WILMINGTON URBAN AREA METROPOLITAN PLANNING ORGANIZATION (WMPO)

Congestion Management Process

FY 14 - INITIAL PROCESS

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I - Introduction

The Wilmington Urban Area Metropolitan Planning Organization (WMPO) is the federally-funded and federally-mandated regional transportation planning organization for New Hanover County and adjacent urbanized portions of Brunswick and Pender Counties. On July 18th, 2012 the WMPO was designated a Transportation Management Area (TMA) by the Federal Highways Administration (FHWA). As a newly designated TMA, the WMPO is required to initiate and maintain a Congestion Management Process (CMP).

WILMINGTON URBAN AREA
Metropolitan Planning Organization

What is a CMP?

Congestion Management Processes (CMPs) are processes required by FHWA of TMAs that allow for a regionally agreed-upon definition, evaluation, and strategy for the management of congestion issues.

This CMP - developed by and for the WMPO - is an on-going data collection and evaluation process that identifies congested locations, determines the causes of congestion, ranks the most congested segments and develops transportation strategies to reduce traffic congestion while enhancing safety and multi-modal mobility region-wide. This document represents the WMPO's first CMP and, as such, will be reviewed and updated as necessary.

CMP Steering Committee

This CMP was developed by a group of local subject-matter experts. The Steering Committee was composed of land use, transportation, and traffic operations professionals from local government organizations, the North Carolina Department of Transportation (NCDOT), and Federal Highways Administration (FHWA).

Steering Committee Makeup
Adrienne Harrington – WMPO Transportation Planner
Albert Eby – Cape Fear Public Transportation Authority Executive Director
Amy Beatty – City of Wilmington Superintendent for Recreation and Downtown Services
Anthony Law – NCDOT Division 3 District 3 District Engineer
Benjamin Hughes - NCDOT Division 3 District 3 Senior Assistant District Engineer
Chris O'Keefe – New Hanover County Planning Director
Denys Vielkanowitz – City of Wilmington Signal Systems Management Engineer
Don Bennett – City Traffic Engineer
Jean Smith – Cape Fear Public Transportation Authority Director of Operations
Jessi Booker – NCDOT Division 3 Deputy Division Traffic Engineer
Jill Stark – FHWA Transportation Planner

Steering Committee Makeup (Continued)
Joseph Geigle – FHWA Congestion Management & ITS Engineer
Katie Hite – NCDOT Division 3 Division Traffic Engineer
Kyle Breuer – Pender County Planning Director
Megan Matheny – Cape Fear Public Transportation Authority Planning Director
Mike Kozlosky – WMPO Executive Director
Nora McCann – NCDOT Transportation Planning Branch MPO Coordinator
Robert Waring – Town of Leland Planning Director
Suraiya Rashid – WMPO Transportation Planner
Tara Murphy – WMPO Transportation Planner

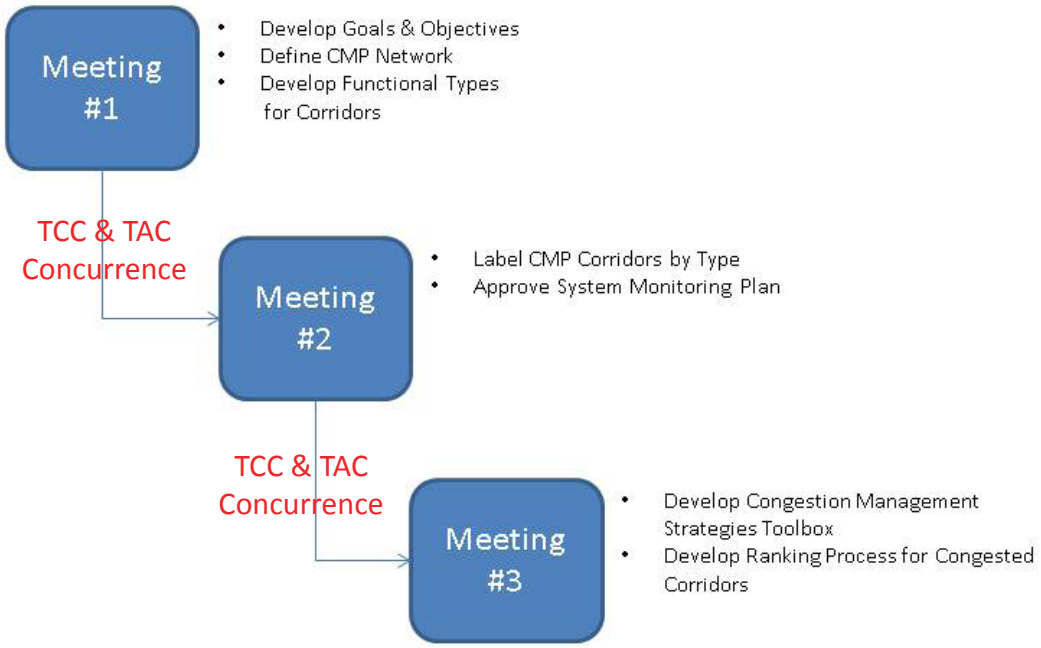
CMP Development Process

FHWA created a guidebook for the development of CMPs, *Congestion Management Process: A Guidebook*, which describes the following steps to create a regionally-defined CMP:

Regional FHWA staff was also extraordinarily helpful in guiding WMPO staff and the WMPO CMP

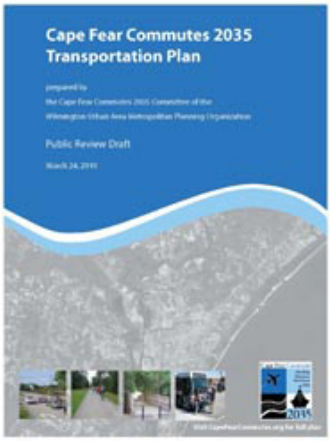
Steering Committee throughout this process through their insight, experience, and examples.

The WMPO CMP Steering Committee had a series of 3 intensive workshop meetings (complete with homework) to derive the bones of this document. The process utilized by the WMPO Steering Committee is described in the diagram below:



After each CMP Steering Committee meeting the results of those meetings were reviewed by the WMPO Technical Coordinating Committee (TCC) and the Transportation Advisory Committee (TAC) in mid-level progress checks and points of concurrence. This allowed the policy-making board of the WMPO to be involved in the development of the CMP in an iterative fashion.

