CMP network should consider the transit, bicycle, and pedestrian modes as well as their interface with the highway network. Doing so can help take advantage of strategies that rely upon the other modes to reduce single occupancy vehicle (SOV) travel. Typically, collectors and local roadways are not included in the roadway analysis of the CMP since it would be time-consuming to address these roadways and they generally have relatively low traffic volumes and congestion levels; however, these facilities should still be considered as potential bicycle, pedestrian, or transit corridors. The CMP analysis network will often include major intersections along arterials, given that intersections are often points where travel delay occurs.

The CORE MPO network (see Figure 2) includes:

- Chatham County and Richmond Hill. At this time, no significant sections of the arterial network are in the Effingham County portion of the CORE MPO Metropolitan Planning Area (MPA).
- Study timeframe: Base year 2015 (where data is available). Other data years may be substituted as needed.
- Roadway network: Major Arterials and higher (autos & freight), transit routes, non-motorized (bike, pedestrian) network and ferry system.
- Top 20 congestion corridors identified in previous CMP efforts.

5.0 Performance Measures

Performance measures are a critical component of the CMP. Per Federal regulation, the CMP must include "appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods. Since levels of acceptable system performance may vary among local communities, performance measures should be tailored to the specific needs of the area and established cooperatively by the State(s), affected MPO(s), and local officials in consultation with the operators of major modes of transportation in the coverage area."[5]

[5] 23 CFR 450.320 (c) 2

Performance measures in the CMP characterize current and future conditions on the multimodal transportation system in the region. However, performance measures serve multiple purposes that intersect and overlap in the context of the CMP, including[6]:

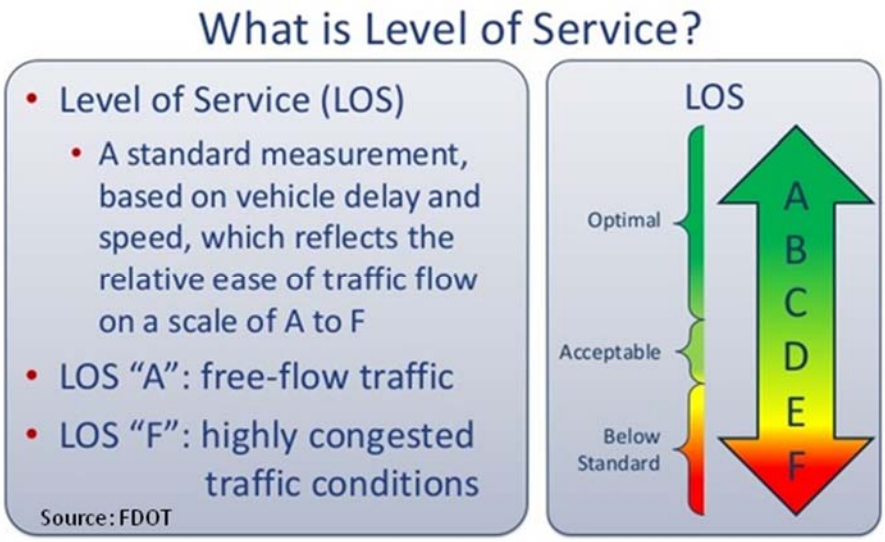
- To characterize existing and anticipated conditions on the regional transportation system;
- To track progress toward meeting regional objectives;
- To identify specific locations with congestion to address;
- To assess congestion mitigation strategies, programs, and projects; and
- To communicate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

This section breaks down the various performance measures used in the CORE CMP update. Another key component to the performance measure is the data used to calculate the measures. Information on the data sources can be found in Section 7: Data Collection.

Level of Service (LOS)

Level-of-Service is introduced by the Highway Capacity Manual (HCM)[7] to denote the level of quality one can derive from a facility under different operation characteristics and traffic volume. HCM proposes LOS as a letter that designates a range of operating conditions on a facility. Six LOS letters are defined by HCM, namely A, B, C, D, E, and F, where A denotes the best quality of service and F denotes the worst (see Figure 4). These definitions are based on Measures of Effectiveness (MOEs) of that facility. Typical measures of effectiveness include speed, travel-time, density and delay. There will be an associated service volume for each of the LOS levels. A service volume or service flow rate is the maximum number of vehicles, passengers, or the like, which can be accommodated by a given facility or system under given conditions at a given LOS. For the purpose of identifying congestion in the CORE MPO CMP, analysis will focus on LOS D, E and F.

Figure 4: Level of Service



[6] http://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/
[7] 2010 Highway Capacity Manual

Travel Time and Reliability[8]

Reliability is an important metric for highway users because it provides information that allows travelers to plan for on-time arrival with more certainty. Commuters can plan the daily trips to work during peak hours, parents can plan the afternoon run to the daycare center, businesses know when a just-in-time shipment must leave the factory, and transit agencies can develop reliable schedules. Travel time reliability measures compare high-delay days to those with an average delay. The most effective methods of measuring travel time reliability are 95th percentile travel times, buffer index, and planning time index.

Most travelers are less tolerant of unexpected delays because such delays have larger consequences than drivers face with everyday congestion. Travelers also tend to remember the few bad days they spent in traffic, rather than an average time for travel throughout the year. To improve travel time reliability, the first step is to measure it. Measures of travel time reliability better represent a commuter's experience than a simple average travel time.

Average Travel Time

Average (mean) travel time is the average of all the recorded travel times. This measure describes the typical experience on the road that year.

95th Percentile Travel Times

Travel time reliability can be measured in percentiles. This method, 95th percentile travel time, is perhaps the simplest method to measures travel time reliability. It estimates how bad delay will be on specific routes during the heaviest traffic days. The one or two bad days each month mark the 95th percentile, respectively. Users familiar with the route (such as commuters) can see how bad traffic is during those few bad days and plan their trips accordingly. This measure is reported in minutes.

Buffer Index

The buffer index represents the extra time (or time cushion) that travelers must add to their average travel time when planning trips to ensure on-time arrival. For example, a buffer index of 40 percent means that for a trip that usually takes 20 minutes a traveler should budget an additional 8 minutes to ensure on-time arrival most of the time.

Average travel time = 20 minutes
Buffer index = 40 percent
Buffer time = 20 minutes × 0.40 = 8 minutes

The 8 extra minutes is called the buffer time. Therefore, the traveler should allow 28 minutes for the trip to ensure on-time arrival 95 percent of the time.

[8] http://ops.fhwa.dot.gov/publications/tt_reliability/TTR_Report.htm

6.0 Methodology and Evaluation

The methodology for evaluating congestion as part of the Congestion Management Process (CMP) focuses on the development of performance measures. The following performance measures were identified by the CORE MPO Technical Coordinating Committee to quantify the CMP's objectives and provide a means for assessing and analyzing congestion. Table 2 depicts the established performance measures, the data needed for the analysis, and how each performance measure aligns with CMP objectives.

The data collection effort for the CORE MPO CMP focused on travel time and speed data, Level of Service, crash data, travel patterns/desire lines and information from the regional travel demand model. Several supplemental data sets were also collected such as transit ridership, non-motorized data, freight data and ferry ridership.

Table 2. Congestion Management Process (CMP) Performance Measures

Performance Measure	Definition	Data Source	CMP Objective
% of Roadway Miles at a Level of Service (LOS)	A qualitative measure that characterizes operational conditions within a traffic stream, and the perception by motorists and passengers.	Travel demand model	Develop congestion management measures
# of Fatalities	Number of Fatalities in the region in relation to the state.	GDOT GEARS	Reduce non-recurring congestion duration
Average Travel Time	Average travel time (the mean) is the average of all the recorded travel times. This measure describes the "average" experience on the road that year.	NPMRDS	• Develop congestion management measures. • Evaluate travel time reliability to 95th percentile.
95th Percentile Travel Time Reliability	The travel time required for reliable on time arrival 95 % of the time.	NPMRDS	• Develop congestion management measures. • Evaluate travel time reliability to 95th percentile.

Performance Measure	Definition	Data Source	CMP Objective
Travel Time Buffer Index	The buffer index represents the extra time (or time cushion) that travelers must add to their average travel time when planning trips to ensure on-time arrival.	NPMDRS	• Develop congestion management measures. • Evaluate travel time reliability to 95th percentile.
% of Travel Patterns on facilities with LOS D or worse	Data extracted from AirSage to determine travel patterns and desire lines and the coordination with potential transit strategies to address congestion	AirSage	• Improve the resiliency, redundancy, and reliability of the transportation network • Develop congestion management measures

7.0 Data Collection

The CMP is a compilation of several data sources analyzed together to help determine areas of concern. Gathering data to monitor system performance is typically the element of the CMP that requires the largest amount of staff time for the MPO and its planning partners. After establishing performance measures that will be used to evaluate system performance and a plan for collecting data, regions are ready to gather the data necessary to inform the CMP. Below is a description of the data collection and resources used for the CMP update.

Travel Time and Speed Data

Travel Time data was collected from three resources.

National Performance Management Research Data Set (NPMRDS)

FHWA has acquired a national data set of average travel times for use in performance measurement. This data set is being made available to States and Metropolitan Planning Organizations (MPOs) as a tool for performance measurement. Passenger probe data is obtained from several sources including mobile phones, vehicles, and portable navigation devices. Freight probe data is obtained from the American Transportation Research Institute leveraging embedded fleet systems. Data includes:

- Passenger vehicle travel times.
- Freight vehicle travel times.
- Combined freight and passenger vehicle travel times.

I-95 Coalition

The I-95 Corridor Coalition is a partnership of transportation agencies, toll authorities, public safety, and related organizations, from the State of Maine to the State of Florida, with affiliate members in Canada. The Coalition provides a forum for key decision makers to address transportation management and operations issues of common interest. This volunteer, consensus-driven organization enables its myriad state, local and regional member agencies to work together to improve transportation system performance far more than they could working individually. The Coalition has successfully served as a model for multi-state/jurisdictional interagency cooperation and coordination for over two decades.

As an affiliate member of the I-95 Coalition the CORE MPO has access to travel time data contained in the Probe Data Analytics tools suite. The Probe Data Analytics tools make use of 3rd party probe data (HERE, INRIX, TomTom, and even the NPMRDS) fused with other agency transportation data in a true "big data" analytics platform. The suite consists of a collection of data visualization and retrieval tools. These web-based tools allow users to download reports, visualize data on maps or in other interactive graphics, and even download raw data for off-line analysis.

Georgia Department of Transportation Crash Data

Crash data is obtained from the electronic repository (relational database) of the state's crash reports. The GDOT Geographic Electronic Accident Reporting System (GEARS) website is developed and maintained by LexisNexis on behalf of the Georgia Department of Transportation to serve as a portal into the State of Georgia's repository for traffic accident reports completed by Georgia law enforcement agencies. The integrity of the GEARS data is dependent upon both the accuracy and frequency with which the data is updated and user's interpretation.

Chatham Area Transit Ridership Data

All of CAT's ridership data is collected through the farebox. Each farebox is probed in the evening, which captures the ridership data from that day and feeds it into the software Genfare. The CAT planning department can then query the ridership data based on day/time, route, bus number, operator, fare type, etc. CAT will be installing Automatic Passenger Counters (APCs) on future bus purchases for stop-level ridership data.

Georgia Department of Transportation Traffic Counts

GDOT collects traffic counts using primarily permanent and portable counting devices at stations throughout the CORE MPO region. A traffic count (TC) is a count of the number of vehicles on State Routes, major county roads, and major city streets in each direction of the traffic flow. The following describes the three most common traffic data collection GDOT uses: permanent, portable and weigh-in motion traffic data collection.

- *Permanent Traffic Data Collection*

  Throughout Georgia, there are approximately 230 traffic data collection sites with permanent traffic data collection devices or Automatic Traffic Recorders (ATR). The devices at these sites classify and count the number of vehicles 7 days a week, 24 hours a day, 365 days a year. Collected traffic data is used for calculating the Annual Average Daily Traffic (AADT) estimates, determining traffic patterns and flows for modeling purposes, and developing plans for

alleviating traffic congestion. There at 19 such devices in Chatham County, 3 in Bryan County and 0 in Effingham County.

- *Portable Traffic Data Collection*

  Throughout Georgia, there are approximately 9,000 traffic data collection sites with portable traffic data collection devices. The devices at these sites count or classify and count the number of vehicles during a typical 48-hour period. Collected traffic data is used for calculating the Annual Average Daily Traffic (AADT) estimates, determining traffic patterns and flows for modeling purposes, and developing plans for alleviating traffic congestion. There are 594 such devices in Chatham County, 94 in Effingham County, and 75 in Bryan County.

- *Weigh-In-Motion Data Collection*

  Throughout Georgia, there are 34 weigh-in-motion data collection sites with portable weigh-in-motion data collection devices and 11 weigh-in-motion data collection sites with permanent weigh-in-motion data collection devices. The Federal Highway Administration (FHWA) requires that 10 of the weigh-in-motion data collection sites are on Interstates. The devices at these sites classify, weigh, and count the number of vehicles. Weigh-in-Motion data is used for pavement and capacity studies, for enforcement and inspection purposes, and for analysis of truck transport practices. There are no such devices in the CORE MPO area.

Local Agency Traffic Counts

Several local agencies have traffic counts completed with traditional counting methods. These counts are not comprehensive for the region but rather completed on an as needed basis. CORE MPO has received traffic count data from Chatham County, the City of Savannah and the City of Richmond Hill on various corridors.

Non-Motorized Data

Non-motorized data includes both bicycle and pedestrians as well as other non-motorized forms of transportation. Data considerations include both supply and volumes.

- *Non-Motorized Volumes*

  Bicycle and pedestrian counts are collected annually in selected locations throughout the planning area using methods published in the National Documentation Project which establish a consistent national bicycle and pedestrian count and survey methodology. Locations were chosen based on current activity, crash locations, and expected future improvements. Counts have been manually conducted by volunteers and therefore samples are limited to generally two-hour periods on two weekday evenings and on one Saturday at mid-day.

- *Non-Motorized Supply*

  The MPO measured mileage of various types of non-motorized facilities to the extent that those types were mapped. Also, a Bicycle Level of Service (BLOS) model was applied to evaluate conditions on the CORE MPO bikeway network. A pedestrian level of service model requires data that is unavailable for most of the planning area, and it therefore has not been applied.

Freight Data

The CORE MPO's Freight Transportation Plan contains a bottleneck analysis where the most critical bottlenecks along the network were identified as well as other areas where congestion exists and where bottlenecks may occur with increased demand. A bottleneck has been defined as a roadway segment with significant negative impacts on freight network performance. Bottlenecks are generally locations where capacities are inadequate to handle traffic flows, which impact the performance of freight network segments. Congestion, or the queuing/delay of freight movements, reduces the performance and dependability of the freight network in terms of serving freight traffic flows.

The bottlenecks were identified through the 2010 traffic survey conducted by GDOT. The available GDOT time-congestion grades, Average Annual Daily Traffic (AADT) and level-of-service (LOS) data were collected for in the study area. LOS information was not available for all segments where AADT was available.

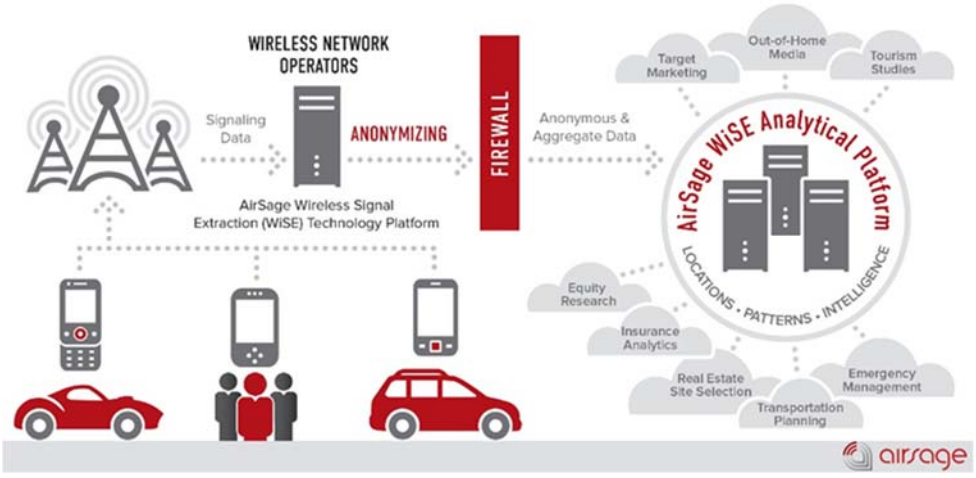
Origin and Destination Data

Origin-Destination studies are often used in transportation planning to determine the travel patterns (origin-destination matrix) of vehicles and goods in an area. Given these travel patterns, the impacts of alternative solutions to current and future transportation problems can be evaluated.

CAT and the CORE MPO entered a partnership to purchase origin and destination data from AirSage. This data will help provide a better understanding of how and where people are traveling throughout the region.

As depicted in Figure 5, AirSage provides data by collecting and analyzing mobile signal data. The data is anonymous and aggregated – the home and work locations of a device are at the census block group level where generally there are between 600 and 3,000 people. Aggregating and analyzing this data by time, location, origin and destination, provides insights into commuter travel patterns. The data will be organized by the Traffic Analysis Zone (TAZ) structure from the most recent CORE MPO travel demand model.

Figure 5. AirSage Data

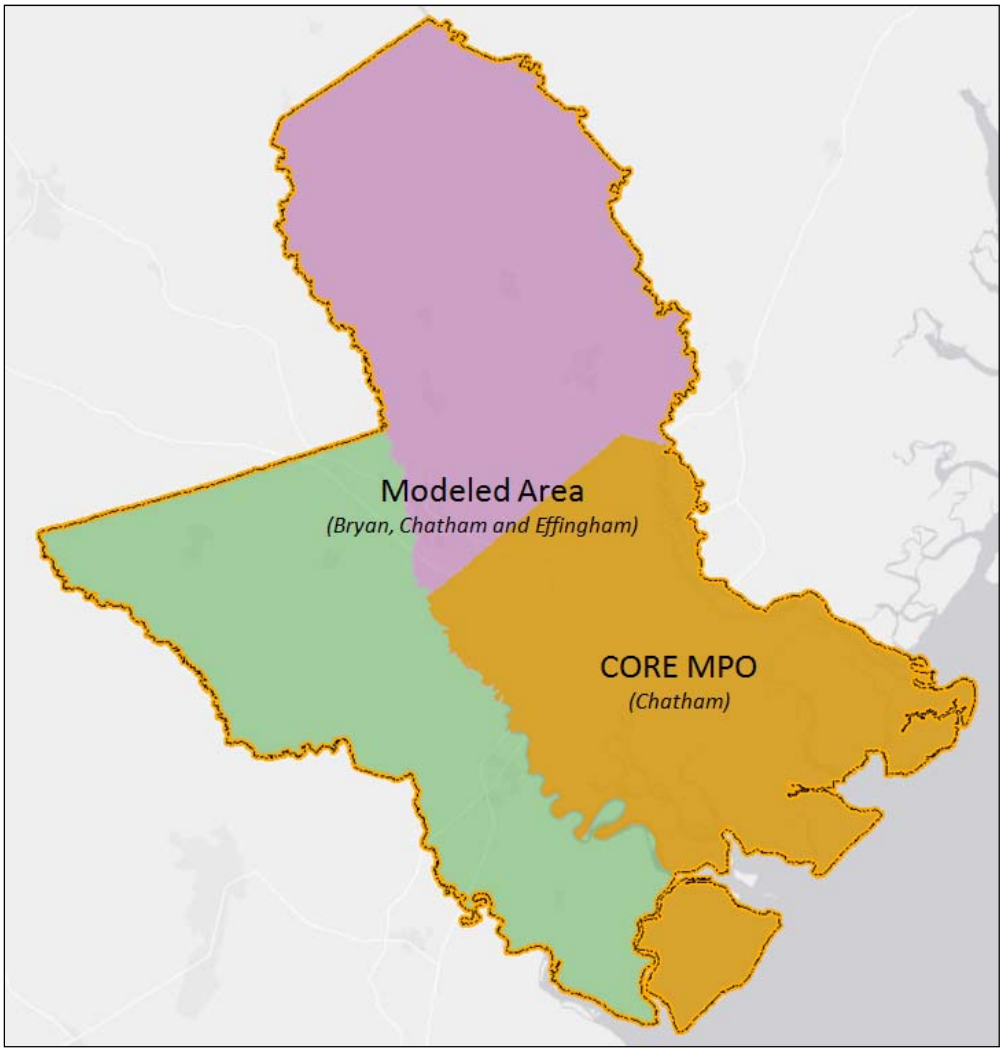


CORE MPO Travel Demand Model

The CORE MPO travel demand model is a traditional four-step aggregate trip based model, the four steps consisting of: trip generation, trip distribution, mode choice and traffic assignment.

While the CORE MPO Metropolitan Planning Area (MPA) consists Chatham County and those parts of Bryan and Effingham Counties within the Census defined 2010 Savannah Urbanized Area, the travel demand model includes all three counties to better represent regional travel patterns (see Figure 6).

Figure 6. CORE MPO Travel Demand Model Area



While the Georgia Department of Transportation is primarily responsible for the development and maintenance of the CORE MPO travel demand model, the MPO prepares the existing and future socioeconomic data within the MPA based upon available data from many sources including U.S. Census data, employment records, land use inventories, historical development patterns and local knowledge of development proposals and anticipated infrastructure improvements.

The CORE MPO travel demand model is a useful analytical tool for predicting future traffic congestion and provides the basis for project identification in the Metropolitan Transportation Plan (MTP) and project traffic forecasts.

8.0 Existing Conditions

Roadway

Though the CMP update mostly focuses on areas within CORE MPO MPA, it is also essential to keep in mind the larger regional network as travel has no boundaries. The three-county area (Chatham, Bryan and Effingham) has more than 1,600 miles of roadway. These roadways are state and county roads and city streets. These roadways are categorized by their use and the amount of traffic that is carried. Table 3 below shows the mileages of these roadways by functional classification. The map below (Figure 7) depicts the functional classification of the roadway network.

Table 3: Miles by Functional Class in the Savannah Area, 2012

Functional Class	Miles				Total		
	State Route		County Route		Miles		Percent
Rural Interstates	25.18	228.70	-	915.74	25.18	1,144.44	68.9%
Rural Principal Arterials	34.51		-		34.51		
Rural Minor Arterials	89.41		-		89.41		
Rural Major Collectors	79.60		104.08		183.68		
Rural Minor Collectors	-		103.09		103.09		
Rural Local	-		708.57		708.57		
Urbanized Interstate	37.51	141.43	-	342.01	37.51	483.44	29.1%
Urbanized Freeway	3.44		-		3.44		
Urbanized Principal Arterial	81.55		34.16		115.71		
Urbanized Minor Arterial	16.54		47.02		63.56		
Urbanized Collector	2.39		22.89		25.28		
Urbanized Local	-		237.94		237.94		
Small Urban Interstate	4.70	13.71	-	19.57	4.70	33.28	2.0%
Small Urban Freeway	-		-		-		
Small Urban Principal Arterial	3.94		-		3.94		
Small Urban Minor Arterial	5.07		-		5.07		
Small Urban Collector	-		2.49		2.49		
Small Urban Local	-		17.08		17.08		
Total		383.84		1,277.32		1,661.16	100.0%

Source: Office of Transportation Data, Georgia Department of Transportation, 445 Series Report, 2012

Interstate/Freeway

Roads that are fully access controlled and are designed to carry large amount of traffic at a high rate of speed over long distances; examples include roadways such as I-16 and Harry Truman Parkway.

Arterials

Roads that are designed to carry large amounts of traffic at a relatively high speed, often over longer distances. Often some degree of access management is incorporated; examples of arterials include Bay Street, Islands Expressway, and SR 204 and US 80.

Collectors

Roads that are designed to carry less traffic at lower levels of speed for shorter distances. These roadways typically "collect" traffic from the local roadways and provide the access to arterials. Examples of collectors include Habersham Street, LaRoche Avenue; and Old Louisville Road.

Local Roadways

Local roadways are those not otherwise classified and tend to serve short, local trips or connect land uses with the collectors to access the broader roadway network.

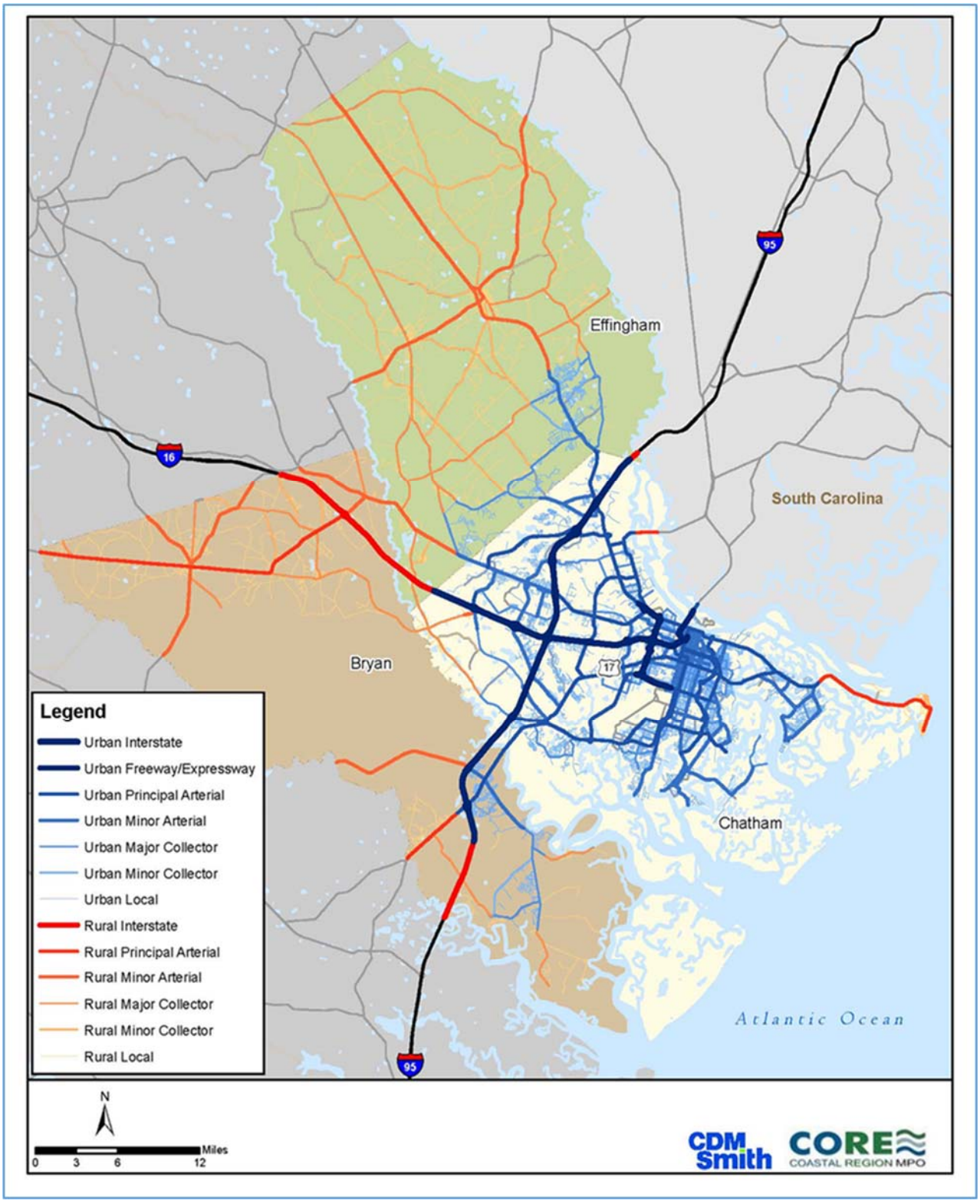
Table 4 shows the breakdown of the Vehicle Miles Traveled (VMT) on the network by functional classification as calculated by the CORE MPO travel demand model for 2010 and 2040. Over 80% of the VMT occurs on the region's principal arterials, expressway, and interstates which make up the CMP network.

Table 4: VMT in CORE MPO Planning Area

Functional Class	VMT 2010	Percent	VMT 2040	Percent
Interstates	2,381,144.36	34.32%	3,287,920.38	33.96%
Other Freeways	288,213.68	4.15%	628,025.26	6.49%
Expressways	197,769.77	2.85%	266,537.91	2.75%
Parkways	202,965.15	2.93%	238,533.11	2.46%
Ramps	187,427.00	2.70%	258,596.58	2.67%
Principal Arterials	2,414,185.11	34.79%	3,194,481.29	33.00%
Minor Arterials	791,808.92	11.41%	1,044,233.99	10.79%
One-Way Arterials	89,720.49	1.29%	106,524.22	1.10%
Major Collectors	236,339.76	3.41%	438,752.62	4.53%
Minor Collectors	76,253.16	1.10%	107,833.26	1.11%
One-Way Collectors	2,557.68	0.04%	3,537.71	0.04%
Local Roads	70,180.88	1.01%	105,546.08	1.09%
Total	6,938,565.96		9,680,522.41	

Source: GDOT CORE MPO Travel Demand Model

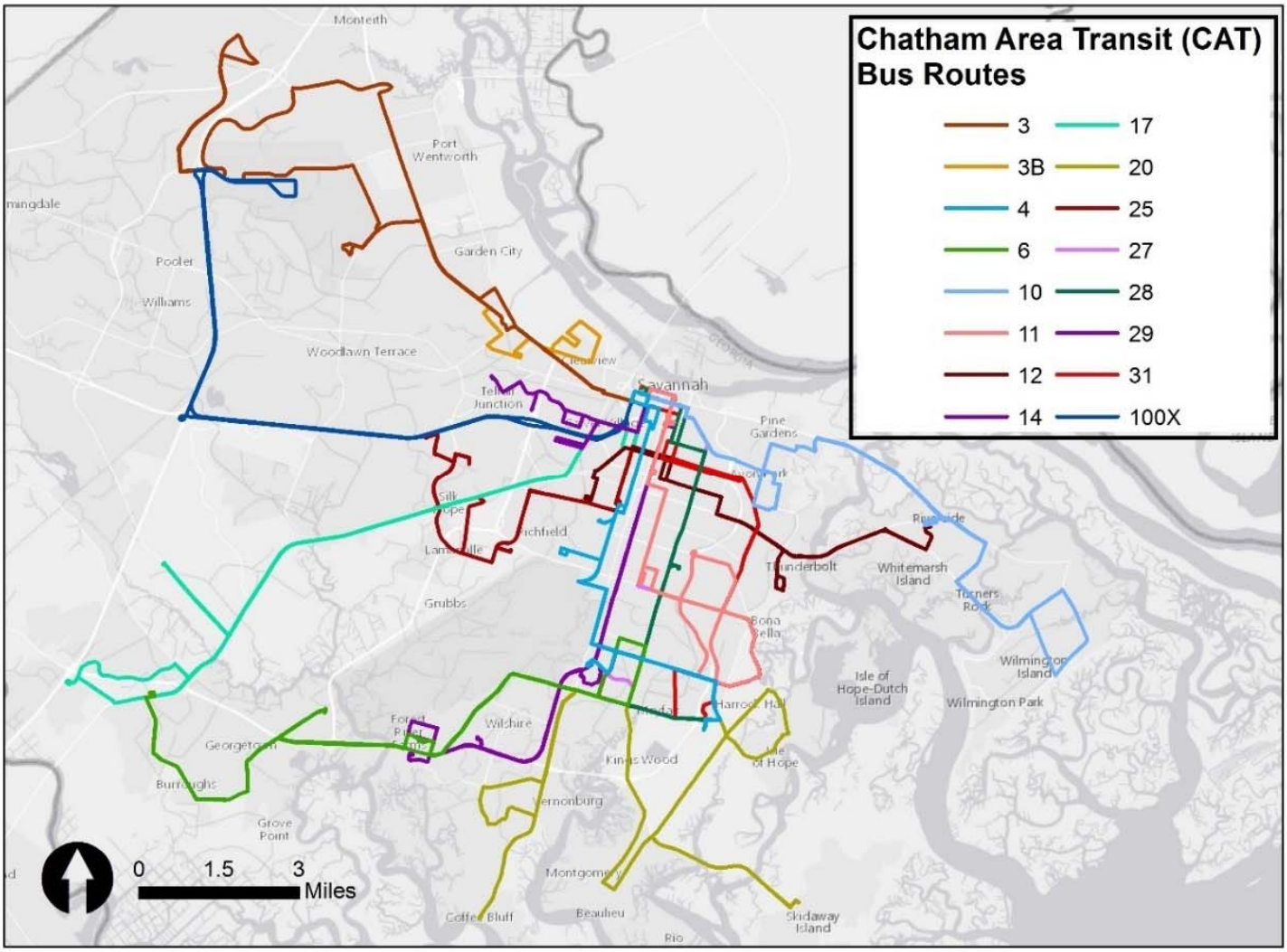
Figure 7: Functional Classification of Network



Transit

Chatham Area Transit operates 16 core routes within the region. CAT also contracts service to operate shuttle services including the DOT, Liberty Street Shuttle and South Savannah University Shuttle. Figure 8 illustrates the current CAT core routes.

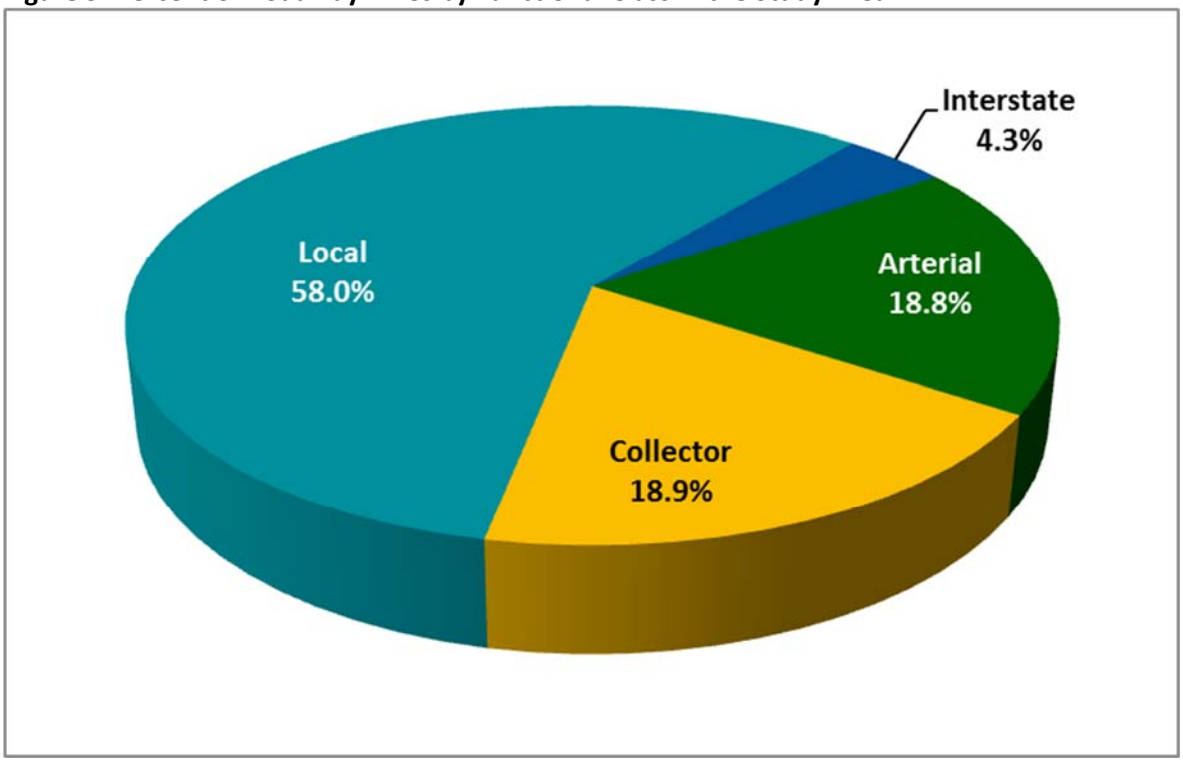
Figure 8: CAT Bus Routes



Freight

Highway functional classification and associated characteristics may be used as a predictor of truck usage. Most trucks rely on the interstate, expressway and arterial roads to move freight. The intended use and vehicle design will guide features that may induce commercial operator usage. Figure 9 below shows the percent of roadway miles by functional class across all area types. Local roads make up over half of the miles in the three-county area at 58.0 percent (964 miles). Therefore, much of truck traffic in the area is concentrated on less than half of the road miles in the area. Most trucks will travel on the 71 miles of interstate and 312 miles of arterial roads in the area, which represent 4.3 percent and 18.8 percent of the total system, respectively. Collector roads total 314 miles, or 18.9 percent.

Figure 9: Percent of Roadway Miles by Functional Class in the Study Area



Source: Office of Transportation Data, Georgia Department of Transportation, 445 Series Report, 2012

Non-Motorized Transportation

Existing Pedestrian Facilities

Sidewalks, crosswalks, and pedestrian signals currently exist in most of the denser portions of the planning area. A complete GIS based inventory of existing sidewalks, has never been developed for the entire planning area. City of Savannah staff maintain a GIS file of sidewalks within Savannah city limits. Chatham County staff have mapped in GIS some but not all of the sidewalks within unincorporated part of the county. MPO staff have mapped some sidewalks that were not covered by other data sources. However, some sidewalks remain to be mapped.

Table 5 lists existing mileage of sidewalks and the shared use paths from the area-wide bicycle network, as those paths may also be used by pedestrians. For the paths, the focus is on those used for

transportation; loop paths that exist inside of some parks are not counted here; paths inside of gated communities are not counted, but paths on Hunter Army Airfield base are. Other bicycle facilites that are not shared with pedestrians are covered in a following section.

Table 5: Mileage of Existing Sidewalks (each side counted separately) and Shared Use Paths

Type	Miles Existing
Sidewalks	448+ *
Shared Use Paths**	31
Totals	**479+**

** Sidewalks mapped to date, and thus easily measured, are mostly those within the City of Savannah (~ 375 miles) and unincorporated Chatham County (~73 miles).*

*** This type of facility is intended to be shared with bicyclists and therefore this category's mileage is also included in the bicycle facility summation in a subsequent table.*

Existing Bicycle Facilities or Treatments

Bicycle facilities include on-street types and off-road paths. Technically, every roadway is a bicycle facility (except roads where bicycling is explicitly prohibited), as Georgia law recognizes bicycles as vehicles with rights to the road. Since general roadway conditions are covered above, this section focuses on more exclusive types of bicycle facilities: bike lanes and shared use paths. Again, for the paths, the focus is on those used for transportation; loop paths that exist inside of some parks are not counted here; paths inside of gated communities are not counted, but paths on Hunter Army Airfield are. Table 6 lists existing bike lanes and share use paths.

Table 6: Mileage of Existing Bicycle Facilities (in centerline miles)

Type	Miles Existing
Bicycle Lanes	17.4
Shared Use Paths* (on Bikeway Network)	30.5
Total	**47.9**

** This type of facility is intended to be shared with pedestrians and therefore the category's mileage is also included in the pedestrian facility summation in a previous table.*

Bicycle Level of Service

The segments of the adopted bikeway network were evaluated based on how appealing they are for bicycle use. The method of evalution is known as the Bicycle Level of Service (LOS) Model, version 2, for Segments (it does not account for condtions at intersections). The method is not applicable to any segments that are existing or proposed off-road paths, and therefore such segments of the bikeway network were not scored.

Important variables in the model, which positively or negatively influence a segment's score are:

- Motorized vehicle volumes;
- Motorized vehicle speeds;
- Percentage of heavy vehicles (e.g. trucks) among the traffic;
- Lane and shoulder widths;

- Pavement conditions.

Application of the model results in scores for each segment, which then are grouped into LOS categories from A to F, with LOS A indicating the most appealing segments of the bicycle network and LOS F indicating the least appealing. The purpose is to highlight the areas of dire need for improvements. It is not necessarily the goal to elevate every segment to LOS A; segments with LOS B or C are at least "good" and may not be priorities for investment, but improvements at such locations might be made if a special opportunity exists.

When analyzing what percentage of the bikeway network falls into each LOS category, the denominator consisted only of the mileage actually scored (i.e. excluded segments to which the model could not be applied – existing or proposed off-road paths). While there are 457.5 miles on the adopted bikeway network, only 360.7 miles could be evaluated with the BLOS model. The results of the bicycle level of service evaluation are depicted in Table 7.

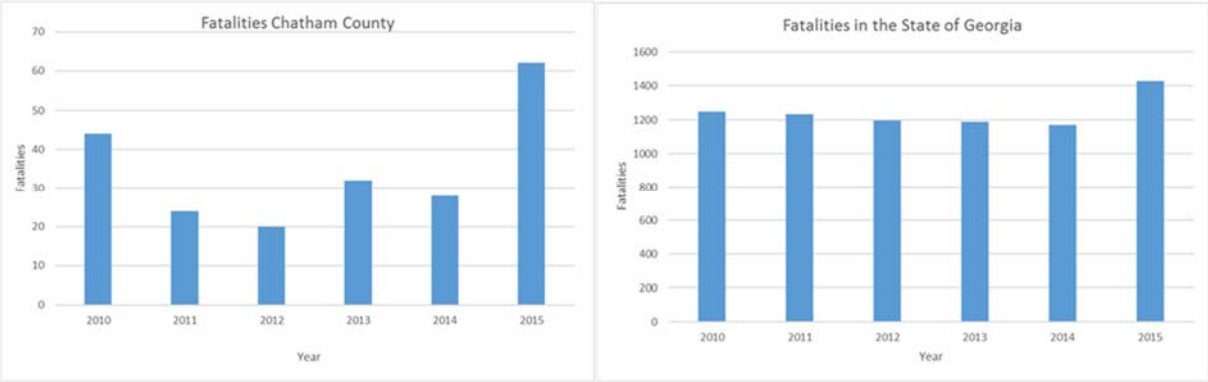
Table 7: Bicycle Level of Service Evaluation Results

BLOS A	7%
BLOS B	5%
BLOS C	11%
BLOS D	17%
BLOS E	30%
BLOS F	30%

Safety

Traffic crashes in Chatham County over the last five-year reporting period (2010-2015) showed some fluctuations with a large spike in 2015. In 2015 there were several deadly crashes involving more than one fatality including three crashes with five fatalities each. Figure 10 below show number of fatalities for both Chatham County and the State of Georgia.

