CONGESTION MANAGEMENT PROCESS

FINAL REPORT

COMPILED BY:

ACOG

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INTRODUCTION

1.1 WHAT IS A CONGESTION MANAGEMENT PROCESS?

A Congestion Management Process (CMP) is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. This CMP identifies strategies in the Association of Central Oklahoma Governments Metropolitan Planning Organization Transportation Management Area (ACOG MPO TMA) to minimize traffic congestion and increase efficient movement of people and goods for specific locations. The CMP was prepared for the ACOG by Olsson and Streetlight Inc. A CMP steering committee, comprised of transportation and planning professionals from local governments, the Oklahoma Department of Transportation (ODOT), and the Federal Highway Administration (FHWA) participated in and provided guidance throughout the update process.

The congestion management process is mandated by the Federal Government for metropolitan areas with a population exceeding 200,000, known as Transportation Management Areas (TMAs). The federal requirements state that in all TMAs, the Congestion Management Process shall be developed and implemented as an integrated part of the metropolitan transportation planning process.

ACOG previously completed their Congestion Management Process in 2016. This area is reviewed every 10 years to ensure that urban and urbanizing sections of the region that are connected by a common economy and transportation system are included in the MPO's transportation planning efforts. This congestion management process update is part of the routine TMA review and is intended to align with updates to Encompass 2045, the Metropolitan Transportation Plan (MTP), which is also the functioning Regional Transportation Plan (RTP). This process is also anticipating a newly updated RTP, which is known as Encompass 2050.

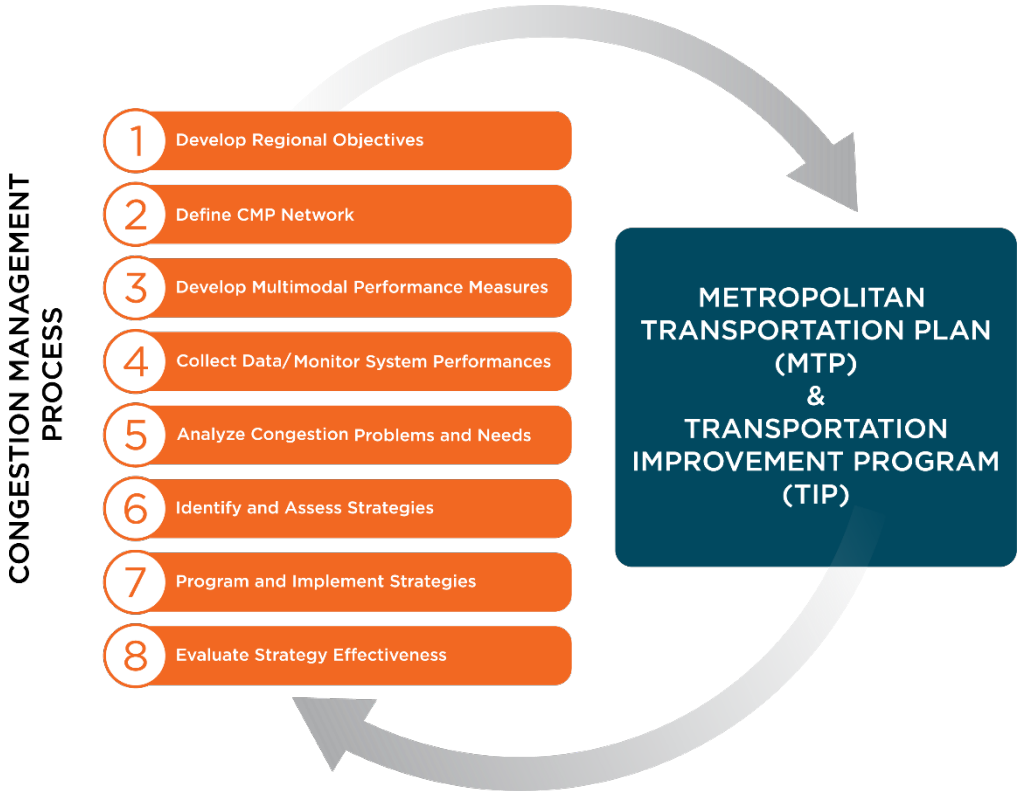
1.2 OVERVIEW AND HISTORY OF THE CONGESTION MANAGEMENT PROCESS

The Congestion Management System (CMS), originated in 1991 when it was introduced by the *Intermodal Surface Transportation Efficiency Act* (ISTEA). This legislation required metropolitan planning organizations (MPOs) and state departments of transportation (DOTs) to provide information on transportation system performance and strategies to improve mobility of goods and people and ease overall congestion. The *Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005* (SAFETEA-LU) changed the name of the CMS to the Congestion Management Process (CMP). The CMP exemplified a shift towards a "living and breathing" process that is fully integrated into the overall state and regional transportation planning process.

The *Moving Ahead for Progress in the 21st Century* (MAP-21) *Act of 2012* also upheld laws related to CMPs, however; it advocated a performance measure-based approach for transportation planning and decision-making. This legislation improved monitoring and reporting of performance measures in reliability and congestion. Additionally, MAP-21 is the legislation that initiated the requirement of TMAs with a population of 200,000 or more to develop a CMP.

The current Congestion Management Process is systematic and identifies congestion and its key causes. The process uses congestion mitigation strategies that aim to improve transportation system reliability and performance. Additionally, the CMP evaluates the outcomes of implemented strategies and their effectiveness. The FHWA and the Federal Transit Administration (FTA) recommend the following actions or elements listed in **Figure 1** that are common among successful CMPs and must be implemented to comply with federal regulations.

Figure 1: **Congestion Management Process**



The eight actions that will be implemented as a part of this process are:

1. **Develop Regional Objectives for Congestion Management:** Congestion management objectives should be developed with meaningful stakeholder participation and an understanding of the needs and desires of the public related to congestion. Ideal objectives should focus on outcomes and follow the SMART principles: Specific, Measurable, Agreed, Realistic, and Time-bound.
2. **Define CMP Network:** Define the geographic boundaries and the system components/network of facilities. Although the CMP has traditionally focused primarily on the road network, the network should consider the transit, bicycle, and pedestrian networks, as well as their interface with the highway network.
3. **Develop Multimodal Performance Measures:** Performance measures should be developed and used at the regional level to measure the performance of the system and at the local level (corridor, segment, intersection) to identify specific location with congestion problems and measure the performance of individual segments and system elements. Performance measures should be adapted and adjusted over time.
4. **Collect Data/Monitor System Performance:** Numerous agencies across the study region must collaborate to collect data and monitor system performance.

5. **Analyze Congestion Problems and Needs:** Raw data are translated into meaningful measures of performance to analyze congestion problems and needs. The analysis should include locations of major trip generators, seasonal traffic variations, time-of-day traffic variations, and separation of trip purpose.
6. **Identify and Assess Strategies:** The data and analysis can be used to identify and assess CMP strategies to effectively manage congestion and achieve congestion management objectives. Important considerations include contribution to meeting regional congestion management objectives, local context, contribution to other goals and objectives, and jurisdiction over CMP strategies.
7. **Program and Implement Strategies:** Strategies should be programmed and implemented through inclusion of congestion management strategies in the various components of the metropolitan transportation planning process, including the Metropolitan Transportation Plan (MTP), TIP corridor plans, and the Regional Intelligent Transportation Systems (ITS) Architecture.
8. **Evaluate Strategy Effectiveness:** After implementation, the MPO should evaluate strategy effectiveness through system-level performance evaluation and strategy-effectiveness evaluation. Ongoing monitoring of transportation system performance provides a feedback loop designed to inform future decision making about the effectiveness of transportation strategies.

Figure 1, shown previously, illustrates these actions and portrays the cyclical nature of the congestion management process. Although these actions are listed in a linear fashion, it is important to note that within the cycles of ACOG transportation planning, some of these actions may be revisited, or take place on an on-going basis, while others may not. The Process Model for this CMP is not intended to be a step-by-step approach, but is intended to show the general flow, building on regional objectives to implementation of strategies, and lastly the evaluation of their effectiveness in mitigating congestion in the ACOG region.