WMPO CMP Goals



The CMP Steering Committee looked to align the goals of the CMP with the WMPO's Cape Fear Transportation 2035 (its adopted long-range transportation plan). The long-range transportation plan (now called the metropolitan transportation plan or MTP) is the guiding document for the actions, processes, and priorities for any federally-mandated metropolitan planning organization (MPO) to include the WMPO. Therefore, the CMP Steering Committee looked at the goals of Cape Fear Commutes 2035 and sought objectives that would complement each of these goals.

These are the goals and objectives of this document, the WMPO's CMP:

Safe

- Reduce bicycle and pedestrian crashes along congested corridors
- Reduce rear-end collision frequency along congested corridors

Efficient

- Prioritize accommodations of all modes over motorized vehicular travel time along corridors that have potential for heavy multimodal usage
- Prioritize accommodations of all modes over reduction in delay at congested intersections where those intersections have potential for heavy multimodal usage
- Maintain or reduce travel times on congested corridors
- Maintain or reduce delay at congested intersections
- Increase transit on-time performance
- Increase vehicle occupancy rates

Appropriate

- Ensure congestion management strategies are compatible with and consider land use along corridors
- Plan for future growth when designing facilities

Responsible

- Identify/prioritize alternate routes prior to widening corridors on CMP network transportation plans

Integrated

- Ensure the CMP is considered in the MTP & other transportation plans
- Ensure the CMP is considered in land use plans

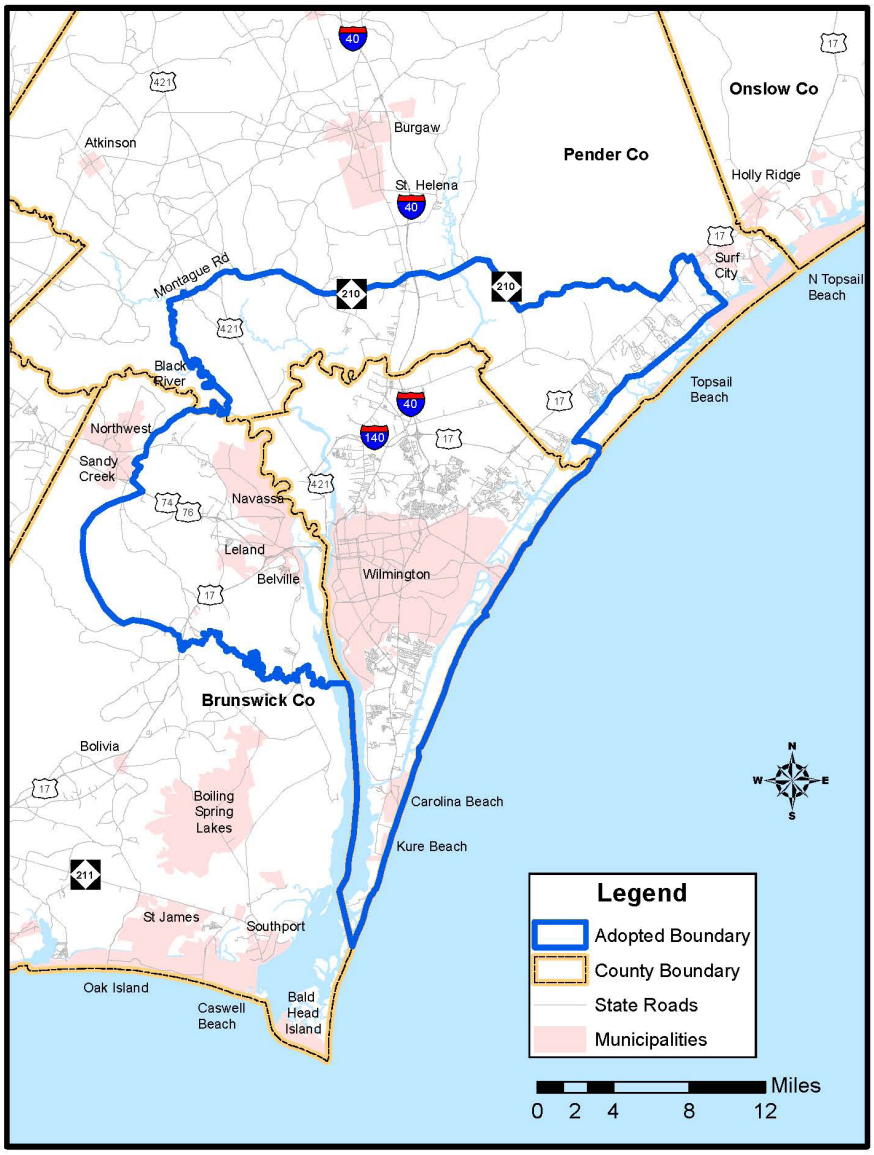
Multi-Modal

- Prioritize multimodal congestion management strategies first

WMPO Planning Area Boundary

The Wilmington Urban Area Metropolitan Planning Organization (WMPO) serves as the intergovernmental transportation planning organization (or Metropolitan Planning Organization –MPO) for New Hanover County and portions of adjacent urbanized/urbanizing portions of Brunswick and Pender Counties.

Wilmington MPO Planning Area Boundary



The WMPO Planning Area geography contains miles of coastal beaches, the Cape Fear River, and several of its tributary creeks and streams. The development of the transportation network has been both driven and constrained by the geography of the region. Whereas the geography of the region – shaped by the location of its ocean, rivers, creeks, and natural ditches – has constrained where and how the transportation network can develop; the history and economic climate in the region is largely driven by its proximity and relationship to these water bodies.

The WMPO planning area contains one of two major North Carolina Ports (the Port of Wilmington) which is supported by a rail network as well as a network of arterials, expressways, and interstates. The geography of the area also drives the economic development of the region as a recreation tourism mecca and as a retirement community. The region's oceanfront beaches and rivers, creeks and streams invite tourism and recreational exploration.