Figure 10: Fatalities for Chatham County and the State of Georgia



Chatham County crashes typically represent about 3% or less of the fatalities occurring in the state for the exception of the spike in 2015 where 4.34% of the state fatalities occurred in Chatham County (see table 8).

Table 8: Chatham County Percent of Statewide Fatalities

2010	2011	2012	2013	2014	2015
3.52%	1.94%	1.67%	2.69%	2.39%	4.34%

For the 6 years of crash data between 2010 and 2015 there were 228 crashes that involved a fatality. In some cases, the crash may have involved more than one fatality. Figure 11 shows 206 of 228 crashes' geographic locations, the remaining crashes did not have enough location information to map properly.

9.0 Analysis of Congestion and Mobility Issues

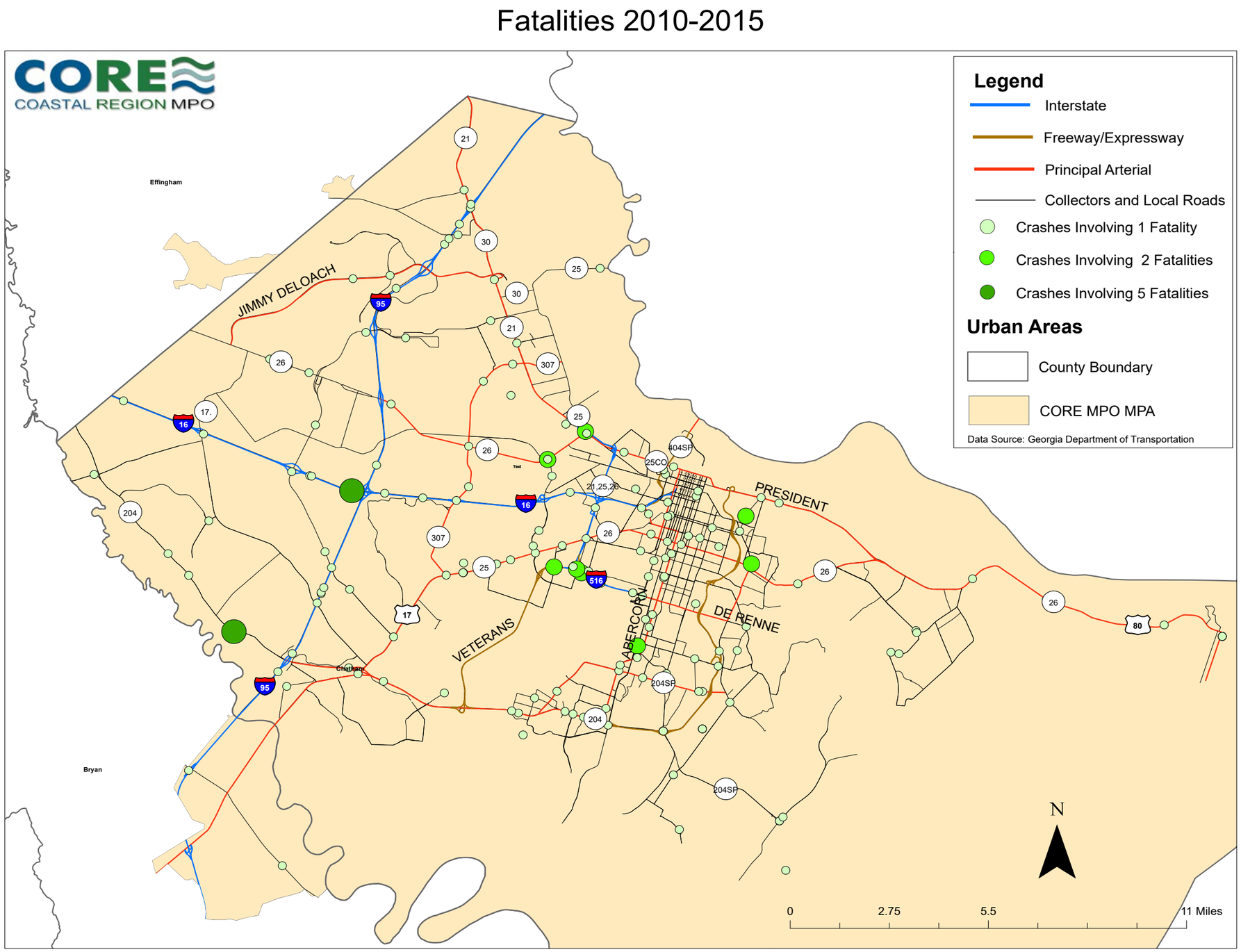
Once collected, raw data must be processed to obtain meaningful measures of performance. The purpose is to identify specific locations with congestion problems, and to identify the sources of these problems. The level of effort for processing data into usable information for analysis varies with the complexity of the multimodal performance measures and data sources chosen. When data has been provided by another source (secondary data) it may have a primary use that is quite different than what is needed for the CMP. In addition, the data may represent something entirely new to the staff assigned to perform the analysis or translation. Several sources of data in this report are being collected and analyzed for the first time for the CMP effort by the CORE MPO[9]. The remainder of this section reports the findings of the data collection and analysis.

Interstate Travel Time Analysis

As part of the CMP analysis, the travel time reliability performance measures previously noted, including average travel time, 95th percentile travel time, and buffer index are evaluated in the following section. Additional measures such as average travel speed, non-motorized data, origin and destination data and freight data are also included to augment the data and help define appropriate congestion reduction strategies.

[9] As the staff been collecting and analyzing the data the staff consulted with local agency experts as a sounding board to ground truth with what the data was reporting. Staff has been taking notes on gaps, weaknesses and improvements that can be made and reporting on those in the "Next Steps" section of the report.

Figure 11: Fatalities in the CORE MPA Boundary



Travel time performance measures were derived from two primary sources, the National Performance Management Research Data Set (NPMRDS) and the I-95 Corridor Coalition Vehicle Probe Data set. The I-95 Corridor Coalition dataset was used to derive travel time information for the interstates in the region including I-95, I-16 and I-516. The NPMRDS data set provided travel time data for the remainder of the CMP network on the National Highway System (NHS)[10]. All data was analyzed for weekdays in the months of October 2015 and April 2016. These months represented a "typical" commuting pattern with school in session, no spring breaks, and no hurricane of severe weather incidents.

The Interstate travel time analyses (see Table 9) showed that overall, the amount of time needed to achieve 95th percentile reliable travel time from the average travel time was a typically less than a 25% increase with most segments less than 10%.

The segments that showed the highest buffer time index were on I-95 Northbound between SR 21 and Pooler Parkway at 4 p.m. with a 243% buffer index adding almost 16 minutes to the 6.5-minute average travel time.

I-516 between US 80 and Mildred Street consistently showed the need for over 20% additional buffer time needed at all time frames evaluated. Northbound 8 a.m. and 5 p.m. both showed a buffer time index over 50%.

Two segments on I-16 were evaluated, one between Old River Road and I-95 and the second segment from I-95 to I-516. Both segments showed a high buffer index during the a.m. eastbound commute hours. The buffer time needed to meet the 95th percentile required almost an additional 20 minutes on top of the average 12 to 13-minute travel time. The eastbound a.m. commute on the segment between I-95 and I-516 required an additional 7 to 13 minutes on top of the average 9 to 10-minute average commute travel time.

[10] There are some isolated segments where there was not enough data for a complete travel time analysis. These segments will be revisited and additional segments will be added in future updates to the CMP as the data sets become more robust.

Table 9: Interstate Travel Time Analysis

Road and Direction	Limits	Direction	Time of Day	Distance (Miles)	Average Travel Time (Minutes)	95th Percentile Travel Time (Minutes)	Buffer Index	Buffer Time (Minutes)
I-95	Between I-16 and Pooler Parkway	SB	7 A.M.	5.5	4.5	4.6	2%	0.1
		SB	8 A.M.	5.5	4.5	4.6	2%	0.1
		SB	4 P.M.	5.5	4.5	5.1	14%	0.6
		SB	5 P.M.	5.5	4.5	4.5	1%	0.0
		NB	7 A.M.	5.5	5.3	6.6	25%	1.3
		NB	8 A.M.	5.5	4.6	4.9	7%	0.3
		NB	4 P.M.	5.5	4.5	4.5	2%	0.1
		NB	5 P.M.	5.5	4.5	4.5	1%	0.0
	Between SR 21 Pooler Parkway	SB	7 A.M.	5.4	4.4	4.5	3%	0.1
		SB	8 A.M.	5.4	4.4	4.5	2%	0.1
		SB	4 P.M.	5.4	4.4	4.4	1%	0.0
		SB	5 P.M.	5.4	4.4	4.4	1%	0.0
		NB	7 A.M.	5.4	4.4	4.5	2%	0.1
		NB	8 A.M.	5.4	4.4	4.5	2%	0.1
		NB	4 P.M.	5.4	6.5	22.3	243%	15.8
		NB	5 P.M.	5.4	5.3	6.2	17%	0.9
I-516	US 80 (Exit 8) to Mildred Street	SB	7 A.M.	6.4	7.2	7.7	7%	0.5
		SB	8 A.M.	6.4	8.7	10.4	20%	1.7
		SB	4 P.M.	6.4	6.4	7.8	23%	1.5
		SB	5 P.M.	6.4	7.4	10.5	42%	3.1
		NB	7 A.M.	6.3	6.3	8.4	34%	2.1
		NB	8 A.M.	6.3	6.2	10.0	61%	3.8
		NB	4 P.M.	6.3	6.4	6.7	5%	0.3
		NB	5 P.M.	6.3	7.0	10.6	52%	3.6
I-16	Between I-95 and Exit 148/Old River	EB	7 A.M.	9.0	12.9	32.8	154%	19.9
		EB	8 A.M.	9.0	11.9	31.2	163%	19.3
		EB	4 P.M.	9.0	7.5	7.7	3%	0.2
		EB	5 P.M.	9.0	7.5	7.7	3%	0.2
		WB	7 A.M.	8.9	7.5	7.7	2%	0.2
		WB	8 A.M.	8.9	7.5	7.6	2%	0.1
		WB	4 P.M.	8.9	7.4	7.6	2%	0.1
		WB	5 P.M.	8.9	7.4	7.6	2%	0.1
	I-95 to I-516	EB	7 A.M.	7.2	9.9	17.5	78%	7.7
		EB	8 A.M.	7.2	10.3	23.8	130%	13.4
		EB	4 P.M.	7.2	6.3	6.6	4%	0.3
		EB	5 P.M.	7.2	6.4	6.9	8%	0.5
		WB	7 A.M.	7.1	6.3	6.5	3%	0.2
		WB	8 A.M.	7.1	6.3	6.5	2%	0.1
		WB	4 P.M.	7.1	7.9	11.4	44%	3.5
		WB	5 P.M.	7.1	10.3	16.0	57%	5.8

Data Source: I-95 Corridor Coalition

Arterial Travel Time Analysis

Travel time data was also collected for principal arterials and higher where data was available. Arterial Travel time performance measures were derived from the National Performance Management Research Data Set (NPMRDS)[11]. Compared to the interstate system, travel times were a bit more inconsistent on the arterial network possibly due to the data source itself as well as several contributing factors such as traffic control devices, delivery trucks, school zones, bus stops and driveways. Table 10 contains the arterial travel time analysis. The following is a summary of the tables below:

US 17

The northbound segments between I-95 and SR 204 experience higher travel times than the southbound portion. The northbound segment experiences the highest travel time in the evening commute, with an average of 10-11 minutes. The 95th percentile the travel time at 5pm is almost double the average at 19.5 minutes.

The segment between SR 204 and SR 307 is more consistent with average travel times of about 6 to 7 minutes. The 95th percentile time on average requires about an additional 3 minutes with the exception of the 4 p.m. southbound segment which shows a 72% buffer index or an almost 5-minute additional travel time.

Between SR 307 and I-516, southbound travel is slower and the buffer index to reach the 95th percentile travel time is much higher, showing greater inconsistently on the route. The buffer index at 4 p.m. reaches 90%, almost doubling the average travel time. Improvements being made to Chatham Parkway from I-16 to US 17 may help relieve congestion US 17 between SR 307 and I-516.

In Richmond Hill, south of SR 144 the 95th percentile travel times show a high buffer index ranging from 63% to 117%. US 17 north from 204 through the Wal-Mart/Chevis Road area up to Kings Ferry/Ogeechee River experiences possible signalized intersection and commercial area delays. There is also a school in that are that would affect speed limits and traffic during school drop off and pick up times. In Bryan County from Kings Ferry/Ogeechee River to SR 144, the main congestion issue would be related to the busy intersection at 17 and 144.

US 17 between SR 144 and I-95 experiences delays at the traffic signal at Harris Trail Road (especially the number of cars turning south on Harris Trail Road). The busy intersection at 17 and 144 causes congestion for the northbound traffic. The potential new interchange on I-95 and Belfast Keller Road could help because it gives evening and morning commuters another option to/from South Bryan County besides the 17/95 or 144/95 interchanges.

SR 21

SR 21 between I-95 and I-516 shows a higher buffer index in the southbound direction both in the morning and the afternoon commute ranging from 42% to 66%. SR 21 through Port Wentworth is highly congested in the a.m. and p.m. The diverging diamond interchange at Exit 109 has helped reduce travel time. However, truck traffic is not using the Jimmy DeLoach extension as originally

[11] There are some gaps in segments where there was not enough data for a complete travel time analysis but much of the network included data coverage.

planned and has had no significant impact of diverting trucks off Hwy. 21. Possibly with the completion of Grange Road widening there will be an improvement.

SR 204/Abercorn

The segment between DeRenne Avenue and I-16 generally shows high travel times in relation to the distance traveled. To have 95th percentile reliability almost an additional 6 minutes was required at 8 a.m. Generally, an additional 3 minutes is required for 95th percentile reliability on the segment in each direction. The slower travel times on the segment between Veteran's Parkway and the Harry S. Truman Parkway tend to be during the evening commute with the buffer index over 60%. Observations of the segment between the Harry S. Truman Parkway and DeRenne Avenue are consistent with the recorded spike in the buffer index during the evening commute in both directions.

DeRenne Avenue

The segment between I-516 and SR 204 sees a spike in the buffer index on the southbound and northbound trip at 8 a.m. There is also a jump in the index during the southbound 5 p.m. commute hour. Over all the additional minutes needed for reliability range from 1.5 to 6.5 additional minutes.

East of SR 204 eastbound on DeRenne the travel time reliably requires about a 5-minute buffer for the exception of 5 p.m. where almost an additional 9 minutes is needed bring the 95th percentile travel time to 20 minutes.

US 80

Both direction between the Wilmington River and Island Expressway require about a 4-7-minute buffer time increase to achieve a 95th percentile reliable travel time.

SR 25

Travel time reliability on the segment between SR 30 and SR 21 is consistent requiring about 30% to 44% buffer putting travel time about 19-23 minutes in total. However, truck traffic is not using the Jimmy DeLoach extension as originally planned and has had no significant impact of diverting trucks off Hwy. 25. Possibly with the completion of Grange Road widening there will be an improvement.

SR 144

The portion of SR 144 between SU 17 and I-95 generally has a buffer time of about 1.5 to 2.5 minutes for 95th percentile travel time reliability. The main congestion occurs between I-95 and US 17 related to the busy intersection at 17 and 144. A potential new interchange on I-95 and Belfast Keller Road could help because it gives evening and morning commuters another option to/from South Bryan County besides the 17/95 or 144/95 interchanges.

Table 10: Arterial Travel Time Analysis

Road and Direction	Limits	Direction	Time of Day	Distance (Miles)	Average Travel Time (Minutes)	95th Percentile Travel Time (Minutes)	Buffer Index	Buffer Time (Minutes)
US 17	Between I-95 and SR 204	SB	7 A.M.	5.2	7.1	9.2	29%	2.1
		SB	8 A.M.	5.2	8.0	9.2	16%	1.2
		SB	4 P.M.	5.2	9.6	13.7	43%	4.1
		SB	5 P.M.	5.2	9.7	13.7	42%	4.0
		NB	7 A.M.	5.5	7.9	12.5	59%	4.6
		NB	8 A.M.	5.5	7.8	10.4	33%	2.6
		NB	4 P.M.	5.5	10.4	13.9	33%	3.5
		NB	5 P.M.	5.5	11.4	19.5	72%	8.1
	Between SR 204 and SR 307	SB	7 A.M.	3.9	7.7	8.8	14%	1.1
		SB	8 A.M.	3.9	6.6	8.6	31%	2.0
		SB	4 P.M.	3.9	6.6	11.4	72%	4.7
		SB	5 P.M.	3.9	7.4	11.0	49%	3.6
		NB	7 A.M.	3.6	5.3	7.5	41%	2.2
		NB	8 A.M.	3.6	7.3	10.8	48%	3.5
		NB	4 P.M.	3.6	6.0	8.6	43%	2.6
		NB	5 P.M.	3.6	6.6	9.8	49%	3.2
	Between SR 307 and I-516 (Northbound not available)	SB	7 A.M.	3.9	7.4	13.1	77%	5.7
		SB	8 A.M.	3.9	6.7	8.6	27%	1.8
		SB	4 P.M.	3.9	11.2	18.8	91%	9.0
		SB	5 P.M.	3.9	8.0	12.8	60%	4.8
	South of SR 144	SB	7 A.M.	2.0	6.0	11.5	90%	5.5
		SB	8 A.M.	2.0	4.6	6.7	38%	1.8
		SB	4 P.M.	2.0	5.8	12.6	117%	6.8
		SB	5 P.M.	2.0	4.8	8.3	72%	3.5
		NB	7 A.M.	1.8	3.9	7.0	82%	3.2
		NB	8 A.M.	1.8	3.9	6.4	63%	2.5
		NB	4 P.M.	1.8	3.8	8.0	108%	4.1
		NB	5 P.M.	1.8	4.4	7.3	67%	2.9
SR 21	Between I-95 and I-516	SB	7 A.M.	8.6	15.2	20.3	34%	5.1
		SB	8 A.M.	8.6	20.2	32.0	58%	11.8
		SB	4 P.M.	8.6	17.4	23.2	33%	5.8
		SB	5 P.M.	8.6	15.0	20.5	36%	5.5
		NB	7 A.M.	10.2	19.7	30.3	53%	10.6
		NB	8 A.M.	10.2	20.5	33.9	66%	13.4
		NB	4 P.M.	10.2	26.7	38.1	42%	11.3
		NB	5 P.M.	10.2	30.5	45.6	50%	15.1

Data Source: National Perfromance Measure Research data Set (NPMRDS)

Table 10: Arterial Travel Time Analysis (Continued)

Road and Direction	Limits	Direction	Time of Day	Distance (Miles)	Average Travel Time (Minutes)	95th Percentile Travel Time (Minutes)	Buffer Index	Buffer Time (Minutes)
SR 204/Abercorn	Between DeRenne and I-16	EB	7 A.M.	1.8	5.4	5.8	7%	0.4
		EB	8 A.M.	1.8	7.9	13.7	74%	5.8
		EB	4 P.M.	1.8	4.9	6.6	34%	1.7
		EB	5 P.M.	1.8	6.5	10.0	55%	3.5
		WB	7 A.M.	3.0	5.1	5.4	7%	0.4
		WB	8 A.M.	3.0	8.1	11.9	47%	3.8
		WB	4 P.M.	3.0	19.2	28.2	47%	9.0
		WB	5 P.M.	3.0	8.6	11.6	34%	3.0
	Between Veteran's Parkway and Harry S. Truman Parkway	EB	7 A.M.	3.9	6.3	9.4	49%	3.1
		EB	8 A.M.	3.9	7.7	10.5	37%	2.9
		EB	4 P.M.	3.9	9.2	14.6	58%	5.4
		EB	5 P.M.	3.9	7.9	13.2	67%	5.3
		WB	7 A.M.	4.0	5.9	7.2	21%	1.2
		WB	8 A.M.	4.0	7.6	12.1	60%	4.6
		WB	4 P.M.	4.0	11.2	19.0	69%	7.8
		WB	5 P.M.	4.0	12.7	21.2	67%	8.5
	Between DeRenne Avenue and Harry S. Truman Parkway	EB	7 A.M.	4.0	9.3	13.7	47%	4.4
		EB	8 A.M.	4.0	8.9	12.7	43%	3.8
		EB	4 P.M.	4.0	11.1	15.4	38%	4.3
		EB	5 P.M.	4.0	11.0	18.9	71%	7.9
		WB	7 A.M.	3.2	8.7	12.7	47%	4.0
		WB	8 A.M.	3.2	8.1	11.7	44%	3.6
		WB	4 P.M.	3.2	9.6	19.5	103%	9.9
		WB	5 P.M.	3.2	8.9	12.5	41%	3.6
DeRenne Avenue	Between I-516 and SR 204	SB	7 A.M.	3.9	5.6	6.9	24%	1.3
		SB	8 A.M.	3.9	9.6	15.4	60%	5.8
		SB	4 P.M.	3.9	6.0	8.6	42%	2.6
		SB	5 P.M.	3.9	6.5	10.1	54%	3.6
		NB	7 A.M.	5.0	7.0	9.2	31%	2.2
		NB	8 A.M.	5.0	8.4	15.1	79%	6.6
		NB	4 P.M.	5.0	6.3	7.4	17%	1.1
		NB	5 P.M.	5.0	7.0	10.2	45%	3.2
	East of SR 204 (westbound not availabe)	EB	7 A.M.	4.8	11.3	16.2	42%	4.9
		EB	8 A.M.	4.8	12.2	17.9	46%	5.7
		EB	4 P.M.	4.8	10.2	14.8	45%	4.6
		EB	5 P.M.	4.8	11.5	20.1	74%	8.6

Data Source: National Perfromance Measure Research data Set (NPMRDS)

Table 10: Arterial Travel Time Analysis (Continued)

Road and Direction	Limits	Direction	Time of Day	Distance (Miles)	Average Travel Time (Minutes)	95th Percentile Travel Time (Minutes)	Buffer Index	Buffer Time (Minutes)
US 80	Willmington River to Island Expressway	EB	7 A.M.	3.5	6.8	9.2	35%	2.4
		EB	8 A.M.	3.5	7.2	11.8	64%	4.6
		EB	4 P.M.	3.5	7.3	13.8	89%	6.5
		EB	5 P.M.	3.5	6.6	12.6	90%	6.0
		WB	7 A.M.	3.1	6.1	9.7	60%	3.7
		WB	8 A.M.	3.1	7.0	14.3	105%	7.3
		WB	4 P.M.	3.1	6.2	10.8	74%	4.6
		WB	5 P.M.	3.1	5.5	8.0	46%	2.5
SR 25	Between SR 30 and SR 21 (NB not available)	SB	7 A.M.	6.8	14.3	18.9	33%	4.7
		SB	8 A.M.	6.8	14.4	19.9	39%	5.6
		SB	4 P.M.	6.8	15.4	20.2	31%	4.8
		SB	5 P.M.	6.8	16.2	23.4	44%	7.2
SR 144	Between US 17 and I-95	EB	7 A.M.	1.2	3.3	3.5	7%	0.2
		EB	8 A.M.	1.2	2.4	3.7	56%	1.3
		EB	4 P.M.	1.2	3.0	4.6	52%	1.6
		EB	5 P.M.	1.2	3.5	6.1	73%	2.6
		WB	7 A.M.	1.3	3.0	5.5	81%	2.5
		WB	8 A.M.	1.3	2.9	4.1	43%	1.2
		WB	4 P.M.	1.3	2.3	4.1	55%	1.4
		WB	5 P.M.	1.3	2.9	5.1	73%	2.1

Data Source: National Perfromance Measure Research data Set (NPMRDS)

Average Travel Time Speeds

The following average travel time speeds were derived from same data that provided the travel time reliable information for the arterials. The speed maps (see Figures 12-17) give a sense of what the driver is experiencing on the ground by what their average speed would be over a commute segment. The travel speed maps are intended to supplement the travel time tables previously mentioned. Feedback from the Technical Coordinating Committee noted some possible inaccuracies in the data primarily showing shower speeds that what is experienced by the driver. We have noted this and will take this into consideration with our overall analysis. Some examples include:

- US 80 out toward Tybee is showing speeds that are too slow.
- In some instances, Jimmy DeLoach is showing slow speeds when it is believed to typically be more free flow.

Travel speed maps were produced for October 2015 and April 2016 weekdays with time periods between:

- 7 a.m. to 9 a.m.
- 7 a.m. to 10 a.m.
- 10 a.m. to 4 p.m.
- 4 p.m. to 6 p.m.
- 4 p.m. to 7 p.m.

The NPMRDS data set used for these maps expands each year. There is additional segment populated with data in April 2016 that were not available in October 2015. We anticipate this dataset to continue to become more robust.

A complete set of travel speed maps can be found in Appendix A.