Federal requirements have explicitly outlined the process for implementation and development of a CMP and its integration with the overall metropolitan transportation planning process. This involves coordination with transportation system management and operations activities. The CMP does not have an update cycle established by Federal requirements, although the four-year certification review cycle and the four or five-year Metropolitan Transportation Plan (MTP) or RTP update cycle for each TMA provide a baseline for an update cycle in the absence of a specific requirement.

Federal emphasis on performance measures is tied to a set of seven national goals. The following are national goals outlined in the MAP-21 Act:

1. **Safety-** To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
2. **Infrastructure Condition-** To maintain the highway infrastructure asset system in a state of good repair.
3. **Congestion Reduction-** To achieve a significant reduction in congestion on the National Highway System.
4. **System Reliability-** To improve the efficiency of the surface transportation system.
5. **Freight Movement and Economic Vitality-** To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
6. **Environmental Sustainability-** To enhance the performance of the transportation system while protecting and enhancing the natural environment.
7. **Reduced Project Delivery Delays-** To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion

through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The USDOT established performance measures in connection with the National transportation goals set by MAP-21. These performance requirements are a result of a series of rulemakings. One of the rulemaking processes focuses on specifically congestion and system performance. It involves the following:

- Defining performance of the interstate system, non-interstate National Highway System and freight movement on the interstate system.
- Finalizing interpretation of scope of Congestion Mitigation and Air Quality Improvement (CMAQ) performance requirements, including congestion and on-road mobile source emissions.
- Summarizing highway performance measure rules from the FAST act.

In 2015, the *Fixing America's Surface Transportation* (FAST) act continued what MAP-21 established and carried on the National Highway Performance Program (NHPP). The NHPP requires MPOs to coordinate with states in selecting performance targets. Additionally, MPOs are required to report on metropolitan system performance as a part of the transportation plan every 4 or 5 years. In 2021, the *Infrastructure Investment and Jobs Act* (IIJA) carried on the requirements for a performance measure-based approach.

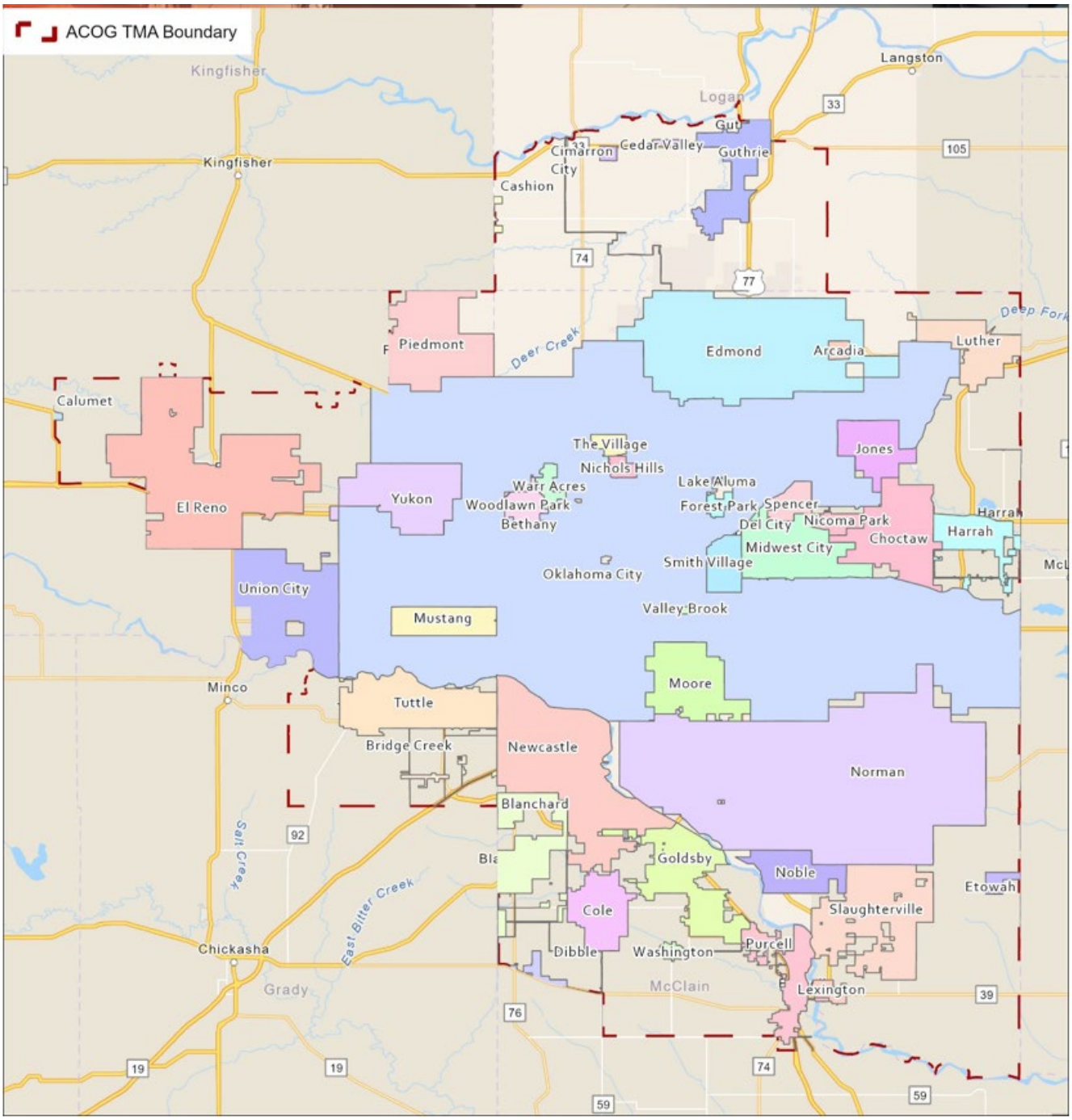
1.3 REGIONAL NETWORK

The CMP is developed through a collaborative and data-driven approach which contributes to a larger strategy for the ACOG region. This report identifies the regional goals and objectives, the regional network, and the methodology for updating the regional network for the future. ACOG is responsible for transportation planning throughout the Transportation Management Area (TMA) in Central Oklahoma. The TMA is also often referred to as the ACOG MPO TMA. This planning boundary updated in 2023, shown in **Figure 2**, includes 2,305 square miles and 47 cities and towns.

The CMP is intended to be an on-going activity, fully integrated into the metropolitan transportation planning process, currently underway for ACOG. The CMP is a living document, continuously adjusting and improving over time as goals and objectives change, new congestion issues arise, new information sources become available, and new strategies are identified and evaluated. Ultimately, the purpose of the CMP is not to identify specific projects, but rather to supply actions and strategies that advance ACOG's overall goals for system performance and reliability. The actions identified in this CMP ultimately influence near-term planning efforts such as the MPO's Transportation Improvement Program (TIP).

ACOG recognizes the importance of linking goals, objectives, and investment priorities to established performance objectives, and that connection is critical to the achievement of national, statewide and regional transportation goals and performance targets. As such, the CMP reflects the goals, objectives, performance measures, and targets as they are available and described in other state and public transportation plans and processes. Federal regulations do not specify a prescribed update cycle for the CMP. ACOG is updating the CMP concurrently with the long-range transportation plan, which allows the goals and objectives to inform the CMP and for the CMP findings to inform the programs and projects.

Figure 2: **ACOG TMA & City Boundaries**



PEER REVIEW & BEST PRACTICES

2.1 PEER COMMUNITIES

A review of CMPs from similar communities nationwide was conducted to understand the state of the practice, identify opportunities for local improvements, and leverage successful approaches from peer MPO's. Screening criteria were developed to identify candidate peer communities and potential best practices relevant to ACOG MPO TMA region challenges. The criteria are listed below.