Rapid economic development and population growth largely preceded planning efforts in the WMPO study area. The organic evolution of the transportation network focused on furthering micro-growth and development instead of anticipating macro problems. While meeting the minimal needs of one development at a time, the incremental development pattern of the transportation network served to also constrain growth on the system by creating congestion points.Incremental development of the transportation network utilized existing major roadways to move regional traffic instead of developing a grid network to better distribute traffic across the region. This non-grid development increasingly relies on a few primary routes and precludes the utilization of alternate routes when incidents or other types of congestion occur.

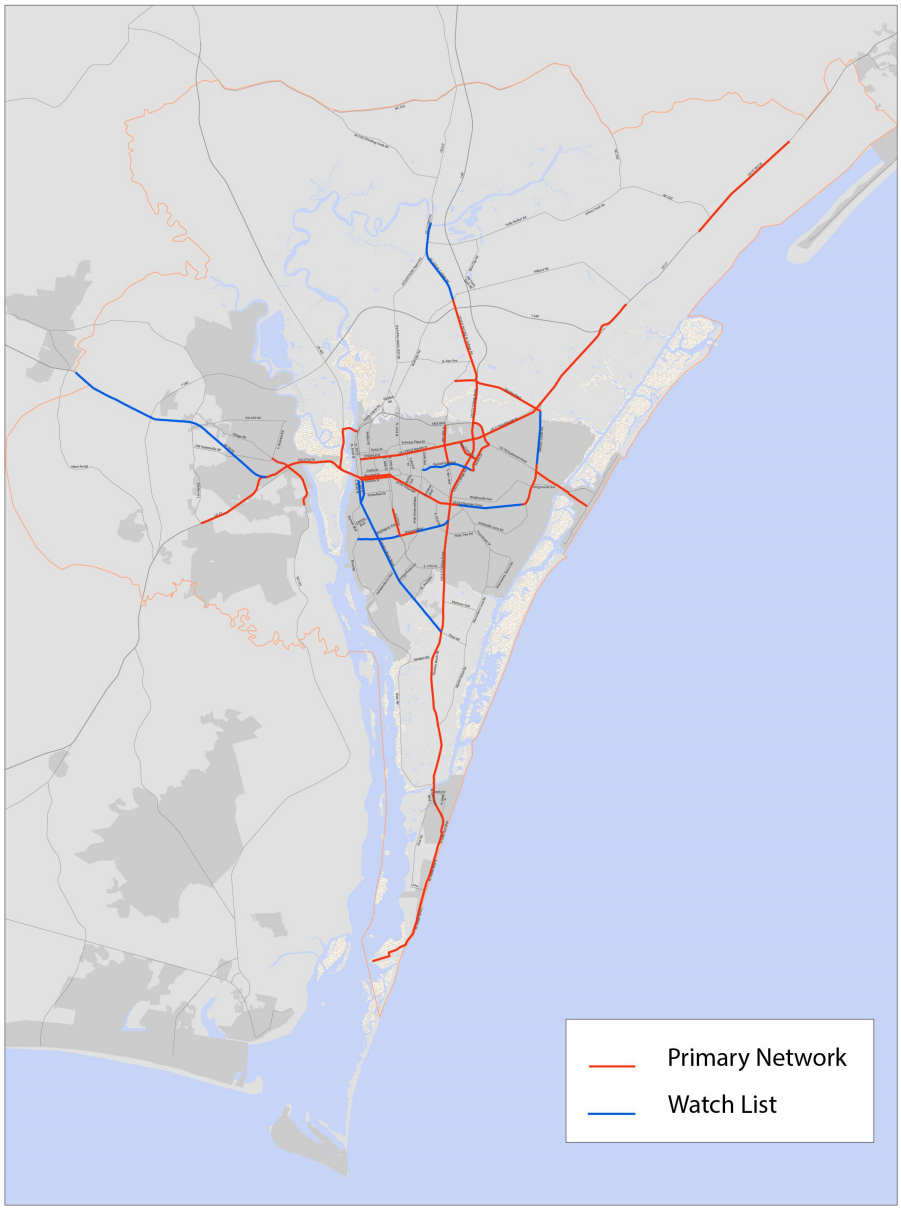
As a result, the major regional travel corridors also serve as major obstacles to travel when they get congested. NC132/US117/US 421 serves as the only major continuous north-south corridor in New Hanover County. US 17, US 421, NC 133/US 117 and I-40 carry the majority of traffic on the vast expanse of unincorporated Pender County within the WMPO's Planning Area. US74/76 and US17 and a few other collectors/arterials serve the Brunswick County portion of the WMPO Study Area – but the greatest challenge for the WMPO's Brunswick County network is the Cape Fear River. The Cape Fear River has two bridges, and a third completing the Dan Cameron bridge crossing at the I-140 is scheduled for completion by 2017, connecting Brunswick County to the rest of the WMPO planning area. A fourth crossing over the Cape Fear River has been identified as a need by the WMPO, but is as of yet unfunded. While having only minimal transportation connectivity; Brunswick and New Hanover counties are tied very closely in terms of economic and community activities.

The fragmented vehicular travel patterns in the region are dominated by "stair-step" (as opposed to direct) movements. Connectivity of travel is further constrained by the limited developments of bicycle, pedestrian and transit facilities which typically rely on the presence of a robust collector street network. Due to the stair-step travel patterns in the region and the limited multimodal options for travel; congestion is a natural function of growth within the WMPO region. Unlike in other regions, corridors prone to congestion are not only those that see a large amount of active adjacent land uses but also those that serve as the sole transportation options for travel routes.

WMPO CMP Study Area

The Federal Highways Administration (FHWA) guidance lists "defining the CMP Network" as an initial step in the creation of a CMP. Defining the CMP network includes defining which elements of a transportation network are a focus of congestion issues in the region.

The WMPO adopted two types of CMP corridors on its CMP Network. The Steering Committee evaluated the network and realized that some corridors required immediate monitoring (through data collection and systems analysis). These corridors are labeled on the WMPO's CMP Network as "Primary Network". Other corridors are important for the WMPO to do cursory examinations of because they either (1) play an important role in relieving congestion on congested corridors; OR (2) it is anticipated that they may see congestion in the near future. These secondary corridors are labeled on the WMPO's CMP Network as "Watch List" corridors.