Figure 12: Average Travel Speeds AM Peak October 2015

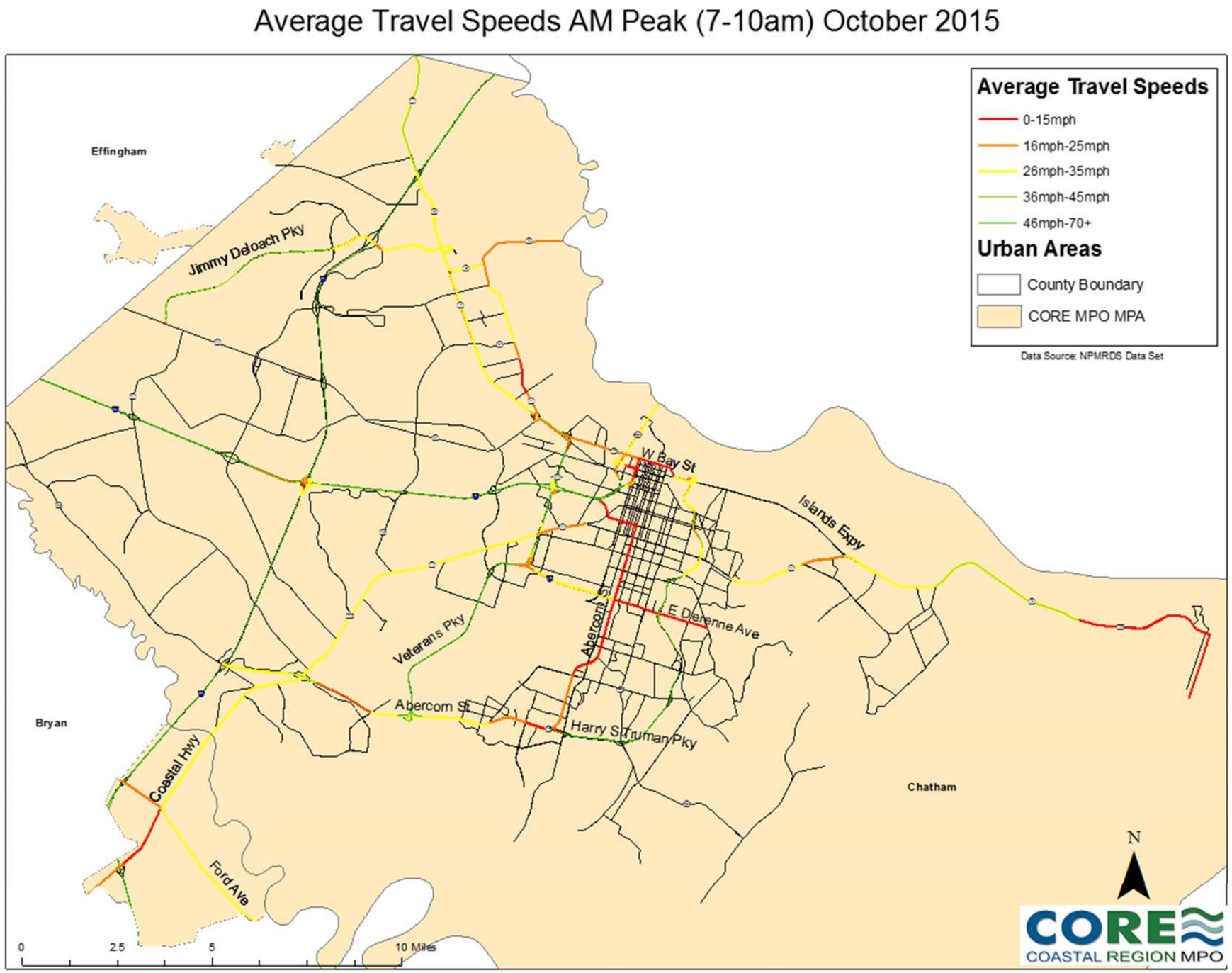


Figure 13: Average Travel Speeds AM Peak April 2016

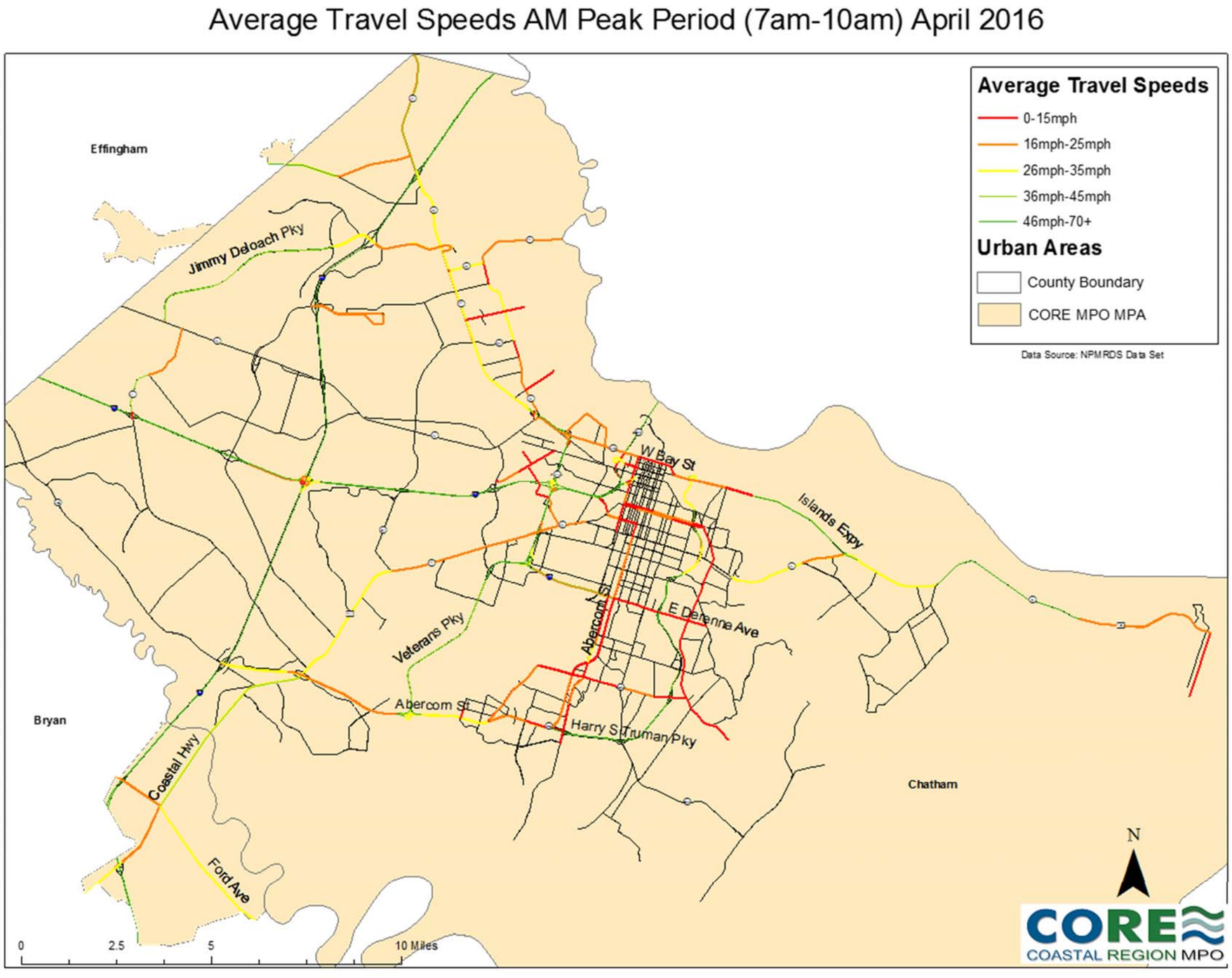


Figure 14: Average Travel Speeds Mid-Day October 2015

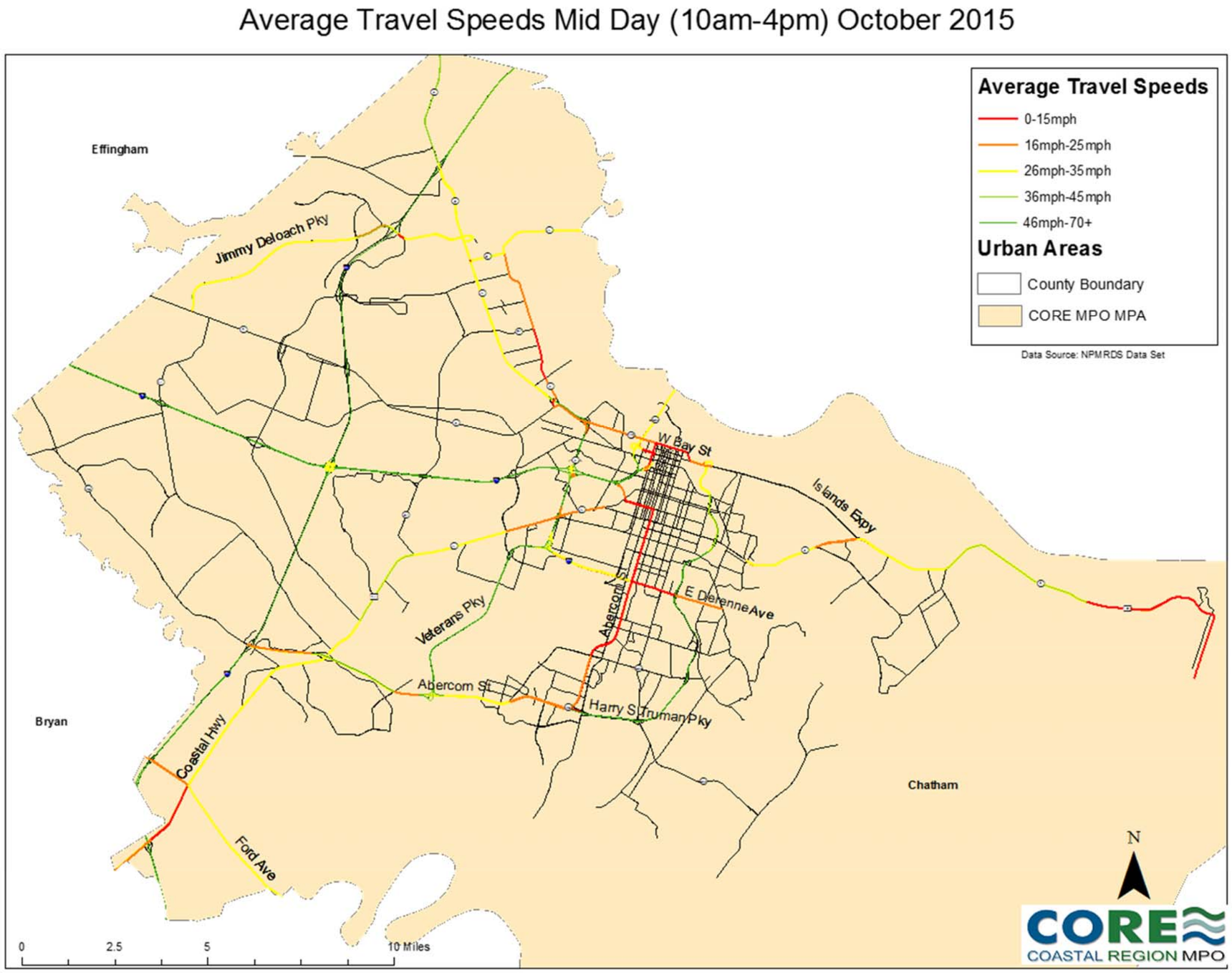


Figure 15: Average Travel Speeds Mid-Day April 2016

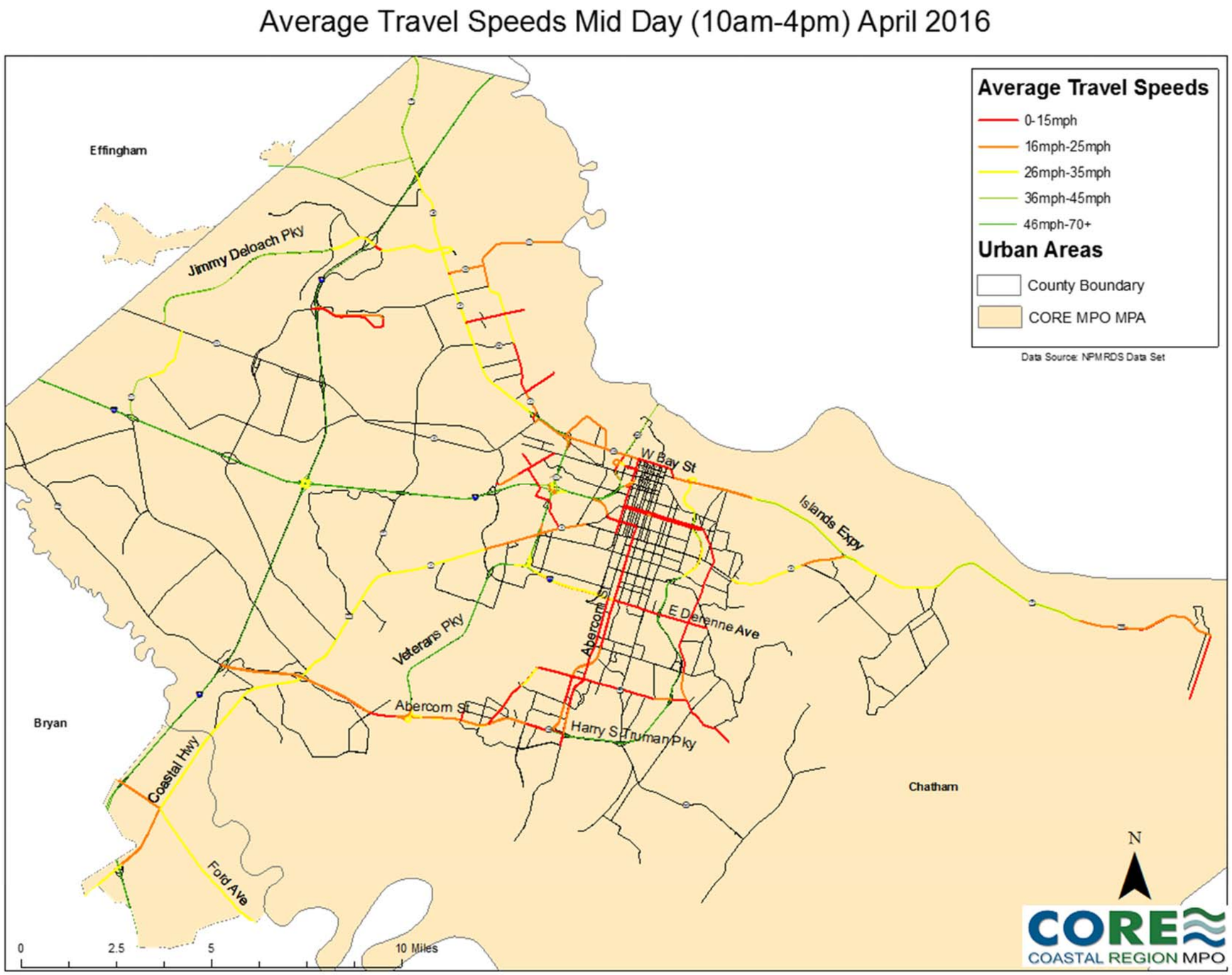


Figure 16: Average Travel Speeds PM Peak October 2015

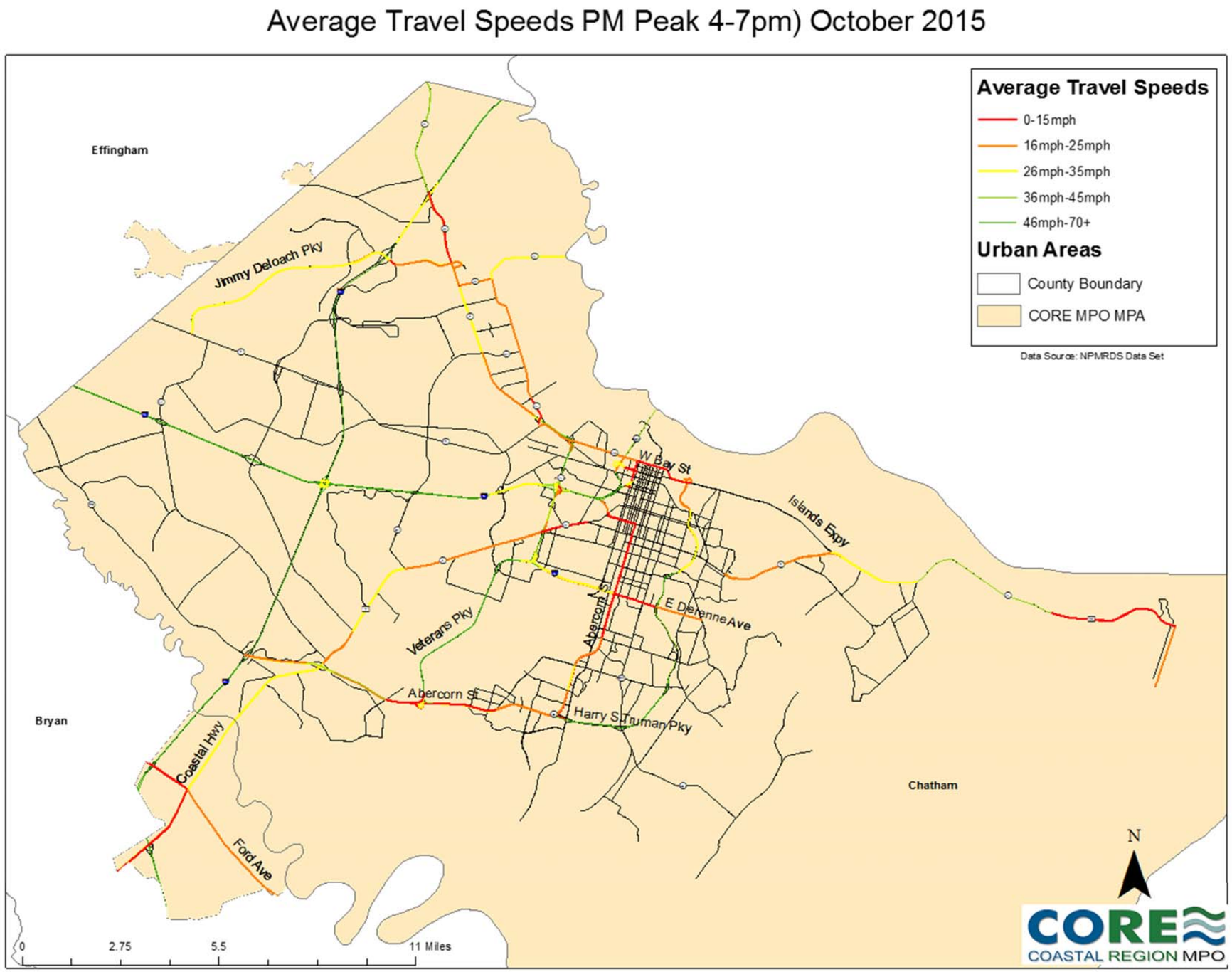
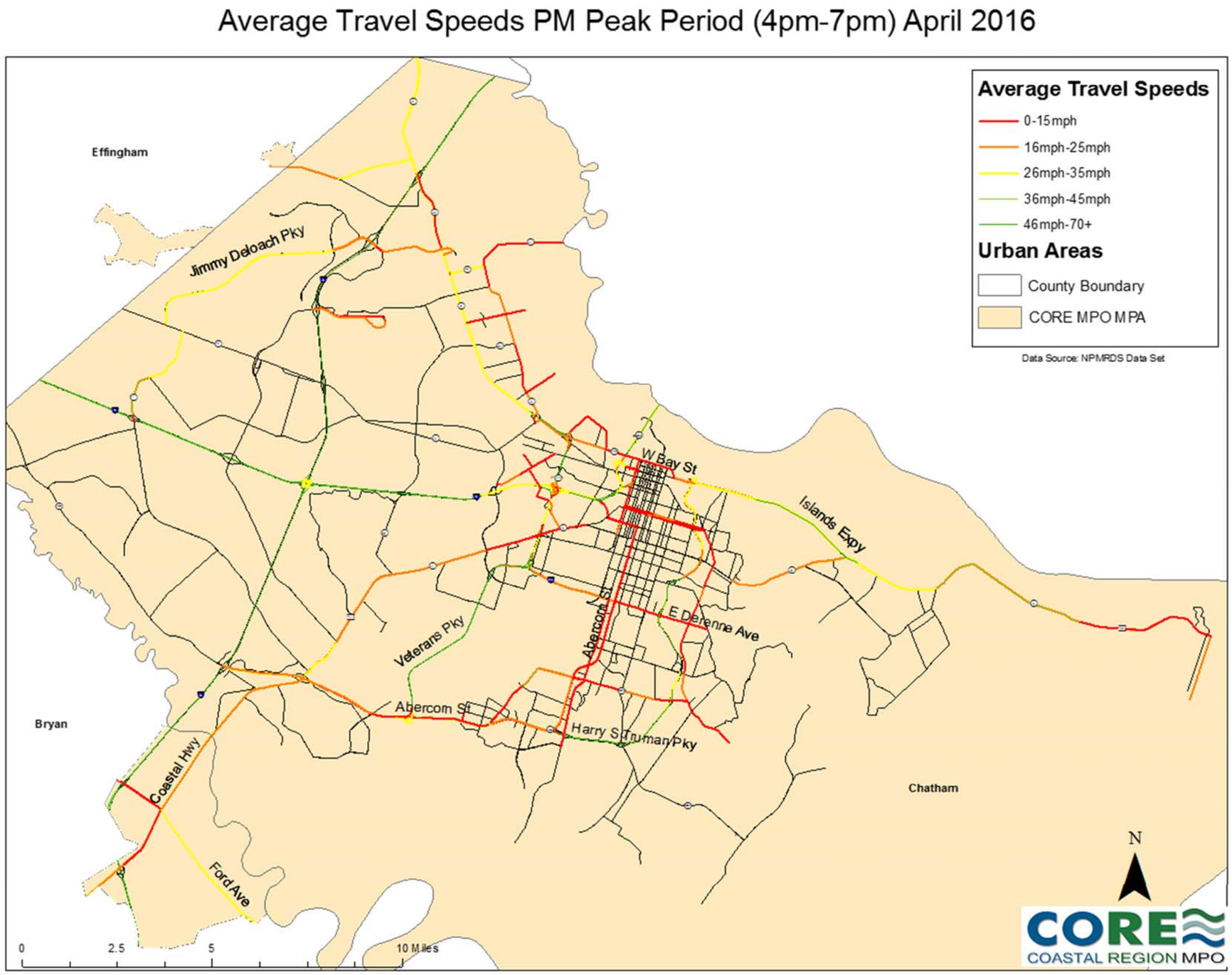


Figure 17: Average Travel Speeds PM Peak April 2016



Bottleneck Locations

The I-95 Corridor Coalition dashboard provided a calculation of bottlenecks within the region[12] utilizing travel time probe data. This measure only takes into consideration I-95, I-16 and I-516 as well as a few segments of SR 21 and US 17 where they overlap with the freeway. The bottleneck calculation was available for 2015 and 2016. The calculation was performed on an annualized average for each year. The full list of the bottleneck locations can be found in Appendix B. For the purposes of the analysis for the CMP the focus will be on the top 20 identified for each year (see Table 11).

The bottleneck ranking includes:

- Rank - The ranked position of the location per the current table ordering (Impact by default)
- Average max length - The average maximum length, in miles, of queues formed by congestion originating at the location
- Average daily duration - The average amount of time per day that congestion is identified originating at the location
- All Events/Incidents - The number of traffic events and incidents that occurred within the space of the bottleneck at any time during the time period being analyzed

SR 21 at Abercorn Street has been ranked the top bottleneck location in both 2015 and 2016. The remaining top five include:

- I-516 at Mildred Street
- I-16 both directions at SR 307
- SR 21 at Veteran's Parkway
- I-16 eastbound at I-95

It is also worth noting that the sheer number of incidents on I-16 and I-516 are significantly higher than that of rest of the interstate bottleneck locations.

Origin and Destination Data

The MPO also obtained, in coordination with Chatham Area Transit, AirSage data[13] for the MPO planning area. This cell-phone based data provides 24-hour travel information stratified into three trip purposes, including:

- Home based work
- Home based other
- Other based Other

The data is also stratified into six residence class attributes including:

- Resident worked
- Home worker
- In-commuter
- Out-commuter
- Short term visitor
- Long term visitor

[12]Vehicle Probe Project Suite Bottleneck calculation https://vpp.ritis.org/suite/help/#bottlenecks

[13] A full description of the AirSage data can be found in Appendix C

Table 11: Top 20 Bottleneck Locations

Year	Bottleneck Rank: Most Congested	Bottleneck Location*	Average Max Length (Miles): Average maximum length of queues formed by congestion originating at the location	Average Daily Duration (Minutes): Average amount of time per day that congestion is identified originating at each location	All Events/Incidents: Number of traffic events and incidents that occurred at bottleneck during year indicated
2015	1	GA-21 S @ GA-204/ABERCORN ST	2.28	2 h 25 m	3
2016			2.3	3 h 58 m	18
2015	2	I-516 S @ MILDRED ST	1.67	46 m	3
2016			1.68	1 h 29 m	85
2015	3	I-16 W @ GA-307/EXIT 160	2.57	26 m	24
2016		GA-21 N @ VETERANS PKWY/EXIT 3	2.36	48 m	11
2015	4	I-16 E @ GA-307/EXIT 160	2.45	26 m	23
2016		I-16 W @ GA-307/EXIT 160	3.14	29 m	14
2015	5	I-16 E @ I-95/EXIT 157	1.57	30 m	11
2016		I-16 E @ GA-307/EXIT 160	2.2	38 m	16
2015	6	GA-21 N @ VETERANS PKWY/EXIT 3	2.43	20 m	0
2016		I-16 W @ CHATHAM PKWY/EXIT 162	1.76	42 m	11
2015	7	I-16 W @ CHATHAM PKWY/EXIT 162	1.59	27 m	18
2016		I-95 N @ GA--SC STATE BORDER	4.28	15 m	59
2015	8	I-16 W @ I-95/EXIT 157	2.25	16 m	30
2016		I-516 N @ EXIT 3	1.33	31 m	72
2015	9	I-95 N @ GA--SC STATE BORDER	3.93	9 m	9
2016		I-16 E @ I-95/EXIT 157	1.49	29 m	8
2015	10	I-95 N @ GA-21/EXIT 109	1.19	22 m	8
2016			1.16	26 m	38
2015	11	US-17 S @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	1.01	24 m	8
2016		US-17 S @ I-16/I-516	0.99	34 m	8
2015	12	I-16 E @ CHATHAM PKWY/EXIT 162	2.36	9 m	35
2016		I-16 W @ I-95/EXIT 157	2.8	8 m	20
2015	13	US-17 N @ GA--SC STATE BORDER/TALMADGE MEMORIAL BRIDGE	1.82	9 m	2
2016		GA-21 N @ I-16/US-17/GA-25/GA-404/EXIT 5	0.9	32 m	15
2015	14	I-95 S @ GA-204/EXIT 94	4.03	3 m	4
2016		I-516 N @ I-16/EXIT 5	0.57	39 m	146
2015	15	I-16 E @ POOLER PKWY/EXIT 155	1.79	8 m	25
2016		US-17 N @ I-16/I-516	0.73	25 m	4
2015	16	I-95 N @ I-16	3.97	3 m	14
2016		I-16 E @ CHATHAM PKWY/EXIT 162	2.59	6 m	15
2015	17	I-95 S @ US-17/EXIT 87	3.3	4 m	1
2016		I-95 S @ GA-204/EXIT 94	4.42	3 m	17
2015	18	I-16 E @ I-516/LYNES AVE/EXIT 164	1.65	8 m	38
2016			1.68	7 m	24
2015	19	I-95 S @ GA-21/EXIT 109	3.48	3 m	2
2016		US-17 N @ GA--SC STATE BORDER/TALMADGE MEMORIAL BRIDGE	1.67	9 m	4
2015	20	I-95 N @ US-17/EXIT 87	6.39	1 m	8
2016		I-95 S @ US-84/GA-38/EXIT 76	10.67	1 m	14

*Interstate only

Source: I-95 Corridor Coalition INRIX dataset.

The AirSage data is provided by Traffic Analysis Zone (TAZ) from the regional travel demand model, although due to the small size of some TAZs, the zones were aggregated. See Figure 18 for a map of the data collection zones. The data is collected for weekdays in October 2015 and April 2016. The results are summarized in this section. A full set of maps can be reviewed in Appendix D.

Figure 18: Data Collection Zones

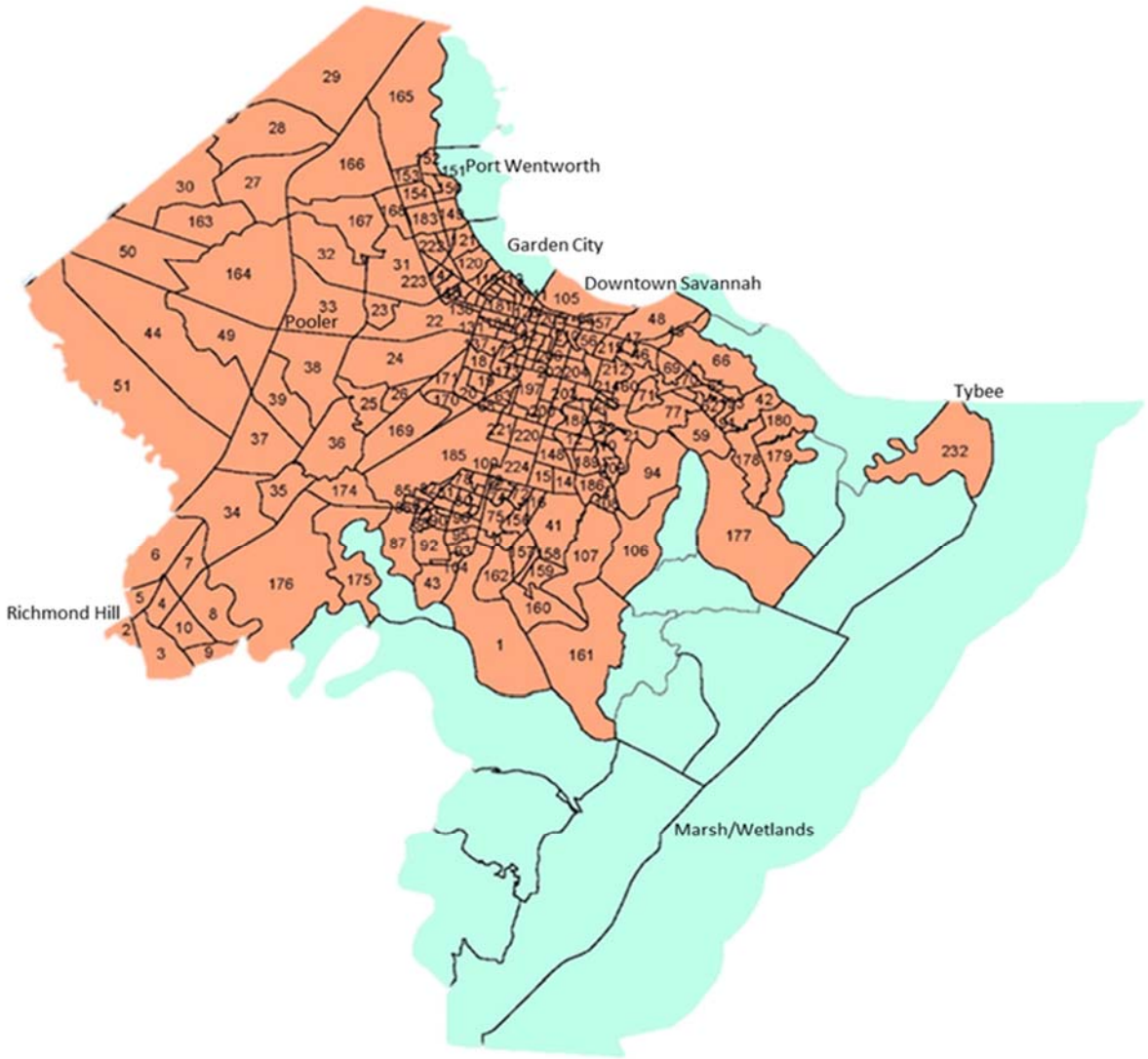
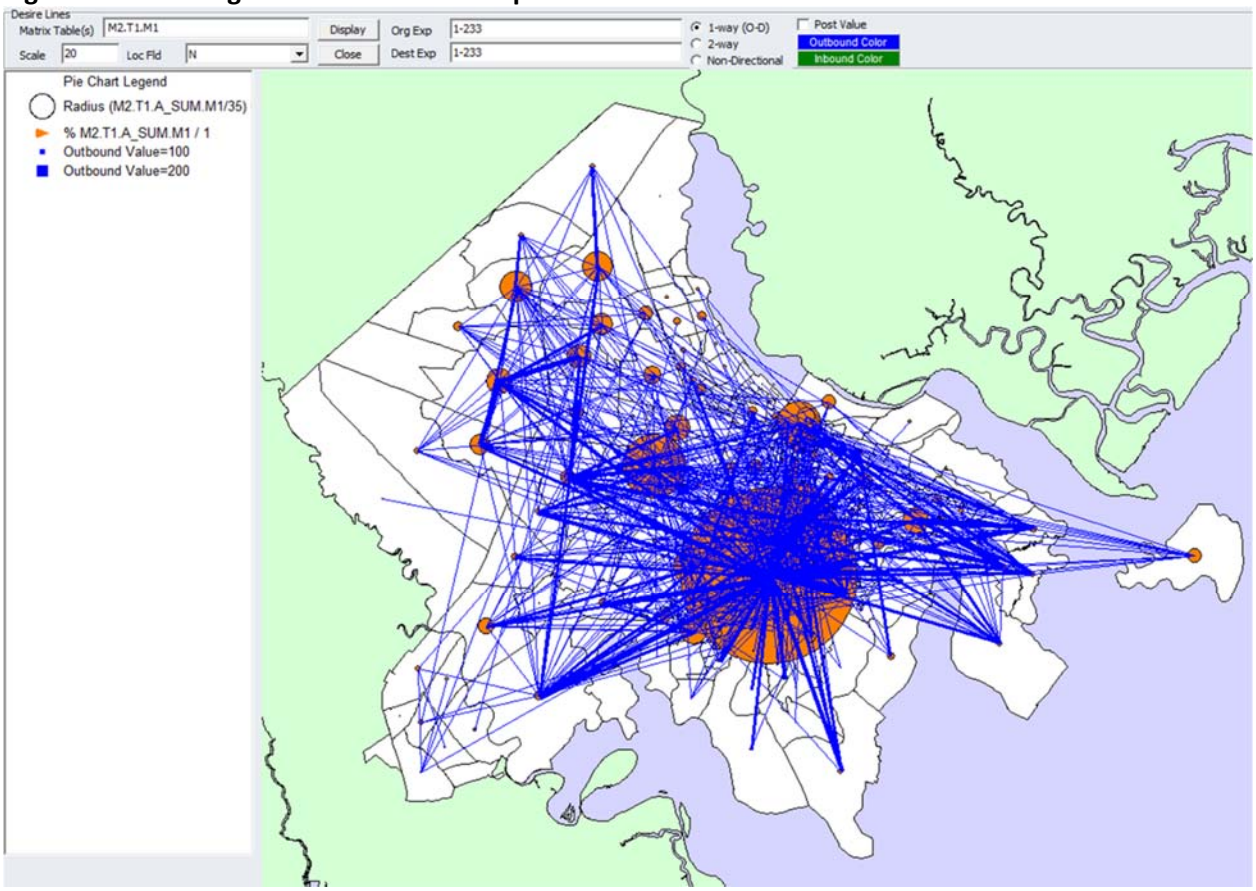
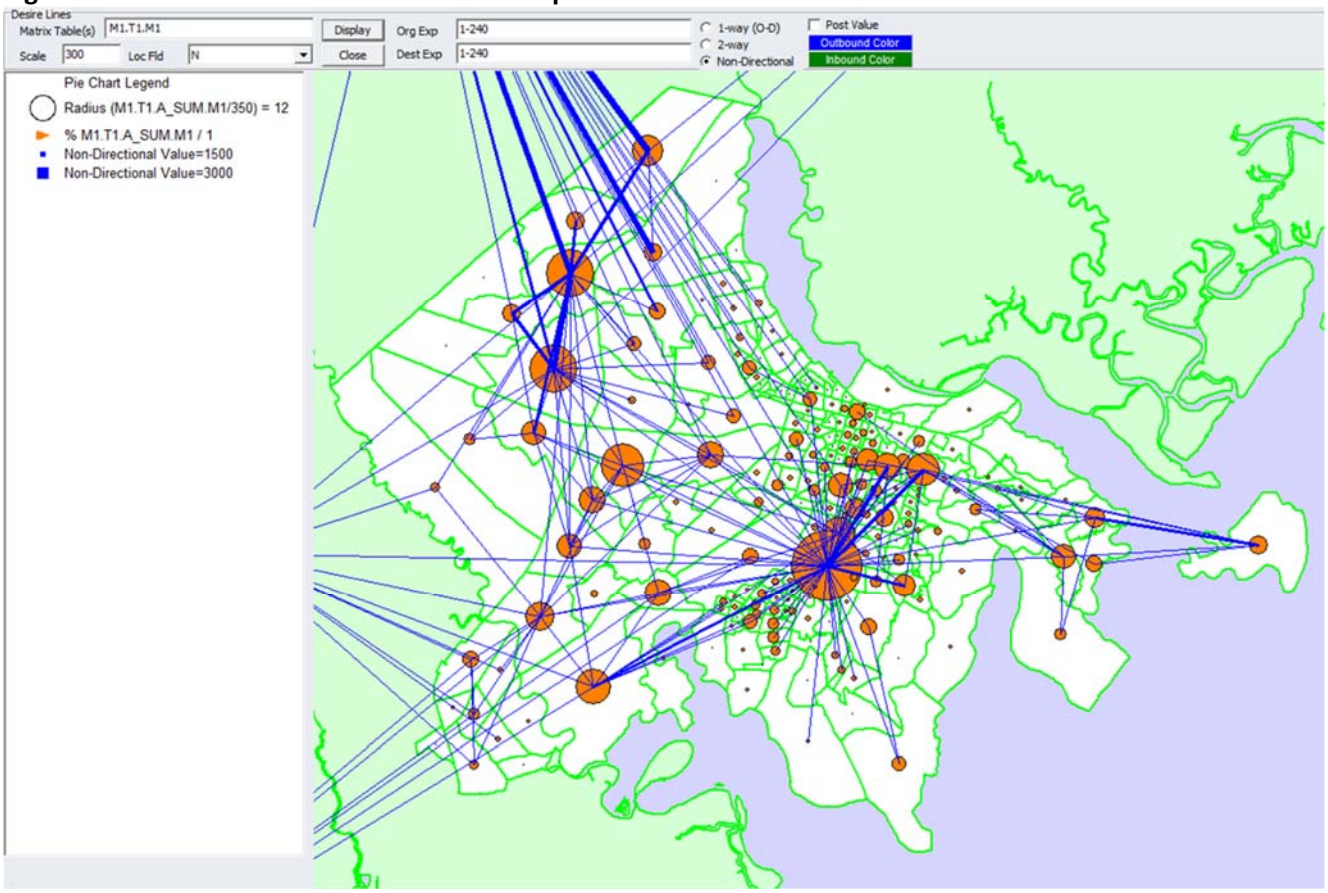


Figure 19: Morning Home Based Work Trips for a Resident Worker



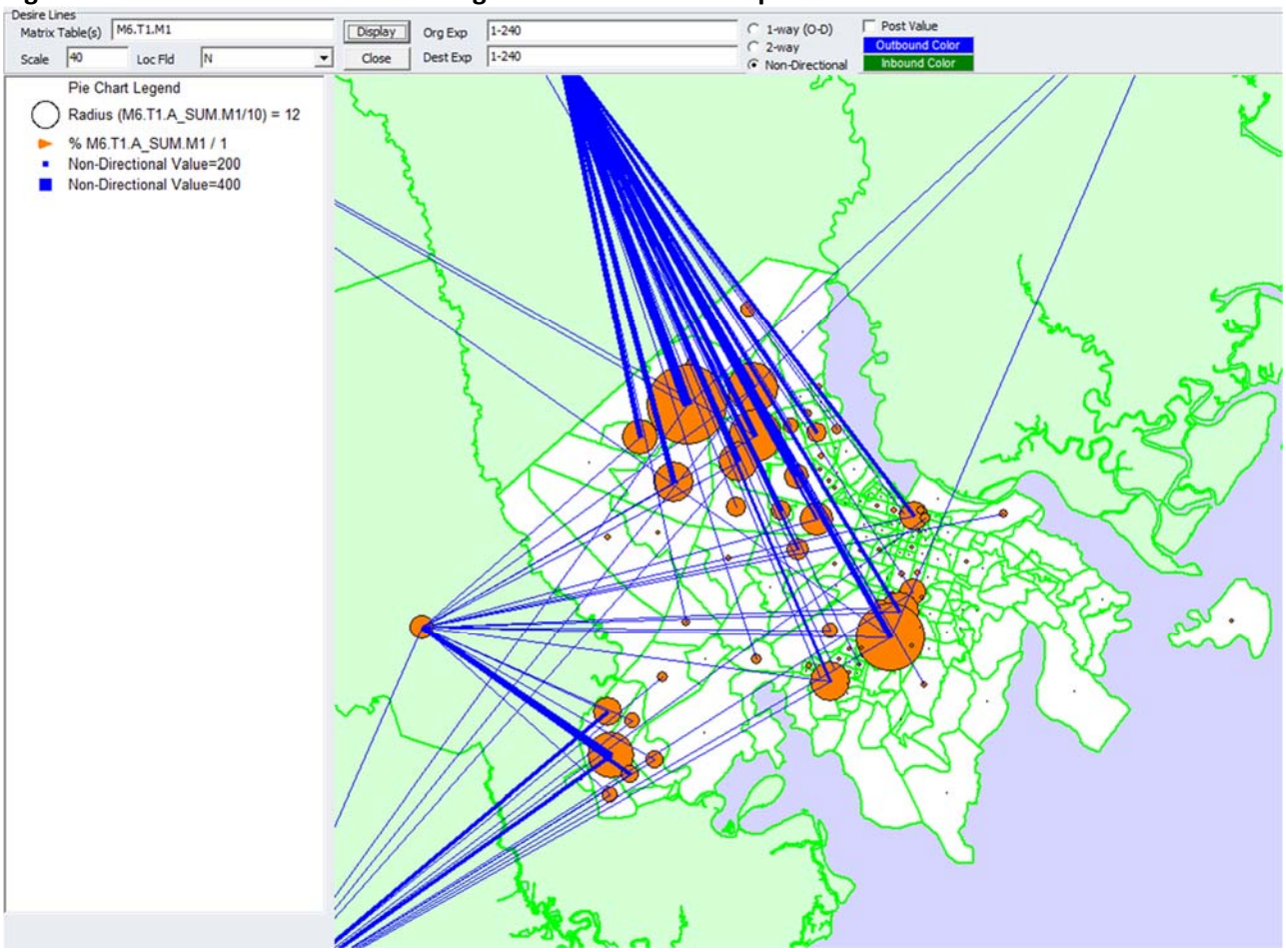
For the morning home based work trip of the resident worker, the largest draw is to the shopping mall area, downtown and Chatham Parkway between I-16 and Ogeechee Road as seen in Figure 19. Both October 2015 and April 2016 showed similar results.

Figure 20: Non-Visitor Home Based Other Trips



The non-visitor home based "other" trips (See Figure 20) showed many trips from Effingham County for services in the commercial areas of Augusta Road (e.g., Rice Hope Market) and the Pooler Town Center. There were many self-contained trips in Western Chatham (e.g., Savannah Quarters to Pooler Town Center). The Oglethorpe Mall dominates in the east, for example to/from North Georgetown and Live Oak. October showed similar results as April with the exception of Tybee, which showed stronger flows in April versus October.

Figure 21: Inbound Commuter Morning Home Based Work Trips



Inbound home based work commuter trips (see Figure 21) from outside the region during the morning commute show strongest flows from Effingham County to Pooler, Liberty and Long Counties to Richmond Hill, and South Carolina to Pooler. Both October 2015 and April 2016 showed similar patterns.

Level of Service

To identify existing and future congested conditions, the traditional LOS analysis was used. Facilities with LOS A through D were identified as minimally congested; LOS E as moderately congested; and LOS F as heavily congested. These levels of congestion were identified by the MPO and GDOT Travel Demand model. Table 12 depicts the existing and future levels of congestion in the study area.

Table 12: Existing and Future Conditions Congestion Levels – Travel Demand Model Data

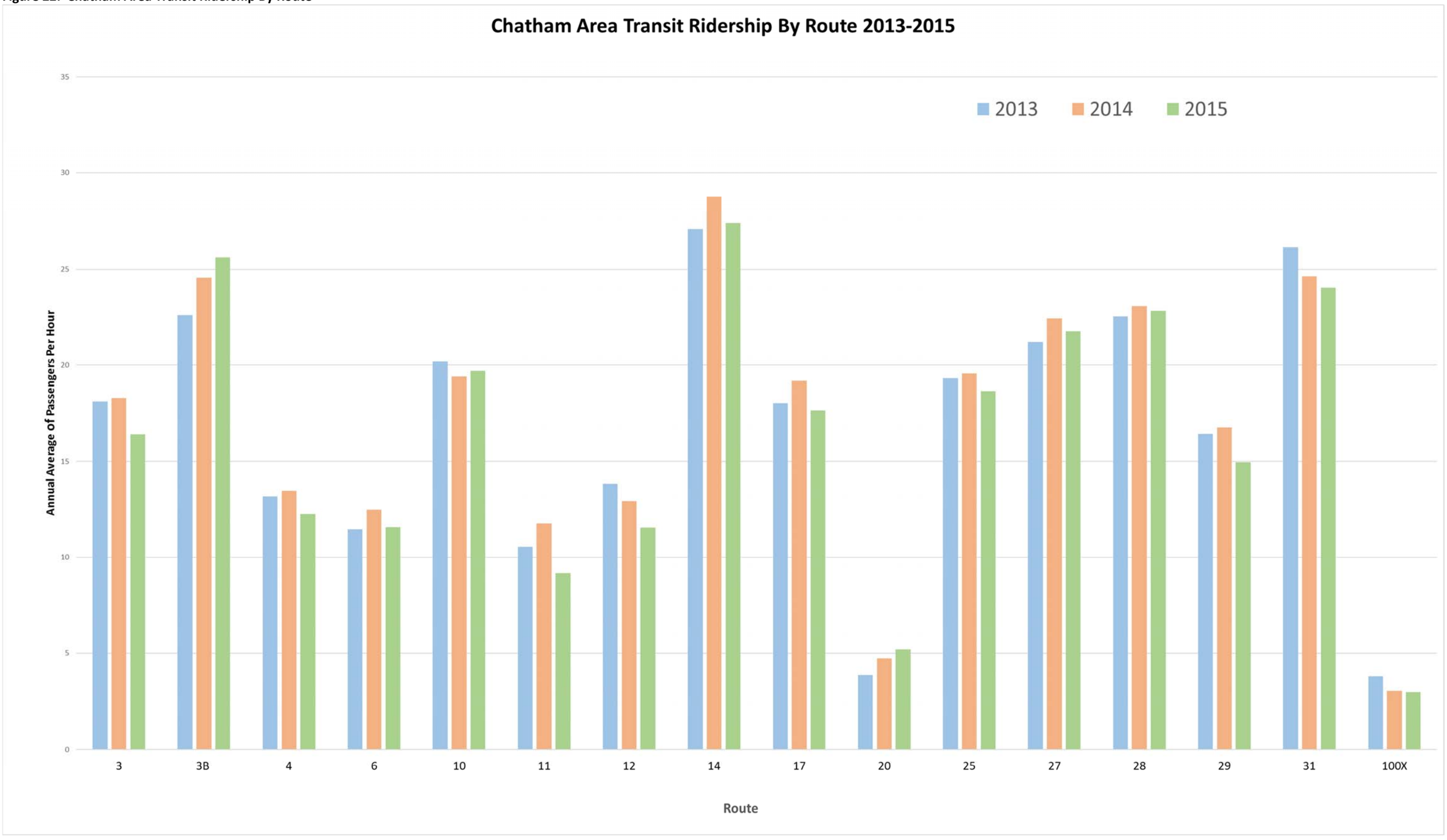
Congestion Level	No. of Miles (%)	
	2010 Conditions	2040 Conditions
Minimal Congestion (LOS A to C)	882.2 (89%)	711.3 (70%)
Moderate Congestion (LOS D)	73.8 (7%)	177.4 (18%)
Heavy Congestion (LOS E)	16.2 (2%)	82.3 (8%)
Heavy Congestion (LOS F)	17.4 (2%)	42.9 (4%)
Total Miles	989.5	1013.4

The identification of future congested conditions was accomplished using traditional Level of Service (LOS) measures. These LOS measures were calculated from the Regional Travel Demand Model. The travel demand model utilizes socio-economic data, in addition to geographic and roadway network data and produces estimated (forecasted) traffic volumes for the transportation network. The 2040 congestion levels were determined using the MTP (Plan System) network, which contains the MPO's planned short and long-range transportation improvement projects.

Transit

The CAT Board uses 'passengers per hour' as a key indicator for analyzing transit route performance. This figure is prepared by dividing the total number of passengers on a given route by the number of revenue hours for that route. The fareboxes used on CAT's vehicles collect the passenger counts, which are adjusted at the end of each month to account for unclassified revenue. This final figure is then divided by the actual revenue hours for that specific route as provided by CAT's operations team. The current desired threshold is 18 passengers per hour. The chart below (Figure 22) represents data collected in fiscal years 2013-2015.

Figure 22: Chatham Area Transit Ridership By Route



Freight Network Bottlenecks Identified in the CORE MPO Freight Transportation Plan

A freight bottleneck is a roadway segment with particular and significant negative impacts on freight network performance. Bottlenecks are generally locations where capacities are inadequate to handle traffic flows, which impacts the performance of the freight network. Congestion, or the queuing/delay of freight movements, reduces the performance and dependability of the freight network in terms of serving freight traffic flows.

To determine freight bottlenecks in the Savannah area, congested segments were ranked in terms of their potential to disturb efficient operation of the network in the CORE MPO Freight Transportation Plan. This selection methodology was based on the following:

- Available GDOT time-congestion grades;
- Three-hour assessment timeframe for each a.m. and p.m. peak hour period;
- Traffic direction;
- Level of service (LOS) grade to determine quality of roadway traffic conditions; and,
- Weighted values according to the Average Annual Daily Traffic (AADT) on the roadway segment over the course of a 24-hour period.

Four categorical values for measuring congestion were associated with segments following application of the bottleneck analysis. The congestion intensity categories include: a.m. congestion, a.m. marginal congestion, p.m. congestion, and p.m. marginal congestion. The highest severity segments were classified as "congested" with lesser but still significant segments classified as "marginally congested." As shown in Tables 13-17, the congestion categories can occur in any combination of congested/marginal with respect to a.m./p.m. travel periods. Following this logic, the worst possible situation for a bottleneck segment is congestion occurring in both the a.m. and p.m. timeframes, shown in Tables 13 and 14, which amounts to significant congestion experienced throughout the entire day along the segment.

The lowest performing segment in the study area, Fort Argyle Road from Sweetwater Station Drive to King George Boulevard, showed a.m. congestion with p.m. marginal congestion. The second lowest performing segment, US 80 between Dean Forest Road and Griffin Avenue, showed both a.m. and p.m. marginal congestion (marginally congested all day).

Table 13: AM Congestion with PM Marginal Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Fort Argyle Road/Abercorn Street	"F" for both Eastbound and Westbound segments	From Sweetwater Station Drive to King George Boulevard This is the only facility showing a.m. congestion and p.m. marginal congestion in the study area.

Table 14: AM and PM Marginal Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	US 80	"D" for Eastbound and "E" for Westbound	From Dean Forest Road to Griffin Avenue. This is the only facility showing a.m. and p.m. marginal congestion in the study area.

Table 15: AM Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Diamond Causeway[14]	"F" for Northbound and "D" for Southbound	From Ferguson Avenue to Pin Point Avenue
2	Ferguson Avenue[15]	None Available	From Pin Point Avenue to Diamond Causeway
3	Fort Argyle Road	"F" for Eastbound and Westbound	From Ford Aveue to Sweetwater Station Drive
4	I-16 Eastbound	"F" and "E" for Eastbound segments	12 Segments included; From Pooler Parkway to I-95
5	I-16 Eastbound Ramp	"F" and "E" for Eastbound segment	Ramp to Eastbound I-16 at Dean Forest Road

Table 16: PM Congestion

Rank	Segment Name	Level of Service (Worst-Case Daily)	Notes
1	Abercorn Street	"E" Eastbound and Westbound	From Janet Drive to East DeRenne Avenue
2	Augusta Road	"F" Northbound and Southbound	From Hendley Road to I-95 NB Onramp
3	I-95 off ramp	"A" and "B" for ramp segments	At Exit #109 to Augusta Road
4	Ogeechee Road	"D" and "F" for Eastbound and Westbound segments	Chatham Parkway to Red Gate Farms Road
5	Waters Drive	"E" for Northbound and "C" for Southbound	From Althea Parkway to East DeRenne Avenue

To provide a simple bottleneck severity ranking, segments analyzed considered a.m. and p.m. congestion and marginal congestion characteristics, and were grouped into the output classification of the roadway segments as is displayed in Tables 15 and 16.

[14] Segment was originally identified during the initial analysis as bottlenecked segment, but is not located on proposed freight network.

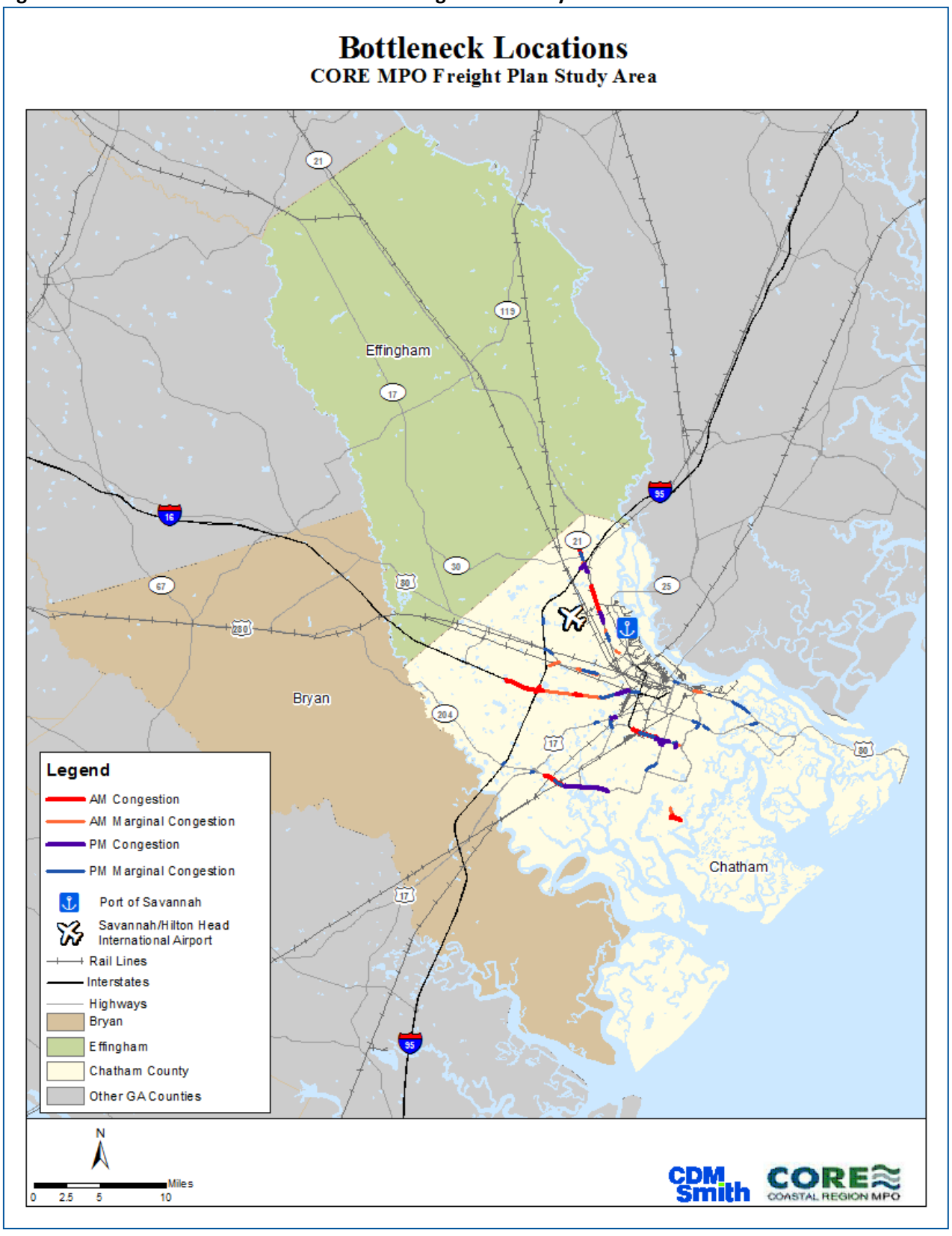
[15] Segment was originally identified during the initial analysis as bottlenecked segment, but is not located on proposed freight network.