Regional Population: Peer agencies were identified as having a regional population similar to the ACOG MPO TMA region (1.4 million residents); the exception being Dallas - Ft. Worth and Houston. These two communities were selected due to their proximity to Oklahoma City and to provide examples of high-quality CMPs for larger regions. Population in the urbanized areas for peer agencies range from 1,006,000 (El Paso) to 2,525,000 (San Antonio). The populations of the larger communities are 7,699,873 (Houston) and 7,874,950 (Dallas – Ft. Worth.)

Travel Time Index (TTI): Travel reliability is an important factor in congestion management. The data shown is from the most recent year available (2022). TTI is the ratio of average travel time in peak hours to free flow travel time. The travel-time index across the peer communities is similar to Oklahoma City (1.19), ranging from 1.13 (El Paso and Memphis) to 1.27 (Houston).

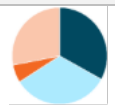
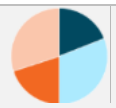
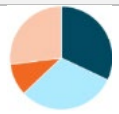
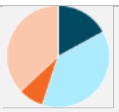
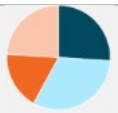
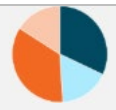
Annual Delay Per Commuter: This metric measures the annual split of excess delay hours experienced by each commuter. This data display is from the most recent year available (2022). Figures range from 38 (El Paso) to 69 (Houston), with Oklahoma City commuters experiencing an average of 52 excess hours of delay per year. This is an increase from the previous CMP showing, 49 hours of delay.

Annual Delay Split: This metric measures the annual split of excess delay across peak and off-peak periods of streets and freeways. The pie charts (found in Table 1) provide a visual representation of the delay split for each community. The delay split for Oklahoma City in 2022 as shown are (Peak, Freeways: 30%), (Peak Streets: 15%), (Off Peak, Freeways: 38%), and (Off Peak, Streets: 14%). According to these results, one can assume residents of the OKC metro are traveling by highway more often in both peak and off-peak periods. A key for the delay split is provided on the following page.

Nine peer communities were reviewed and compared using the above metrics. The results of the peer community screening are shown in **Table 1.**

A key takeaway from the peer comparison is the Oklahoma City region is most similar in congestion to Kansas City, St. Louis, and Jacksonville when comparing Travel Time Index (TTI), Delay Per Commuter, and Delay Split. It is important to compare similarities and differences across peer communities and to understand the best practices of how each community addresses and monitors congestion over time.

Table 1: Peer Community Comparisons

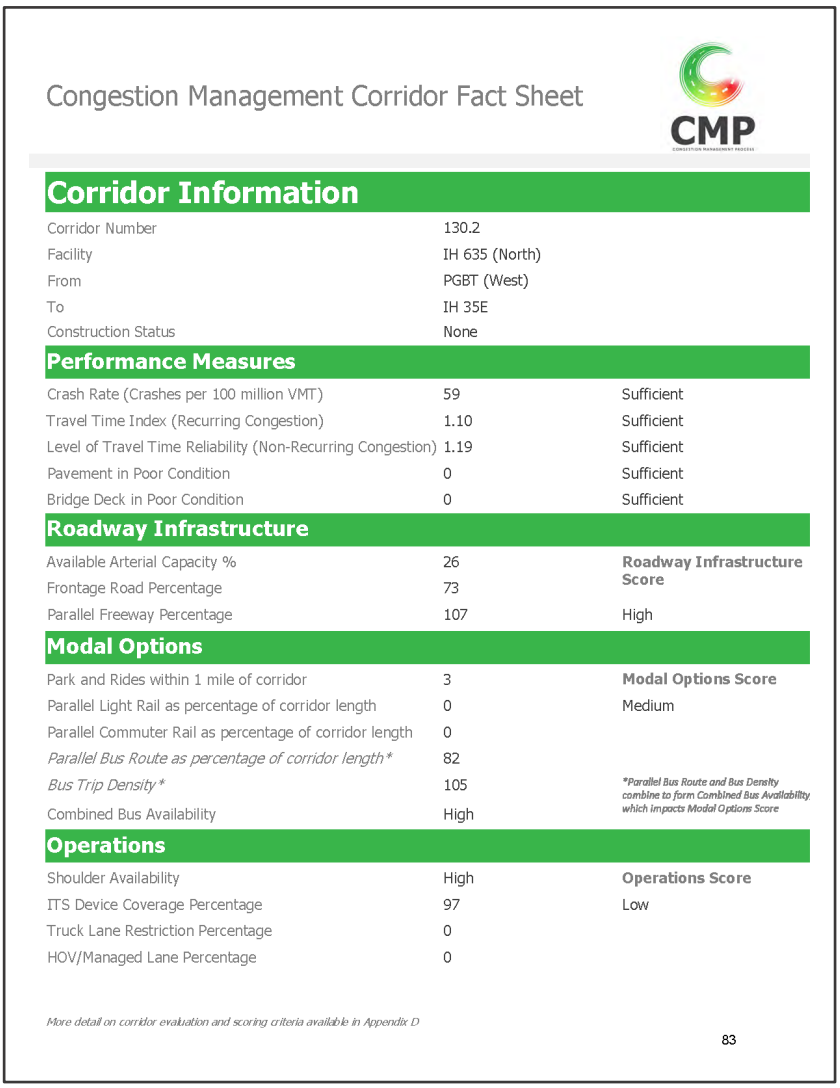
City	Agency	Last CMP Update	Population (Current)	Travel Time Index (TTI)	Delay Per Commuter	Delay Split	Non-Attainment Area
Dallas/Ft. Worth	North Central Texas Council of Governments (NCTCOG)	2021	7,874,950	1.23	68		*
San Antonio	Alamo Area Metropolitan Planning Organization (AAMPO)	2018	2,525,000	1.21	48		*
Memphis	Memphis Metropolitan Planning Organization (MMPO)	2015	1,188,000	1.13	58		–
Houston	Houston -Galveston Area Council (HGAC)	2021	7,699,873	1.27	69		*
El Paso	El Paso Metropolitan Planning Organization	2019	1,006,000	1.13	38		–
Kansas City	Mid-America Regional Council (MARC)	2023	1,754,000	1.15	54		*
Charlotte	Charlotte Regional Transportation Planning Organization (CRTPO)	2012	2,321,000	1.17	48		*
St. Louis	East – West Gateway Council of Governments (EWCOG)	2013	2,795,504	1.14	49		–
Jacksonville	North Florida Transportation Planning Organization (TPO)	2015	1,713,240	1.19	54		–
Oklahoma City	Association of Central Oklahoma Governments (ACOG)	2016	1,477,926	1.19	52		–

*Annual Hours of Delay During Peak Periods

2.2 BEST PRACTICES

In the best practices review, peer communities generally followed the recommended actions from the FWHA and FTA; however, each CMP varied in their methodology, strategies, and evaluation tactics to assess strategy effectiveness. Peer CMPs integrated with their individual regional/metropolitan transportation plans and aligned their strategies based upon what their stakeholders and residents desired and the outcomes their data produced. Extra attention to sizable and realistic best practices is key to ensuring a cohesive, efficient, and effective CMP for the ACOG MPO TMA region. Best practices that stood out in the review are listed below:

- **Data-Driven Corridor Identification and Analysis:** This practice uses real-time traffic data, GIS analysis, and modeling and narrows the focus on specific roadway corridors that complete the CMP network. The practice also prioritizes specific areas/corridors based on both recurring and non-recurring congestion factors, such as traffic incidents and weather conditions. Below is a clip from the NCTCOG CMP, displaying a possible outcome of data-driven corridor identification[1].