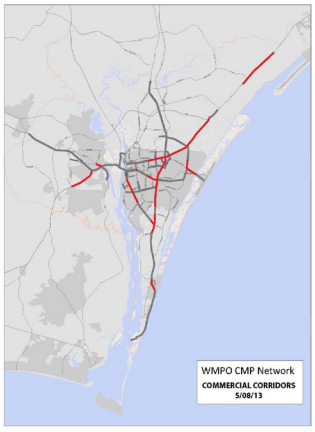


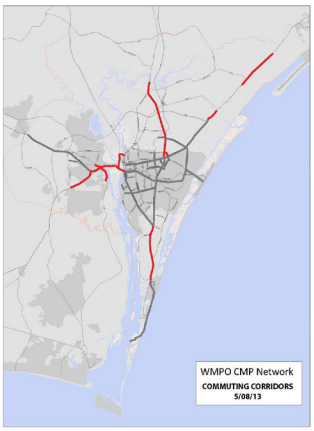
The CMP Network will define what is being evaluated through the CMP. It will define the geographic area upon which data is collected and analyzed for congestion issues.

Corridor Functional Types

In initial evaluations of congestion on the WMPO's CMP network, the Steering Committee noted that different corridors are congested for different reasons, used by different users, and adjacent to different land uses. As such, the CMP Steering Committee further defined and applied five functional types to identify how congested corridors were currently being used, what performance measures should be used to evaluate them, and what solutions are best targeted to which type of corridor. The five functional types of corridors are as is detailed below:

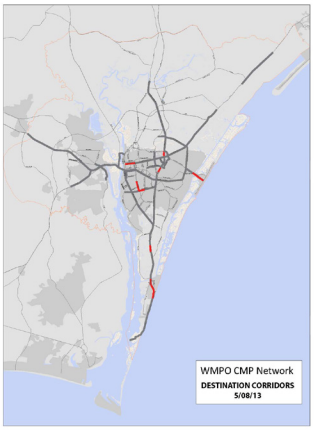
Commercial Corridors
Volume along corridor sees multiple commercial/ errand trips with trips generated by destinations along corridor



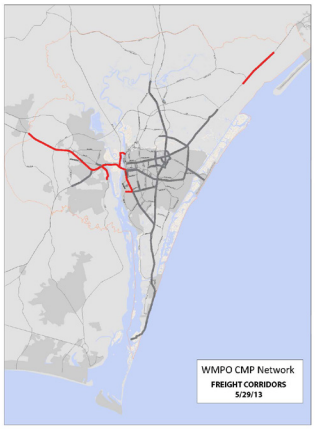


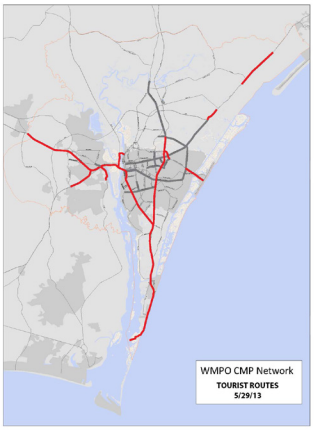
Commuting Corridors
Volume seeking to pass through corridor from an origin outside corridor to a destination outside corridor

Destination Corridors
Volume along corridor consists of trips generated by major destinations along corridor



Freight Corridors
Large volume of truck/freight traffic looking to travel along corridor





Tourist Routes
Volume seeking to pass through corridor from an origin outside corridor to a destination for the purpose of tourism. Volume has a higher percentage of users who are unfamiliar with the transportation network.

CMP Corridor Functional Types are used both for targeting particular corridors for data collection efforts and in targeting particular corridors with proposals for the most apropos congestion mitigation strategies. The use of CMP Corridor Functional Types will be further discussed in Chapter 2 System Monitoring and Chapter 4 Identification of Congestion Management Strategies.

How will the CMP be integrated into WMPO processes?

All metropolitan planning organizations (MPOs) are mandated by the Federal Highways Administration (FHWA) to create and maintain three documents: the Metropolitan Transportation Plan (MTP – this is the guiding document for MPO projects), the Metropolitan Transportation Improvement Program (MTIP this is the 2-year program for surface transportation projects within the MPO's boundary), and the Unified Planning Work Program (UPWP – the annual operating budget for the MPO to include budgets for data collection, studies, plans, and staff).

FHWA further mandates that CMPs be implemented as a continuous part of the metropolitan planning process for all MPOs that are designated as TMAs. The CMP will be used as a first step for addressing regional congestion and thus will define items for inclusion in the MTP, MTIP, and the UPWP. The interaction of the CMP with each of the 3 key documents that the MPO is responsible for is described below:

Metropolitan Transportation Plan (MTP)

The WMPO's CMP interacts with the MTP in two ways. First, the goals for this CMP were taken from the MTP. The MTP is developed through extensive public involvement so as to ensure that it – as the guiding document of the MPO – is driven by community desires and input. The effort of aligning the goals of this CMP with the goals of the MTP is derived from a desire to reflect the community-supported and adopted goals in the MTP.

Secondarily, projects that are suggested as a result of this CMP will be evaluated and ranked within the fiscally constrained MTP. The rankings resulting from this CMP will directly and proportionally impact the ranking of each project when it is inserted into the MTP.

Metropolitan Transportation Improvement Program (MTIP)

The WMPO's CMP interacts with the MTIP only secondarily, through the MTP's interaction with the MTIP. Whereas the CMP project ranking has a direct and proportional impact on the MTP's project list; the MTP feeds projects into the MTIP for programming.

Unified Planning Work Program (UPWP)

The process of developing the WMPO's CMP utilizes items programmed into the UPWP on an annual basis. The funding for the data collection and staffing (and occasionally that that is programmed for special studies and plans) comes from the UPWP.