Table 17: Freight Advisory Committee (FAC) Identified Bottleneck Locations

Location	FAC Comments
SR 307 to I-16	Main Port Authority Route
SR 307 to SR 21 to Jimmy DeLoach Parkway to I-95	Main Port Authority Route
Brampton Road route to I-516	Main Port Authority Route
US 17 through Richmond Hill	
I-516 Corridor	Obsolete Design Standards
Pooler Parkway/Airways Avenue @ I-95	Outlet Mall Development Mix between retail and freight traffic near Gulfstream Road Signal timing issue along Service Road (I-95 is city boundary for signal ownership)

In addition, the Freight Advisory Committee (FAC) identified the following potential bottleneck locations for freight movements during the Freight Transportation Plan development as shown in Table 17. The freight bottleneck locations have been mapped and are displayed in Figure 23.

Figure 23: Bottleneck Locations: CORE MPO Freight Plan Study Area



Non-motorized Traffic

CORE MPO's pedestrian and bicycle count program is conducted annually in accord with the methods of the National Bicycle and Pedestrian Documentation Project. The counts so far have been conducted manually, and thus the number of samples and duration are limited to typically three time periods, for two hours each, for the selected locations each year. With limited samples, high variability in volumes from year to year is observed at most locations for both pedestrian and bicycle trips. In this section, pedestrian trips are reviewed first followed by bicycle trips. Unlike the peaks observed for automobile trips, the peak periods for pedestrians and bicyclists are not necessarily related to work trips. Thus, for each of the two modes, a mid-day weekend sample is included. The average weekday p.m. period is displayed first, followed by the weekend mid-day period.

Pedestrian Trips

Pedestrian trip trends, from the MPO's annual count program, are shown in Figures 24-27. Among all the pedestrian count locations, Broughton Street, in the core of Savannah's business district, always has the highest volumes (as high as 2000 trips in two hours), which is not surprising. (The large difference between volumes at that location and every other location necessitates display for Broughton on a separate chart (Figures 22 and 24), to facilitate readability of trends at the lower volume locations.) Because Broughton Street is a moderate-to-high density location, the Documentation Project's adjustment factors can be applied to its counts, to estimate totals for longer time periods. The average daily pedestrian volume on Broughton Street, just east of Bull Street, is estimated to range from 6510 to 9445, according to the extrapolation method. This range is somewhat higher than motor vehicle counts at that location, which range from 5560 to 7070 in recent years, according to GDOT traffic counts.

US 80/Tybee Road (near Lazaretto Creek), a rural section, shows the lowest pedestrian volumes. This location was included to obtain "before" data for comparison after a future path extension and connection across the creek is completed, which may have a large positive impact on trips there. Other conclusions from the pedestrian data include the observation that suburban locations of Berwick Boulevard and Johnny Mercer Boulevard also usually have low numbers of pedestrian trips during the sample periods. However, SR 21 in Garden City, a seven-lane arterial with apartments, retail, and food and beverage stores, often rivals several downtown Savannah locations in pedestrian volumes.

Figure 24: Pedestrian Trip Trends in Weekday Evening

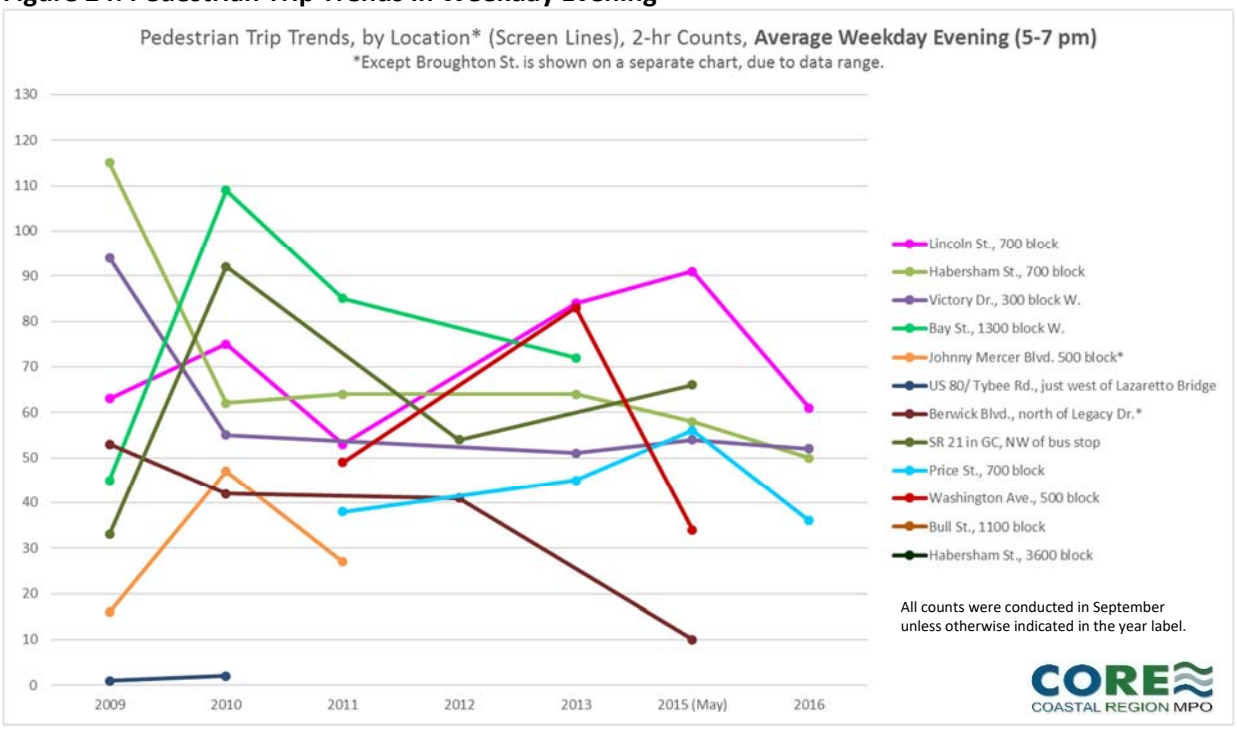
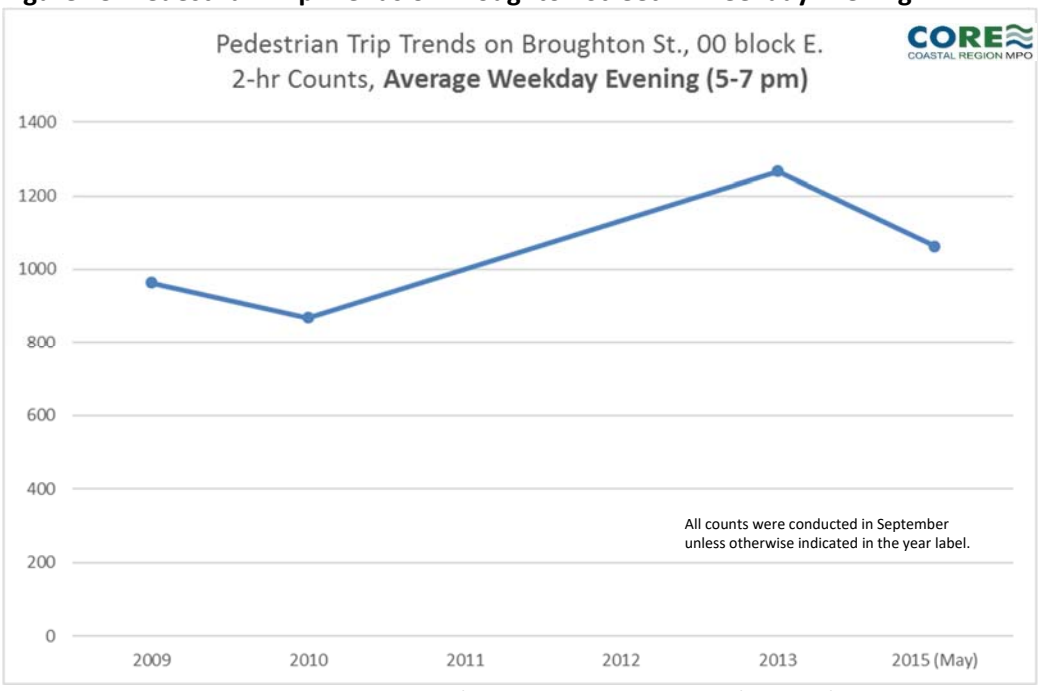


Figure 25: Pedestrian Trip Trends on Broughton Street in Weekday Evening



In 2016, Broughton Street was not among the count locations.

Figure 26: Pedestrian Trip Trends at Saturday Mid-day

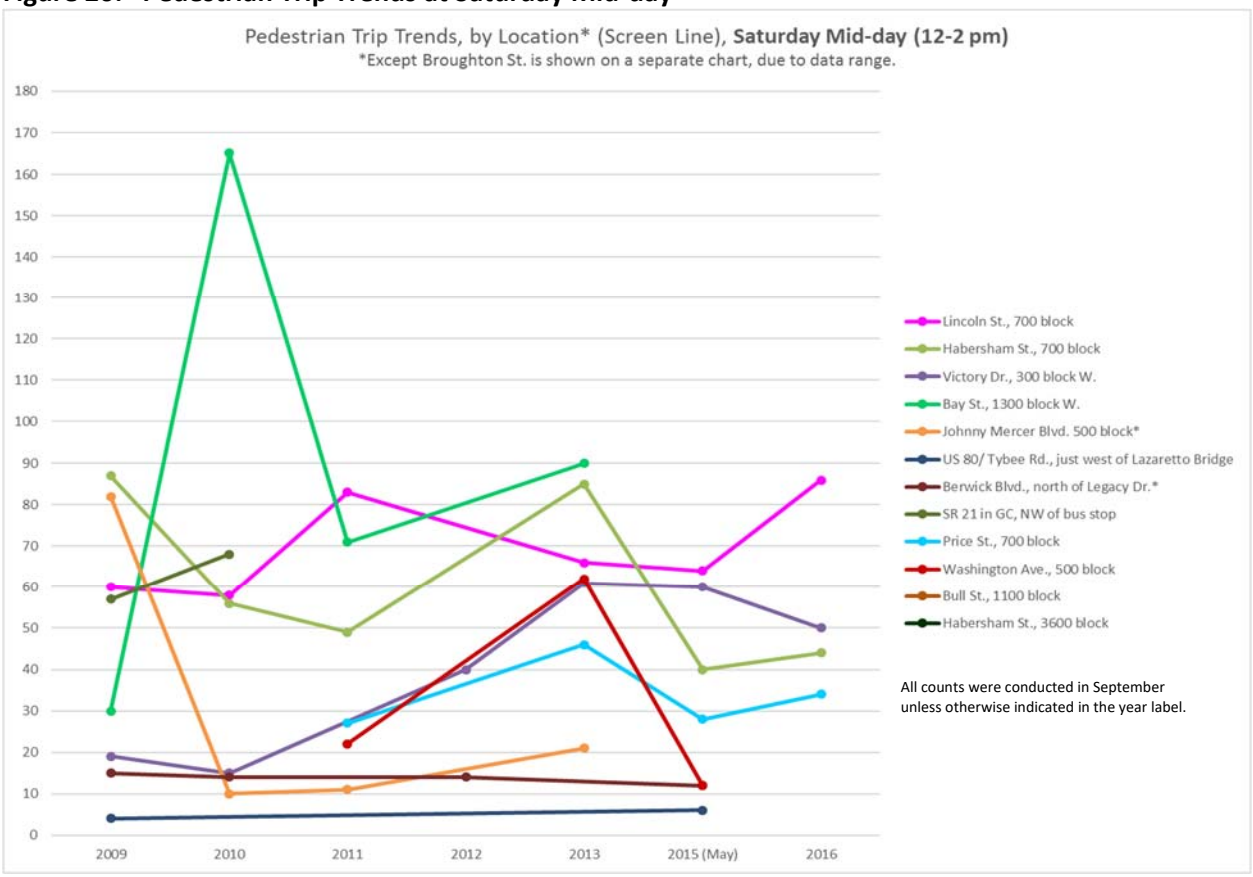
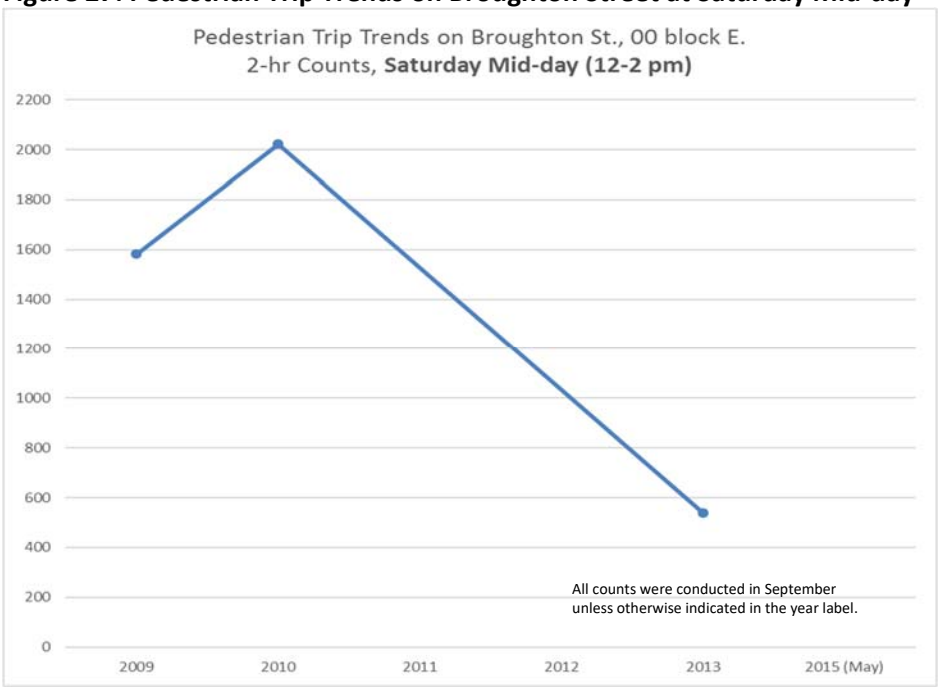


Figure 27: Pedestrian Trip Trends on Broughton Street at Saturday Mid-day



In 2016, Broughton Street was not among the count locations.

Bicycle Trips

Bicycle trip trends, from the MPO's annual count program, are shown in Figures 28 and 29 one for average weekday evening, and one for Saturday mid-day. These locations include some that have bicycle lanes (Lincoln, Price, and Washington Street corridors), some that have a shared use path (Johnny Mercer and Berwick Boulevards), and many that have only standard travel lanes shared with motor vehicles. Bicyclists using sidewalks were counted also, even though the behavior is illegal in most locations.

The downtown Savannah locations typically show the highest bicycle volumes among the count locations: Broughton Street; Bull Street near Park Avenue; and Lincoln, Habersham, and Price Streets near Kroger.

As with the pedestrian trips, US 80/Tybee Road, near Lazaretto Creek, shows the lowest bicycle volumes, but this is expected to increase greatly once better shoulders and path connections are provided in a planned road project, as a Savannah-Tybee bicycle connection is the most requested in surveys.

Figure 28: Bicycle Trip Trends in Weekday Evening

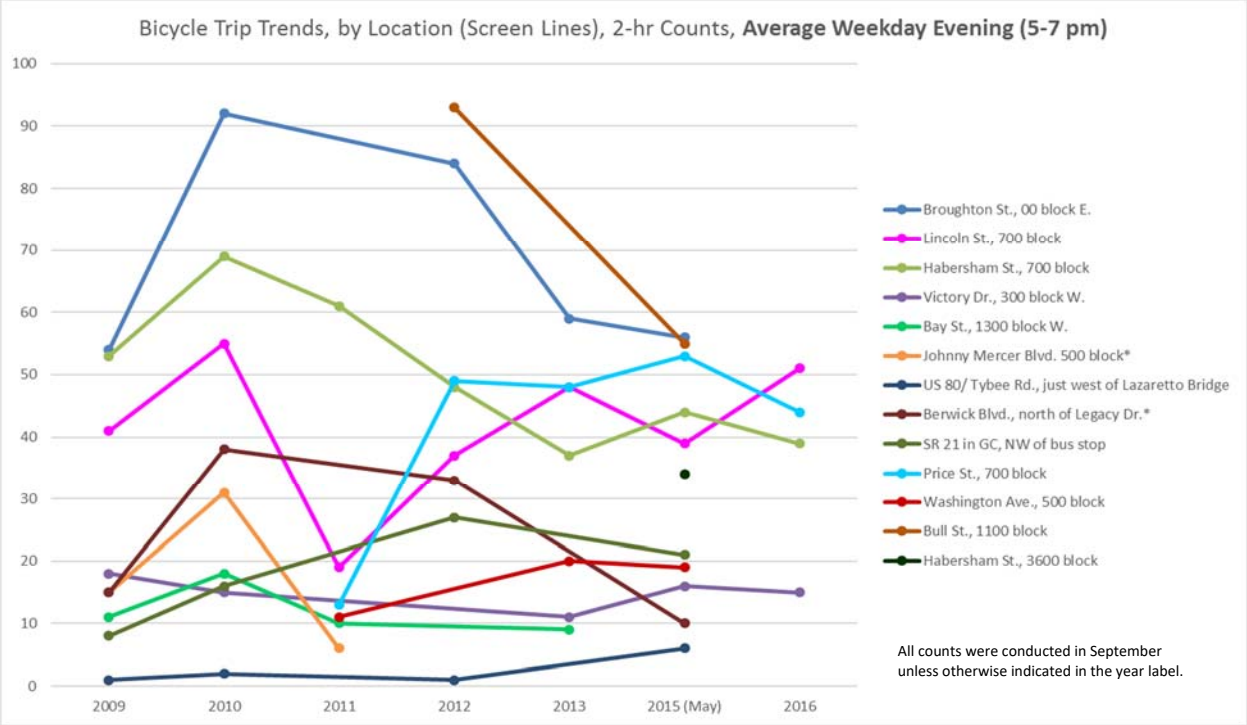
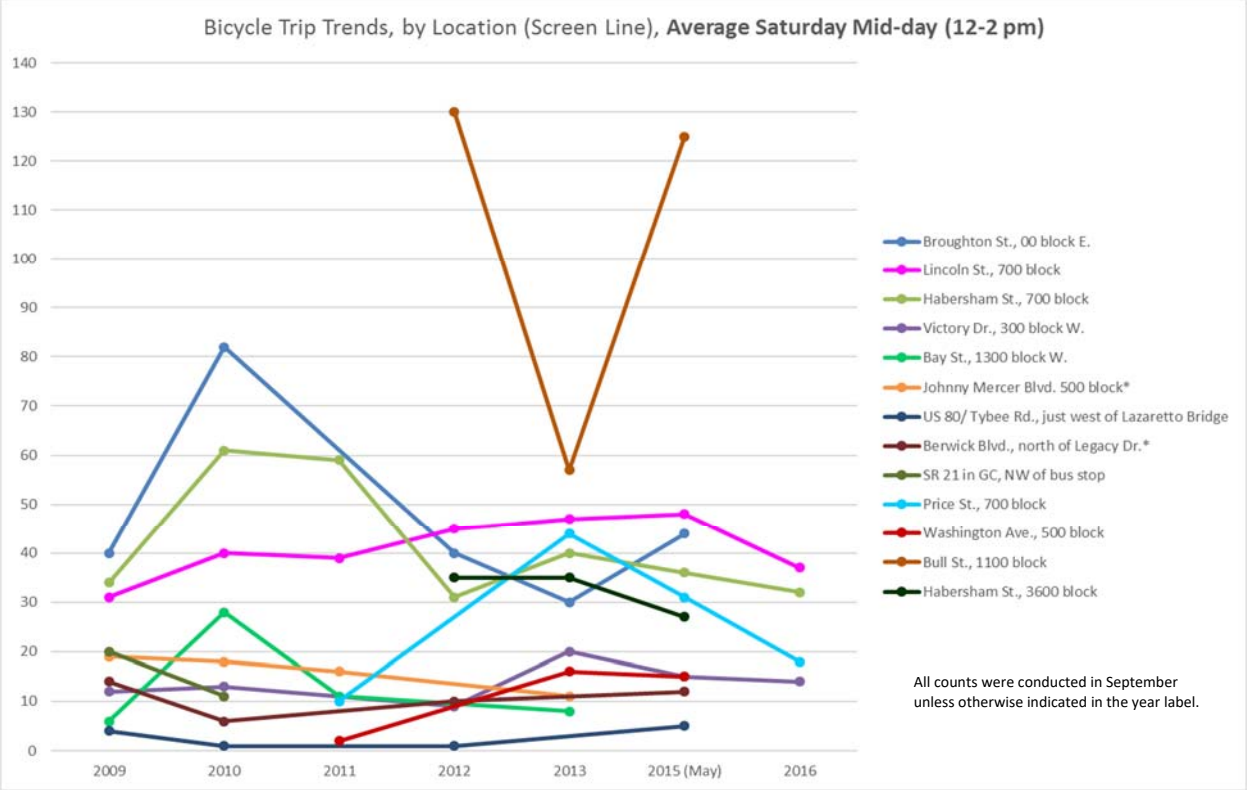


Figure 29: Bicycle Trip Trends at Saturday Mid-day



Before-and-After Analysis of the Impact of the Price Street Bike Lane on Bicycle Volumes

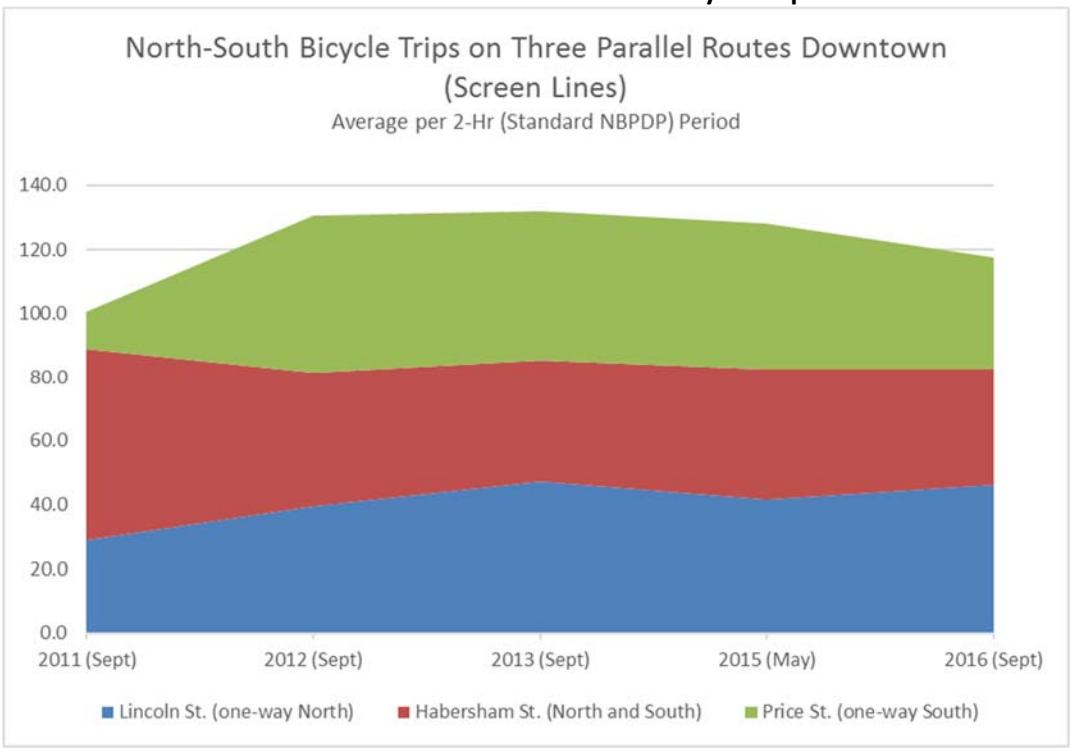
The amount of walking and bicycling in a community is likely affected by the quality and type of infrastructure, among other factors such as density and mixture of land uses. This may be especially true for bicycling. Without dedicated facilities, bicyclists are expected to mix with other vehicles on the road, which can be intimidating to some people who would otherwise consider using a bicycle for certain trips. The annual counts constitute observed demand, but latent demand may exist due to lack of comfortable facilities. Comparing the volumes of bicycle trips before an infrastructure improvement with volumes after an infrastructure improvement can reveal whether latent demand has become observed demand as a result of the improvement.

The Price Street bicycle lane project allowed such a comparison. Before May of 2012, Price Street was a two-lane, one-way, southbound street with no on-street parking. The City of Savannah decided to revise the use of the pavement without widening the street (i.e. implement a road diet), to potentially mitigate several issues such as speeding, crashes, and the tendency for wrong-way (southbound) bicycle operation in the parallel, northbound Lincoln Street bicycle lane. Since sometime in May of 2012, Price Street has been a one-way, southbound street with a one-way southbound bike lane and on-street parking. MPO staff has not obtained data at this time to compare the speeds or crashes before and after the project, but the effect of the project on bicycling volumes and wrong-way riding can be analyzed. Price Street was included among the bicycle and pedestrian count locations in 2011

when MPO staff first became aware of plans for the Price Street project. Thus, there is a Price Street sample for the "before" state for only one year.

Because any new trips on Price Street could be trips that simply shifted from other nearby routes, this analysis looks at Price Street as well as two nearby parallel streets in the bicycle network: Lincoln Street, with the northbound bike lane, and Habersham Street, which is a two-way, shared lane, signed bike route. The Price Street bicycle lane evidently increased bicycle traffic on Price Street itself by a factor of about four, and increased bicycle traffic on all three corridors by roughly 30% in most years. For Price Street, itself, volumes from the 2012-2016 periods consistently averaged about 44 trips per two-hour period, whereas the 2011 "before bike lane" state showed only 12 trips per two-hour period. Some of the Price Street trips were attracted from the parallel Habersham Street, but the three routes together, from 2012 onward, averaged about 130 trips per two-period usually, compared to 100 bicycle trips per two-hour period in 2011, before Price Street had the bike lane. Figure 30 below illustrates the data graphically. Although the data samples are limited, the analysis suggests that the provision of the Price Street bicycle lane drew out some previously latent demand for bicycling on the east side of downtown Savannah at least.

Figure 30: The Positive Effect of the Price Street Bike Lane on Bicycle Trips on Three Streets



As mentioned above, another intended outcome of the Price Street (southbound) bicycle lane was reducing the wrong-way (southbound) bicycle trips on Lincoln Street. The Price Street project has not consistently achieved this outcome. The percent of observed trips on Lincoln street that were in the illegal direction in 2009-2011 (before the Price Street project provided a parallel, legal southbound bike lane two blocks away), were in the range of 31%-34%. After the Price Street project, Illegal trips

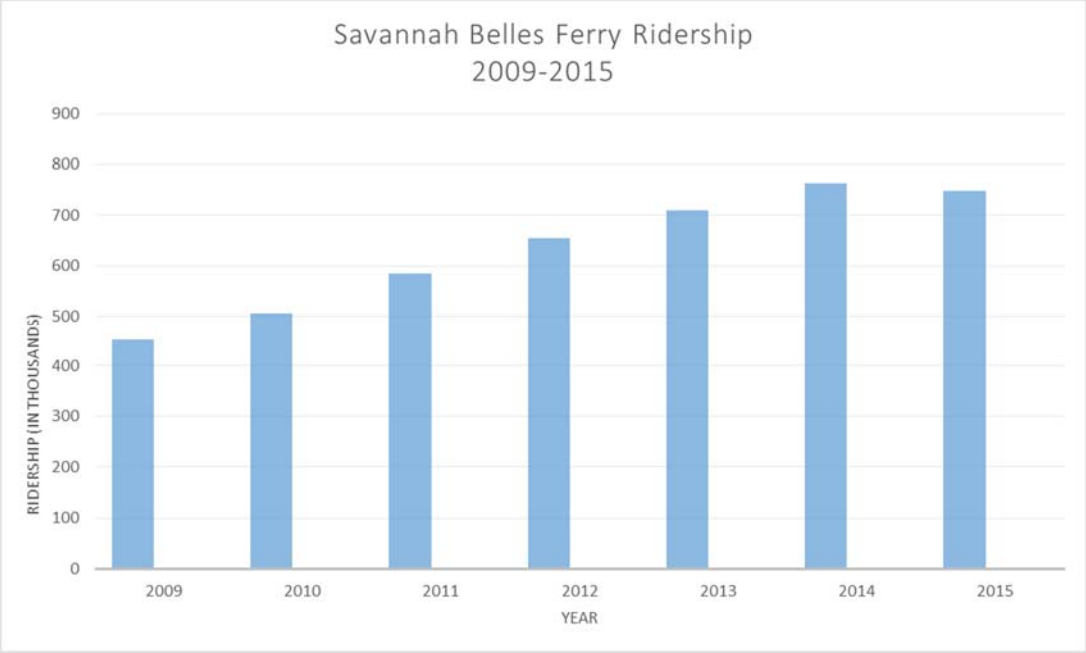
on Lincoln Street remained at similar level in 2012 (31%), decreased to 23% and 18% in 2013 and 2015 respectively, before coming back to 34% in 2016.

Savannah Belles Ferry

The Savannah Belles Ferry is operated through a partnership between the Savannah Convention Center and CAT. The ferry system serves to transport passengers between River Street and the Convection Center and Westin Hotel on Hutchinson Island. The ferry system has been well utilized for events taking place at the Convention Center such as the Rock and Roll Marathon. This allows passengers to park on Hutchinson Island and be ferried across the river. By having passengers park on Hutchinson Island and ride the ferry, many potential parking and congestion issues have been alleviated.

The annual average ridership is 631,332 passengers with approximately 1,743 per day (see Figure 31). The system supported over 1,095 events in Savannah with over one million attendees between 2009 and 2015.

Figure 31: Savannah Belles Ferry Ridership



Source: Chatham Area Transit

10.0 Congested Corridors

The data revealed several congested corridors. By supplementing the data analysis with the TCC's firsthand knowledge, a list of congested corridors was compiled, for which congestion reduction strategies could be identified. Table 18 lists the most congested corridors identified in the region.

Table 18: Most Congested Corridors

Roadway	Segment
US 17	Between SR 204 and SR 307
	Between SR 307 and I-516 (Northbound not available)
	Between SR 144 (Bryan County) and SR 204
	Between I-95 and SR 144
	Bryan County boundary (or SR 196) to I-95 (Partially Outside of MPA)
SR 21	Between I-95 and I-516
SR 204/Abercorn	Between DeRenne Avenue and I-16
	Between Veteran's Parkway and Harry S. Truman Parkway
	Between Harry S. Truman Parkway and DeRenne Avenue
DeRenne Avenue	Between I-516 and SR 204
	East of SR 204 (westbound not available)
SR 144	Between US 17 and I-95
I-95	Between Pooler Parkway and SR 21 (includes SR 21/I-95 interchange)
	At GA--SC State Border (State line is outside of MPA)
I-16	Between Exit 148/Old River Road and I-95
	I-95 to I-516 (Includes I-16 at I-95, I-16 at SR 307 / Exit 160 and I-16 at Chatham Pkwy / Exit 162)
I-516	At SR 204/Abercorn
	At Mildred Street
	At Veterans Parkway/Exit 3
SR 307	Between I-16 and SR 25
Pooler Parkway	Between I-95 and I-16
Victory Drive/US 80	Between I-516 and Bee Road
	Between Bee Road and Wilmington River
	Wilmington River to Islands Expressway
Grange Rd	Between SR 21 to East of SR 25
Brampton Rd	Between SR 21/SR 25 to SR 21 Spur
SR 26 (Ogeechee Rd)	I-516 to Victory Drive
SR 25 Connector	Between I-516 to the Bay Street Viaduct

Constrained Corridors

In addition to the congested corridors listed in the previous section, the CMP also identifies "constrained corridors". The Savannah region has many corridors which have been identified as being constrained. The CORE MPO's Transportation Amenities Plan identified such corridors as part of the effort to preserve and support the unique characteristics of the region, and ensure that future roadways are developed with full consideration of context sensitive design principles and complete streets concepts. This is accomplished through the conservation and management of existing scenic and historic roadways and the integration of enhancement activities, such as sidewalks, landscaping, tree preservation and bikeways into future roadway construction projects. This plan was inspired by citizen concerns regarding the impacts of road construction projects, particularly the loss of trees. The CORE MPO, the City of Savannah, Chatham County and GDOT worked together to develop a resolution in support of these types of transportation amenities. The resolution was adopted by the CORE MPO, the Chatham County Commission, the City of Savannah and the Town of Thunderbolt. The development of the Transportation Amenities Plan[16] followed this resolution, seeking to continue the growth of the transportation system in ways that take advantage of the unique characteristics of the region's roadways. Implementation of the Transportation Amenities Plan is a two-phase process. Phase I of the Plan, completed in 2004, addresses existing roads exhibiting unique features and intrinsic qualities which the community desires to preserve. Corridors identified during Phase I were targeted for conservation and management strategies, and the MPO's MTP reviewed and revised to eliminate any projects, not already in progress, which would have destructive impacts on the corridors' exemplary characteristics. The Phase I Amenity Corridors were classified into seven categories:

- Canopy Roadways,
- Replanting Areas Due to Lost Canopy,
- Community Gateways,
- Palm-Lined Causeways,
- Historic Road Segments,
- Landscaping of New and Recently Completed Roads, and
- Scenic Vistas.

Phase II of the Transportation Amenities Plan, completed in 2006, addresses new construction and roadway reconstruction through the development and adoption of a Context Sensitive Design (CSD) Manual to guide new roadway development.

A context sensitive solutions (CSS) approach to transportation projects seeks to seamlessly integrate transportation projects into their surrounding communities and environments. A successful project utilizing CSS principles builds consensus among project stakeholders, upholds community values, and reaches the best possible solutions to transportation issues while minimizing impacts to the surrounding community and environment. To further enhance and preserve the region's unique environment and transportation system, the CSD manual provides design guidelines for future

[16] http://www.thempc.org/docs/lit/CoreMpo/Manuals/ContextSensitive/Manual.pdf

transportation projects that are sensitive to the amenities, history and character that were identified along corridors in Phase I of the Transportation Amenities Plan. The CORE MPO initiated the development of this manual to maintain its vision for the transportation system in the region, which is:

- Treating trees (especially canopy trees) as historic, essential elements of the region;
- Providing streets that encourage travel for automobiles, bicycles, and pedestrians through the use of landscaping and other enhancements; and
- Involving these ideals as an integral part of the planning and design processes.

Development of the Context Sensitive Design Manual involved an extensive public involvement process that consisted of local meetings, workshops, and one-on-one stakeholder discussions. The Context Sensitive Design Manual addresses various project types in multiple contexts, and gives examples of how transportation facilities can be better implemented using context sensitive design, accommodating all facility users rather than just the automobile. Guidelines are presented using typical sections and design criteria, allowing both technical designers and less technical citizens to communicate clearly about project designs and expectations. Guidelines include:

- Developing and maintaining canopy streets; and
- Roadway design for various facility types that are in:
    - Historic districts,
    - Traditional neighborhoods,
    - Village centers,
    - Suburban and gated communities,
    - Scenic corridors, and
    - Rural or undeveloped corridors.

Traditional capacity adding projects would not be favorable options for mitigating congestion in constrained corridors. These roadways are often limited by tree canopy and or denoted as historic corridors. Compromising the character of these roadways typically is not a valid option. The complete list of constrained corridor is available the MTP. The CMP includes a selection of principal and minor arterial constrained corridors that are known to experience congestion (see Table 19). The next section discusses strategies to mitigate congestion on constrained corridors.

Table 19: Constrained Corridors

Constrained Corridors			
		Constraints	
Corridor	Segment	Canopy/Replanting/Palm Lined	Historic Road/Scenic Vista
37th Street	Ogeechee Road to west of Waters Avenue	X	X
Abercorn Street	Victory to 67th Street	X	
Anderson Street	Habersham to Cedar Road	X	
Bay Street	MLK Boulevard to Presidents Street	X	X
Bull Street	Most sections	X	X
Henry Street	Habersham to Bee Road	X	
Johnny Mercer Boulevard	Most sections	X	X
Liberty Street	MLK Boulevard to East Broad Street	X	
MLK Boulevard	River Street to 52nd Street	X	X (portions)
Montgomery Street	South of Victory Drive to south of Staley Street	X	
Oglethorpe Avenue	MLK Boulevard to East Broad Street	X	X
Victory Drive (US 80)	Ogeechee Road to Wilmington River	X	X
Washington Avenue	Bull Street to Bee Road	X	
Waters Avenue	South of DeRenne Avenue to north of Stephenson Ave and 52nd Street to Victory Drive	X	
White Bluff Road	DeRenne Avenue to Truman Parkway and Vernonburg Ave to Old Coffee Bluff Road	X	X
*This list is not comprehensive but focuses on major arterials. The complete list was included in the 2030 MTP.			

11.0 Identify and Assess CMP strategies

The identification and assessment of appropriate congestion mitigation strategies is a key component of the CMP. A set of recommended solutions to effectively manage congestion and achieve congestion management objectives is identified. The strategies that are selected should support the congestion management objectives that have been agreed-upon for the region noted in Section 3.

To help the CORE MPO achieve its goal of managing congestion, a comprehensive "toolbox" of CMP strategies has been identified and summarized in Tables 20-22. Using USDOT[17] guidance, a full range of potential congestion management strategies were identified for freeways (Table 20), non-freeways (Table 21) and the overall region (Table 22). The strategies are grouped into four major categories: demand management; alternative mode promotion; traffic operations; and land Use.

Additionally, these techniques are summarized as related to: term effectiveness (short, mid, long); congestion type (recurring, non-recurring or both); and public acceptance (low, medium, high).

Several of the techniques are already in place in the region yet there is room to consider incorporating more. These strategies and others that evolve will continue to be evaluated as part of the CMP and MTP process. Many of the non-capacity adding strategies identified in the tables would be most appropriate for the constrained corridors where added capacity is not a favorable option.

Constrained Corridors

Traditional capacity adding projects such as road widening would not be favorable options for mitigating congestion on most of the constrained corridors. These roadways often have extensive tree canopy or significant historic features. Some examples of strategies can be found in tables 21 and 22

[17] Congestion Management Process: A Guidebook, USDOT, FHWA, April 2011

such as traffic signal optimizing and alternative mode options, transit access, ridesharing and telecommuting.