Congestion Management Corridor Fact Sheet

CMP

Corridor Information

Corridor Number	130.2
Facility	IH 635 (North)
From	PGBT (West)
To	IH 35E
Construction Status	None

Performance Measures

Crash Rate (Crashes per 100 million VMT)	59	Sufficient
Travel Time Index (Recurring Congestion)	1.10	Sufficient
Level of Travel Time Reliability (Non-Recurring Congestion)	1.19	Sufficient
Pavement in Poor Condition	0	Sufficient
Bridge Deck in Poor Condition	0	Sufficient

Roadway Infrastructure

Available Arterial Capacity %	26	**Roadway Infrastructure Score**
Frontage Road Percentage	73	
Parallel Freeway Percentage	107	High

Modal Options

Park and Rides within 1 mile of corridor	3	**Modal Options Score**
Parallel Light Rail as percentage of corridor length	0	Medium
Parallel Commuter Rail as percentage of corridor length	0	
*Parallel Bus Route as percentage of corridor length**	82	
*Bus Trip Density**	105	**Parallel Bus Route and Bus Density combine to form Combined Bus Availability which impacts Modal Options Score*
Combined Bus Availability	High	

Operations

Shoulder Availability	High	**Operations Score**
ITS Device Coverage Percentage	97	Low
Truck Lane Restriction Percentage	0	
HOV/Managed Lane Percentage	0	

More detail on corridor evaluation and scoring criteria available in Appendix D

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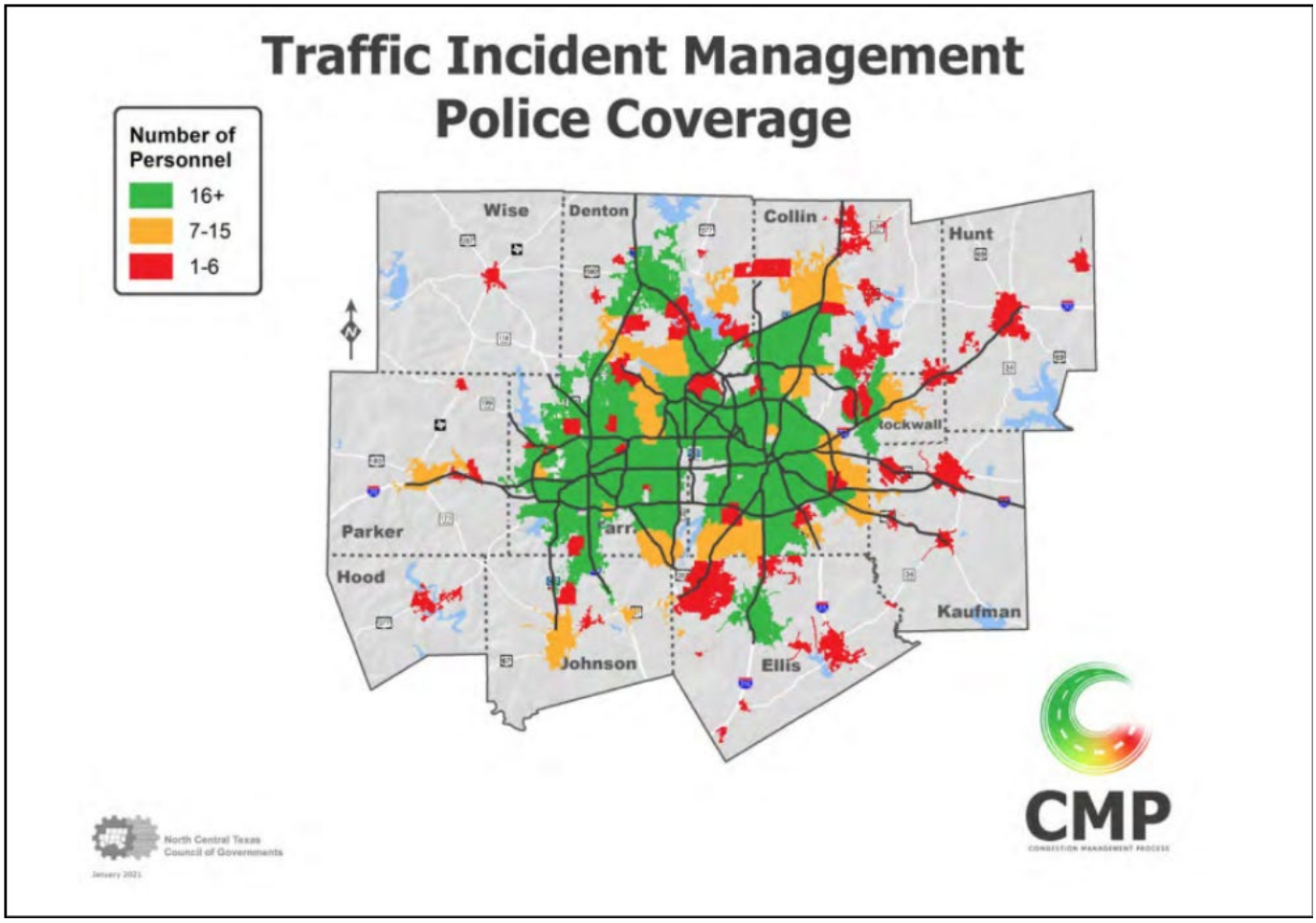
[1] NCTCOG CMP 2021

- **Congestion Definition Beyond Volume and Capacity:** This best practice attempts to take on congestion mitigation more holistically, using both quantitative and qualitative metrics such as delay, travel time reliability, non-recurring events, and user experience. As an example, Dallas/Ft. Worth (NCTCOG) utilizes Traffic Incident Management Police Coverage and Fire Coverage as performance measures in their CMP. This helps an agency understand the potential for congestion as non-recurring traffic incidents take place. Below is a clip from the NCTCOG CMP displaying police coverage across the region for traffic incident coverage.



- **Tiered Strategy Toolboxes:** This practice involves grouping strategies by intensity or impact. Many of the peer communities provided layered strategy toolkits that focus on corridor types or congestion severity. Some examples also include cost and benefit notes to help communities prioritize and plan for potential implementation projects. This CMP includes a toolbox, informed by stakeholders and assessment of the current toolbox and its use. The MARC CMP for the Kansas City region provides a good example of a tiered approach to different strategies in their toolbox[2].

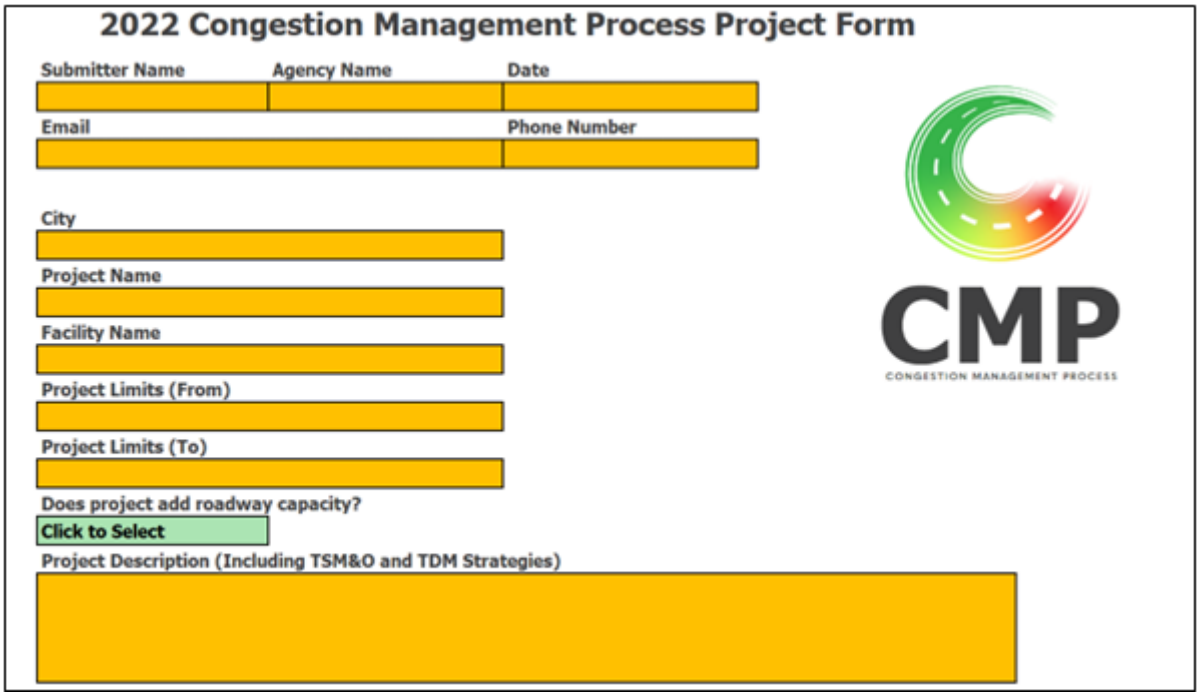
Table 2.1 Summary of Congestion Management Strategies