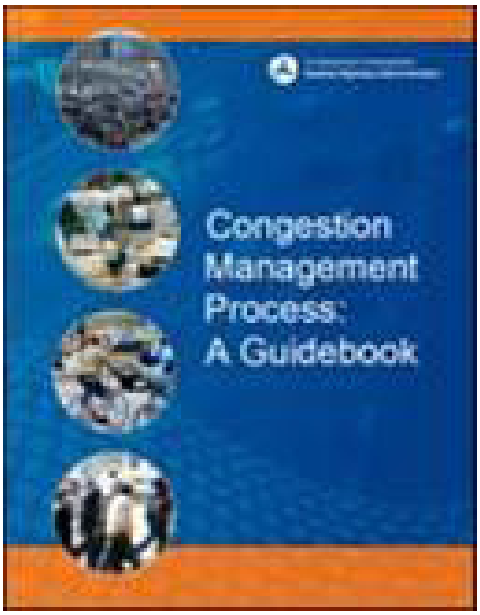
II- System Monitoring

The CMP Network will be monitored in part by multiple partner agencies to include the City of Wilmington Traffic Engineering Division, NCDOT, the Cape Fear Public Transportation Authority, and the WMPO. A report will be created every other year to evaluate the CMP corridors based on this data collected from multiple partner agencies. The biennial report will serve to enable the WMPO, the public, and particularly the Steering Committee to evaluate the effectiveness of the WMPO's CMP strategies. The synthesis of data from these multiple agencies for a biennial CMP report will be the responsibility of the WMPO.

This biennial report will include evaluation of the CMP Network based on performance measures through data collection as is described in the following sections of this chapter.

Performance Measures

Within the context of this CMP, performance measures are used to identify, assess, and quickly communicate information about congestion on the identified CMP corridors and the overall network. They do this through evaluating metrics of current and future multimodal conditions on the regional transportation network. Performance measures are assessed on a continual basis and will be reported in a biennial report.



FHWA Guidance states that "the action of developing performance measures is a highly iterative component of the CMP, and typically consists of three major activities:

- Selecting performance measures
- Developing a data collection plan, and
- Refining objectives and performance measures"

This suggests that for this CMP these performance measures may be seen as preliminary and – without baseline data- will likely need to be adjusted over time.

Performance measures were chosen for this CMP based on the availability to collect data and a desire to assess performance of the CMP on a multimodal basis to reflect the identified goals and objectives.

Preliminary system-wide performance measures are as follows, based on the objectives outlined in Chapter 1:

Safe

Objective:	Reduce bicycle and pedestrian crashes along congested corridors
Performance Measurement:	Number of bicycle and pedestrian crashes in the WMPO area within a 2-year timeframe
Collection Method:	TEAAS Data
Collection Agency:	NCDOT - Transportation Mobility and Safety Unit

Objective:	Reduce rear-end collision frequency along congested corridors
Performance Measurement:	Number of rear-end collisions in the WMPO area within a 2-year timeframe
Collection Method:	TEAAS Data
Collection Agency:	NCDOT - Transportation Mobility and Safety Unit

Efficient

Objective:	Prioritize accommodations of all modes over motorized vehicular travel time along corridors that have potential for heavy multimodal usage
Performance Measurement:	Bicycle and pedestrian CMP corridor counts per capita in the WMPO area within a 2-year timeframe
Collection Method:	DVR Monitoring
Collection Agency:	WMPO

Objective:	Prioritize accommodations of all modes over reduction in delay at congested intersections where those intersections have potential for heavy multimodal usage
Performance Measurement:	Number of CMP corridor intersection legs with pedestrian indications at intersections
Collection Method:	Intersection counts
Collection Agency:	WMPO

Objective:	Maintain or reduce travel times on congested corridors
Performance Measurement:	Average travel time on the WMPO CMP network within a 2-year timeframe
Collection Method:	Floating Car Studies
Collection Agency:	WMPO, City of Wilmington

Objective:	Maintain or reduce delay at congested intersections
Performance Measurement:	Average duration of delay at intersections within the WMPO CMP network within a 2-year timeframe
Collection Method:	Floating Car Studies
Collection Agency:	WMPO, City of Wilmington

Objective:	Increase transit on-time performance
Performance Measurement:	Percentage of fixed-route trips that are on-time in the WMPO area within a 2-year timeframe
Collection Method:	WAVE Transit farebox data
Collection Agency:	WAVE Transit

Objective:	Increase vehicle occupancy rates
Performance Measurement:	Number of participants in the WMPO's TDM program
Collection Method:	TDM program enrollees count
Collection Agency:	WMPO

Appropriate

Objective:	Ensure congestion management strategies are compatible with and consider land use along corridors
Performance Measurement:	Percentage of CMP corridor facility improvements that have low, medium and high difficulty and reflect strategies appropriate for their CMP corridor functional types
Collection Method:	CMP Biennial Report
Collection Agency:	WMPO

Objective:	Plan for future growth when designing facilities
Performance Measurement:	Percentage of CMP facility improvements that incorporated consideration of 2040 projected volumes
Collection Method:	CMP Biennial Report
Collection Agency:	WMPO

Responsible

Objective:	Identify/prioritize alternate routes prior to widening corridors on CMP network transportation plans
Performance Measurement:	Percentage of miles of CMP routes that have parallel facilities that alleviate congestion on CMP routes
Collection Method:	GIS Analysis
Collection Agency:	WMPO

Integrated

Objective:	Ensure the CMP is considered in the MTP & other transportation plans
Performance Measurement:	Percentage of WMPO adopted plans is the CMP referenced in over a two-year period
Collection Method:	WMPO TAC Meeting Minutes
Collection Agency:	WMPO

Objective:	Ensure the CMP is considered in land use plans
Performance Measurement:	Percentage of the WMPO's 13 member jurisdictions land use plans referencing the CMP over a two-year period
Collection Method:	Request for information from the WMPO's 13 member jurisdictions
Collection Agency:	WMPO

Multi-Modal

Objective:	Prioritize multimodal congestion management strategies first
Performance Measurement:	Bicycle and pedestrian CMP corridor counts per capita in the WMPO area within a 2-year timeframe
Collection Method:	DVR Monitoring
Collection Agency:	WMPO

The biennial reports will assess the high-level functioning of the CMP based on these performance measures.

Data Collection Techniques

The biennial CMP report will also look at a localized type of performance measures by collecting the following data for each congested corridor:
Data will be used to evaluate the primary CMP network and to track performance metrics over time.