Table 20: Congestion Management Strategies – Freeways

Techniques for Fully Controlled Access Facilities (Freeways)	Currently In Use	Term Effectiveness	Congestion Type	Public Acceptance
Demand Management				
HOV Lanes	No	L	R	L
Variable Priced Lanes	No	L	R	L
Congestion Pricing High Occupancy Toll (HOT) Lanes	No	M	R	L
Bridge Tolling	N/A	L	R	L
Electronic Payment Systems	No	M	R	H
Alternative Mode Promotion				
Park-and-Ride Lot Improvements	No	S	R	H
Use of shoulders for Transit Vehicles During Peak Periods	No	M	R	H
Traffic Operations				
Imaging for Surveillance and Detection	Yes	S	N	H
Work Zone Management	No	S	N	H
Reversible Lanes or Movable Medians	Yes (Evacuation routes only)	M	RN	M
Spot Safety Improvements		S	N	H
Freeway Ramp Metering	No	M	RN	L
Variable Speed Limits	No	M	RN	M
Variable Message Signs (VMS)	Yes	S	RN	H
Land Use				
Transportation-Land Use Plans with Locals Governments	No	M	R	H

Symbol Legend:
Term Effectiveness: (**S**)hort, (**M**)id, (**L**)ong
Congestion Type: (**R**)ecurring, (**N**)on-Recurring, or Both(**RN**)
Public Acceptance: (**L**)ow, (**M**)edium, (**H**)igh

Table 21: Congestion Management Strategies – Non-Freeways

Techniques for No/Partially Controlled Access Facilities (Non-Freeways)	Currently In Use	Term Effectiveness	Congestion Type	Public Acceptance
Demand Management				
Access Management Program	No	M	RN	M
High Occupancy Vehicle (HOV) Lanes	No	L	R	L
Congestion Pricing	No	M	R	L
Bridge Tolling	N/A	L	R	L
Alternative Mode Promotion				
Transit Signal Priority Systems	No but Possible	M	R	H
Park-and-Ride Lot Improvements	No	S	R	H
Addition of Bicycle Racks at Public Transit Stations / Stops	Yes	S	R	H
Bicycles and Pedestrian Access to Transit Improvement	Yes	S	R	H
Sidewalk Gap Closure Program	Yes	M	R	M
Improve Pedestrian Facilities at Intersections	No	S	R	H
Creation of New Bicycle and Pedestrian Facilities	Yes	M	R	H
Bike Sharing Programs	Yes	M	R	M
Enhance Transit Amenities	No	S	R	H
Use of Shoulders for Transit Vehicles During Peak Periods	No	M	R	H
Safe Routes to School Initiatives	Yes	M	R	H
Bicycle / Pedestrian Education Program	Yes	M	R	H
Bicycle and/or Pedestrian Corridor Safety Studies and Implementation	Yes	M	RN	H

Table 21: Congestion Management Strategies – Non-Freeways (Continued)

Techniques for No/Partially Controlled Access Facilities (Non-Freeways)	Currently In Use	Term Effectiveness	Congestion Type	Public Acceptance
Traffic Operations				
Imaging for Surveillance and Detection	Yes	S	N	H
Traffic Signal Timing	Yes	S	R	M
Red-Light Camera Enforcement	No	S	N	M
Dynamic Traffic Signal Systems	Yes (Pooler)	M	R	M
Service Patrols (e.g. IMAP)	No	M	N	H
Emergency Management Systems (EMS)	Yes	S	N	H
Work Zone Management	No	S	N	H
Turn Lane Construction and Extension	Yes	S	R	H
Roundabout Constructions	Yes	S	RN	M
Reversible Lanes or Movable Medians	No	M	RN	M
Safety Improvements	Yes	S	N	H
Variable Speed Limits	No	S	RN	H
Variable Message Signs (VMS)	Yes	S	RN	H
Land Use				
Transportation-Land Use Plans with Locals Governments	Yes	M	R	H
Develop Overlay Districts to Manage Development Densities and Form	Yes	M	R	M
Use best practices in school siting decisions	No	L	RN	M

Symbol Legend:

Term Effectiveness: (**S**)hort, (**M**)id, (**L**)ong

Congestion Type: (**R**)ecurring, (**N**)on-Recurring, or Both (**RN**)

Public Acceptance: (**L**)ow, (**M**)edium, (**H**)igh

Table 22: Congestion Management Strategies – Regional

Techniques for Strategies Applied on a Regional Level (Regional)	Currently In Use	Term Effectiveness	Congestion Type	Public Acceptance
Demand Management				
Ridematching services	Yes (Employer Based)	S	R	L
Vanpooling	No	S	R	L
Parking Cash-out or Carpool Parking Incentives	No	M	R	M
Alternative Commute Subsidy Program	No	M	R	M
Telecommuting Promotion	Yes (Employer Based)	S	R	M
Compressed/Flexible Workweeks	Yes (Employer Based)	S	R	M
Employer Outreach/Mass Marketing	No	M	R	M
Alternative Mode Promotion				
Improvements/Added Capacity to Transit	Yes	ML	R	H
Service Coordination	No	M	RN	H
Traffic Operations				
Traffic Management Centers (TMCs)	Yes	M	N	H
Parking Management and Information Systems	No	S	R	H
511 Traveler Information	Yes	S	RN	H
Highway Advisory Radio (HAR)	No	S	RN	H
Transit Information Systems	No	S	R	H
Land Use				
Encourage Activity Centers	No	M	R	M
Live-Work Proximity Incentives	No	L	R	M
Require MPO Review for Regional Scale Developments	Yes	L	R	M
Growth Management Restrictions	No	L	R	M

Symbol Legend:
Term Effectiveness: (**S**)hort, (**M**)id, (**L**)ong
Congestion Type: (**R**)ecurring, (**N**)on-Recurring, or Both (**RN**)
Public Acceptance: (**L**)ow, (**M**)edium, (**H**)igh

Interstate and Principal Arterial Strategies

Taking into the consideration the congested corridors identified through data analysis and Technical Coordinating Committee input, Table 23 identifies the strategies that could or already are being applied to relieve congestion. The table identifies the roadway segment with a brief description and recommended CMP action. Many of the roadways identified have projects already in place which are noted in the table along with a general timeframe or phase of the project. In many situations, it will be necessary to reevaluate the congested roadway segments identified after the completion of the recommended CMP actions to determine whether or not the congestion mitigation strategy was effective.

Table 23: Congestion Strategies by Corridor Segment

Road	Limits/At	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
US 17	Between SR 204 and SR 307	GDOT completed several quick turnaround projects at various locations to add/extend left turn lanes - at Quacco Road, at Berwick Blvd, etc.	Revisit this segment after Chatham County improvements are completed on Quacco Road Consider ultimately a six lane access controlled	Complete
		Chatham County is working on Quacco Road Improvements from US 17 to I-95 - will improve US 17/Quacco Intersection.		Preliminary Engineering underway
		Chatham County is working on operational improvements at US 17/Berwick Blvd.	Duel lefts and included in SRTOP deployment	Project underway: Design Phase
	Between SR 307 and I-516 (Northbound not available)	Garden City is making improvements to Chatham Parkway from I-16 to US 80. This project might help relieve congestion between SR 307 and I-516.	Revisit this segments after Garden City has completed improvements and reevaluate.	Project underway
		GDOT is working on Ogeechee Road Widening from E of Lynes Parkway to Victory Drive (PI# 521855) to relieve congested on the two lane segment.	PI# 521855 will widen the roadway to four lanes. The project is also a part of the CORE MPO's Bikeway Plan.	Preliminary Engineering underway
		Signal coordination and optimization	Included in SRTOP deployment	Project underway
	Between SR 144 (Bryan County) and SR 204	Segment includes extensive wetlands with limited access in vicinity of Ogeechee River. Extensive commercial development in both Chatham and Bryan County portions of segment. One school zone in Chatham County. In Bryan County from Kings Ferry/Ogeechee River to SR 144, the main congestion issue would be related to the busy intersection at 17 and 144.	Consider ultimately a six lane widening in commercial areas with access control. Consider intersection improvements.	Long range (consider in 2045 MTP)
		Park and Ride lot near Walmart has potential to reduce congestion on US 17, SR 204 and I-16	Identified in the Park and Ride lot study	Long range
	Between I-95 and SR 144	The traffic signal at Harris Trail Road (especially the number of cars turning south on Harris Trail Road) causes delays. The busy intersection at 17 and 144 causes congestion for the northbound traffic.	The potential new interchange on I-95 and Belfast Keller Road could help because it gives evening and morning commuters another option to/from South Bryan County besides the 17/95 or 144/95 interchanges.	Long range (project outside the region)
		Park and Ride Lot at US 17/SR 144 or I-95/SR 144 has potential congestion relief on US 17, SR 144 and I-95 in Bryan County.	Identified in the Park and Ride lot study	Long range
		Heavily congested	Member request to obtain travel time data and study in future CMP Expand CMP data collection to include new segment	Next CMP cycle
	Bryan County boundary (or SR 196) to I-95 (Partially Outside of MPA)	This section is heavily congested in the evenings with Ft. Stewart traffic and there are two lights in close proximity at the 17/95 interchange that causes congestion problems.	Member request to obtain travel time data and study in future CMP Expand CMP data collection to include new segment	Next CMP cycle

Table 23: Congestion Strategies by Corridor Segment (Continued)

Road	Limits/At	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
SR 21	**Between I-95 and I-516**	GDOT opened the diverging diamond at SR 21/I-95 (PI# 0012722).	Continue to monitor this segment and revisit after data has been collected after the project completion. CORE MPO completed a corridor study of this segment in 2013.	Project completed but data will be captured in next CMP
		2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.	2040 MTP has I-95 at SR 21 / Augusta Rd Interchange Reconstruction in Cost Band Three.	Long Range: MTP cost band 3
		Effingham Parkway and Benton Boulevard projects are expected to relieve some traffic off SR 21.	Continue to monitor this segment and revisit after data has been collected after the project completion.	Project underway: Design and Engineering Phase
		Completion of Jimmy DeLoach Parkway Extension from US 80 to I-16 (Phase 2) and Interchange at Jimmy DeLoach/US 80 will most likely relieve some of the truck traffic on SR 21.	Study after projects are completed in next CMP.	Right of way and utilities certified. Construction expected in FY 2018.
		The Savannah International Multi-Modal Connector is expected to increase the Port's rail capacity on site and allow for the railroad companies to provide faster and more frequent service. The rail efficiently will reduce rail/highway conflicts on SR 21 and SR 307, thus has the potential to reduce congestion on these roadways.	Study after project is completed.	Total completion of the Multi-Modal Connector is projected for 2021.
		Park and Ride lots at SR 21/I-95 and at SR 21 South of Rincon have potential to reduce congestion on SR 21, I-95 and I-16.	Identified in the Park and Ride lot study	Long range
		GDOT is working on SR 25 Connector between I-516 to the Bay Street Viaduct (PI# 0002923), whose completion might help congestion relief on the I-516 side of this SR 21 segment.	Study after project is completed.	Project under construction
		The SR 21 through Port Wentworth congested in the AM and PM. The diverging diamond at Exit 109 has helped reduce travel time. Truck traffic is not using the Jimmy Deloach extension as originally anticipated and has had no significant impact of diverting trucks off SR 21 or SR 25. The completion of Grange Road widening between SR 21 and SR 25 and Brampton Road Connector between SR 21/SR 25 to SR 21 Spur may offer relief.	Grange Road widening between SR 21 to East of SR 25 (MTP project PI 0007885 and identified in the freight plan) will access a new gate at GPA, and encourage greater utilization of JDL extension. Brampton Road Connector will facilitate better port access as well.	Grange Road Widening is under construction. Brampton Road Connector right-of-way acquisition is ongoing. Monitor in future CMP update.
SR 204/Abercorn	**Between DeRenne and I-16 (37th Street Connector)**	Project DeRenne - PI# 0008358, I-516 @ CS 1503/DeRenne Ave Diversion of NBLT movements at SR 204 and DeRenne may reduce congestion at this intersection. Otherwise, a constrained urban corridor. Should consider an operational improvement such as RTOP.	Continue to monitor and revisit as Project DeRenne makes progress. Consider traffic operations improvement such as RTOP.	Project DeRenne's preliminary engineering phase is underway.
		PI# 0010236, SR 21 from CS 346/Mildred Street SR 204 . Predominately a median and access control improvement on DeRenne Avenue, associated intersection improvements are expected to have a minimal impact on this segment	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
	Between Veteran's Parkway and Harry S. Truman Parkway	GDOT completed an intersection improvement project at SR 204/Apache Avenue and added a new travel lane on each side at Rio Road/Forest River.	Continue to monitor and revisit	Next CMP cycle/After completion of SR 204/King George Blvd. Interchange
		CORE MPO complete a corridor analysis on the SR 204 in 2013.	Study complete	Study complete
		A signal coordination effort could be considered	RTOP candidate	Mid range (consider in 2045 MTP)
	Between Harry S. Truman Parkway and DeRenne Avenue	GDOT completed an intersection improvement project at SR 204/Largo Drive.	Continue to monitor and revisit	Next CMP cycle
		City of Savannah completed intersection upgrade at Wilshire and White Bluff	Continue to monitor and revisit	Next CMP cycle
		A signal coordination effort could be considered	SRTOP candidate	Mid range (consider in 2045 MTP)

Table 23: Congestion Strategies by Corridor Segment (Continued)

Road	Limits/At	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
DeRenne Avenue	Between I-516 and SR 204	Project DeRenne - PI# 0008358, I-516 @ CS 1503/DeRenne Ave. will address intersection delays due to large NBLT volumes on SR 204 and White Bluff Rd.	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 0010236, SR 21 from CS 346/Mildred Street SR 204 will improve median and access control.	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
		A signal coordination effort could be considered	RTOP candidate	Mid range (consider in 2045 MTP)
	East of SR 204 (westbound not available)	Project DeRenne - PI# 0008358, I-516 @ CS 1503/DeRenne Ave	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 000835, East DeRenne from SR 204 to Harry Truman Parkway	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 0010236, SR 21 from CS 346/Mildred Street SR 204 .	Continue to monitor and revisit as Project DeRenne makes progress.	Project Under preliminary engineering phase. Construction expected after 2020.
		A signal coordination effort could be considered	SRTOP candidate	Mid range (consider in 2045 MTP)
SR 144	Between US 17 and I-95	Park and Ride Lot at US 17/SR 144 or I-95/SR 144 has potential congestion relief on US 17, SR 144 and I-95 in Bryan County.	Identified in the Park and Ride lot study	Long range
		PI# 0010739, SR 144 @ I-95 Southbound and Northbound Off Ramps (roundabouts) Roundabouts will alleviate Ft. Steward congestion on SR 144 northwest of I-95 as well as with I-95 South off-ramp traffic	Revisit this segment after project complete	Projects underway and completed data will be captured in next CMP
		Provide an alternate option for evening and morning commuters to/from South Bryan County besides the 17/95 or 144/95 interchanges.	Potential new interchange on I-95 and Belfast Keller Road	Long range (consider in 2045 MTP)
		The segment need to be extended for better analysis.	This data may need to be extended to CR 100 or CR 154 for a full analysis	Next CMP cycle
I-95	Between Pooler Pkwy and SR 21 (includes SR 21/I-95 interchange).	Park and Ride lots at SR 21/I-95 and at SR 21 South of Rincon have potential to reduce congestion on SR 21, I-95 and I-16.	Identified in the Park and Ride lot study	Long range
		GDOT opened the diverging diamond at SR 21/I-95 (PI# 0012722).	Continue to monitor	Project completed but data will be captured in next CMP
		I-95 at SR 21 / Augusta Rd Interchange Reconstruction (Major interchange reconstruction currently in long range.)		2040 MTP cost band 3
		I-95 at Airways Avenue interchange experiencing increasing congestion particularly NB due to commercial and residential development in Pooler and expansion at Gulfstream at SAV.	Airport Authority has requested assistance from CORE MPO to conduct a major transportation study in the area. A preliminary scope has been prepared and funding will be pursued. Interchange reconstruction is likely to be one study recommendation.	Short Term: dependent upon funding
		GDOT completed left turn lane project at I-95/Pooler Parkway/Airways Avenue.	Continue to monitor	Project completed but data will be captured in next CMP
	At GA--SC STATE BORDER (State line is outside of MPA)	Some congestion, incident and seasonally related. Lane drop at South Carolina state line creates choke point. Problem cause is outside of MPA.	Continue to monitor with LATS MPO and SCDOT particularly in relation to the construction of the Jasper Port and any road improvements related to that effort, such as SC milepost 3 proposed interchange or I-95 widening.	No proposed action, continue to monitor and coordinate

Table 23: Congestion Strategies by Corridor Segment (Continued)

Road	Limits/At	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
I-16	Between Exit 148/Old River Rd. and I-95	PI# 0012757, I-16 Widening from I-95 TO I-516;	Continue to monitor and revisit after projects are complete.	Design-build project underway: CST expected in FY 2018
		PI# 0012758, I-16 @ I-95 - Interchange reconstruction	Continue to monitor and revisit after projects are complete.	Design-build project underway: CST expected in FY 2018
		Park and Ride Lots at US 80/Bloodmingdale Road and at I-16/US 280/SR 30 have potential to reduce congestion on I-16 and US 80 in the westside.	Identified in the Park and Ride lot study	Long range (consider in 2045 MTP)
		2040 MTP has PI 0015528 widening of I-16 from Pooler Pkwy to I-95, in Cost Band Three	Continue to monitor and revisit after projects are complete.	2040 MTP cost band 3
	I-95 to I-516 (Includes I-16 at I-95, I-16 at SR 307 / Exit 160 and I-16 at Chatham Pkwy / Exit 162)	PI# 0012757, I-16 Widening from I-95 TO I-516	Continue to monitor and revisit after projects are complete.	Design-build project underway: CST expected in FY 2018
		PI# 0012758, I-16 @ I-95 - Interchange reconstruction	Continue to monitor and revisit after projects are complete.	Design-build project underway: CST expected in FY 2018
		PI# 0013727, I-16 @ SR 307 diverging diamond.	Continue to monitor and revisit after projects are complete.	Preliminary engineering underway. Expected to be let with the design-build projects in FY 2018.
I-516	At SR 204/Abercorn	PI# 0008358, I-516 @ CS 1503/DeRenne Ave	Continue to monitor and revisit after projects are complete.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 0008359, East DeRenne from SR 204 to Harry Truman Parkway	Continue to monitor and revisit after projects are complete.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 0010236, SR 21 from CS 346/Mildred Street to SR 204.	Continue to monitor and revisit after projects are complete.	Project Under preliminary engineering phase. Construction expected after 2020.
	At MILDRED ST	PI# 0008358, I-516 @ CS 1503/DeRenne Ave	Continue to monitor and revisit after projects are complete.	Project Under preliminary engineering phase. Construction expected after 2020.
		PI# 0010236, SR 21 FROM CS 346/Mildred Street to SR 204.	Continue to monitor and revisit after projects are complete.	Project Under preliminary engineering phase. Construction expected after 2020.
	At VETERANS PKWY/EXIT 3	I-516 / Lynes Parkway Widening from Veterans Pkwy to Mildred Street	Extension of southbound left turn	Long range (consider in 2045 MTP)
		I-516 / Lynes Parkway Widening from I-16 to Veterans Pkwy.	Continue to monitor.	Long range (consider in 2045 MTP)

Table 23: Congestion Strategies by Corridor Segment (Continued)

Road	Limits/At	Description: Congestion issues and Ongoing Projects	CMP Actions/Projects	Time Frame for Action
SR 307	**Between I-16 and SR 25 (Main street)**	The Savannah International Multi-Modal Connector is expected to increase the Port's rail capacity on site and allow for the railroad companies to provide faster and more frequent service. The rail efficiently will reduce rail/highway conflict on SR 21 and SR 307, thus has the potential to reduce congestion on these roadways.	Study after project is completed.	Total completion of the Multi-Modal Connector is projected for 2021.
		Congested segment based on TCC input but data available was not adequate to fully analyze	Obtain travel time data and study in future CMP	Next CMP cycle
Pooler Parkway	**Between I-95 and I-16**	Heavy congestion near I-95 and near outlet mall area. Pooler, City of Savannah and Airport Commission are working on an adaptive signal coordination project	Continue to monitor and revisit after projects are complete. Obtain travel time data and study in future CMP	Next CMP cycle
		Extension of southbound left turn	Continue to monitor.	Mid Term
Victory Drive/US 80	**Between I-516 and Bee Road**	Constrained corridor. CORE MPO has conducted corridor study on some segments.	RTOP corridor/under development. Continue to monitor and revisit after projects are complete. Obtain travel time data and study in future CMP Victory Drive Corridor Study recommendations.	Next CMP cycle
	Between Bee Road and Wilmington River	Constrained corridor. CORE MPO has conducted corridor study on some segments.	RTOP corridor/under development. Continue to monitor and revisit after projects are complete. Obtain travel time data and study in future CMP Victory Drive Corridor Study recommendations.	Next CMP cycle
	Wilmington River to Islands Expressway	Constraints: School zone	No proposed action, continue to monitor	No proposed action, continue to monitor, possibly with more narrowly defined peak period.

Freight Bottleneck Strategies

In conjunction with the freight infrastructure improvement recommendations, the freight policy recommendations provide guidance in the maintenance and investment of the freight infrastructure and movement of freight and goods in the Savannah area. As the Savannah region and the state continue to invest in the Port of Savannah, improving connections to the port is crucial. To ensure the efficient movement of freight and goods, any freight project should be recognized and given a higher priority due to its benefits to the economy and the continued investment of technological and innovative improvement in the national, state, and regional freight transportation system. A series of freight policy and infrastructure recommendations are listed below which relate to freight bottlenecks and congestion. A complete list of freight related strategies can be found in the CORE MPO Freight Transportation Plan.[18]

Develop corridor signal timing on major truck routes – example GDOT Regional Traffic Operations Program (RTOP)

With limited funds, available for adding capacity to roadways through widening projects, maximizing the existing infrastructure by increasing vehicle throughput within the existing corridor is a necessity. The GDOT RTOP invests resources in improving traffic operations on major arterials by improving the signal operations for the corridor. The purpose of the GDOT RTOP is to increase travel throughput by reducing delays along congested corridors through the improvement of signal operations.

Since RTOP focuses on corridors, these sections of roadways typically cross city and county boundaries. GDOT coordinates with the local governments on the signal timing for the corridors. Currently, the RTOP is only utilized for corridors in the Metro Atlanta region and Savannah, though GDOT is targeting other corridors around the state for the program. More information about the RTOP is available at www.dot.ga.gov/DS/SafetyOperation/RTOP. Future RTOP candidates for the Savannah MSA would include: US 80, SR 21 and SR 307.

Short – Term Freight Infrastructure Improvement Recommendations (Years 0 – 5)

The short-term recommendations include strategies that can be implemented quickly to provide immediate benefits to freight and goods movement in the Savannah region. The identified improvements, strategies, and recommendations are both broad-based freight policies and programs, and specific infrastructure, operational, and mobility enhancement projects. Projects classified as Short-Term are anticipated to be constructed or programmed for construction within the next five years (see table 24)[19]. Additional short terms projects already under construction are identified in Table 25.

[18] http://www.thempc.org/Dept/Freight

[19] The short-range grade crossing improvement projects are programmed primarily to provide active warning devices at crossing locations where they do not currently exist or are lacking updated safety infrastructure.

The short-range grade crossing improvement projects are programmed primarily to provide active warning devices at crossing locations where they do not currently exist or are lacking updated safety infrastructure.

Table 24: Short Term Infrastructure Improvments (0-5 Years)

Short Term Infrastructure Improvements (0-5 Years)
I-516/Lynes Parkway Widening from I-16 to Veterans Parkway
Intersection Operational Improvements Ogeechee Road (US 17/SR 25) at Chatham Parkway
PI# 0012757, I-16 Widening – I-95 to I-516
PI# 0012758, I-16 at I-95 Interchange Reconstruction

Table 25: Projects Underway

Projects Underway
Savannah Harbor Expansion Project (Deepening)
PI# 0007885, CS 602/CS 650/Grange Rd from SR 21 to E of SR 25
PI# 0010553, CS651/Crossgate Rd from SR 21 to NS#734150L in Port Wentworth
PI# 0012722, SR 21 from SR 30 to I-95; Including Interchange (Diverging Diamond Interchange)
I-95 at Airways Avenue Interim Improvements
PI# 0002923, SR 25 Conn/Bay Street from I-516 to the Bay Street Viaduct (West Bay Street Widening)

Mid – Term Freight Infrastructure Improvement Recommendations (Years 6 – 15)

The Mid-Term Infrastructure improvement recommendations include strategies that may require design and right-of-way acquisition to provide intermediate benefits to freight and goods movement in the Savannah region. The identified improvements, strategies, and recommendations are both broad-based freight policies and programs, and specific infrastructure, operational, and mobility enhancement projects (see Table 26).

Table 26: Mid Term Improvements (6-15 Years)

Mid Term Infrastructure Improvements (6-15 Years)
PI# 0008359, East DeRenne from SR 204 to Harry S Truman Parkway (East DeRenne Avenue Improvements)
PI# 0010236, SR 21 from CS 346/Mildred Street to SR 204 (West DeRenne Avenue Improvements)
Operations and Safety Enhancements – SR 21 Corridor
Airways Avenue Flyover to Gulfstream Road
I-95 at Airways Avenue Diverging Diamond Interchange
Chatham Parkway Improvements from I-16 to US 80

Long – Term Freight Infrastructure Improvement Recommendations (Years 16 – 25)

The long-term recommendations include strategies that may require design and right-of-way acquisition, additional funding and extensive coordination with community stakeholders to provide long-term benefits to freight and goods movement in the region. The identified improvements, strategies, and recommendations are both broad-based freight policies and programs, and specific infrastructure, operational, and mobility enhancement projects (see Table 27).

Table 27: Long Term Improvements (16-25 years)

Long Term Infrastructure Improvements (16-25 Years)
I-95 at SR 21/Augusta Rd Interchange Reconstruction
US 80/Victory Drive Improvements/Congestion Mitigation
I-516/Lynes Parkway Widening from Veterans Parkway to Mildred Street
I-516/Lynes Parkway at I-16 Interchange Reconstruction
I-16 at Chatham Parkway – Interchange improvements
I-95 and Airways Avenue Interchange Reconstruction
I-16 Interchange Reconstruction @ SR 307

The Thoroughfare Plan

To achieve the goals of the CMP and the Total Mobility Plan, as well as those of the updated Comprehensive Plan, the CORE MPO, together with local jurisdictions, developed a Thoroughfare Plan for the region. This Thoroughfare Plan, coordinated with the Non-motorized Transportation Plan, is intended to:

- Ensure and increase accessibility, mobility, and connectivity for people and freight.

- Promote safe and efficient travel for all users and create a framework for common sense tradeoffs between automobile capacity and multimodal design elements.
- Support community development and land use goals, and promote a sense of place with on-street parking, bike travel, land access, and pedestrian friendly intersections.
- Establish transparent expectations for transportation infrastructure and create consistency in code references to the road network, which provides predictable and consistent information to development community. Thoroughfare types are defined by their function in the road network as well as the character of the area they serve.

The duality of transportation function and the relationship with the character, or context, of each facility informs each thoroughfare type's recommended design parameters. Thoroughfare planning is promoted as part of a larger movement called context sensitive design or context sensitive solutions. The Institute of Transportation Engineers (ITE) defines context sensitive solutions (CSS) as follows: CSS is a different way to approach the planning and design of transportation projects. It is a process of balancing the competing needs of many stakeholders starting in the earliest stages of project development. It is also flexibility in the application of design controls, guidelines and standards to design a facility that is safe for all users regardless of the mode of travel they choose.

The Thoroughfare Plan can help address localized congestion and mobility needs in the region. The CMP network focuses on the principal arterial or higher roadway classification. The typical sections identified for the Thoroughfare Plan include Major Arterials, Minor Arterials and Collectors. Each of these classifications is then further categorized as Urban or Suburban and the typical sections include the design elements that appropriately serve the transportation need, as well as the adjacent land uses and community character. Each of the identified projects in the MTP has been correlated with the Thoroughfare Plan to incorporate the appropriate design elements based on the roadway typology. In addition, the Vision Plan, or unfunded projects, includes the complete list of projects identified through the Thoroughfare Plan. The Thoroughfare Plan was also coordinated with the Non-motorized Transportation Plan to ensure consistency throughout the planning efforts.

Non-Motorized Transportation

The true expectations from a transportation system are to allow the movement of people and freight. The movement of people need not equate always with the movement of cars. A physical environment designed mainly for motorized vehicle travel contributes to modern day congestion. Table 28 shows the design-based strategies from the Non-motorized Transportation Plan which would promote walking and bicycling as trip-making options. It is not only the design of roads, but also the design of cities overall, that determines the feasibility of these modes.

Table 28: Non-motorized Transportation Strategies

STRATEGIES
Road Design
Adopt road design policies and standards that address all users and incorporate context. (This will be facilitated by the Thoroughfare Plan, discussed above.)
Recognize current flexibility to use narrower lanes to allow bike/pedestrian retrofit projects.
Adopt policy that critical-link bridge projects that provide bicycle and pedestrian accommodations of appropriate. types, regardless of land use context.
Zoning and Development
Encourage and allow densities for some areas in excess of 7 du/acre and 25 employees /acre.
Allow mixed uses within some districts.
Specify pedestrian-friendly setbacks and parking requirements for the denser commercial, residential, and mixed use districts.
Require sidewalks in commercial development and office parks, as well as in residential developments.
Development of Schools
Remove minimum acreage requirements for schools.
Add "Non-motorized Access to Site" to the Miscellaneous Site Information section on the Georgia DOE Preliminary School Site Evaluation and Facility Site Approval Form.
Within the decision-making process for siting new schools, consider the costs of constructing off-site bicycle and pedestrian connections (which will later fall to local governments).
Adopt LEED-ND (Leadership in Energy and Environmental Design - Neighborhood Development) standards for siting new schools.
Eliminate policy that, when school refurbishment cost exceeds 50% of new construction cost, State funds are not available for refurbishment of existing schools.

Transit

Chatham Area Transit has several initiatives they will be exploring implementing over the next several years to improve efficiency, service and increase ridership. Some of these initiatives include:

- Expansion of the CAT bikeshare program - The current bike share program has two stations and will be expanding with five more. A third expansion is planned if funds are available in the next TIP cycle.
- Implementation of mobile fare collection technologies - This would improve collection rates as well and allow greater ease to customers and operators for handling payments.
- Development of alternative transit services including - microtransit, first and last mile coordination with Transportation Network Companies (TNCs), vanpools, & flex services
- Development of park & ride lots in outlying areas – This could help provide service to outlying areas and still allow service routes to be efficient.
- Initiation of better data collection strategies – Improving data collection will provide more accurate ridership data that can assist in improved service route planning & optimization. Chatham Area transit has recently purchased an origin and destination dataset to help better understand the needs of the transit user and potential users. This could potentially lead to service modifications to better serve the needs of the customers.
- Implementation of traffic signal priority (TSP) or preemption –TSP techniques detect transit vehicles as they approach an intersection and adjusting the signal timing dynamically to improve service for the transit vehicle. TSP technology can also open the door for future Bus

Rapid Transit (BRT) type service. BRT is a bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system. Typically, a BRT system includes roadway that is dedicated to buses, and gives priority to buses at intersections where buses may interact with other traffic; alongside design features to reduce delays caused by passengers boarding or leaving buses, or purchasing fares. BRT aims to combine the capacity and speed of a light rail with the flexibility, lower cost and simplicity of a bus system.

Savannah Belles Ferry

The Savannah Belles ferry system will continue to be a useful service especially helping to alleviate event traffic and parking congestion issues. Future projects to enhance the system include:

- A dock replacement and shelter at City Hall landing,
- Major maintenance and rehabilitation,
- Signage improvements for better wayfinding and
- Hutchinson Dock replacement.

Program and implement CMP strategies

As noted earlier in the strategy section above some projects are already underway. Projects that are yet to be programmed will be need to go through the planning process ensuring incorporation into the MTP and TIP as funding allows. Implementation of CMP strategies occurs on three levels: system or regional, corridor, and project.

Regional-level implementation of congestion management strategies occurs through inclusion of strategies in the fiscally-constrained MTP and the TIP. At the corridor level, more specific strategies such as bicycle and pedestrian improvements and operational improvements can be assessed in studies and implemented using a variety of funding sources, including federal funding streams such as the Surface Transportation Block Grant Program (STBG) as well as through state or local funding or other discretionary funding sources.

Use the CMP in criteria for prioritizing projects in the MTP and/or TIP - The process of prioritizing projects for inclusion in the MTP and TIP include a scoring element that gives weight to the relative congestion on that corridor based on the CMP data. In a formal scoring process, points are allotted based on several factors, including the potential for the project to address and manage congestion.

12.0 Evaluate Strategy Effectiveness

Evaluation of strategy effectiveness is an on-going process. The primary goal of this is to ensure that implemented strategies are effective at addressing congestion as intended, and to make changes based on the findings as necessary. Two general approaches are used for this type of analysis[20]:

1. System-level performance evaluation - Regional analysis of historical trends to identify improvement or degradation in system performance, in relation to objectives
2. Strategy effectiveness evaluation - Project-level or program-level analysis of conditions before and after the implementation of a congestion mitigation effort.

[20] https://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/chap02.cfm#sec2.8

Improvement in congested conditions due to implemented strategies can be used to encourage further implementation of these strategies, while negative findings may be useful for discouraging the implementation of similar strategies in similar situations. The information learned from evaluation should be used to inform the TIP and MTP, as well future updates to the CMP.

The CORE MPO developed a CMP report card which revisited the original CMP congested corridors and strategies identified in 2004. The MPO documented which recommendations were implemented and any resulting level of service improvements. The report card lists the original LOS data collected in 2004 and compares it to LOS data collected in 2015. The report card showed that several of the CMP recommendations were implemented or underway. Improvements in level of service were seen across many of the congested corridors where the strategies were implemented. A few projects are still under way and will be revisited in future CMP updates. A summary of the strategy effectiveness can be found in Table 29. The complete report card is located Appendix E. The full version of the report card in the Appendix also contains model data to show anticipated results of the CMP actions and future traffic conditions.

13.0 Next Steps

The MPC will begin the process of updating the MTP in fiscal year 2018. The update will be focused on the horizon year 2045. This CMP effort will help inform the Total Mobility Plan 2045 update and will offer an opportunity for CMP identified congested corridors not already included it the plan to be considered for inclusion.

The CMP corridors will continue to be monitored as strategies are implemented. A CMP report card will be released periodically with a full CMP update preceding each major MTP update.

Future CMP Updates

The CMP is a dynamic process that can include updates and improvements as more data set and improved technology allow. Throughout the CMP process several items have been identified for future consideration in the next CMP update. Some items to consider include:

- Expanded CMP network to include some minor arterials
- Expand the CMP network to explore traffic coming in from outside the region both in Georgia and South Carolina.
- Collect and map posted speed data to determine the planning time index.
- Use travel time data to calculate a travel shed for major generators.
- Calculate a fatality and serious injury rate using vehicle miles traveled.
- Use one common data source such as INRIX with a dashboard tool to reduce data analysis times and ensure consistent results. CORE MPO is currently exploring the possibility of purchasing a statewide data license in coordination with the other Georgia MPOs through GAMPO
- Revisit any locations with ongoing projects to assess strategy effectiveness in a future CMP cycle.
- Review bridge and pavement conditions as part of the analysis.

- Include the Performance Based Planning Approach targets and measures as part of the CMP process.
- Ensure that the next Surface Transportation Block Grant call for projects includes scoring criteria considering the analysis in the CMP.
- Periodically complete CMP report cards as strategies are implemented.

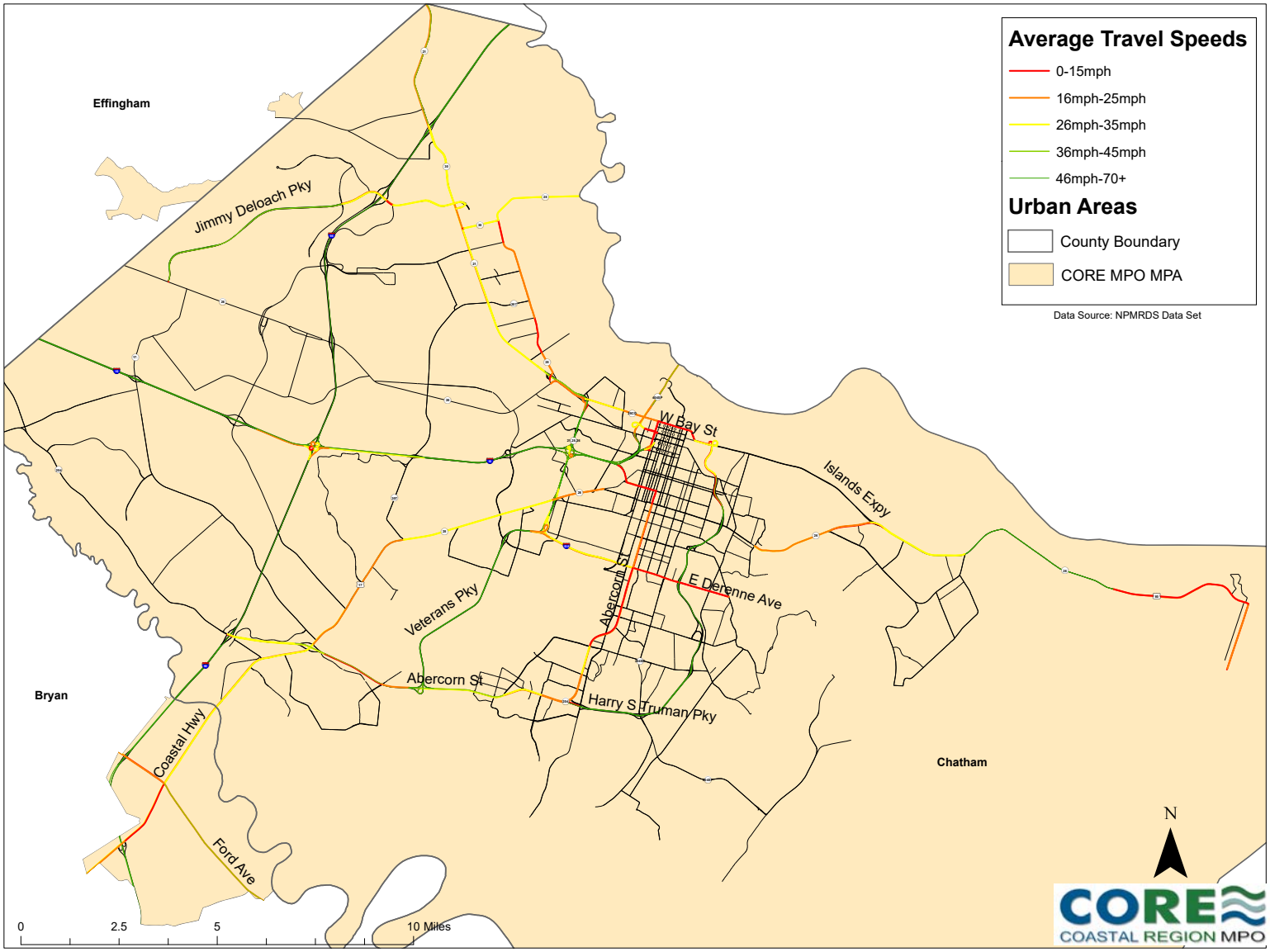
Table 29: 2016 CMP Report Card and Strategy Evaluation