Major Categories	Number of Strategies	Benefits	Costs	Examples
Access Management	11 strategies identified	Increase capacity, efficiency, and mobility, reduce travel time	Vary from low to high and include, design, implementation, and maintenance costs	Turn restrictions, turn lanes, frontage roads, roundabout intersections
Active Transportation	8 strategies outlines	Decrease auto mode share, reduce VMT, provide air quality benefits	Low to moderate	New sidewalks and bike lanes, improved facilities near transit stations, bike sharing, and exclusive rights of way
Highway	11 strategies identified	Increase capacity, mobility, and traffic flow	Vary from low to high depending on strategy. Constructing new ROW results in higher cost than design improvements.	HOV lanes, super street arterials, highway widening, acceleration and deceleration lanes, design improvements
Land Use	6 strategies identified	Decrease SOV trips, increase walk trips, increase transit mode share, air quality benefits	Low to moderate and involve establishing ordinances and may require economic incentives to encourage developer buy-in	Infill, TOD development, densification
Parking	7 strategies identified	Increase transit use, reduce VMT, generate revenue	Low to moderate but require economic incentives to encourage developer buy-in	Preferential parking for HOVs, park and ride lots, advanced parking systems
Regulatory	10 strategies identified	Decrease VMT, air quality benefits, increase safety, generate revenue	Vary	Carbon pricing, VMT fee, pay as you drive insurance, auto restriction zones, truck restrictions
TDM	11 strategies identified	Reduce peak period travel, reduce SOV VMT	Low to moderate	Alternative work hours, telecommuting, road pricing, toll roads
Transit	19 strategies identified	Shifting mode share, increasing transit ridership, reduce VMT, provide air quality benefits	Vary from low to high depending on strategy. Constructing new transit travelways is higher cost than improving service frequencies.	Increasing coverages and frequencies, new fixed guideway travelways, employer incentive programs, signal priority, intelligent transit stops (tech improvements)
Transportation Operations and Management	20 strategies identified	Reduce travel time, reduce stops, reduce delays, increase safety	Vary but tend to be low to moderate. Large scale projects involving new infrastructure and devices higher cost.	Signal coordination, ramp metering, highway information systems, service patrols

- **Multimodal and ITS-Focused Performance Measures:** Many CMPs across the peer communities have shown a widespread shift towards time-based and reliability measures over previous reliance on volume and capacity measures. Metrics like speed index, travel time index, incident duration, and on-time transit performance may be used to shape the CMP network for the ACOG MPO TMA depending upon data availability and local adoption. Some notable exceptions to this are Charlotte and Memphis that still focuses on traditional volume and capacity ratios and LOS measures.

[2] MARC CMP Update

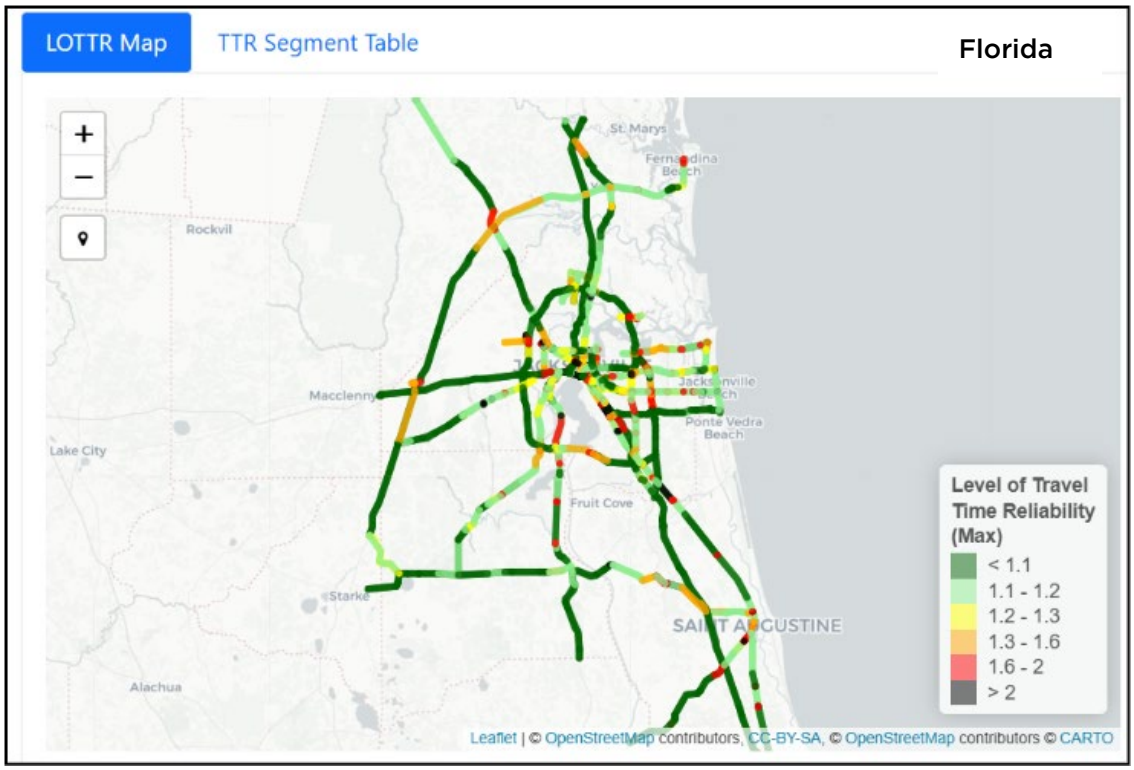
- **Project-Level CMP Screening or Evaluation Tools:** Many of the peer communities such as Dallas/Ft, Worth, Kansas City, Houston[3], and Jacksonville[4] use project analysis forms or checklists to screen TIP or RTP projects for CMP relevance. This ensures a level of accountability between the MPO and the member agencies it serves. Through evaluation of proposed TIP and RTP projects, agencies can understand how projects influence delay, reliability and multimodal access. Additionally, agencies can screen their projects for their contribution to CMP corridors and the effectiveness of implemented strategies. The following clip is from NCTCOG CMP Project Form.