Traffic Counts

Collection Method:	Tube detectors & vehicle detectors
Collection Agency:	WMPO, NCDOT & City of Wilmington Traffic Engineering
Usage:	This data will tell us how many vehicles use the particular facility. This is a useful not directly as a congestion measurement itself but in normalizing the values of other metrics

Travel Time Data

Collection Method:	Floating Car Studies, INRIX
Collection Agency:	City of Wilmington Traffic Engineering & WMPO
Usage:	This data will tell us how long it takes a vehicle to travel through a corridor. This is a direct metric used to show congestion. Ideally, strategies would try to reduce or maintain travel time in the future. This will be a metric used to track whether our implemented strategies are successful

Hot Spot Identification

Collection Method:	Floating Car Studies, INRIX
Collection Agency:	City of Wilmington Traffic Engineering & WMPO
Usage:	This data will tell us where there are specific points of congestion. Ideally, strategies would try to reduce the intensity or eliminate hot spots in the future

Truck Counts

Collection Method:	High Star Counter & DVR System
Collection Agency:	WMPO
Usage:	This data will allow us to monitor the volume of trucks

Bicycle Counts

Collection Method:	DVR Monitoring
Collection Agency:	WMPO
Usage:	This data will allow us to monitor the volume of bicyclists

Pedestrian Counts

Collection Method:	DVR Monitoring
Collection Agency:	WMPO
Usage:	This data will allow us to monitor the volume of pedestrians

Transit Boarding Data

Collection Method:	WAVE Transit
Collection Agency:	WAVE Transit
Usage:	This data will allow us to monitor the locations where transit ridership is highest for origins & destinations

Data Collection Technique	Commercial Corridors	Commuting Corridors	Destination Corridors	Freight Corridors	Tourist Routes
Traffic Counts	x	x	x	x	x
Travel Time Data	x	x	x	x	x
Hot Spot Identification	x	x	x	x	x
TEAAS Data	x	x	x	x	x
Truck Counts				x	
Bicycle Counts	x		x		
Pedestrian Counts	x		x		
Transit Data	x	x	x		x

III - Evaluation of CMP Corridors

As evidenced by the Primary CMP Network identified by the CMP Steering Committee, congestion is a concern on a large set of roadways in the WMPO Study Area. Limitations on transportation funding require that strategies to improve the network be prioritized in order to focus efforts on those projects that will be most beneficial to the region. The sections below detail the criteria by which CMP corridors will be evaluated and a methodology to rank the corridors in order of priority.

Criteria

The set of criteria used to evaluate CMP corridors is delineated below. These criteria were chosen for the availability of data to evaluate them and their importance in terms of the identified goals and objectives of the CMP.

Criteria

1) Travel Time
2) Safety
3) Volume
4) Transit Performance

Ranking Process

The process for ranking the CMP corridors involves ranking all corridors by the individual criteria listed above, weighting all the evaluation criteria evenly, summing them, and then identifying which corridors have the highest cumulative impact across all criteria. This ranking process is particularly useful because it quantifies a CMP value associated with each CMP corridor. This will allow any project identified in the WMPO's Metropolitan Transportation Plan (MTP) to be evaluated easily by a CMP score in the MTP's prioritization matrix. In other words, the rank of the CMP corridor can be used as criteria for prioritization in the MTP.

Process

1) Rank each corridor by their relative value for each identified criteria. Flip values of each criteria
2) Add all rankings

IV - Identification of Congestion Management Strategies

One of the most critical steps of the Congestion Management Process is the application of strategies that can manage regional congestion to achieve the objectives set by the CMP. For this CMP, four strategies have been identified for this purpose. Specific to each strategy is a set of techniques (defined below). A table (see) further classifies each technique within each strategy by the difficulty of its implementation and the corridor functional type(s) to which each is applicable. Ideally, techniques that are easier to achieve should be prioritized when there is available funding. Techniques should also only be applied when they are seen as assisting in the achievement of mitigating congestion on a roadway classified as a particular corridor functional type.

WMPO Strategies

The following four strategies will be utilized to manage congestion in the WMPO:
1) Reduce Demand – The purpose of this strategy is to reduce congestion through lessening the demand for motorized vehicular capacity on the congested corridors
2) Shift Mode of Trip – The purpose of this strategy is to reduce congestion by shifting usage of the congested corridor from single-occupant vehicles to more capacity-efficient modes
3) Improve Operations – The purpose of this strategy is to reduce congestion by improving the operational aspects of congested corridors
4) Increase Capacity – The purpose of this strategy is to reduce congestion by increasing the capacity to accommodate additional traffic along congested corridors or at congested points along corridors

WMPO Congestion Mitigation Techniques

Specific to each of the four strategies for congestion management are several techniques to achieve those strategies (described below). Chapter 5 will explain how strategies will be applied to manage congestion in the WMPO.

Reduce Demand

HOV Lanes – A high-occupancy vehicle (HOV) lane is a restricted traffic lane reserved at peak travel times or longer for the exclusive use of vehicles with a driver and one or more passengers.
Land Use – Managed Growth – This technique includes encouraging growth in areas where the transportation network is best able to accommodate additional trips and not accommodating additional growth where the transportation network is less able to accommodate additional trips. Utilization of this technique may require code amendments
Alternative Roadways – This technique includes the improved usage of non-CMP roadways in order to remove demand on the CMP Network.