CORE MPO 2016 CMP Report Card 2004 Most Congested Segments

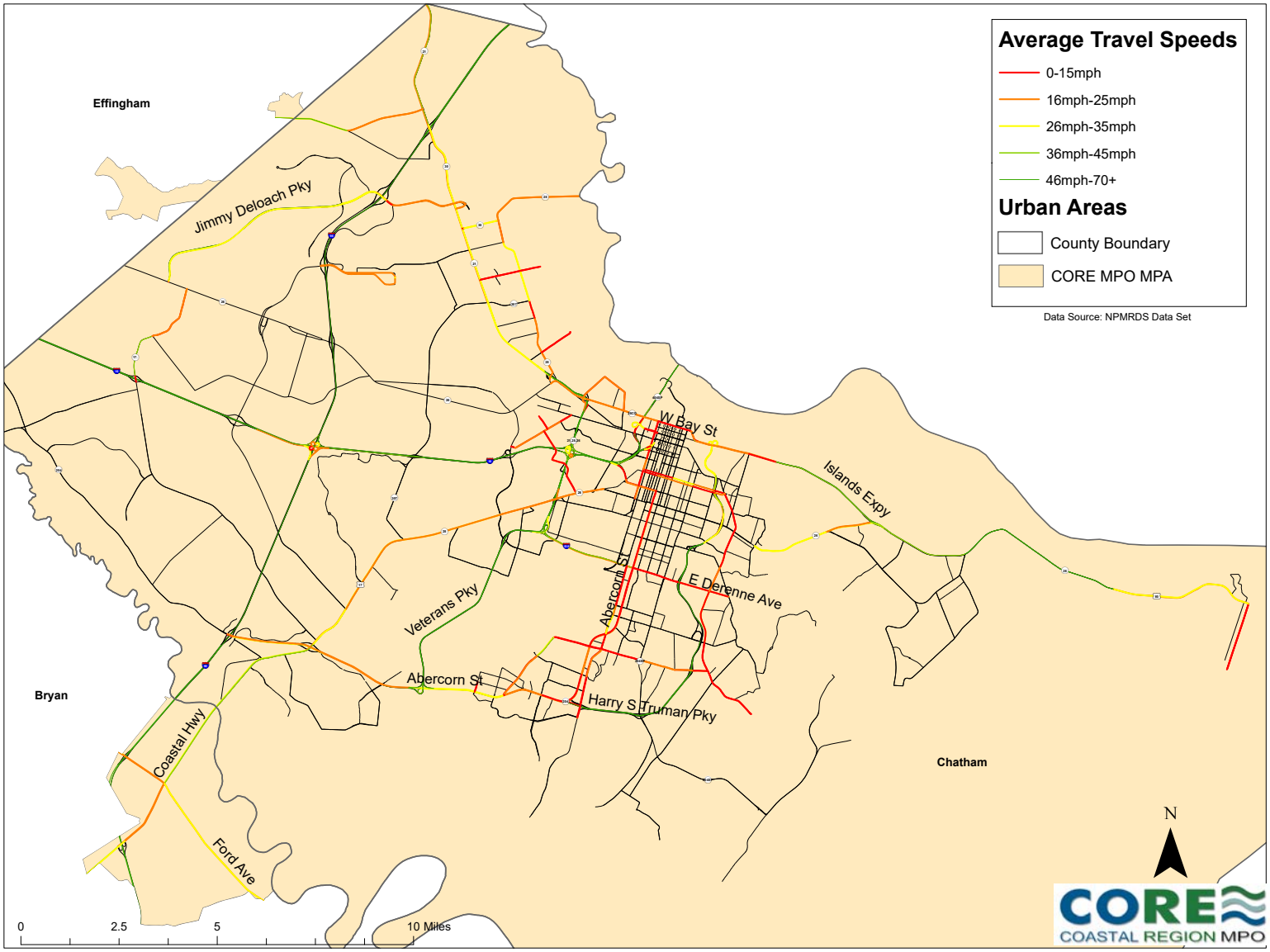
Rank	Road and Direction	Limits	Peak Hour	GPS Data 2003 LOS	2004 Observations	2004 Recommendations	Congestion Mitigation Process Actions 2004-2016	CMP Action	CMP Recommendation Fulfilled?	Current Traffic Counts and LOS				CMP Recommendation Fulfilled? (At time of 2040 MTP
										2015	2015 LOS	% Trucks	%APR Change	
1	Waters Avenue - Northbound	Stephenson to DeRenne	PM	F	Canopy -Constrained Corridor; Corridor will improve with extension of Truman	Constrained Corridor -Improvements limited to Optimizing Signal Operations. Study next CMP, review in E-W Study	The opening of Truman Pkwy Phase IV impacts the traffic of this segment. The AADT has decreased from 2005 to 2015.	Completion of Truman Parkway	Yes	14,500	D	2.18	-8.81	Yes
			MD	F										
			AM	F										
2	Habersham Street - Southbound	Johnston to Stephenson	PM	F	Currently under construction on Stephenson	Stephenson widening will help Habersham	Widening of Stephenson is completed, including additional turn lanes on Habersham. Congestion situation improved.	Additional Turn Lanes Completed	Yes	8,580	C	2.08	0.59	Yes
			AM	D										
3	White Bluff Road - Southbound	Eisenhower to Abercorn	PM	F	Canopy -Constrained Corridor, Minor Approach	NB/SB left turns very light, consider restricting them, add NB Right turn overlap.	None	Signal Retiming, model anomalies	Yes	27,300	D	1.92	0	Yes
			AM	D										
			MD	D										
4	Mall Boulevard - Westbound	Mall Way to Abercorn	PM	F	Planned Intersection TIP	Consider change in lane use for shared dual left, study addition of NB right turn.	Intersection improvement project at Abercorn St/Mall Blvd has been completed to relieve some congestion.	Intersection Improvement Completed	Yes	13,800	C	2.04	0	Yes
			AM	E	Excessive delays back through Mall Way									
5	White Bluff Road - Northbound	Hampstead to DeRenne	PM	F	Canopy -Constrained Corridor, Minor Approach	Constrained Corridor -Improvements limited to Optimizing Signal Operations, study in E-W study	Signal synchonization project along DeRenne Ave is completed. Proposed Hampstead Connector will alleviate some congestion.	Signal Retiming, model anomalies, DeRenne Imps. Underway	Yes/In Progress	27,300	F	1.92	0	Yes/In Progress
			MD	F										
			AM	F										
6	Habersham Street - Northbound	Johnston to DeRenne	PM	F	Minor Approach to DeRenne	Cross Street Delay Expected, Study further in E-W study for improving DeRenne	Proposed DeRenne Widening may reduce congestion on Habersham.	Signal Retiming, model anomalies	Yes/In progress	8,580	D (F in 2006)	2.08	0.59	Yes/In progress. Need to monitor once Hampstead and DeRenne Improvements Implemented
			AM	E										
7	Waters Avenue - Southbound	DeRenne to Stephenson	PM	F	Corridor will improve with extension of Truman	Study next CMP	The opening of Truman Pkwy Phase IV impacts the traffic of this segment. The AADT has decreased from 2005 to 2015.	Completion of Truman Parkway	Yes	14,500	F	2.18	-8.81	Yes / Constrained Corridor Local Policy Decision to accept remaining congestion
8	SR 204 - Southbound	Veterens Pkwy to King George	PM	F	Westbound Delays to King George	Priority IC -Widen 4-6 between King George and Rio, Priority II -Widen 6-8, widen King George approach.	A new interchange at SR 204/King George Blvd is under construction right now. The completion of this project will help relieve congestion in this area.	Interchange Under Construction	Yes	54,000	F	2.49	0	Yes
			MD	D										
9	DeRenne Avenue - Eastbound	Montgomery to Bull	PM	F	Signal Timing	Once traffic is metered through Montgomery, signals should be coordinated for progression, Consider in E-W Study.	Signal synchonization project along DeRenne Ave is completed. Proposed Hampstead Connector and DeRenne Improvements will reduce congestion.	Signal Retiming	Yes/In progress	45,400	F	4.19	0	Yes/In progress
			MD	E										
			AM	E										
10	US 17 - southbound	Quacco to SR 204 WB Ramp	PM	F	Currently under construction	Study next CMP	The completion of US 17 Widening relieved some congestion.	Widening Completed	Yes	28,800	B	8.26	0	Yes
11	SR 21 - Southbound	Cross Gate to SR 307	AM	F	Currently detour due to construction on SR 25	Study next CMP	The completion of construction on SR 25 relieved some congestion. This corridor will be further studied in the future CMP.	Port Connector Under Construction, Corridor Study	Yes	32,900	C	11.32	0	Yes
			MD	F										
			PM	E										
12	SR 21 - Northbound	SR 307 to Cross Gate	PM	F	Currently under construction on SR 25	Study next CMP	The completion of construction on SR 25 relieved some congestion. This corridor will be further studied in the future CMP.	Port Connector Under Construction, Corridor Study	Yes	32,900	C	11.32	0	Yes
13	SR 204 - Westbound	Apache to Rio	PM	F	Excessive delays at Rio	Priority IC -Widen 4-6 from Rio to Truman, Optimize from Rio to King George	GDOT has completed a lump sum project to convert the shoulder to a travel lane on each side on the bridge at Rio which relieved some congestion.	Corridor Study Completed. Signals Retimed	Yes/Partially. Corridor Study completed. Local support for recommended alternative?	39,600	B (C in 2014)	2.56	-20.96	Yes/Partially. Corridor Study completed. Local support for recommended alternative?
14	Skidaway Road - Southbound	La Roche to DeRenne	AM	F	Canopy - Constrained Corridor; Corridor will improve with extension of Truman and Widening of Skidaway	Study next CMP	The opening of Truman Pkwy Phase IV relieved some congestion. Skidaway Road improvement project is ongoing to improve safety and reduce congestion.	Completion of Truman Parkway	Yes	13,600	D	NA	0	Yes
			PM	D										
15	Bull Street - Southbound	61st St to DeRenne	MD	F	Canopy -Constrained Corridor, Minor Approach	Constrained Corridor -Improvements limited to Optimizing Signal Operations	Signal synchronization project along DeRenne Ave is completed. Proposed West DeRenne improvements and Hampstead Connector may reduce congestion.	Signals Retimed. DeRenne Imps. In PE. Model Anomalies	Yes	9,530	D	NA	0	Yes
			PM	D										
			AM	D										
16	Montgomery Cross Road - Eastbound	Tibet Ave to Abercorn	PM	F	Funded Project for construction FY 2004-06 (PRC)	PI #550570 will widen from 2-4 lanes between Abercorn & Abercorn, study approach at Abercorn	The Middleground Road Widening project has completed and relieved congestion along this corridor.	Widening Completed	Yes	11,700	C	3.95	0	Yes
			AM	F										
			MD	E										
17	Montgomery Cross Road - Westbound	Sallie Mood to Waters	MD	F	Lack of coordination between Waters and Abercorn	Signal Operations -Coordination between Waters and Abercorn	City of Savannah completed a signal coordination project several years ago.	Signals Retimed, Truman Completed	Yes	28,100	D	NA	0	Yes
			AM	E										
			PM	D										
18	Abercorn Street - Northbound	Private Drive to DeRenne	PM	F	Excessive Intersection Delays	Priority IB -Operational -Optimize Derenne and Abercorn will improve, NB right turn lane planned	Signal synchonization projects along DeRenne and Abercorn are completed. Intersection improvement at Abercorn /DeRenne has been completed.	Model Anomalies, DeRenne Imps. In PE	Yes	31,900	D	2.34	-3.09	Yes
			AM	F										
			MD	D										
19	Bourne Street - Southbound	SR 25 to SR 21	AM	F	Heavy Truck Traffic, construction detour	High Percentage of Trucks and many stopped for queuing at Port -Widen shoulder to provide storage	The SR 307 overpass project has completed and relieved some congestion. This area will be further studied in the future CMP.	Overpass completed. SR 21 Corridor Studied.	Yes	7,730	C	44.9	0	Yes
			MD	E										
			PM	E										
20	SR 204 - Eastbound	Pine Grove to King George	AM	F	Excessive eastbound delays at King George	Priority II -Widen 4-6 from US 17 to King George, accel lane for EB rights, widen King George approach.	A new interchange at SR 204/King George Blvd is under construction right now. The completion of this project will help relieve congestion in this area.	Interchange under constuction, Model Anomaly	Yes	54,000	F	2.49	0	Yes
			MD	F										
			PM	E										

Appendix A: Travel Speed Maps

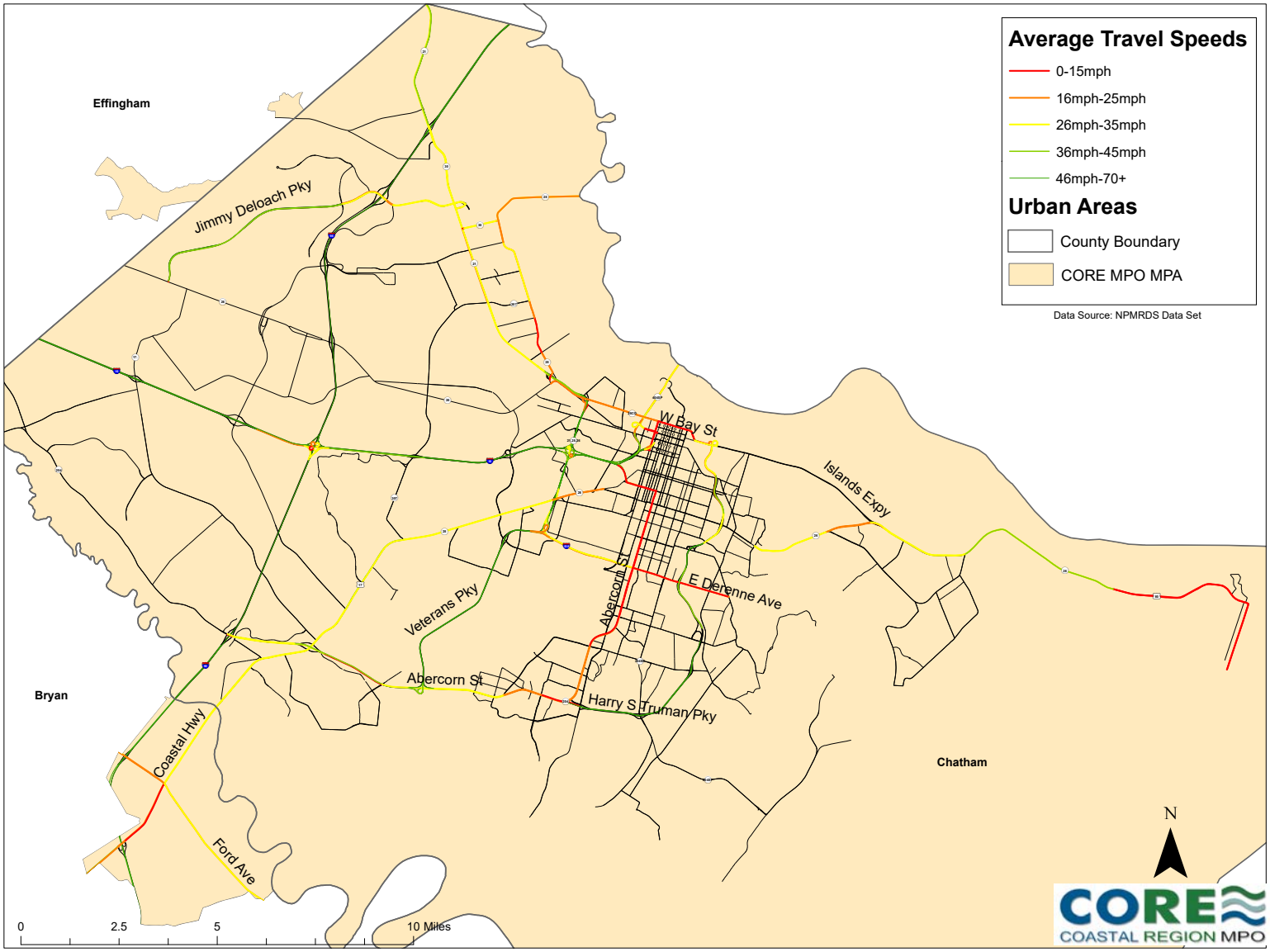
Average Travel Speeds AM Peak (7-9am) October 2015



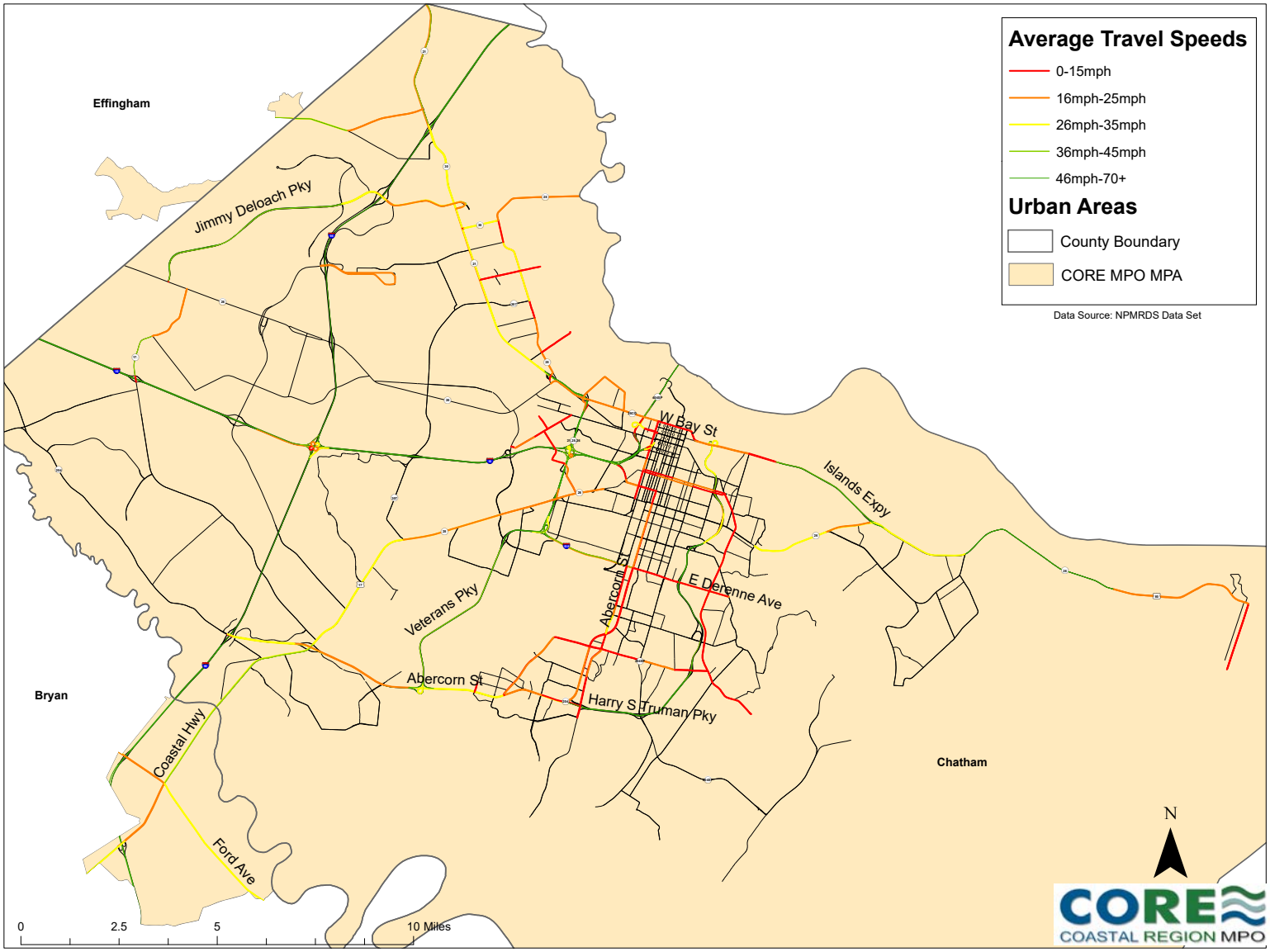
Average Travel Speeds AM Peak Period (7am-9am) April 2016



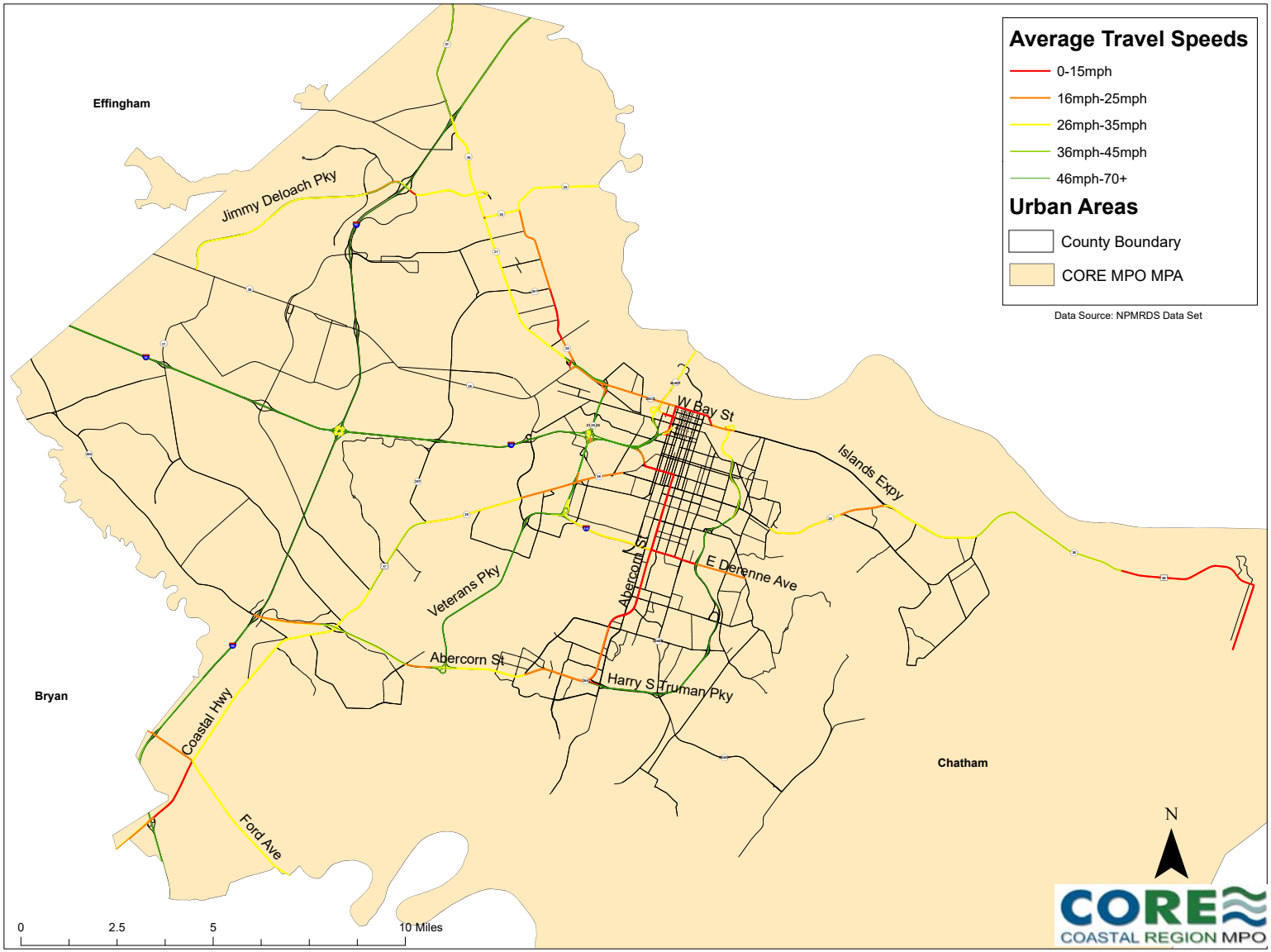
Average Travel Speeds AM Peak (7-10am) October 2015



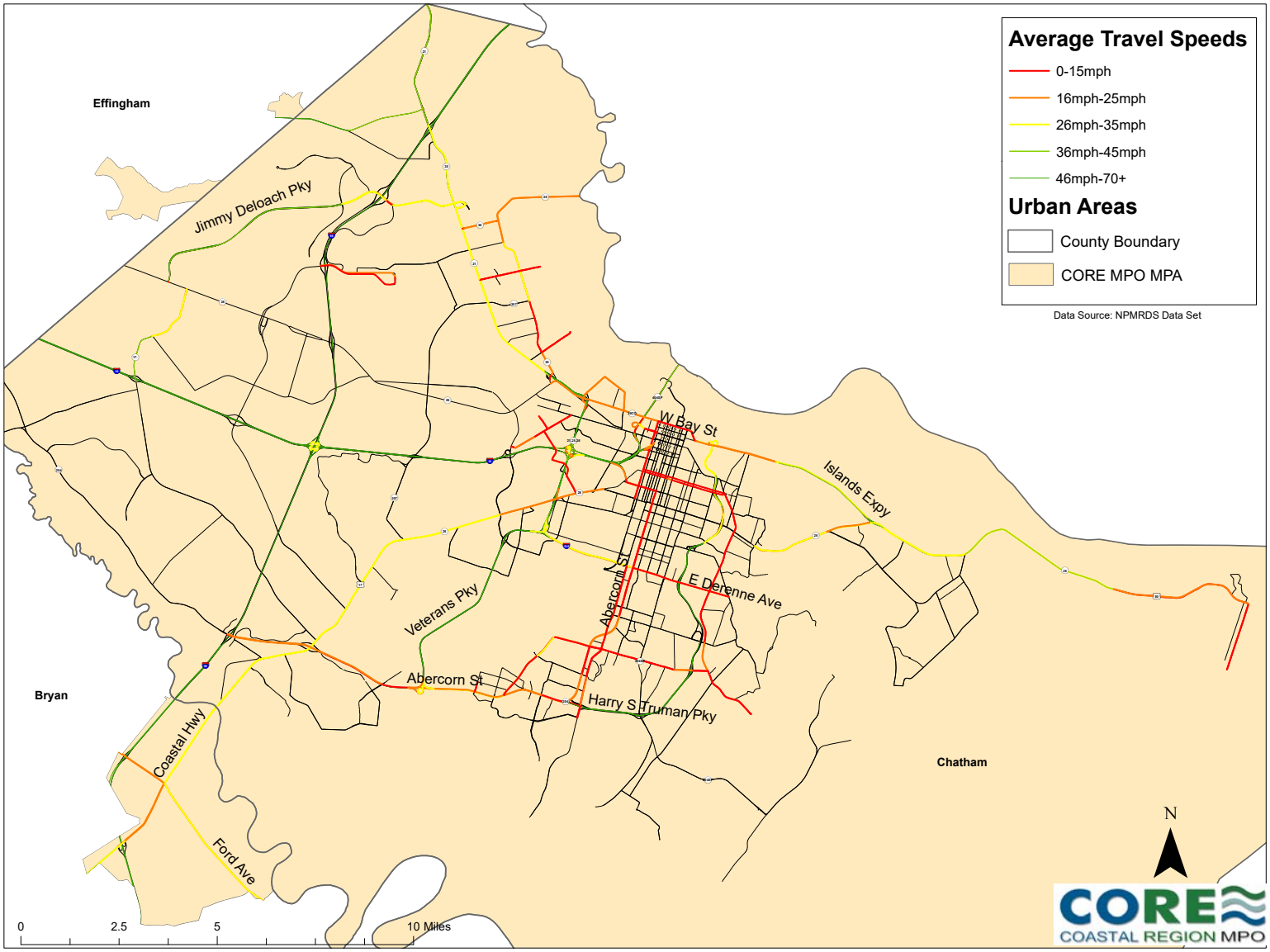
Average Travel Speeds AM Peak Period (7am-10am) April 2016



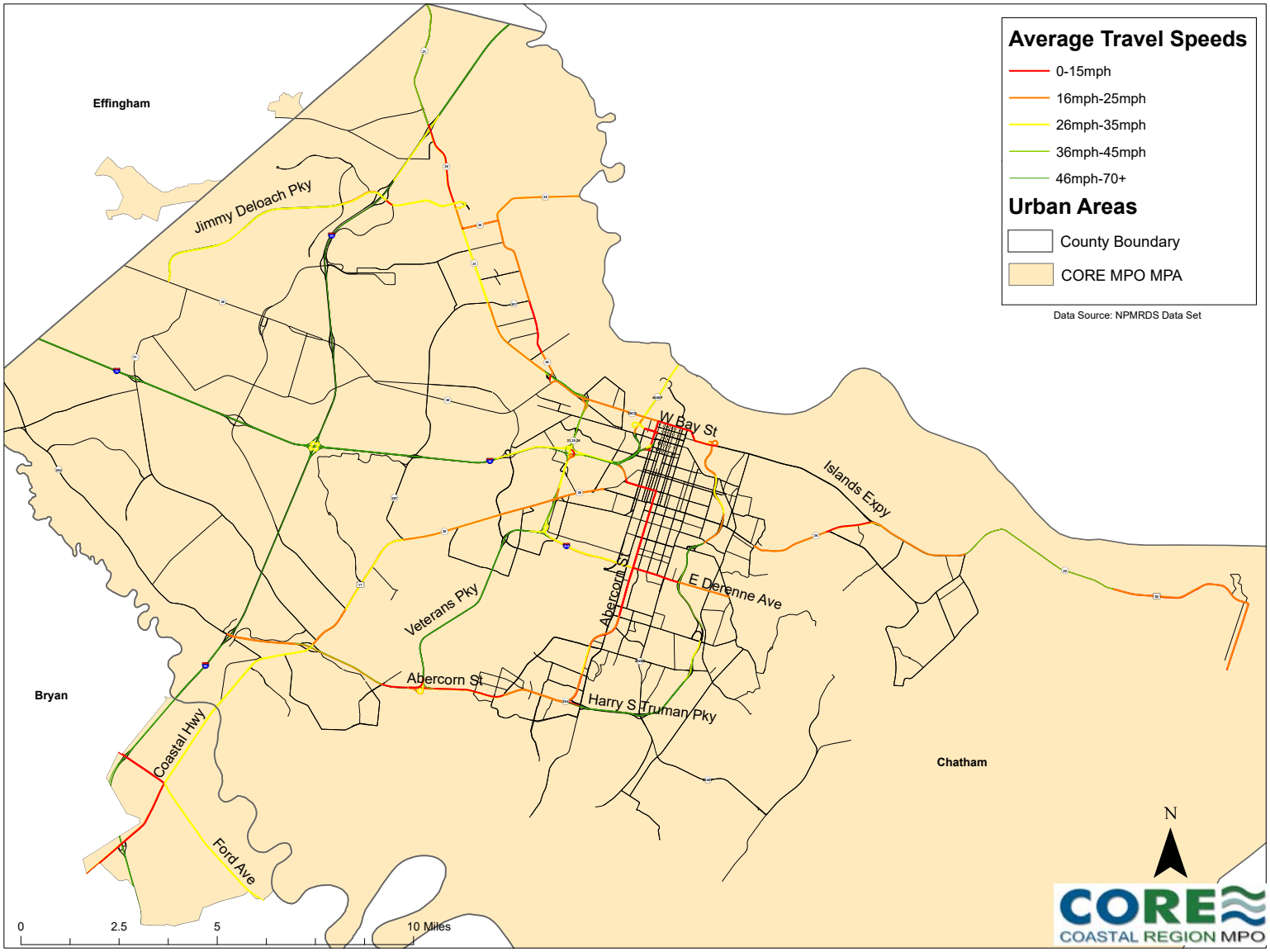
Average Travel Speeds Mid Day (10am-4pm) October 2015



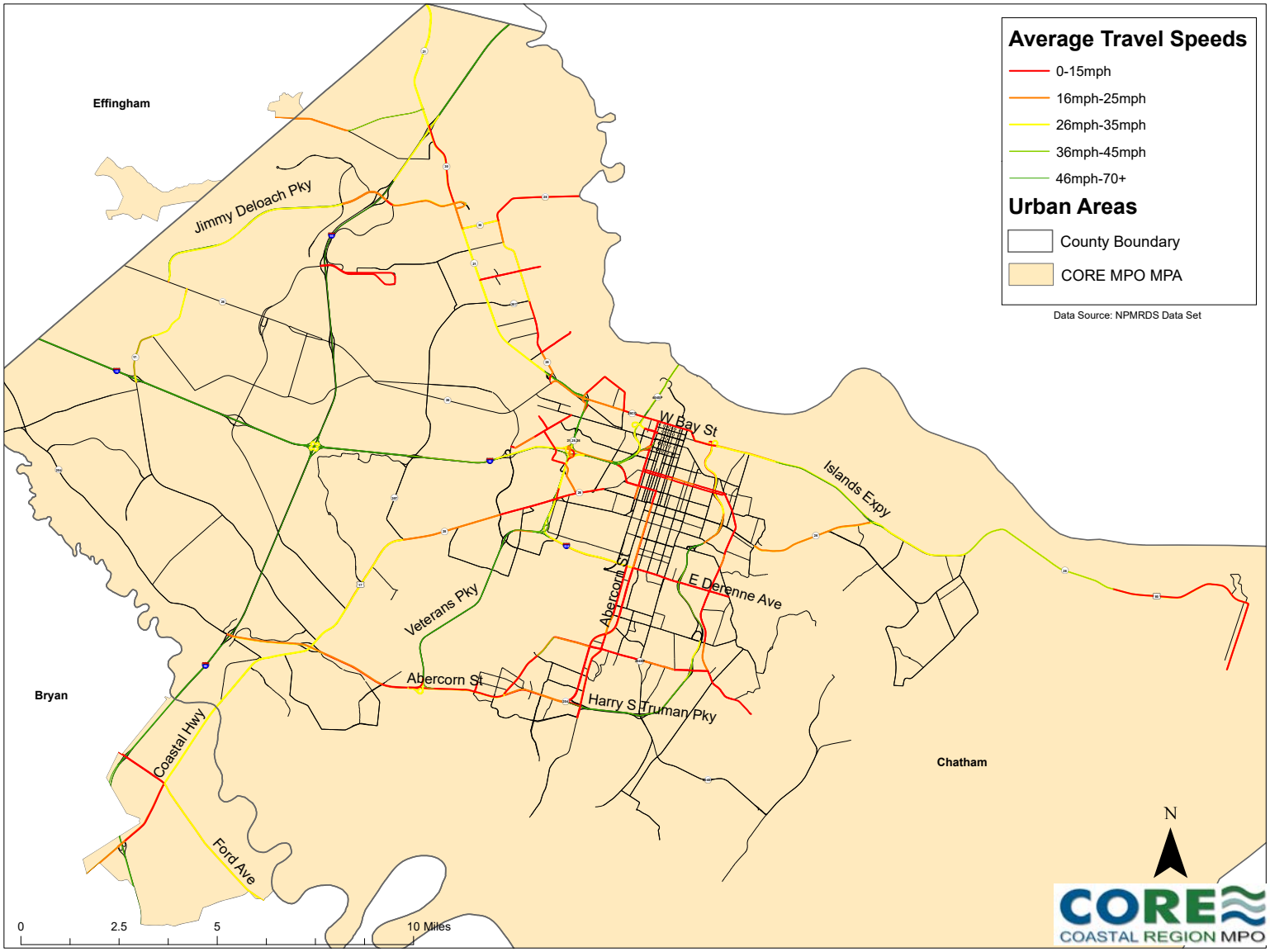
Average Travel Speeds Mid Day (10am-4pm) April 2016



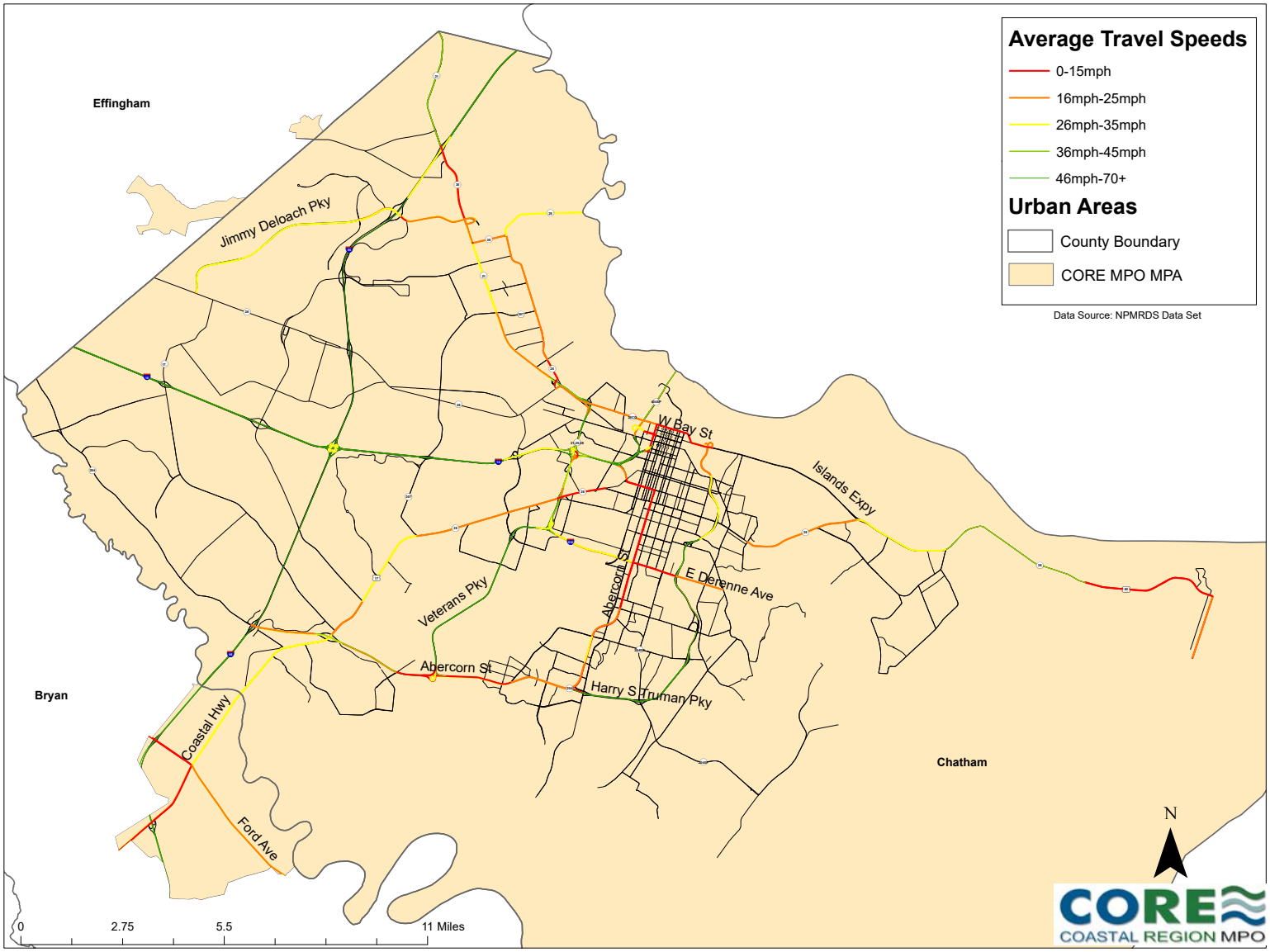
Average Travel Speeds PM Peak (4-6pm) October 2015



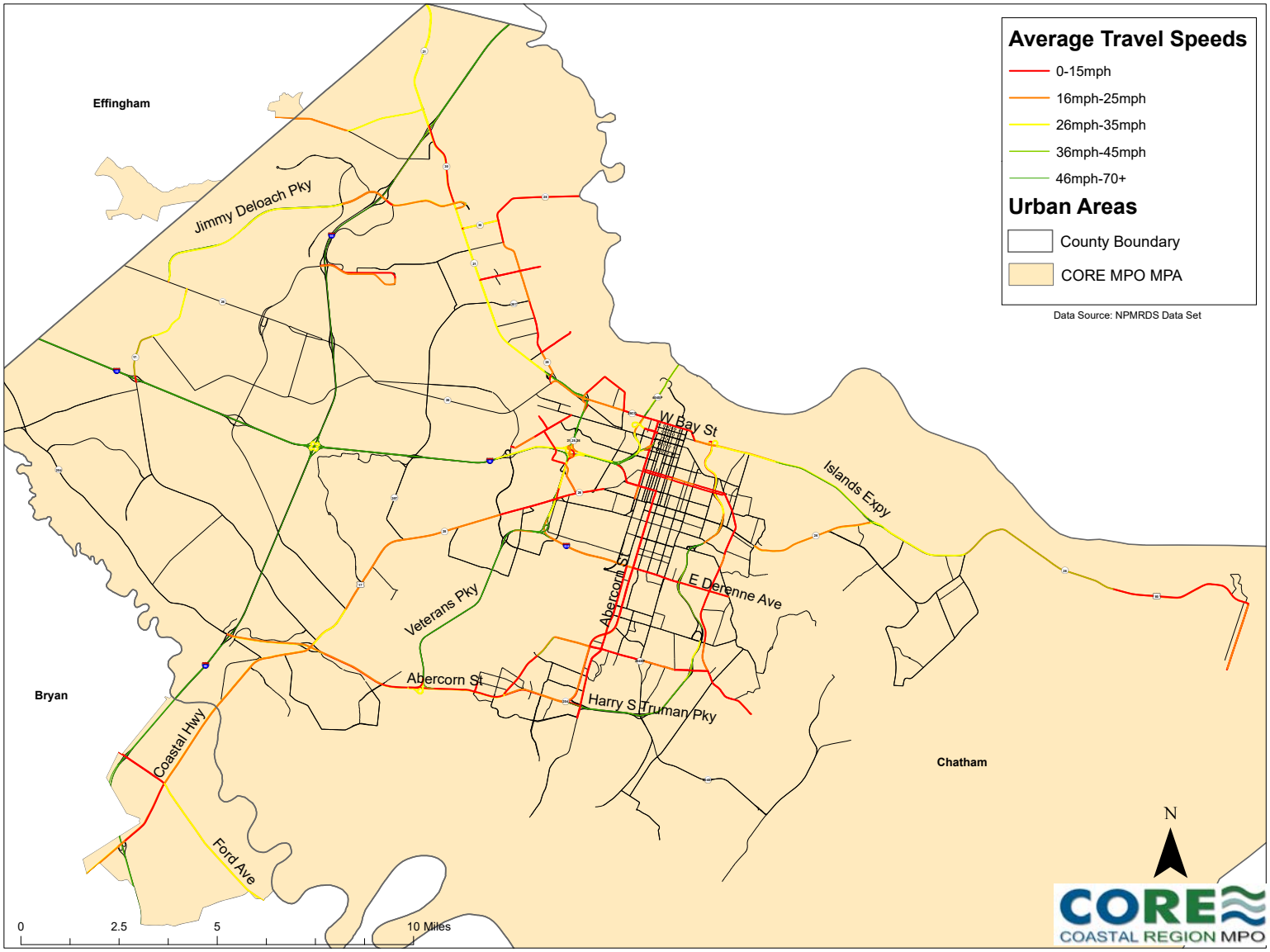
Average Travel Speeds PM Peak Period (4pm-6pm) April 2016