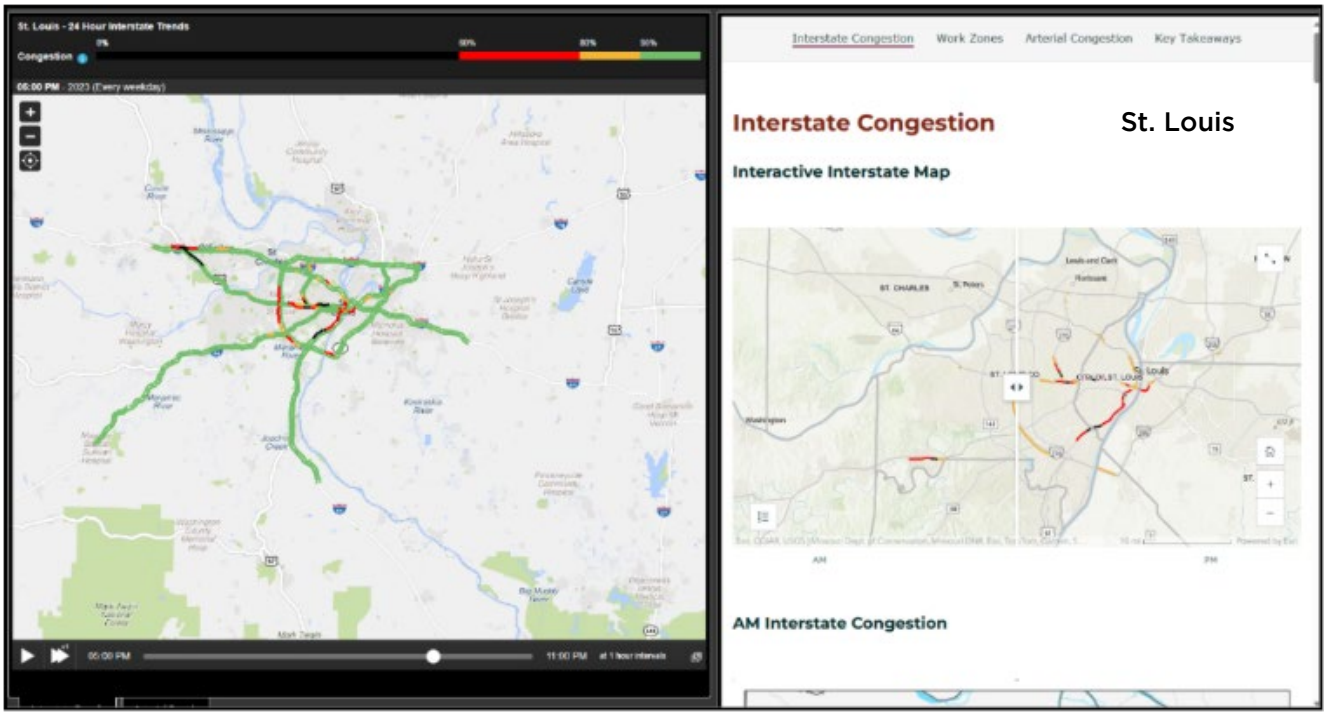
- **Monitoring and Reporting Dashboards:** This practice is a great way to track system performance over the lifetime of the congestion management process. Evaluating strategy effectiveness is a key element to a CMP and providing a dashboard with real time data is just one way of accomplishing this. As a part of this CMP update, a dashboard was created to monitor the ACOG CMP system performance.

On the following page, a snippet from the North Florida TPO[5] CMP dashboard report is shown.

[3] HGAC CMP
[4] 2019 NFTP CMP
[5] North Florida TPO - Annual Mobility Report 2024



The snippet below is from the EWCOG in St. Louis[6] dashboard which provides a strong example of reporting that highlights congestion according to time-of-day or time travel reliability.



[6] 2023 Congestion Dashboard

- **Strategy Effectiveness Evaluation Frameworks:** Evaluation of strategies is still emerging as a practice across CMPs; however, several MPOs use tactics such as: before and after studies, strategy-specific performance indicators, annual reports and ongoing feedback loops via mobility reports or stakeholder input. The previous ACOG CMP highlighted the use of the Regional Travel Demand Model, Tool for Operations Benefit Cost Analysis (TOPS-BC), Transportation Demand Management Evaluation Models, etc. This CMP update includes many similar frameworks and tools to ensure ongoing evaluation of the CMP's progress.

Peer review and identification of best practices emphasize the need for a locally tailored yet federally aligned approach. A key trend among peer regions is the shift toward data-driven corridor analysis, using real-time traffic data, GIS tools, and modeling to prioritize problem areas. These efforts are often supported by broader definitions of congestion that go beyond volume and capacity, incorporating metrics like travel time reliability, delay, and non-recurring factors such as weather and incidents. Many regions also use tiered strategy toolboxes, which group congestion mitigation strategies by severity or corridor type and often include cost-benefit information to support decision-making.

Additionally, best practices include the use of multimodal and Intelligent Transportation System (ITS)-focused performance measures, such as travel time index and on-time transit performance, which better capture system reliability. Several MPOs implement project-level CMP screening tools to ensure consistency between CMP goals and project selection in Transportation Improvement Programs (TIPs) and long-range plans. Real-time monitoring dashboards have also gained popularity, offering accessible ways to track system performance and strategy effectiveness. Finally, emerging evaluation frameworks—such as before-and-after studies and ongoing stakeholder input—highlight a growing emphasis on adaptive, performance-based planning. These practices serve as a strong foundation for ACOG's CMP update, helping ensure strategies are relevant, measurable, and impactful.

2.3 PEER COMMUNITIES - CMP PERFORMANCE MEASURES AND IMPLEMENTATION

Performance measures across the selected group of peer communities varied in the details; however, the following themes remained consistent. **Table 2** provides a comprehensive list of performance measures and the number of peer agencies across the selected peers that include specific measures in their CMPs.

Table 2: Performance Measure Utilization

Performance Measure	# of CMPs Used In
Travel Time Index (TTI)	6
Level of Travel Time Reliability (LOTTR or PTI)	6
Crash Rate / Safety Measures	6
Vehicle Miles Traveled (VMT)	5
Volume-to-Capacity Ratio (V/C)	5
Transit Ridership	5
On-Time Transit Performance	5
Bicycle Facility Mileage	5
Pedestrian Facility Mileage	5
Daily/Annual Delay per Commuter	5
Park-and-Ride Lot Capacity or Coverage	4
Percent of Population with Transit Access	4
Pavement Condition	4
Average Travel Speed	4
Incident Duration/Clearance Time	4
Average Commute Time	4
Bridge Condition	3
Percent Miles Severely Congested	3
Truck Travel Time Reliability (TTTR)	3
Emissions/Air Quality Indicators	3
Project Screening Tools or Checklists	3
Passenger per Revenue Mile/Hour	3
System Reliability Index/Congestion Cost per Capita	2
Freight Movement/Goods Moved	2
Enplanements (Airport Access)	2
Vehicle Occupancy	2
Total Number of System Users	1
Air Cargo Volume	1
Tons of Freight Moved	1
Person Miles Traveled	1
Truck Miles Traveled	1
Percent Miles Meeting LOS Criteria	1
System-wide Travel Time Reliability	1
Delay by Corridor or Mode	1
Number of Vanpool Users	1
Mode Share (Bike/Ped/Transit/Auto)	1
Park-and-Ride Lot Utilization	1
Average Vehicle Age	1
Average Load on Transit Vehicles	1
Cost of Congestion Per Capita	1
Jobs Near State Highways	1
Percent of BRT Stops Near Bike Facilities	1
Number of Transit Marketing Programs	1
GDP Near State Highways	1

The performance measures compiled from peer CMPs offer valuable insights for ACOG as it updates its Congestion Management Process. Widely adopted metrics like Travel Time Index (TTI), Level of Travel Time Reliability (LOTTR or PTI), and crash rate/safety measures each used in six CMPs highlight the importance of focusing on travel time reliability and safety, which ACOG can incorporate as foundational elements. Additionally, common measures such as vehicle miles traveled (VMT), volume-to-capacity ratios, transit ridership, and multimodal infrastructure (bike and pedestrian facilities) suggest strong peer emphasis on system efficiency and multimodal connectivity, aligning well with ACOG's goals to promote sustainable transportation. Less frequently used but still meaningful metrics, such as emissions and vanpool utilization, present opportunities for ACOG to tailor its performance tracking based on local priorities and available data. Overall, this review reinforces the value of a balanced performance framework that combines commonly used national indicators with locally relevant measures to support a robust, data-driven CMP update.