TDM – Alternative Work Schedules – This technique includes any employer-run effort to reduce vehicles on road during peak commuting hours including promotion of telecommuting, teleworking, flexible work week, and compressed work week options
TDM- Carpools & Vanpools – This technique includes commuters sharing a vehicle trip for the purpose of getting to and from their place of employment
Roadway User Fees/HOT Lanes – A high-occupancy/toll lane is a road pricing scheme that gives motorists in single occupant vehicles access to high-occupancy vehicle lanes (or HOV lanes).
Land Use – Accommodate All Modes in New Development – This technique includes requiring new development to consider and appropriately accommodate bicycles, pedestrians, and transit in site design. Utilization of this technique may require code amendments
Land Use – Construct Supportive Collector Street Network with New Development - This technique includes requiring new development to consider and appropriately enhance the higher functional classification network with collector streets. Utilization of this technique may require code amendments

Shift Mode of Trip

Light Rail - Light Rail is a form of public transport using steel-tracked fixed guideways that operate primarily along exclusive rights of way and have vehicles capable of operating as a single train or as multiple units coupled together.
Transit Express Routes – Transit express routes are public transit fixed-routes that serve a large area with a limited number of high-ridership stops.
Transit – Increase Frequency – This technique would increase the frequency of existing public transit fixed routes
Land Use – Transit Oriented Development – This technique utilizes mixed-use residential and commercial areas designed to maximize access to public transit and often incorporates features to encourage transit ridership. Utilization of this technique may require code amendments
Land Use – Mixed-Use – This technique blends land uses (commercial, residential, cultural, institutional, industrial, etc.) where those functions are physically and functionally integrated. Utilization of this technique may require code amendments
Expand Pedestrian Network – This technique includes expanding the pedestrian network to include installation of sidewalks, crosswalks and multi-use paths to complement the transportation network
Expand Bicycle Network – This technique includes expanding the bicycle network to include installation of bicycle lanes, multi-use paths, sharrows, and crosswalks to complement the transportation network
Improve Multimodal Access at Intersections – This technique includes the installation of crosswalks and pedestrian indications at existing roadway intersections
Improve Bicycle Storage – This technique includes provision of storage for bicycles to encourage increased bicycle ridership

Establish Park & Ride lots – This technique utilizes car parks with connections to fixed-route public transit to allow commuters and other people to leave their vehicles and transfer to the fixed-route system
Car Sharing – This technique allows for car rentals for short periods of time for occasional use, often by the hour
Bicycle Sharing Program – This technique allows for bicycles to be made available for shared use by individuals on a very short-term basis

Improve Operations

Access Management – This technique manages access to land uses by limiting turning movements and conflict points typically through the provision of a median
Geometric Intersection Improvements – This technique changes the use of the intersection by changing the physical layout of the intersection through changes to the location/size of curbs, travel lanes, medians, and other geometric aspects of the intersection
Signal Retiming – This technique optimizes the operations of signalized intersections to enable them to better respond to traffic patterns and the demands of all modes of transportation
Signal Event/Holiday Timing Plans – This technique optimizes the operations of signalized intersections to enable them to better respond to traffic patterns specific to a particular holiday or event
Reversible Lanes – This technique designates particular lanes to allow them to be used for traffic to flow in the other direction at certain points in time, typically to account for higher flows of traffic in a particular direction during rush hour
Improve Signage – This technique can be used to better inform traffic of route options and can better distribute or channelize traffic to improve patterns
Dynamic Messaging – This technique can be used to better inform traffic of current conditions to more dynamically shift traffic patterns as needed

Increase Capacity

Bus Rapid Transit Lanes –This technique designates particular lanes for the restricted use of public transportation to allow for more rapid fixed-route usage along a particular corridor. This technique generally involves dedication of additional right-of-way to provide bus stop facilities such as shelters, benches, platforms, and to provide pedestrian infrastructure to and from bus stops
Add General Purpose Lanes – This techniques adds capacity through the provision of additional travel lanes
Add Turning Lanes –– This technique adds turning lanes in order to decrease delay and separate vehicular movement types at intersections
Convert Intersection to Interchange – This technique reduces delay at roadway junctions through utilizing a grade separation and one or more ramps to permit traffic on at least one highway to pass through the junction without directly crossing any other traffic stream

Strategy	Technique	Difficulty	Commercial Corridors	Commuting Corridors	Destination Corridors	Freight Corridors	Tourist Routes
Reduce Demand							
	HOV lanes	High		X			X
	Land Use - managed growth	Medium	×	×	×		
	Alternative Roadways	High (urban)/ Medium (suburban/rural)	×	×	×	×	×
	TDM- Alternative work schedules	Low		×			
	TDM- Carpools & Vanpools	Low		×			
	TDM- Employer shuttles	Medium		×			
	Roadway User Fees/HOT lanes	High		×	×		
	Land Use - Accomodate all modes in new development	Medium	×	×	×		×
	Land Use - Construct supportive collector street network with new development	Medium	×	×	×		×
Shift Mode of Trip							
	Light Rail	High	×	×	×		×
	Transit Express Routes	High	×	×	×		×
	Transit - increase frequency	High	×	×	×		
	Land Use - TOD	High	×	×	×		
	Land Use - mixed use	Medium	×	×	×		
	Expand pedestrian network	Low urban, Medium Suburban/rual	×	×	×		
	Expand bicycle network	Low urban, Medium Suburban/rual	×	×	×		×
	Improve multimodal access at intersections	Low urban, Medium Suburban/rual	×	×	×		×
	Improve bicycle storage	Low	×	×	×		×
	Establish Park & Ride lots	Low		×			
	Car Sharing	Medium	×		×		×
	Bicycle Sharing Program	Low	×	×	×		×
Improve Operations							
	Access Management	Medium suburban High urban	×		×	×	×
	Geometric intersection improvements	Medium suburban High urban	×	×	×	×	×
	Signal retiming	Low	×	×	×	×	×
	Signal event/holiday timing plans	Low	×		×		×
	Reversible lanes	High		×	×		
	Improve signage	Low	×		×	×	×
	Dynamic messaging	Low	×	×	×	×	×
Increase Capacity							
	Bus Rapid Transit Lanes	High	×	×	×		×
	Add general purpose lanes	High	×	×	×	×	×
	Add turning lanes	Medium	×	×	×	×	×
	Convert intersection to interchange	High	×	×	×	×	×

V - Application of Congestion Management Strategies

This chapter shows how congestion management strategies will be applied to particular corridors to achieve the goals and objectives laid out in Chapter 1. A biennial data report will be produced to evaluate how congested corridors are functioning and to gauge how the CMP objectives are being met. Each corridor will be evaluated and – based on the identified needs and applicable corridor functional types – strategies will be suggested to manage congestion. The application of these strategies will be prioritized based on the criteria and ranking process described in Chapter 3.