Average Travel Speeds PM Peak 4-7pm) October 2015



Average Travel Speeds PM Peak Period (4pm-7pm) April 2016



Appendix B: Bottleneck Ranking

2015 Annual

Rank	Head Location (approximate)	Impact	Average max length (miles)	Average daily duration	Total duration	All Events/Incidents
1	GA-21 S @ GA-204/ABERCORN ST	115,117.81	2.28	2 h 25 m	36 d 21 h 54 m	3
2	I-516 S @ MILDRED ST	26,645.80	1.67	46 m	11 d 19 h 13 m	3
3	I-16 W @ GA-307/EXIT 160	23,633.92	2.57	26 m	6 d 16 h 14 m	24
4	I-16 E @ GA-307/EXIT 160	22,635.23	2.45	26 m	6 d 15 h 58 m	23
5	I-16 E @ I-95/EXIT 157	17,115.33	1.57	30 m	7 d 19 h 35 m	11
6	GA-21 N @ VETERANS PKWY/EXIT 3	16,681.95	2.43	20 m	5 d 03 h 51 m	0
7	I-16 W @ CHATHAM PKWY/EXIT 162	15,225.17	1.59	27 m	7 d 00 h 15 m	18
8	I-16 W @ I-95/EXIT 157	13,879.12	2.25	16 m	4 d 01 h 41 m	30
9	I-95 N @ GA--SC STATE BORDER	13,655.89	3.93	9 m	2 d 09 h 52 m	9
10	I-95 N @ GA-21/EXIT 109	9,721.60	1.19	22 m	5 d 14 h 12 m	8
11	US-17 S @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	9,082.17	1.01	24 m	6 d 03 h 33 m	8
12	I-16 E @ CHATHAM PKWY/EXIT 162	8,937.53	2.36	9 m	2 d 12 h 39 m	35
13	US-17 N @ GA--SC STATE BORDER/TALMADGE MEMORIAL BRIDGE	7,199.36	1.82	9 m	2 d 10 h 26 m	2
14	I-95 S @ GA-204/EXIT 94	6,939.64	4.03	3 m	1 d 00 h 03 m	4
15	I-16 E @ POOLER PKWY/EXIT 155	6,251.10	1.79	8 m	2 d 05 h 39 m	25
16	I-95 N @ I-16	5,969.85	3.97	3 m	20 h 58 m	14
17	I-95 S @ US-17/EXIT 87	5,663.05	3.3	4 m	1 d 05 h 58 m	1
18	I-16 E @ I-516/LYNES AVE/EXIT 164	4,327.28	1.65	8 m	2 d 01 h 29 m	38
19	I-95 S @ GA-21/EXIT 109	4,245.45	3.48	3 m	21 h 02 m	2
20	I-95 N @ US-17/EXIT 87	3,321.48	6.39	1 m	6 h 15 m	8
21	US-17 N @ GA-25C/W BAY ST	3,137.24	0.38	17 m	4 d 09 h 34 m	1
22	US-17 S @ I-16/I-516	2,787.96	0.74	10 m	2 d 16 h 56 m	1
23	US-17 N @ GA-25C/W OGLETHORPE AVE	2,616.99	0.38	14 m	3 d 18 h 50 m	0
24	I-16 W @ POOLER PKWY/EXIT 155	2,550.50	1.5	4 m	1 d 05 h 27 m	15
25	I-516 N @ I-16/EXIT 5	2,436.30	0.53	13 m	3 d 10 h 13 m	1
26	US-17 S @ GA-25C/W BAY ST	2,290.77	1.79	3 m	21 h 50 m	7
27	US-17 S @ GA-25C/W OGLETHORPE AVE	2,282.49	0.59	6 m	1 d 16 h 43 m	7
28	I-16 W @ GA-17/BLOOMINGDALE RD/EXIT 152	2,271.50	1.68	3 m	23 h 53 m	16
29	I-16 W @ GA-204/EXIT 165	2,250.02	0.54	9 m	2 d 06 h 57 m	0
30	I-95 S @ I-16	2,159.96	1.25	4 m	1 d 05 h 37 m	3
31	I-95 N @ POOLER PKWY/EXIT 104	1,994.73	1.69	2 m	17 h 50 m	8
32	I-95 S @ GA-144/EXIT 90	1,840.68	2.86	1 m	7 h 37 m	2
33	I-16 E @ GA-17/BLOOMINGDALE RD/EXIT 152	1,647.25	1.63	2 m	16 h 54 m	19
34	I-516 N @ EXIT 3	1,611.96	1.36	3 m	19 h 39 m	1
35	I-16 W @ I-516/LYNES AVE/EXIT 164	1,594.54	0.82	5 m	1 d 09 h 08 m	1
36	I-95 N @ JIMMY DE LOACH PKWY/EXIT 106	1,429.79	2.05	1 m	10 h 26 m	7
37	I-516 N @ EXIT 8	1,280.68	0.5	7 m	1 d 21 h 28 m	4
38	I-95 N @ GA-204/EXIT 94	1,090.39	2.92	1 m	7 h 14 m	1
39	I-16 W @ OLD RIVER RD/EXIT 148	1,059.24	2.48	1 m	9 h 33 m	17
40	I-95 S @ JIMMY DE LOACH PKWY/EXIT 106	1,034.37	1.51	1 m	7 h 28 m	1
41	I-516 N @ TREMONT AVE/EXIT 4	1,009.69	0.6	4 m	1 d 05 h 52 m	1
42	I-95 N @ US-80/EXIT 102	974.62	1.96	1 m	7 h 53 m	13
43	US-17 N @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	856.83	0.49	4 m	1 d 05 h 07 m	0
44	I-16 E @ US-17/GWINNETT ST/EXIT 166	782.29	0.29	6 m	1 d 17 h 20 m	3
45	I-95 S @ US-80/EXIT 102	738.58	1.33	1 m	8 h 23 m	0
46	I-95 S @ POOLER PKWY/EXIT 104	555.83	1.25	1 m	8 h 27 m	0
47	I-516 N @ US-17/US-80/EXIT 3	545.36	0.84	1 m	11 h 29 m	1
48	I-95 N @ GA-144/EXIT 90	533.7	1.2	1 m	6 h 53 m	3
49	I-516 S @ EXIT 3	420.23	0.67	1 m	11 h 32 m	3
50	I-16 E @ GA-204/EXIT 165	418.33	0.47	4 m	1 d 01 h 17 m	29
51	I-95 S @ US-84/GA-38/EXIT 76	380.16	10.28	0 m	37 m	1
52	I-516 S @ US-17/US-80/EXIT 3	361.98	0.77	1 m	8 h 09 m	5
53	I-516 N @ AUGUSTA AVE/EXIT 7	270.83	0.69	1 m	8 h 36 m	3
54	I-516 S @ GWINNETT ST/EXIT 6	266.8	0.62	1 m	7 h 18 m	0
55	I-516 S @ EXIT 8	209.34	0.29	2 m	12 h 53 m	0
56	I-516 S @ BAY ST/LATHROP AVE/EXIT 7	206.04	0.62	0 m	6 h 04 m	0
57	I-16 E @ OLD RIVER RD/EXIT 148	169.5	0.7	0 m	4 h 04 m	0
58	I-516 S @ I-16/EXIT 5	168.98	0.2	2 m	14 h 23 m	2
59	I-516 S @ TREMONT AVE/EXIT 4	167.18	0.26	1 m	11 h 30 m	2
60	I-16 W @ US-17/GWINNETT ST/EXIT 166	158.03	0.49	0 m	5 h 25 m	0
61	US-17 S @ LOUISVILLE RD	127.61	0.56	0 m	5 h 03 m	7
62	US-17 N @ LOUISVILLE RD	106.88	0.74	0 m	2 h 22 m	0
63	GA-21 S @ W GWINNETT ST/EXIT 6	84.81	0.3	0 m	4 h 47 m	0
64	GA-21 N @ W GWINNETT ST/EXIT 6	78.6	0.24	1 m	7 h 47 m	0
65	I-516 N @ BAY ST/LATHROP AVE/EXIT 7	66.97	0.36	0 m	5 h 18 m	3
66	I-516 N @ GWINNETT ST/EXIT 6	65.66	0.31	0 m	5 h 34 m	1
67	I-516 S @ AUGUSTA AVE/EXIT 7	55.78	0.19	0 m	5 h 08 m	0

2016 Annual

Rank	Head Location (approximate)	Impact	Average max length (miles)	Average daily duration	Total duration	All Events/Incidents
1	GA-21 S @ GA-204/ABERCORN ST	185,251.58	2.3	3 h 58 m	60 d 13 h 17 m	18
2	I-516 S @ MILDRED ST	50,597.09	1.68	1 h 29 m	22 d 18 h 37 m	85
3	GA-21 N @ VETERANS PKWY/EXIT 3	39,201.15	2.36	48 m	12 d 08 h 53 m	11
4	I-16 W @ GA-307/EXIT 160	30,400.84	3.14	29 m	7 d 09 h 11 m	14
5	I-16 E @ GA-307/EXIT 160	29,550.02	2.2	38 m	9 d 16 h 06 m	16
6	I-16 W @ CHATHAM PKWY/EXIT 162	25,279.64	1.76	42 m	10 d 19 h 48 m	11
7	I-95 N @ GA--SC STATE BORDER	23,312.12	4.28	15 m	3 d 20 h 05 m	59
8	I-516 N @ EXIT 3	14,614.85	1.33	31 m	8 d 01 h 19 m	72
9	I-16 E @ I-95/EXIT 157	14,504.59	1.49	29 m	7 d 09 h 23 m	8
10	I-95 N @ GA-21/EXIT 109	12,689.28	1.16	26 m	6 d 17 h 55 m	38
11	US-17 S @ I-16/I-516	11,600.88	0.99	34 m	8 d 20 h 05 m	8
12	I-16 W @ I-95/EXIT 157	10,693.37	2.8	8 m	2 d 04 h 00 m	20
13	GA-21 N @ I-16/US-17/GA-25/GA-404/EXIT 5	10,412.76	0.9	32 m	8 d 06 h 19 m	15
14	I-516 N @ I-16/EXIT 5	7,702.53	0.57	39 m	9 d 22 h 20 m	146
15	US-17 N @ I-16/I-516	6,242.88	0.73	25 m	6 d 09 h 22 m	4
16	I-16 E @ CHATHAM PKWY/EXIT 162	5,529.10	2.59	6 m	1 d 18 h 30 m	15
17	I-95 S @ GA-204/EXIT 94	5,356.60	4.42	3 m	20 h 43 m	17
18	I-16 E @ I-516/LYNES AVE/EXIT 164	5,343.77	1.68	7 m	1 d 22 h 46 m	24
19	US-17 N @ GA--SC STATE BORDER/TALMADGE MEMORIAL BRIDGE	5,283.39	1.67	9 m	2 d 07 h 44 m	4
20	I-95 S @ US-84/GA-38/EXIT 76	4,345.67	10.67	1 m	6 h 45 m	14
21	I-516 S @ EXIT 3	4,133.99	0.54	22 m	5 d 18 h 06 m	91
22	I-516 N @ TREMONT AVE/EXIT 4	4,113.07	0.66	18 m	4 d 15 h 11 m	78
23	I-95 S @ I-16	4,094.91	1.33	6 m	1 d 18 h 25 m	19
24	I-516 N @ US-17/US-80/EXIT 3	3,985.69	0.7	17 m	4 d 09 h 08 m	78
25	I-95 N @ POOLER PKWY/EXIT 104	3,971.15	1.67	6 m	1 d 18 h 09 m	6
26	GA-21 S @ VETERANS PKWY/EXIT 3	3,811.96	0.53	21 m	5 d 09 h 28 m	5
27	I-16 W @ OLD RIVER RD/EXIT 148	3,811.11	2.95	3 m	22 h 26 m	23
28	I-516 S @ BAY ST/LATHROP AVE/EXIT 7	3,749.16	0.93	11 m	2 d 21 h 46 m	13
29	GA-21 N @ US-17/US-80/GA-25/GA-26/EXIT 3	3,360.21	0.77	13 m	3 d 11 h 28 m	14
30	I-516 N @ EXIT 8	3,237.63	0.58	15 m	4 d 00 h 16 m	19
31	I-95 N @ I-16	3,186.03	3.23	2 m	13 h 22 m	8
32	GA-21 N @ US-80/GA-25/GA-26/BAY ST	3,151.65	0.67	13 m	3 d 13 h 07 m	38
33	I-95 N @ GA-144/EXIT 90	2,978.51	1.77	3 m	23 h 23 m	13
34	I-16 W @ GA-17/BLOOMINGDALE RD/EXIT 152	2,933.06	2.48	3 m	19 h 36 m	30
35	GA-21 S @ US-17/US-80/GA-25/GA-26/EXIT 3	2,863.08	0.81	10 m	2 d 14 h 25 m	6
36	I-516 S @ US-17/US-80/EXIT 3	2,851.23	0.7	11 m	3 d 00 h 55 m	62
37	I-95 S @ GA-144/EXIT 90	2,835.14	2.99	1 m	10 h 44 m	15
38	I-16 W @ POOLER PKWY/EXIT 155	2,707.66	1.76	3 m	20 h 48 m	19
39	I-16 E @ GA-17/BLOOMINGDALE RD/EXIT 152	2,706.03	2.32	2 m	17 h 28 m	6
40	I-95 N @ GA-204/EXIT 94	2,575.87	2.8	2 m	12 h 21 m	21
41	I-95 S @ GA-21/EXIT 109	2,528.60	1.54	1 m	10 h 58 m	388
42	GA-21 S @ US-80/GA-25/GA-26/BAY ST	2,502.61	0.79	8 m	2 d 05 h 55 m	1
43	I-16 W @ I-516/LYNES AVE/EXIT 164	2,490.07	0.75	9 m	2 d 08 h 16 m	8
44	US-17 S @ GA-25C/W BAY ST	2,388.25	1.6	4 m	1 d 00 h 24 m	20
45	I-516 N @ AUGUSTA AVE/EXIT 7	2,335.35	0.58	11 m	2 d 23 h 58 m	81
46	GA-21 N @ GA-25	2,285.37	0.61	10 m	2 d 17 h 52 m	38
47	I-516 S @ GWINNETT ST/EXIT 6	2,049.62	0.55	11 m	2 d 20 h 19 m	16
48	I-95 N @ US-17/EXIT 87	2,006.21	3.21	0 m	6 h 01 m	8
49	US-17 S @ I-516/US-80/GA-21/GA-26/LYNES PKWY	2,005.94	0.95	5 m	1 d 12 h 21 m	3
50	I-95 S @ US-80/EXIT 102	1,789.23	1.78	2 m	13 h 00 m	36
51	I-95 S @ US-17/EXIT 87	1,714.82	2.12	1 m	9 h 13 m	21
52	I-16 E @ POOLER PKWY/EXIT 155	1,691.33	1.95	2 m	14 h 39 m	6
53	I-95 N @ US-80/EXIT 102	1,609.95	1.66	3 m	19 h 05 m	1
54	GA-21 S @ W GWINNETT ST/EXIT 6	1,574.39	0.5	9 m	2 d 08 h 50 m	1
55	I-516 S @ I-16/EXIT 5	1,545.98	0.35	11 m	2 d 23 h 16 m	22
56	US-17 N @ GA-25C/W OGLETHORPE AVE	1,519.66	0.38	12 m	3 d 06 h 24 m	1
57	US-17 S @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	1,327.06	0.62	6 m	1 d 14 h 46 m	29
58	US-17 N @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	1,315.82	0.55	7 m	1 d 20 h 20 m	0
59	GA-21 S @ I-16/US-17/GA-25/GA-404/EXIT 5	1,066.99	0.34	8 m	2 d 02 h 54 m	1
60	I-516 N @ GWINNETT ST/EXIT 6	920.36	0.34	8 m	2 d 02 h 17 m	70
61	GA-21 N @ W GWINNETT ST/EXIT 6	898.71	0.34	8 m	2 d 02 h 25 m	4
62	I-516 N @ BAY ST/LATHROP AVE/EXIT 7	879.04	0.35	7 m	1 d 21 h 24 m	91
63	I-95 S @ POOLER PKWY/EXIT 104	861.09	1.39	1 m	9 h 19 m	9
64	I-16 E @ GA-204/EXIT 165	828.17	0.86	2 m	16 h 51 m	11
65	I-95 N @ JIMMY DE LOACH PKWY/EXIT 106	782.36	1.63	1 m	7 h 56 m	9
66	US-17 S @ LOUISVILLE RD	777.86	0.28	8 m	2 d 03 h 12 m	27
67	I-516 S @ EXIT 8	768.07	0.29	7 m	1 d 21 h 59 m	2
68	I-516 S @ TREMONT AVE/EXIT 4	677.37	0.31	6 m	1 d 16 h 07 m	14
69	I-16 E @ OLD RIVER RD/EXIT 148	640.17	0.7	2 m	15 h 26 m	3
70	I-516 S @ AUGUSTA AVE/EXIT 7	608.76	0.37	5 m	1 d 09 h 35 m	14
71	I-95 S @ JIMMY DE LOACH PKWY/EXIT 106	602.89	1.52	1 m	6 h 48 m	30
72	US-17 N @ GA-25C/W BAY ST	597.59	0.2	9 m	2 d 07 h 43 m	1
73	GA-21 S @ GA-25	564.43	0.29	5 m	1 d 09 h 47 m	0
74	US-17 N @ LOUISVILLE RD	529.21	0.57	2 m	15 h 06 m	0
75	US-17 N @ GA-204/37TH CONN/EXIT 165	407.98	0.75	1 m	10 h 11 m	4
76	I-16 W @ US-17/GWINNETT ST/EXIT 166	357.88	0.49	2 m	12 h 30 m	6
77	I-16 E @ US-17/GWINNETT ST/EXIT 166	224.21	0.36	2 m	13 h 49 m	11
78	I-16 W @ GA-204/EXIT 165	186.83	0.35	1 m	9 h 50 m	6
79	US-17 S @ GA-204/37TH CONN/EXIT 165	151.26	0.57	0 m	5 h 08 m	9
80	US-17 S @ GA-25C/W OGLETHORPE AVE	70.33	0.17	2 m	12 h 18 m	27

October 2015

Rank	Head Location (approximate)	Impact	Average max length (miles)	Average daily duration	Total duration	All Events/Incidents
1	GA-21 S @ GA-204/ABERCORN ST	18,087.28	2.28	4 h 39 m	6 d 00 h 19 m	1
2	I-516 S @ MILDRED ST	4,055.90	1.69	1 h 27 m	1 d 21 h 24 m	0
3	I-95 S @ US-17/EXIT 87	3,370.20	3.25	36 m	19 h 05 m	0
4	I-16 E @ GA-307/EXIT 160	3,141.62	2.65	41 m	21 h 26 m	0
5	I-95 S @ GA-204/EXIT 94	2,504.42	5.21	17 m	8 h 57 m	0
6	I-16 W @ CHATHAM PKWY/EXIT 162	2,414.07	1.74	54 m	1 d 04 h 06 m	0
7	GA-21 N @ VETERANS PKWY/EXIT 3	2,013.09	2.46	30 m	15 h 59 m	0
8	I-95 N @ GA--SC STATE BORDER	1,551.94	4.44	9 m	4 h 55 m	1
9	I-16 E @ I-95/EXIT 157	1,400.36	1.74	32 m	16 h 59 m	0
10	I-16 E @ CHATHAM PKWY/EXIT 162	1,039.49	1.94	14 m	7 h 42 m	0
11	I-16 E @ I-516/LYNES AVE/EXIT 164	777.04	1.7	8 m	4 h 10 m	0
12	I-16 W @ GA-307/EXIT 160	711.61	2.52	11 m	5 h 50 m	0
13	I-95 S @ JIMMY DE LOACH PKWY/EXIT 106	647.22	3.34	5 m	2 h 40 m	0
14	I-95 N @ GA-21/EXIT 109	619.65	1.14	23 m	12 h 01 m	0
15	I-516 N @ EXIT 8	326.7	0.6	20 m	10 h 45 m	0
16	I-516 N @ EXIT 3	309.67	1.63	7 m	3 h 41 m	0
17	US-17 N @ GA--SC STATE BORDER/TALMADGE MEMORIAL BRIDGE	297.81	1.93	4 m	2 h 21 m	0
18	US-17 S @ I-16/I-516	279.76	0.71	14 m	7 h 35 m	0
19	I-516 N @ I-16/EXIT 5	274.66	0.56	26 m	13 h 35 m	0
20	I-95 S @ GA-144/EXIT 90	258.84	2.73	2 m	1 h 17 m	0
21	US-17 S @ GA-25C/W BAY ST	192.83	1.79	3 m	1 h 51 m	1
22	I-95 S @ I-16	190.94	2.29	2 m	1 h 28 m	0
23	US-17 S @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	190.8	1.29	6 m	3 h 10 m	1
24	US-17 N @ GA-25C/W OGLETHORPE AVE	172.26	0.27	24 m	12 h 30 m	0
25	I-16 E @ POOLER PKWY/EXIT 155	165.66	1.95	2 m	1 h 25 m	0
26	I-95 S @ POOLER PKWY/EXIT 104	127.14	1.19	4 m	2 h 05 m	0
27	I-95 N @ US-17/EXIT 87	114.99	7.03	0 m	14 m	0
28	I-516 N @ TREMONT AVE/EXIT 4	114.73	0.64	7 m	3 h 49 m	0
29	I-516 N @ AUGUSTA AVE/EXIT 7	98.21	1.31	3 m	1 h 42 m	0
30	US-17 N @ GA-25C/W BAY ST	95.6	0.32	13 m	6 h 44 m	0
31	I-516 S @ EXIT 3	88.09	0.68	5 m	2 h 42 m	0
32	I-95 S @ US-80/EXIT 102	86.98	1.23	2 m	1 h 18 m	0
33	I-16 W @ OLD RIVER RD/EXIT 148	78.82	1.36	2 m	1 h 04 m	0
34	I-95 N @ I-16	78.35	4.61	0 m	17 m	0
35	I-16 W @ GA-17/BLOOMINGDALE RD/EXIT 152	75.75	1.26	2 m	1 h 06 m	0
36	I-516 N @ US-17/US-80/EXIT 3	73.84	1.26	3 m	1 h 35 m	0
37	I-95 S @ GA-21/EXIT 109	70.14	2.18	1 m	49 m	0
38	I-16 W @ I-516/LYNES AVE/EXIT 164	64.51	0.72	4 m	2 h 05 m	0
39	I-16 W @ I-95/EXIT 157	64.01	1.75	1 m	40 m	0
40	I-16 W @ POOLER PKWY/EXIT 155	63.88	1.36	1 m	44 m	0
41	US-17 N @ I-16/GA-404 SPUR/GWINNETT ST/EXIT 166	60.74	0.49	4 m	2 h 04 m	0
42	GA-21 N @ W GWINNETT ST/EXIT 6	38.75	0.4	6 m	3 h 11 m	0
43	I-516 S @ EXIT 8	37.36	0.29	4 m	2 h 13 m	0
44	I-95 N @ JIMMY DE LOACH PKWY/EXIT 106	33.84	1.41	0 m	25 m	0
45	I-516 S @ US-17/US-80/EXIT 3	33.77	0.7	1 m	55 m	0
46	I-16 E @ US-17/GWINNETT ST/EXIT 166	32.87	0.34	2 m	1 h 30 m	0
47	I-16 W @ GA-204/EXIT 165	30.04	0.38	2 m	1 h 08 m	0
48	I-16 E @ GA-17/BLOOMINGDALE RD/EXIT 152	30	1.29	1 m	33 m	0
49	I-16 E @ OLD RIVER RD/EXIT 148	29.42	0.7	1 m	42 m	0
50	US-17 S @ GA-25C/W OGLETHORPE AVE	27.14	0.35	4 m	2 h 04 m	1
51	I-95 N @ POOLER PKWY/EXIT 104	26.26	1.08	0 m	29 m	0
52	I-516 S @ BAY ST/LATHROP AVE/EXIT 7	25.51	0.92	0 m	24 m	0
53	I-95 N @ US-80/EXIT 102	25.12	1.23	0 m	24 m	0
54	I-95 N @ GA-144/EXIT 90	23.4	1.19	0 m	23 m	0
55	I-516 S @ TREMONT AVE/EXIT 4	23.22	0.28	3 m	1 h 58 m	0
56	I-516 S @ GWINNETT ST/EXIT 6	20.86	0.61	1 m	34 m	0
57	I-16 E @ GA-204/EXIT 165	19.06	0.55	1 m	38 m	0
58	I-516 N @ GWINNETT ST/EXIT 6	17.56	0.41	3 m	1 h 37 m	0
59	I-95 N @ GA-204/EXIT 94	17.33	3.47	0 m	5 m	0
60	I-16 W @ US-17/GWINNETT ST/EXIT 166	15.56	0.49	1 m	32 m	0
61	I-516 N @ BAY ST/LATHROP AVE/EXIT 7	14.38	1.06	1 m	1 h 00 m	0
62	I-516 S @ AUGUSTA AVE/EXIT 7	13.38	0.24	1 m	46 m	0
63	I-516 S @ I-16/EXIT 5	10.36	0.2	3 m	1 h 39 m	0
64	US-17 S @ LOUISVILLE RD	5.87	0.35	0 m	18 m	0
65	GA-21 S @ W GWINNETT ST/EXIT 6	2.68	0.3	0 m	9 m	0
66	US-17 N @ LOUISVILLE RD	2.39	0.48	0 m	5 m	0

April 2016

Rank	Head Location (approximate)	Impact	Average max length (miles)	Average daily duration	Total duration	All Events/Incidents
1	GA-21 S @ GA-204/ABERCORN ST	319.7	2.28	5 m	2 h 54 m	0
2	I-95 N @ GA--SC STATE BORDER	197.31	3.52	2 m	1 h 07 m	0
3	I-16 E @ GA-307/EXIT 160	178.25	2.52	2 m	1 h 17 m	1
4	GA-21 N @ I-16/US-17/GA-25/GA-404/EXIT 5	93.07	0.64	4 m	2 h 25 m	0
5	I-516 N @ I-16/EXIT 5	85.31	0.56	5 m	2 h 31 m	22
6	I-95 N @ POOLER PKWY/EXIT 104	79.02	1.74	1 m	57 m	0
7	I-516 S @ I-16/EXIT 5	48.34	0.41	3 m	1 h 54 m	0
8	GA-21 S @ I-16/US-17/GA-25/GA-404/EXIT 5	48.34	0.41	3 m	1 h 54 m	0
9	I-16 E @ CHATHAM PKWY/EXIT 162	33.35	4.95	0 m	12 m	1
10	I-16 E @ I-95/EXIT 157	31.56	0.97	1 m	34 m	1
11	GA-21 N @ US-80/GA-25/GA-26/BAY ST	20.9	0.91	1 m	32 m	0
12	I-516 N @ AUGUSTA AVE/EXIT 7	20.76	0.91	1 m	32 m	22
13	I-95 S @ JIMMY DE LOACH PKWY/EXIT 106	18.52	1.55	0 m	15 m	0
14	I-516 N @ EXIT 3	18.41	1.53	0 m	12 m	0
15	US-17 N @ I-16/I-516	17.49	0.73	0 m	24 m	1
16	GA-21 S @ W GWINNETT ST/EXIT 6	16.47	0.67	0 m	25 m	0
17	I-516 S @ GWINNETT ST/EXIT 6	16.29	0.66	0 m	25 m	0
18	US-17 S @ I-16/I-516	13.53	0.71	0 m	19 m	0
19	I-95 S @ POOLER PKWY/EXIT 104	12.81	2.56	0 m	5 m	0
20	I-516 S @ MILDRED ST	12.67	1.58	0 m	10 m	0
21	GA-21 N @ US-17/US-80/GA-25/GA-26/EXIT 3	11.85	0.47	0 m	25 m	0
22	I-516 N @ US-17/US-80/EXIT 3	11.85	0.47	0 m	25 m	0
23	GA-21 N @ VETERANS PKWY/EXIT 3	9.92	2.48	0 m	6 m	1
24	I-95 S @ I-16	9.29	0.71	0 m	17 m	0
25	GA-21 S @ US-17/US-80/GA-25/GA-26/EXIT 3	6.6	0.69	0 m	10 m	4
26	GA-21 N @ GA-25	6.44	0.43	0 m	20 m	0
27	I-516 N @ EXIT 8	6.44	0.43	0 m	20 m	0
28	I-516 S @ US-17/US-80/EXIT 3	5.23	0.58	0 m	10 m	1
29	US-17 N @ GA-25C/W OGLETHORPE AVE	5.21	0.25	0 m	25 m	0
30	US-17 S @ I-516/US-80/GA-21/GA-26/LYNES PKW	4.93	0.82	0 m	6 m	0
31	I-95 N @ US-80/EXIT 102	4.51	0.9	0 m	7 m	0
32	I-516 N @ TREMONT AVE/EXIT 4	3.63	0.42	0 m	22 m	0
33	GA-21 N @ W GWINNETT ST/EXIT 6	3.09	0.48	0 m	9 m	0
34	I-516 N @ GWINNETT ST/EXIT 6	3.09	0.48	0 m	9 m	22
35	US-17 S @ LOUISVILLE RD	2.05	0.26	0 m	9 m	0
36	GA-21 S @ US-80/GA-25/GA-26/BAY ST	1.32	0.33	0 m	4 m	0
37	I-516 S @ AUGUSTA AVE/EXIT 7	1.32	0.33	0 m	4 m	0

Appendix C: AirSage Data Attributes

Trip Matrix

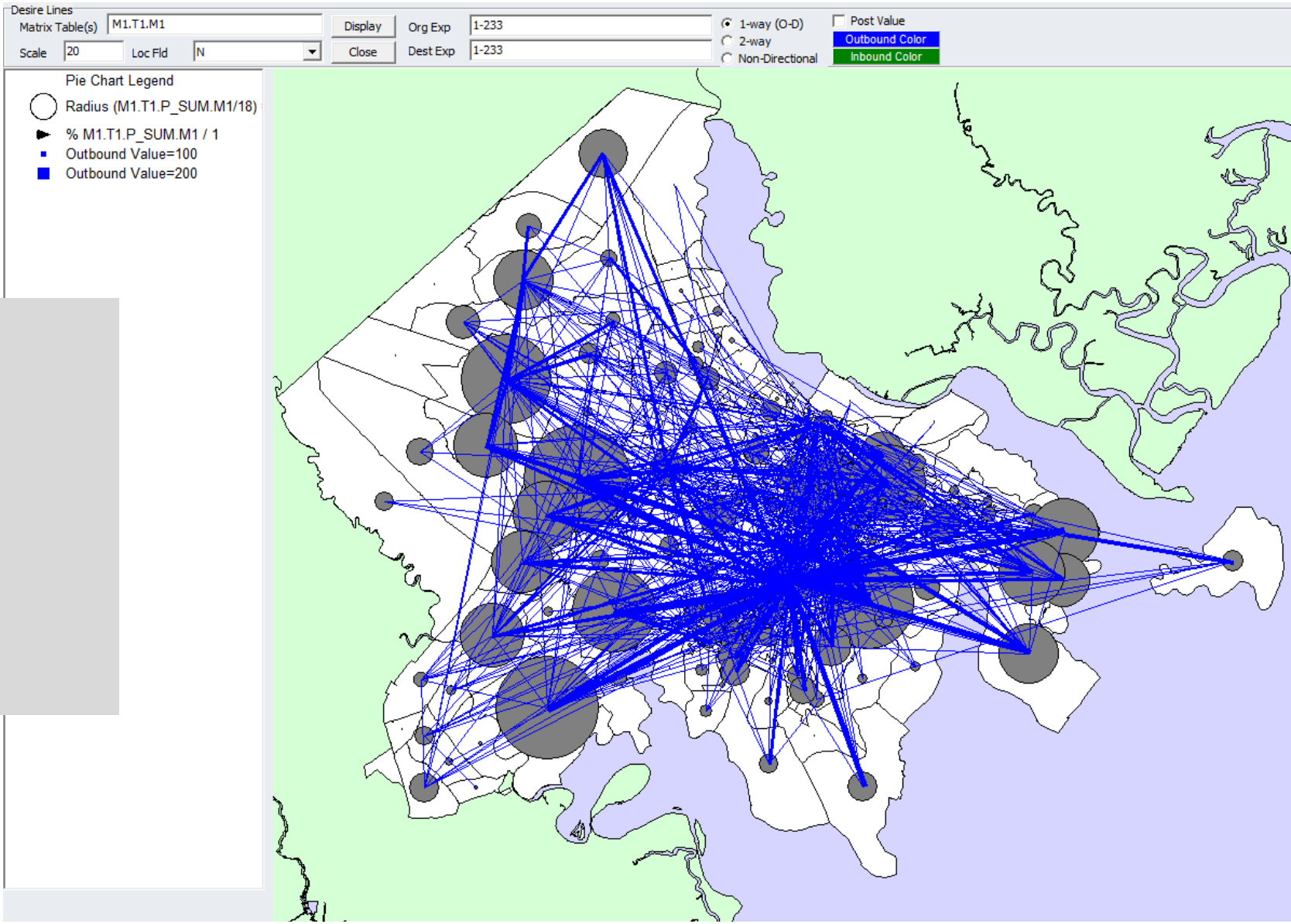
Are you trying to understand and quantify the number and types of trips being made throughout an area? With Trip Matrix analytics you select the specific geographic areas and date range(s) for which you are interested, whether you want to see only part of the day or the whole day, and how you want to aggregate the data over the week (choose every day or see averages for weekends only, for example). Additionally, there are options on the types of trips you need to analyze (home to work, work to other, etc.) – the level of detail is up to you!

Field Name	Field Description	Example Value
Origin Zone	The zone where the trips began (e.g. county, zip code, census tract)	484530024105
Destination Zone	The zone where the trips ended (e.g. county, zip code, census tract)	482150246002
Start Date	The starting date of the Date Range (YYMMDD)	120601
End Date	The ending date of the Date Range (YYMMDD)	120630

Time of Day	The Time of Day Periods are defined as follows:
	
	1. One of 5 pre-defined Day Parts (DP):
	a. Early AM (DP1) = 12:00:01AM to 6:00:00AM;
	b. AM Peak (DP2) = 6:00:01AM to 10:00:00AM;
	c. Mid-Day (DP3) = 10:00:01AM to 3:00:00PM;
	d. PM Peak (DP4) = 3:00:01PM to 7:00:00PM;
	e. Late PM (DP5) = 7:00:01PM to 12:00:00PM.
	2. Any contiguous window of time three or more hours in length defined by the customer and identified by Hx(n) where x is the hour of the day which is the beginning of the n hour window.
	3. A single 24 hour day (Day)
	
	Note: If the Time Period is null, then the Time Period is for the entire Date Range.
		DP2

Field Name	Field Description	Example Value
Aggregation	The Aggregation for which the number is calculated is as follows: 1. Total (Tot) = the total for the Time Period(s) over the Date Range; 2. Average (Avg) = the average day for the Time Period(s) over the Date Range; 3. Week (W) = the average week for the Time Period(s) over the Date Range; 4. Weekday (WD) = average weekday (Tues, Wed, Thurs) for the Time Period over the Date Range; 5. Weekend Day (WE) = average weekend day (Sat, Sun) for the Time Period over the Date Range	Tot
Purpose	***Optional:*** A value characterizing the Departure and Arrival Zones of the Trips. One of two classification schemes can be provided: 1. 3-Class : Home-Based Work (HBW); Home-Based Other (HBO); and Non-Home Based (NHB) ; or 2. 9-Class: any/all combinations of Home, Work, and Other (e.g. HO, HW, HH, WH, etc.)	HO
Residence Class	***Optional:*** A value characterizing the trips between residents versus visitors. One of two classification schemes can be provided: 1. 2-Class : Resident or Visitor 2. 6-Class:: Resident Worker, Home Worker, Inbound Commuter, Outbound Commuter, Short-term Visitor, Long-term Visitor	RW
Count	The number (or other Aggregation as shown) of trips, made by people with the given Attribute, that started in the given Origin Zone and ended in the given Destination Zone during the given Date Range and Time Period	5172

Appendix D: Origin and Destination Maps

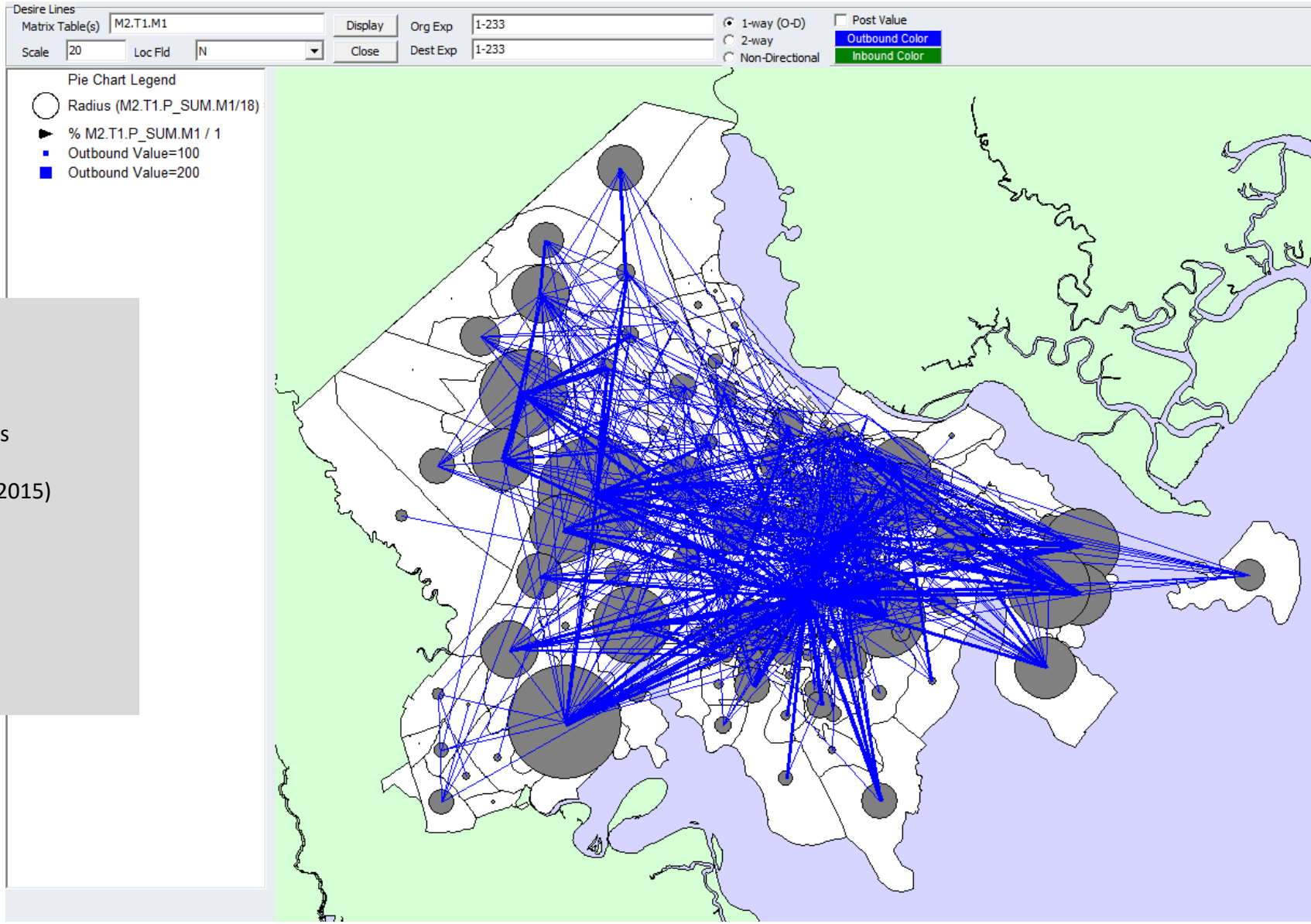


Custom 1:
Morning Home Based Work
Resident Worker

Productions and Desire Lines

Dataset: Final (April 2016)
Table: DP
Time: AM
Purpose: HBW
Filter: None

<u>Observations</u>

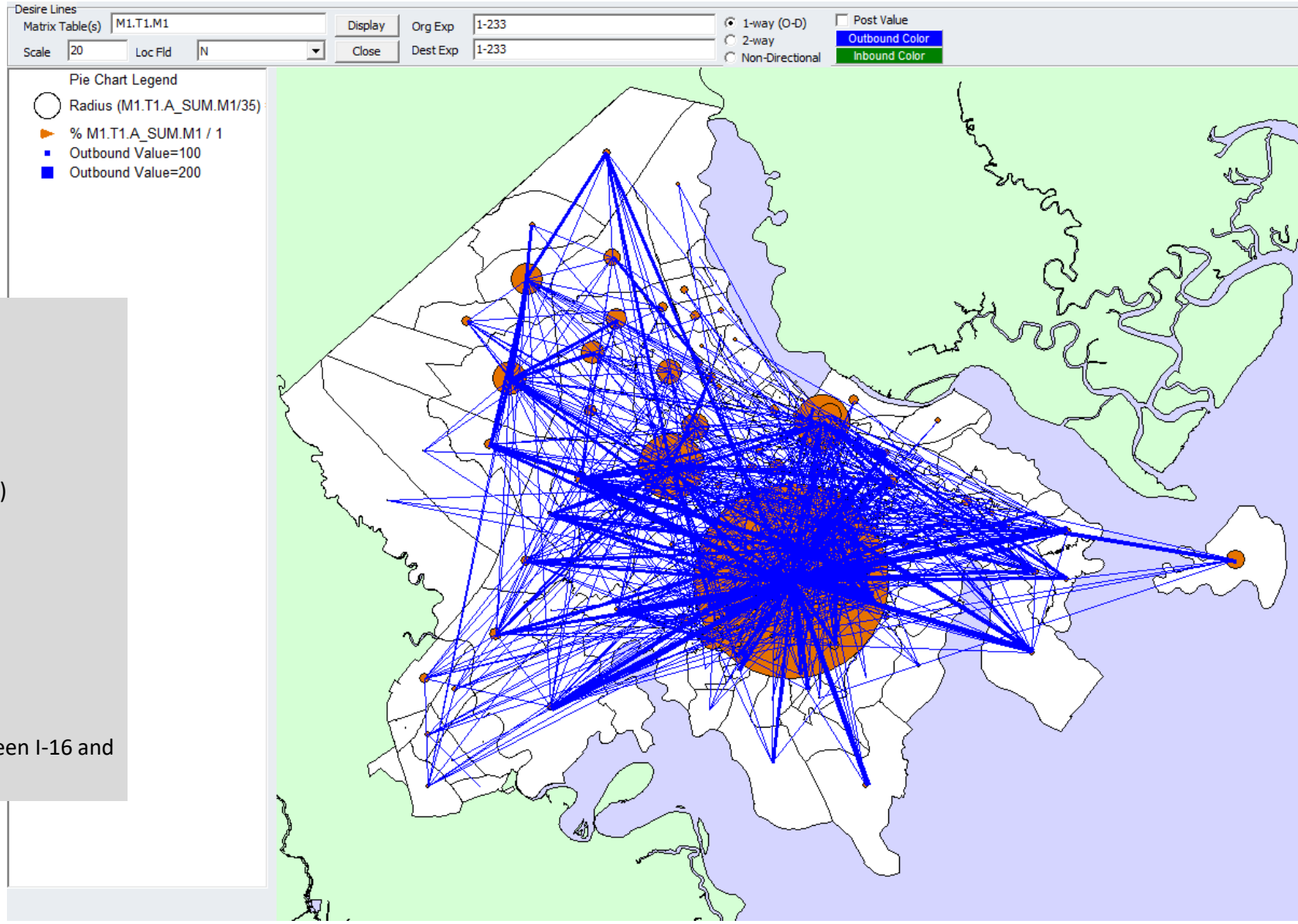


Custom 1:
Morning Home Based Work
Resident Worker

Productions and Desire Lines

Dataset: Final (October 2015)
Table: DP
Time: AM
Purpose: HBW
Filter: None

<u>Observations</u>



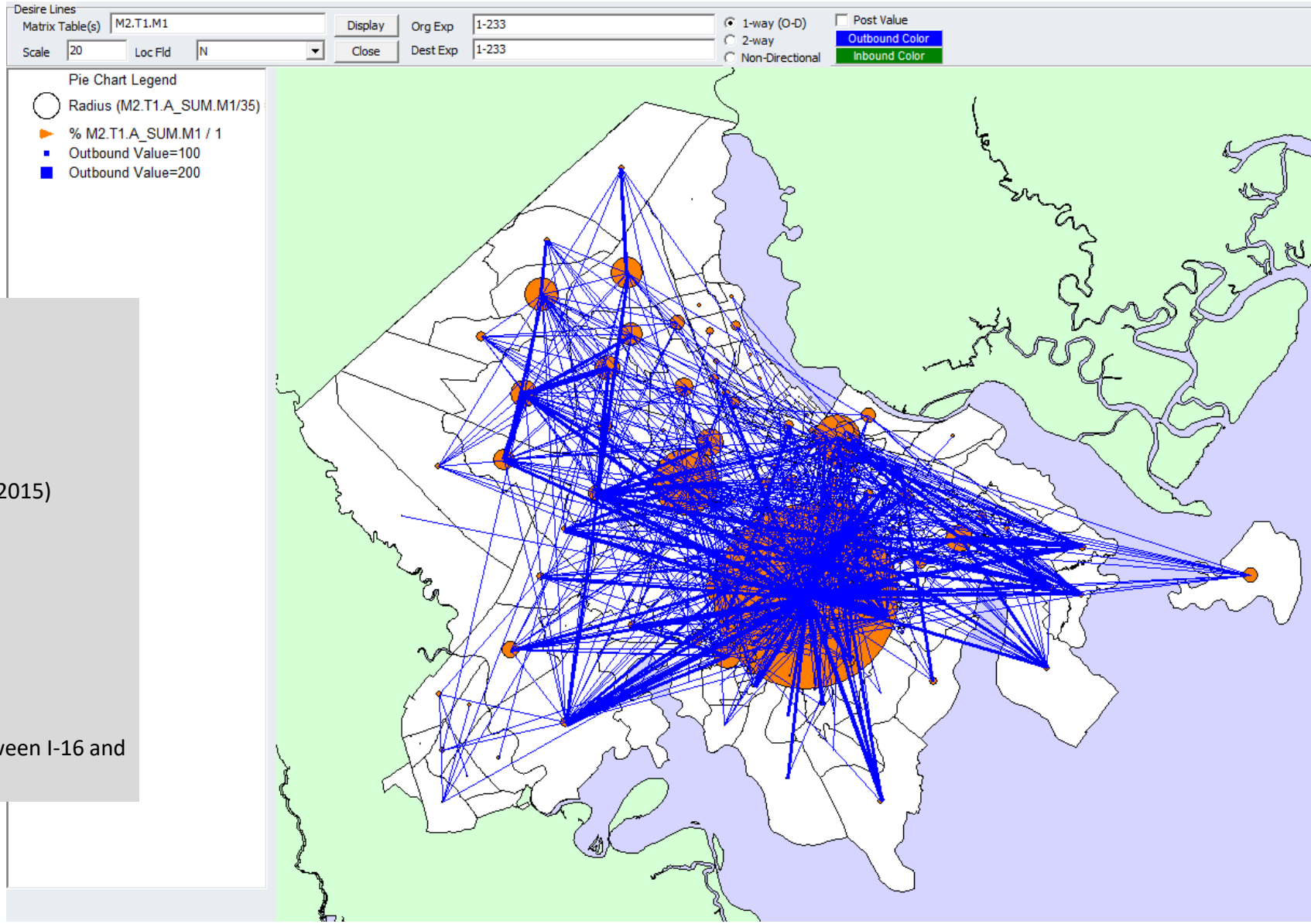
Custom 1:
Morning Home Based Work
Resident Worker