As part of its Congestion Management Process (CMP) update, the project team reached out to each of the peer communities and heard back from NCTCOG (Dallas-Fort Worth), HGAC (Houston), MARC (Kansas City), El Paso MPO, AAMPO (San Antonio), CRTPO (Charlotte), and St. Louis. These agencies demonstrate a range of approaches in integrating performance measures with planning, monitoring performance, and evaluating community impacts. Notably, the emphasis is shifting toward data-driven frameworks that support project prioritization in long-range plans and TIPs, ongoing performance tracking with real-time and third-party data, and greater responsiveness to community preferences and mobility shifts. Below are standout agencies that are enacting best practices in their regions:

PERFORMANCE MEASURES AND INTEGRATION WITH TIP AND RTPS:

- NCTCOG uses CMP metrics like travel time reliability and congestion levels to score and prioritize TIP projects, ensuring alignment with mobility and accessibility goals.
- El Paso MPO systematically embeds performance metrics in both TIP and MTP project evaluations to promote system reliability and congestion reduction.
- MARC (Kansas City) uses the Congestion Management Network (CMN) to guide project selection and screening. Projects located on CMN routes are evaluated for congestion and reliability before inclusion in TIPs.

MONITORING PERFORMANCE MEASURES:

- HGAC uses a combination of GIS, ITS, and third-party probe data to monitor travel time index, delay, and bottlenecks across the network.
- MARC applies HERE and INRIX data through RITIS tools to measure reliability, delay, and incident clearance times. They also assess historical commuting corridors to understand evolving patterns.
- NCTCOG combines National Performance Management Research Data Set (NPMRDS), GIS, ITS, and crash data to comprehensively track travel time reliability, congestion, and transit performance.

COMMUNITY RESPONSE AND STRATEGY IMPACT:

- NCTCOG reports a positive public response to CMP strategies, especially regarding improved traffic flow and enhanced transit options. The public also acknowledged environmental improvements and increased multimodal investments.
- El Paso MPO received community feedback prioritizing congestion mitigation—71% of MTP survey respondents ranked it as a top concern. This feedback informed greater focus on transit access, non-motorized travel, and incident management in project programming.
- AAMPO (San Antonio) anticipates future community engagement as their updated CMP goes out for public comment and expects strategy impacts to be more visible in upcoming project calls.

These examples illustrate how MPOs are increasingly grounding their CMPs in measurable outcomes, using data to inform investment, and adapting strategies to better reflect public demand and system needs. Based on the best practices derived from peer communities, as well as the previous ACOG CMP, the following practices were considered for this CMP update.

- Data Driven Corridor Identification and Analysis: Dependent on the data available; this practice can ensure the CMP network is analyzed consistently across all roadway corridors in the ACOG MPO TMA region.
- Congestion Definition Beyond Volume and Capacity: This practice goes hand and hand with the method listed above. ACOG has used time travel, reliability and non-recurring congestion in its previous CMP, and these were considered in this updated CMP.
- Multimodal and ITS Focused Performance Measures: The implementation of this method is dependent on the data available. Focusing on alternative measures that reduce bottlenecks and the amount of vehicles on specific corridors is beneficial to the transportation system in the ACOG MPO TMA region.
- Project-Level CMP Screening or Evaluation Tools: Ensuring projects going through the TIP and LRTP processes are also identified in the CMP is key in achieving regional goals and objectives. Providing local agencies within the Metropolitan Planning Area (MPA) with tools to streamline review and screening of projects can facilitate straightforward compliance and alignment with the regional vision.
- Monitoring and Reporting Dashboards: Monitoring and reporting dashboards are powerful tools that allow agencies to visualize and track key performance measures like travel time reliability, delay, and safety in real time. For ACOG, integrating a dashboard into the CMP update can enhance data-driven decision-making, improve transparency, and support ongoing evaluation of strategy effectiveness. This tool, developed as part of this update, helps align future TIP and RTP project selections with measurable outcomes.
- Strategy Effectiveness Frameworks: Strategy effectiveness frameworks provide a structured way to evaluate how well CMP strategies perform by using before-and-after analyses, performance metrics, and ongoing monitoring. This strategy was incorporated in the CMP update incorporating a framework into the CMP to help identify which strategies deliver the greatest impact, support continuous improvement, and ensure accountability in meeting regional congestion goals.

STAKEHOLDER ENGAGEMENT

Stakeholder engagement is a key element of the CMP and is critical to ensuring the process reflects local conditions, community priorities, and on-the-ground transportation challenges across the ACOG region. Meaningful engagement allows the CMP to move beyond a purely data-driven exercise by incorporating institutional knowledge from member jurisdictions, operators, and decision-makers who directly experience and manage congestion within their communities.

For the ACOG CMP, stakeholder engagement was conducted through a combination of regularly scheduled meetings and targeted surveys distributed to members of the ACOG MPO Technical Committee and Policy Committee. These engagement activities created multiple opportunities for stakeholders to provide input throughout the CMP development process, including identifying congestion concerns, validating methodologies, and discussing ongoing and planned strategies within their respective jurisdictions.

The CMP federal guidance emphasizes congestion management should be an ongoing, systematic, and cooperative effort. By actively involving stakeholders, the CMP supports regional coordination, promotes shared ownership of congestion solutions, and ensures that recommended strategies are realistic, implementable, and aligned with local and regional goals. The ACOG engagement activities included discussion around desires and needs for the CMP, as well as existing congestion and strategic actions taking place in respective jurisdictions.

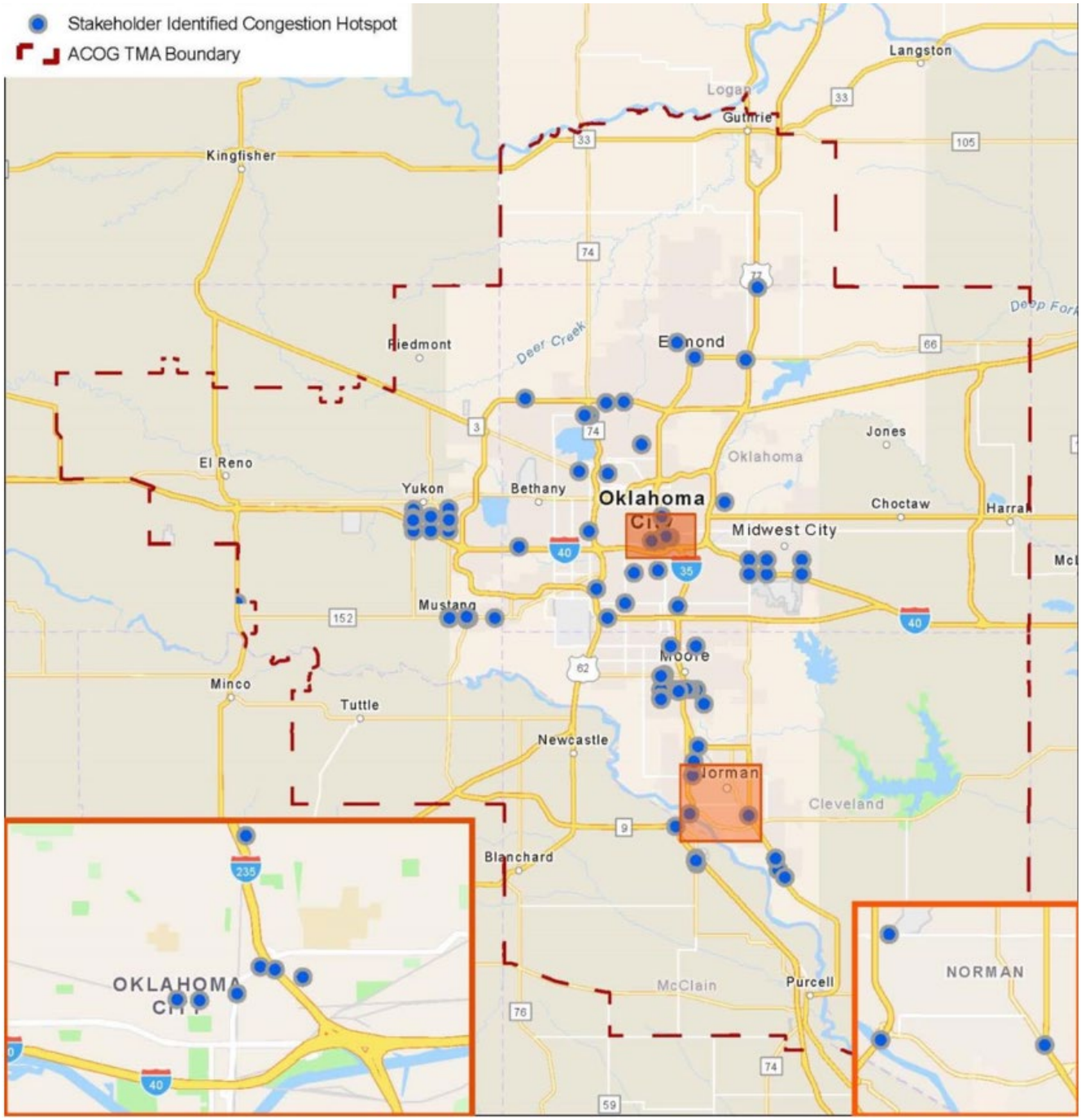
3.1 STAKEHOLDER CONGESTION LOCATION INPUT