Biennial Data Report

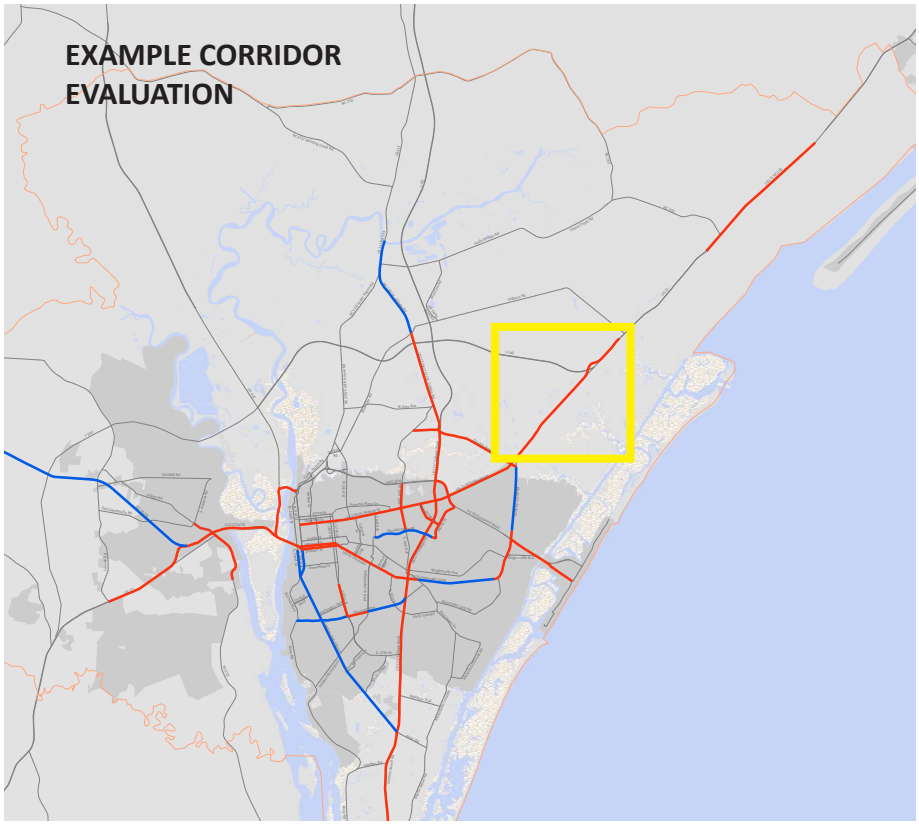
As part of the WMPO's Congestion Management Process, the WMPO will collect data on an ongoing basis as is outlined in Chapter 2. This data will be synthesized in the form of a report every two years. The report will outline how the CMP network has performed according to the performance measures outlined in Chapter 2 and also will detail how each problem corridor is functioning based on its associated corridor functional types. The biennial data report will highlight where congestion management strategies are most needed and whether applied strategies have effectively managed congestion. While the CMP will require the WMPO to constantly monitor data, the biennial report will be a quick snapshot comparing datasets to quickly assess where strategies are working and where there are opportunities for improvement.

Example Corridor Evaluation

The biennial data report will be composed of two primary sections. The first section will outline how the CMP network is performing according to the adopted goals & objectives of this document. The second section will utilize snapshots of the performance of corridors to show what CMP data has been collected on the corridor within the 2-year period and what strategies are suggested to improve congestion on that section. Look to the next page for a preliminary example of what these corridor evaluation sheets will look like. The corridor evaluation sheets can be thought of as snapshots and scorecards to illuminate how corridors are functioning and how they can improve.

Project Ranking & Programming Process

Data reported in the biennial data report will be used to score and rank congested corridors according to the process outlined in Chapter 3. These scores will be used as inputs in the WMPO's Metropolitan Transportation Plan (MTP). CMP projects will be ranked against other projects in the WMPO's MTP. The project ranking in the MTP will impact the horizon year and the likelihood of programming the project in the State Transportation Improvement Program (STIP) and potentially through alternate funding sources.



CORRIDOR CHARACTERISTICS
Volume:
Travel Time:
Peak Hours:
Truck Counts:
Bicycle Counts:
Pedestrian Counts:
Transit Routes:
Transit Boarding Data:
Transit On-Time Performance:

CORRIDOR FUNCTIONAL TYPES
Commercial Corridor
Commuting Corridor
Destination Corridor
Freight Corridor
Tourist Route

HOT SPOTS:
- *Porter's Neck Rd*
- **Marsh Oaks Rd**

	Congestion Mitigation Strategies	Applicable Strategy?
Reduce Demand	• *TDM* • *Land Use - Contain growth* • *Construct Alternative Roadways*	• *IN USE* • *Yes* • *No*
Shift Mode of Trip	• *Transit Express Routes* • *Improve multimodal access at intersections* • *Expand bicycle network* • *Expand pedestrian network*	• *No* • *Yes* • *No* • *Yes*
Improve Operations	• *Land Use - Driveway eliminations* • *Access management* • *Signal retiming*	• *IN USE* • *Yes* • *No*
Increase Capacity	• *Bus Rapid Transit Lanes* • *Add general purpose lanes* • *Add turning lanes* • *Convert intersection to interchange*	• *Yes* • *No* • *No* • *No*

PROBABLE CONGESTION CAUSES
- *Heavy PM peak volume*
- *Access Management Issues*
- *No Alternate Route*

FUTURE PROJECTS
- *None*

RECOMMENDATIONS
- *None*

VI - Evaluate Strategy Effectiveness

As the CMP is an ongoing data collection and analysis process, adjustments to the CMP can be made on a regular basis. With every biennial data report the CMP should be reviewed for effectiveness. This should occur first of all on a holistic basis. Changes in the WMPO's performance based on its goals and objectives can highlight what is and isn't working with the adopted process. WMPO staff should assess whether the CMP Steering Committee needs to reconvene to evaluate the CMP as described in this document; and how comprehensive an adjustment needs to be made.

The CMP will also be analyzed with every biennial report based on the performance of the congested corridors in their snapshot evaluations (see previous page). Areas where CMP strategies have been applied will be analyzed for changes and correlated to the effectiveness of the applied strategies. Where strategies are not working or are not proving to have a great enough effect, other strategies may be sought and prioritized according to the process described in Chapter 3.