Attractions and Desire Lines

Dataset: Final (April 2016)
Table: DP
Time: AM
Purpose: HBW
Filter: None

Observations

1. **Mall**
2. Downtown
3. Chatham Parkway between I-16 and Ogeechee Road



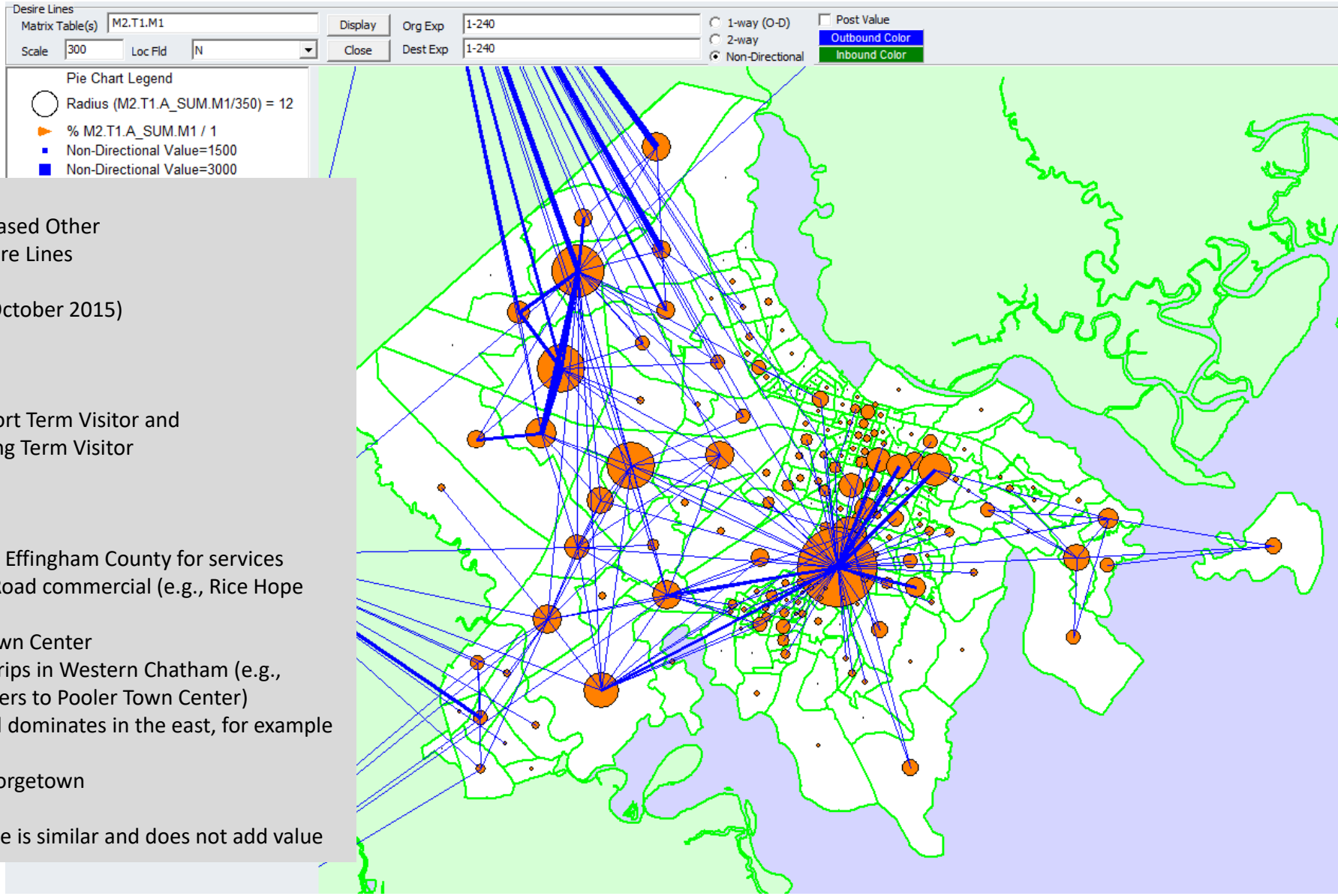
Custom 1:
Morning Home Based Work
Resident Worker

Attractions and Desire Lines

Dataset: Final (October 2015)
Table: DP
Time: AM
Purpose: HBW
Filter: None

Observations

1. **Mall**
2. Downtown
3. Chatham Parkway between I-16 and Ogeechee Road

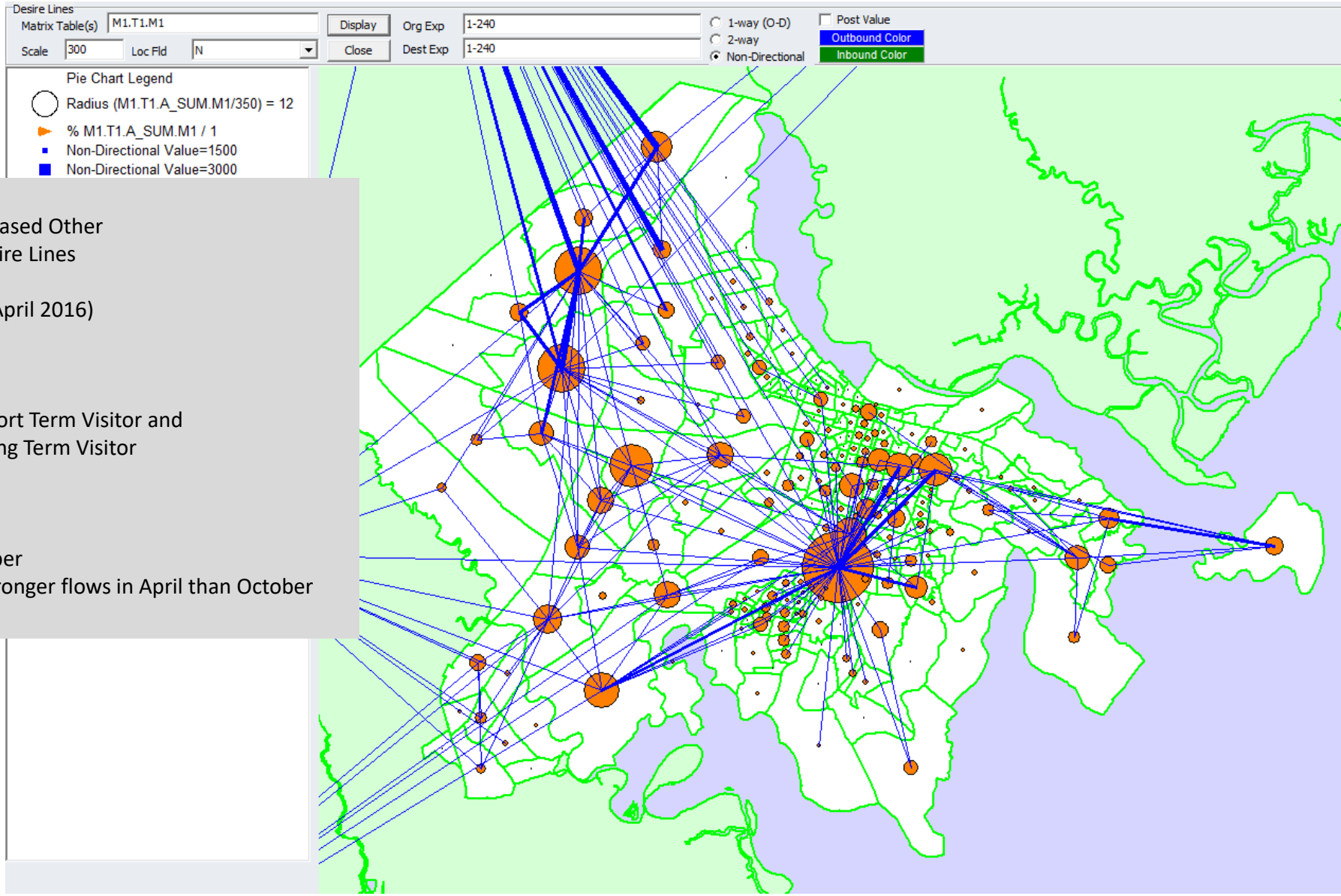


Custom 2:
Non Visitor Home Based Other Attractions and Desire Lines

Dataset: Final (October 2015)
Table: H
Time: All
Purpose: HBO
Subscriber: Not Short Term Visitor and Not Long Term Visitor
Filter: None

<u>Observations</u>

- Many trips from Effingham County for services
  - Augusta Road commercial (e.g., Rice Hope Market)
  - Pooler Town Center
- Self-contained trips in Western Chatham (e.g., Savannah Quarters to Pooler Town Center)
- Oglethorpe Mall dominates in the east, for example to/from:
  - North Georgetown
  - Live Oak
- Production figure is similar and does not add value

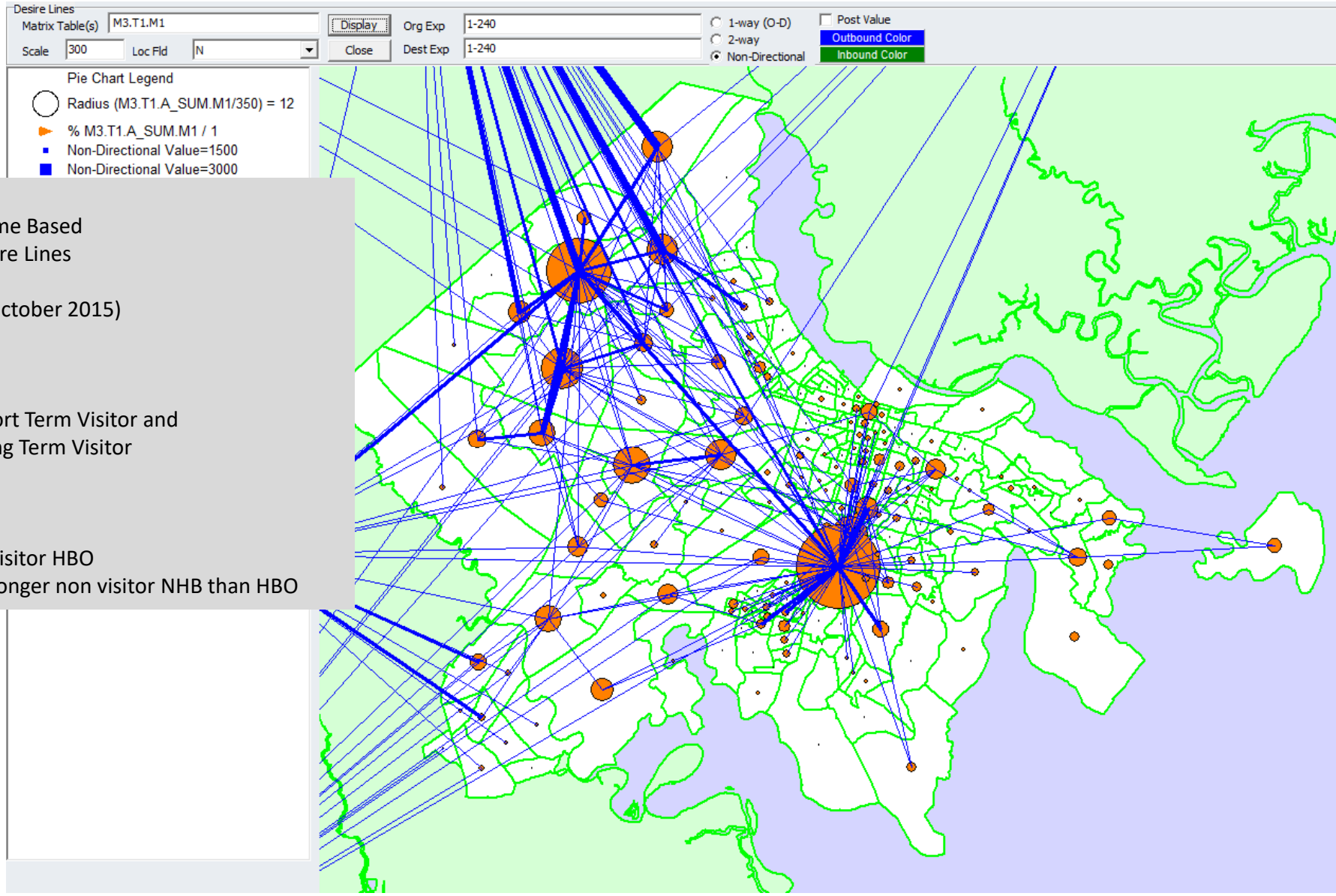


Custom 2:
Non Visitor Home Based Other Attractions and Desire Lines

Dataset: Final (April 2016)
Table: H
Time: All
Purpose: HBO
Subscriber: Not Short Term Visitor and Not Long Term Visitor
Filter: None

<u>Observations</u>

- Similar to October
- Tybee shows stronger flows in April than October

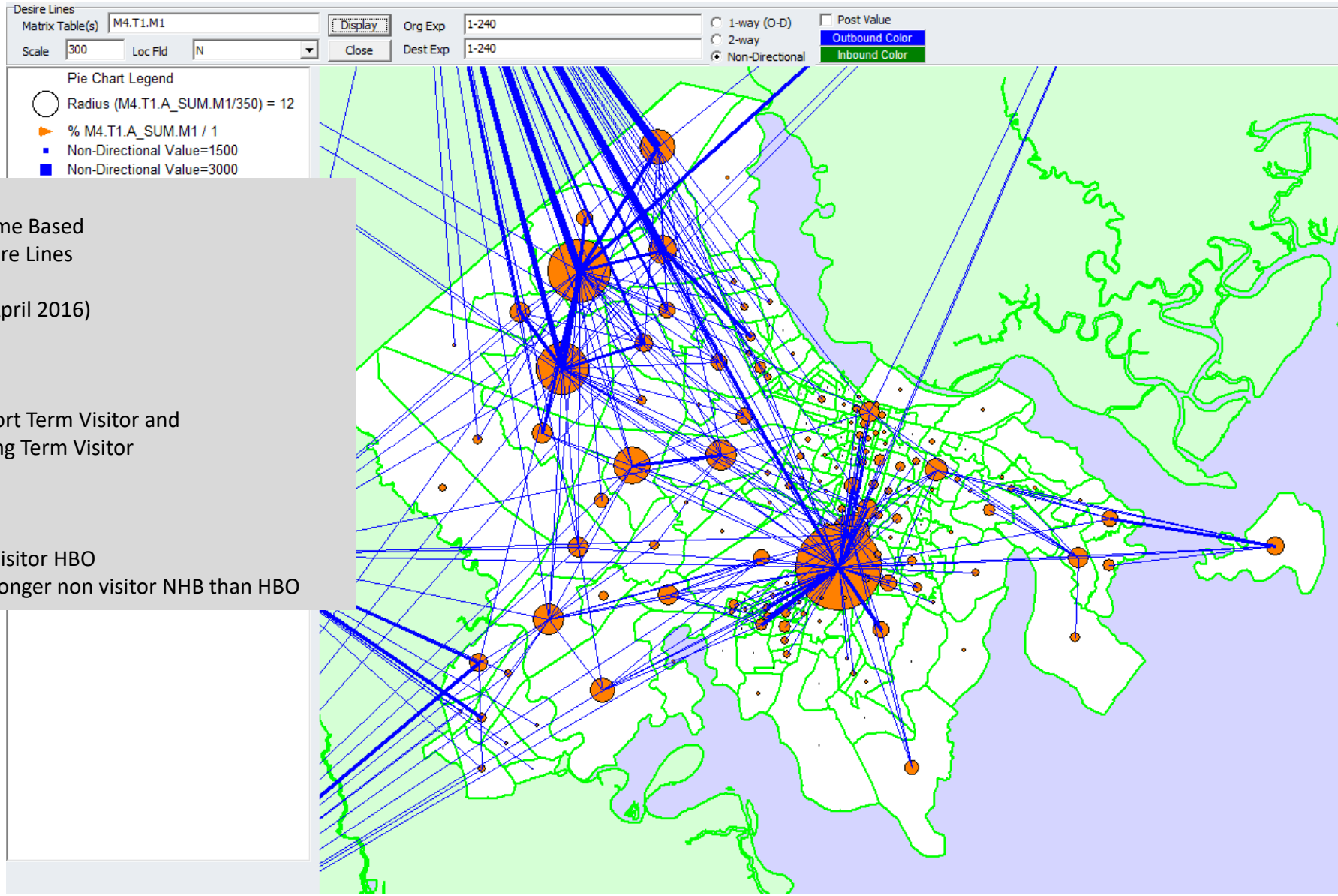


Custom 3:
Non Visitor Non Home Based
Attractions and Desire Lines

Dataset: Final (October 2015)
Table: H
Time: All
Purpose: NHB
Subscriber: Not Short Term Visitor and Not Long Term Visitor
Filter: None

<u>Observations</u>

- Similar to Non Visitor HBO
- Liberty/Long stronger non visitor NHB than HBO

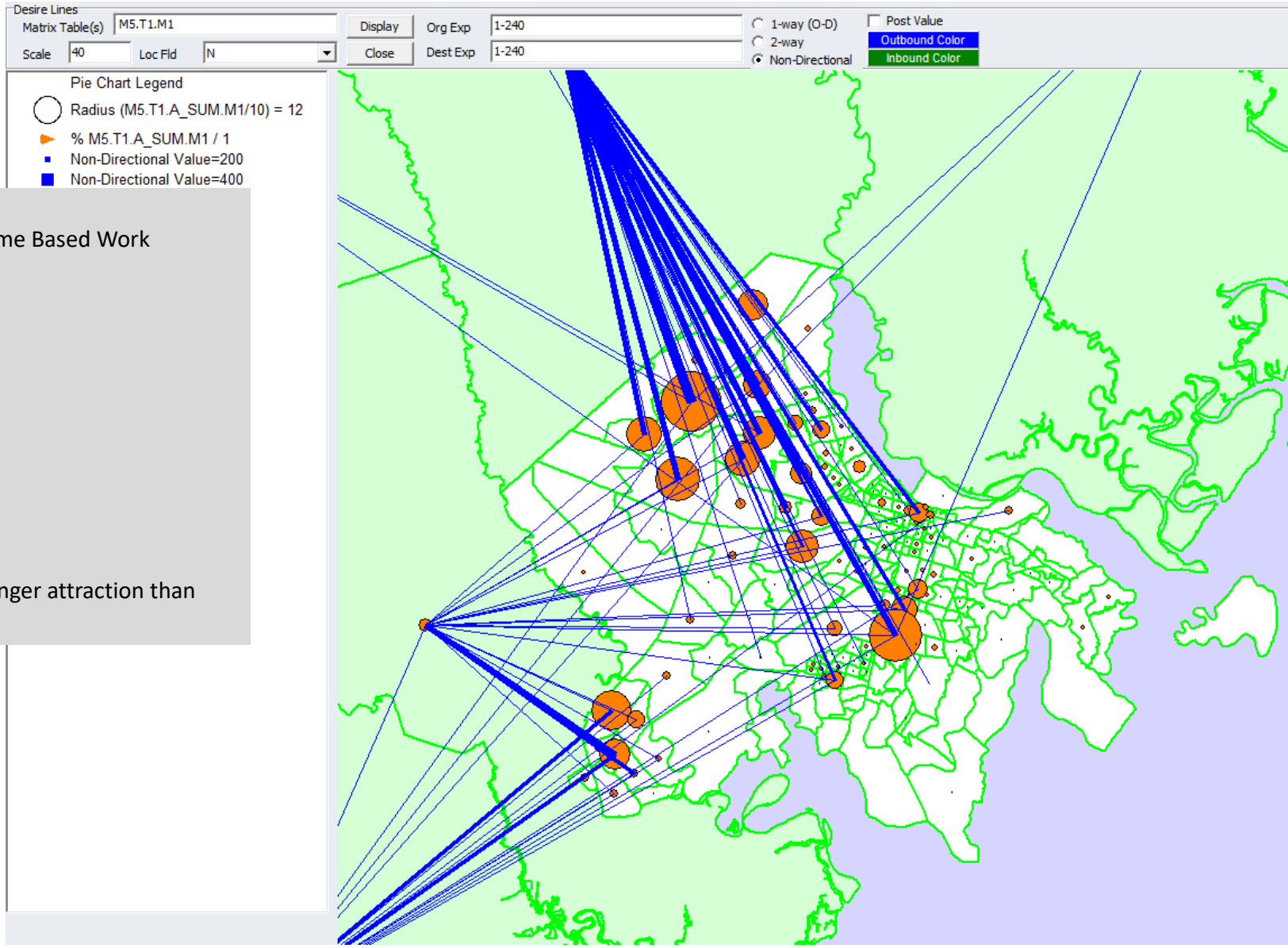


Custom 3:
Non Visitor Non Home Based
Attractions and Desire Lines

Dataset: Final (April 2016)
Table: H
Time: All
Purpose: NHB
Subscriber: Not Short Term Visitor and
Not Long Term Visitor
Filter: None

<u>Observations</u>

- Similar to Non Visitor HBO
- Liberty/Long stronger non visitor NHB than HBO



Custom 4:
Inbound Commuter Morning Home Based Work
With Attractions

Dataset: Final (April 2016)
Table: DP
Time: AM
Purpose: HBW
Subscriber: Inbound Commuter

<u>Observations</u>

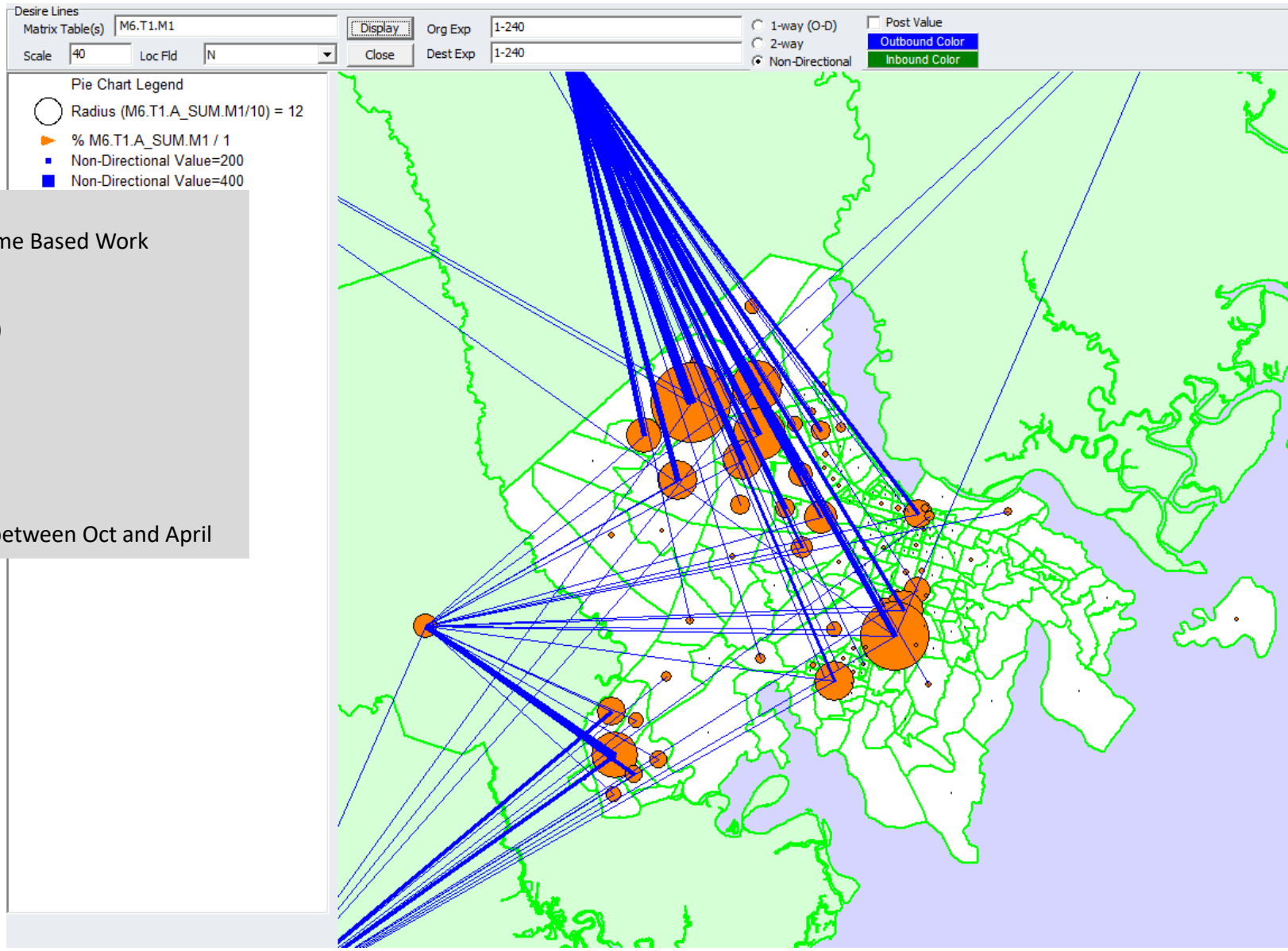
- Effingham-Pooler
- Liberty/Long – Richmond Hill
- South Carolina: Pooler a stronger attraction than others

Custom 4:
Inbound Commuter Morning Home Based Work
With Attractions

Dataset: Final (October 2015)
Table: DP
Time: AM
Purpose: HBW
Subscriber: Inbound Commuter

<u>Observations</u>

- Desire lines are *very* similar between Oct and April



Appendix E: CMP 2016 Report Card

CORE MPO 2016 CMP Report Card 2004 Most Congested Segments

Rank	Road and Direction	Limits	Distance (Feet)	Peak Hour	GPS Data						2004 Observations	2004 Recommendations	Congestion Mitigation Process Actions 2004-2016	Travel Demand Model (TDM) Data			CMP Recommendation Fulfilled?						CMP Recommendation Fulfilled?	TDM DATA		
					Average Segment Speed	Average Weighted Speed Limit	Congestion Index	Average Segment Delay (sec)	Average Stop Delay (sec)	Control	2003 LOS			2010 Volume (One Way) Low	2010 Volume (One Way) High	2010 LOS	CMP Actions		2015	2015 LOS	% Trucks	%APR Change	Major Freight Route?		2040 Volume (One Way) Low	2040 Volume (One Way) High	2040 LOS
1	Waters Avenue - Northbound	Stephenson to DeRenne	5497.7	PM	11.3	35	0.32	251.2	111.7	Signal	F	Canopy -Constrained Corridor; Corridor will improve with extension of Truman	Constrained Corridor -Improvements limited to Optimizing Signal Operations. Study next CMP, review in E-W Study	The opening of Truman Pkwy Phase IV impacts the traffic of this segment. The AADT has decreased from 2005 to 2015.	7600	8800	D-E	Completion of Truman Parkway	Yes	14,500	D	2.18	-8.81		Yes	7000	8900	C-E
			5497.7	MD	16.1	35	0.46	130.3	62.0	Signal	F															
			5497.7	AM	18.7	35	0.53	109.4	49.7	Signal	F															
2	Habersham Street - Southbound	Johnston to Stephenson	3189.1	PM	7.9	35	0.23	241.3	126.0	Cross Street	F	Currently under construction on Stephenson	Stephenson widening will help Habersham	Widening of Stephenson is completed, including additional turn lanes on Habersham. Congestion situation improved.	3500	4300	A-C	Additional Turn Lanes Completed	Yes	8,580	C	2.08	0.59		Yes	4000	5000	A-C
			3189.1	AM	17.5	35	0.50	66.7	44.3	Cross Street	D															
3	White Bluff Road - Southbound	Eisenhower to Abercorn	2720.2	PM	9.2	40	0.23	179.3	129.3	Signal	F	Canopy -Constrained Corridor, Minor Approach	NB/SB left turns very light, consider restricting them, add NB Right turn overlap.	None	12000	12900	A-C	Signal Retiming, model anomalies	Yes	27,300	D	1.92	0		Yes	11800	13000	C-D
			2720.2	AM	26.2	40	0.66	44.8	33.5	Signal	D															
			2720.2	MD	23.5	40	0.59	44.1	29.3	Signal	D															
4	Mall Boulevard - Westbound	Mall Way to Abercorn	889.8	PM	5.0	40	0.12	179.2	138.0	Signal	F	Planned Intersection TIP	Consider change in lane use for shared dual left, study addition of NB right turn.	Intersection improvement project at Abercorn St/Mall Blvd has been completed to relieve some congestion.	7600	7600	A-C	Intersection Improvement Completed	Yes	13,800	C	2.04	0		Yes	7800	7800	A-C
			889.8	AM	9.6	40	0.24	76.1	57.5	Signal	E	Excessive delays back through Mall Way														
5	White Bluff Road - Northbound	Hampstead to DeRenne	1250	PM	4.3	35	0.12	177.4	132.7	Signal	F	Canopy -Constrained Corridor, Minor Approach	Constrained Corridor -Improvements limited to Optimizing Signal Operations, study in E-W study	Signal synchonization project along DeRenne Ave is completed. Proposed Hampstead Connector will alleviate some congestion.	12600	14900	D	Signal Retiming, model anomalies, DeRenne Imps. Underway	Yes/In Progress	27,300	F	1.92	0		Yes/In Progress	9000	9000	A-C
			1250	MD	6.2	35	0.18	111.7	89.0	Signal	F															
			1250	AM	8.2	35	0.23	91.2	69.8	Signal	F															
6	Habersham Street - Northbound	Johnston to DeRenne	2430.1	PM	7.6	35	0.22	176.3	106.7	Cross Street	F	Minor Approach to DeRenne	Cross Street Delay Expected, Study further in E-W study for improving DeRenne	Proposed DeRenne Widening may reduce congestion on Habersham.	3700	4400	D	Signal Retiming, model anomalies	Yes/In progress	8,580	D (F in 2006)	2.08	0.59		Yes/In progress. Need to monitor once Hampstead and DeRenne Improvements Implemented	4300	4900	A-C
			2430.1	AM	13.8	35	0.39	82.6	67.7	Cross Street	E															
7	Waters Avenue - Southbound	DeRenne to Stephenson	5497.8	PM	14.0	35	0.40	159.8	47.3	Signal	F	Corridor will improve with extension of Truman	Study next CMP	The opening of Truman Pkwy Phase IV impacts the traffic of this segment. The AADT has decreased from 2005 to 2015.	7300	8500	D-E	Completion of Truman Parkway	Yes	14,500	F	2.18	-8.81		Yes / Constrained Corridor Local Policy Decision to accept remaining congestion	6600	8600	C-E
8	SR 204 - Southbound	Veterens Pkwy to King George	5532.3	PM	27.0	55	0.49	144.9	64.5	Signal	F	Westbound Delays to King George	Priority IC -Widen 4-6 between King George and Rio, Priority II -Widen 6-8, widen King George approach.	A new interchange at SR 204/King George Blvd is under construction right now. The completion of this project will help relieve congestion in this area.	26900	26900	E	Interchange Under Construction	Yes	54,000	F	2.49	0		Yes	37500	37500	D
			5532.3	MD	36.5	55	0.66	38.2	22.0	Signal	D															
9	DeRenne Avenue - Eastbound	Montgomery to Bull	1374.5	PM	6.0	40	0.15	140.9	103.0	Signal	F	Signal Timing	Once traffic is metered through Montgomery, signals should be coordinated for progression, Consider in E-W Study.	Signal synchonization project along DeRenne Ave is completed. Proposed Hampstead Connector and DeRenne Improvements will reduce congestion.	29600	30600	E-F	Signal Retiming	Yes/In progress	45,400	F	4.19	0	**Yes**	Yes/In progress	29100	30900	E
			1374.5	MD	15.2	40	0.38	69.4	48.7	Signal	E															
			1374.5	AM	21.0	40	0.53	60.1	39.0	Signal	E															
10	US 17 - Westbound	Quacco to SR 204 WB Ramp	6651.9	PM	19.0	40	0.47	138.7	53.0	Signal	F	Currently under construction	Study next CMP	The completion of US 17 Widening relieved some congestion.	12100	14100	A-C & D	Widening Completed	Yes	28,800	B	8.26	0	**Yes**	Yes	14600	17600	D-E
11	SR 21 - Eastbound	Cross Gate to SR 307	7509.7	AM	29.3	55	0.53	138.1	64.0	Signal	F	Currently detour due to construction on SR 25	Study next CMP	The completion of construction on SR 25 relieved some congestion. This corridor will be further studied in the future CMP.	14800	15400	A-C & D	Port Connector Under Construction. Corridor Study	Yes	32,900	C	11.32	0	**Yes**	Yes	14400	14700	D
			7509.7	MD	25.2	55	0.46	137.1	44.0	Signal	F															
			7509.7	PM	33.0	55	0.60	72.3	43.0	Signal	E															
12	SR 21 - Westbound	SR 307 to Cross Gate	7509.7	PM	26.6	55	0.48	135.5	55.8	Signal	F	Currently under construction on SR 25	Study next CMP	The completion of construction on SR 25 relieved some congestion. This corridor will be further studied in the future CMP.	14800	15400	A-C & D	Port Connector Under Construction. Corridor Study	Yes	32,900	C	11.32	0	**Yes**	Yes	13500	13800	C
13	SR 204 - Southbound	Apache to Rio	2685.1	PM	15.8	45	0.35	127.9	70.5	Signal	F	Excessive delays at Rio	Priority IC -Widen 4-6 from Rio to Truman, Optimize from Rio to King George	GDOT has completed a lump sum project to convert the shoulder to a travel lane on each side on the bridge at Rio which relieved some congestion.	24000	24700	D	Corridor Study Completed. Signals Retimed	Yes/Partially. Corridor Study completed. Local support for recommended alternative?	39,600	B (C in 2014)	2.56	-20.96		Yes/Partially. Corridor Study completed. Local support for recommended alternative?	25900	26600	E
14	Skidaway Road - Southbound	La Roche to DeRenne	3331.7	AM	13.3	35	0.38	126.9	85.5	Signal	F	Canopy - Constrained Corridor; Corridor will improve with extension of Truman and Widening of Skidaway	Study next CMP	The opening of Truman Pkwy Phase IV relieved some congestion. Skidaway Road improvement project is ongoing to improve safety and reduce congestion.	5700	7800	A-C & D	Completion of Truman Parkway	Yes	13,600	D	NA	0		Yes	5900	7800	C-D
			3331.7	PM	19.9	35	0.57	50.1	24.3	Signal	D															
15	Bull Street - Southbound	61st St to DeRenne	3527.4	MD	13.6	35	0.39	118.2	92.5	Signal	F	Canopy -Constrained Corridor, Minor Approach	Constrained Corridor -Improvements limited to Optimizing Signal Operations	Signal synchronization project along DeRenne Ave is completed. Proposed West DeRenne improvements and Hampstead Connector may reduce congestion.	1300	1300	A-C	Signals Retimed. DeRenne Imps. In PE. Model Anomalies	Yes	9,530	D	NA	0		Yes	1500	3000	A-C
			3527.4	PM	23.0	35	0.66	35.8	19.0	Signal	D															
			3527.4	AM	23.0	32	0.72	35.5	22.8	Signal	D															
16	Montgomery Cross Road - Eastbound	Tibet Ave to Abercorn	8340.3	PM	20.9	35	0.60	113.1	89.0	Signal	F	Funded Project for construction FY 2004-06 (PRC)	PI #550570 will widen from 2-4 lanes between Abercorn & Abercorn, study approach at Abercorn	The Middleground Road Widening project has completed and relieved congestion along this corridor.	6600	9500	A-C	Widening Completed	Yes	11,700	C	3.95	0		Yes	6000	9400	A-C
			8340.3	AM	23.8	35	0.68	85.8	67.0	Signal	F															
			8340.3	MD	25.8	35	0.74	57.7	69.5	Signal	E															
17	Montgomery Cross Road - Westbound	Sallie Mood to Waters	4851.7	MD	18.1	45	0.40	111.0	94.5	Signal	F	Lack of coordination between Waters and Abercorn	Signal Operations -Coordination between Waters and Abercorn	City of Savannah completed a signal coordination project several years ago.	8500	13000	A-C	Signals Retimed, Truman Completed	Yes	28,100	D	NA	0		Yes	5600	9400	A-C
			4851.7	AM	24.1	45	0.53	73.7	37.6	Signal	E															
			3078.1	PM	19.1	35	0.55	53.5	38.3	Signal	D															
18	Abercorn Street - Northbound	Private Drive to DeRenne	729.3	PM	4.4	40	0.11	107.0	81.6	Signal	F	Excessive Intersection Delays	Priority IB -Operational -Optimize Derenne and Abercorn will improve, NB right turn lane planned	Signal synchonization projects along DeRenne and Abercorn are completed. Intersection improvement at Abercorn /DeRenne has been completed.	21200	21200	D	Model Anomalies, DeRenne Imps. In PE	Yes	31,900	D	2.34	-3.09		Yes	21600	21600	D
			729.3	AM	5.6	40	0.14	83.8	66.2	Signal	F															
			729.3	MD	11.2	40	0.28	42.8	24.7	Signal	D															
19	Bourne Street - Southbound	SR 25 to SR 21	5674.7	AM	22.9	45	0.51	104.9	93.8	Signal	F	Heavy Truck Traffic, construction detour	High Percentage of Trucks and many stopped for queuing at Port -Widen shoulder to provide storage	The SR 307 overpass project has completed and relieved some congestion. This area will be further studied in the future CMP.	5000	5600	A-E	Overpass completed. SR 21 Corridor Studied.	Yes	7,730	C	44.9	0	**Yes**	Yes	13300	13800	A-C
			5674.7	MD	27.7	45	0.62	72.5	56.7	Signal	E															
			5674.7	PM	27.8	45	0.62	66.7	38.8	Signal	E															
20	SR 204 - Northbound	Pine Grove to King George	3413.4	AM	26.2	55	0.48	103.9	59.5	Signal	F	Excessive eastbound delays at King George	Priority II -Widen 4-6 from US 17 to King George, accel lane for EB rights, widen King George approach.	A new interchange at SR 204/King George Blvd is under construction right now. The completion of this project will help relieve congestion in this area.	19600	19600	A-C	Interchange under constuction, Model Anomaly	Yes	54,000	F	2.49	0		Yes	26500	26500	E
			3413.4	MD	19.4	55	0.35	85.3	58.0	Signal	F															
			3413.4	PM	28.2	55	0.51	69.3	40.3	Signal	E															

Data Source: CORE MPO travel Demand Model and TIP, GDOT traffic counts