A congestion survey was administered to members of the ACOG MPO Technical Committee and Policy Committee, which allowed each entity within the MPO TMA area to identify the location within their community experiencing the MOST significant congestion. This approach ensured congestion concerns were identified not only through regional performance data, but also through local expertise and lived experience.

Survey results, shown in **Figure 3,** identified dozens of hot spots throughout the region, beyond the initial CMP Network. This stakeholder-driven approach made the CMP Network more robust and ensured congestion solutions can be tailored to the needs of the communities. The survey responses highlighted location-specific issues, such as operational bottlenecks, recurring peak-period congestion, event-related impacts, and corridors experiencing rapid growth or land use change—conditions that may not always be fully captured by regional datasets alone.

By grounding the CMP Network in both data and stakeholder insight, ACOG is better positioned to identify appropriate multimodal strategies, prioritize investments, and support local jurisdictions in addressing congestion challenges that matter most to their communities. Ultimately, stakeholder engagement enhances the credibility, transparency, and effectiveness of the CMP, reinforcing its role as a key decision-support tool for regional transportation planning, project prioritization, and long-term system performance monitoring.

Figure 3: 2025 Stakeholder Input – Congestion Hotspots



CMP NETWORK & METHODOLOGY

The CMP study area includes the overall transportation system within the ACOG boundary, which will be evaluated and monitored and where congestion management policies, procedures, and physical improvements need to be applied. The congestion management process must be applied to a specific set of links throughout a region's transportation network. The ACOG MPO transportation network was reviewed to determine the best use of this process and its resulting management and implementation strategies.

The CMP Network is a specific set of roadway links that provide the framework for analyzing congestion problems within the ACOG MPO TMA. The CMP Network was defined using an initial set of screening criteria, defined below. This initial screened CMP Network was then made more robust by adding previously congested corridors and stakeholder identified location of congestion throughout the region.

After creating the CMP Network, Streetlight Data was used to identify specific segments that have performed poorly and met congestion metric thresholds. These congested Streetlight Segments were then refined into CMP Focus Segments based on logical termini, alongside staff and stakeholder input.

4.1 INITIAL SCREENING OF ACOG MPO TMA NETWORK

The CMP Network consists of roadways around the ACOG region selected for inclusion in the analysis and monitoring process. The initial screening of roadways was based on the following factors:

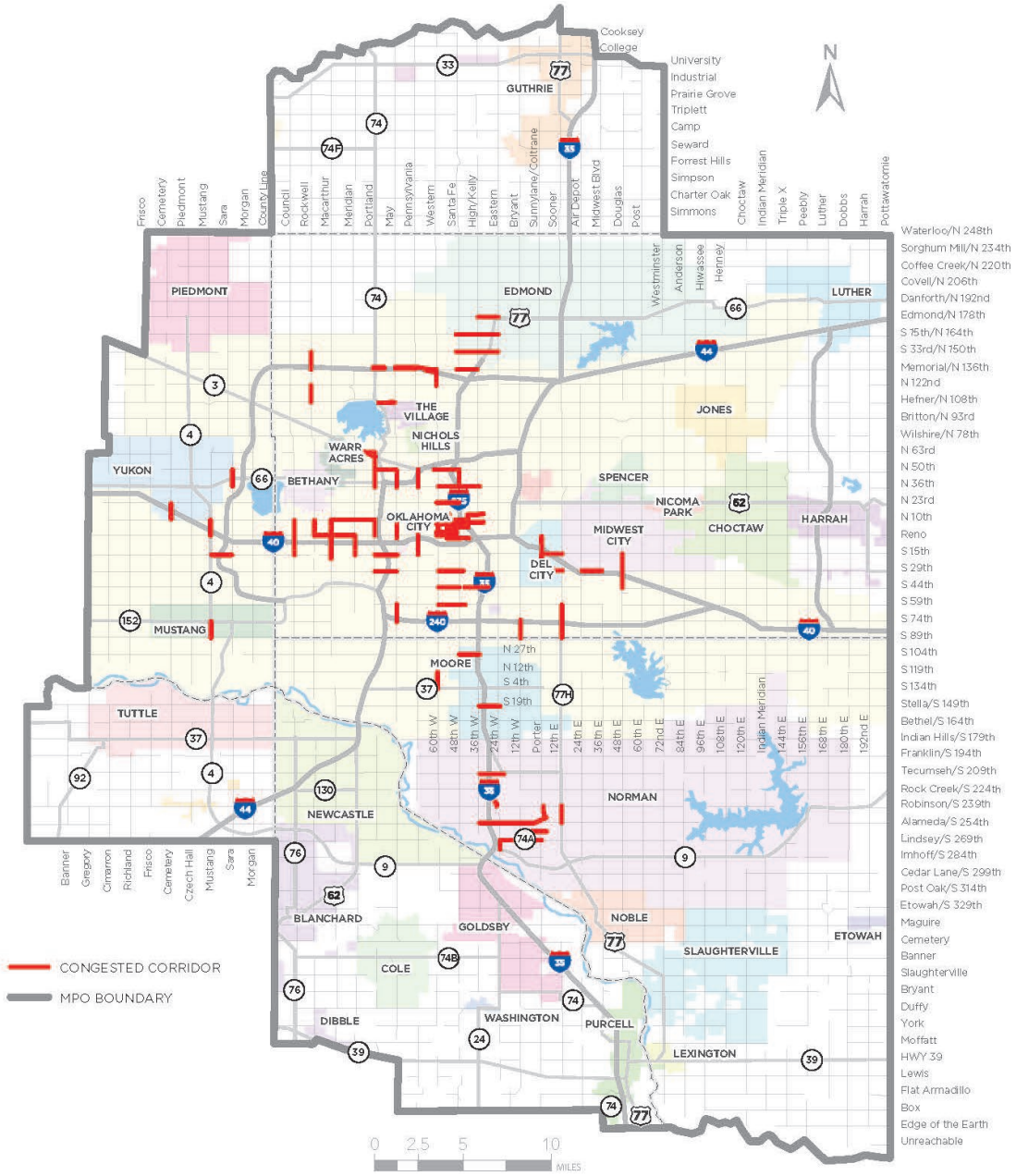
- All National Highway System (NHS) routes, including Freeways and tollways, US Highways, and State Highways.
- All routes are designated as an arterial within the Encompass 2045 plan.
- All routes with average daily traffic volume of over 25,000.
- All routes with high levels of transit service.

PREVIOUS CONGESTED CORRIDORS

Through previous planning efforts, including the regional transportation plan ENCOMPASS 2045, several corridors were previously designated as the top congested corridors in the region. These corridors, highlighted in past studies and illustrated within the planning documentation, serve as existing focal points for ongoing monitoring and analysis. By incorporating these previously identified segments into the current CMP, ACOG ensures continuity in evaluating and addressing long-standing congestion issues. The previous segments are shown in **Figure 4** on the following page.

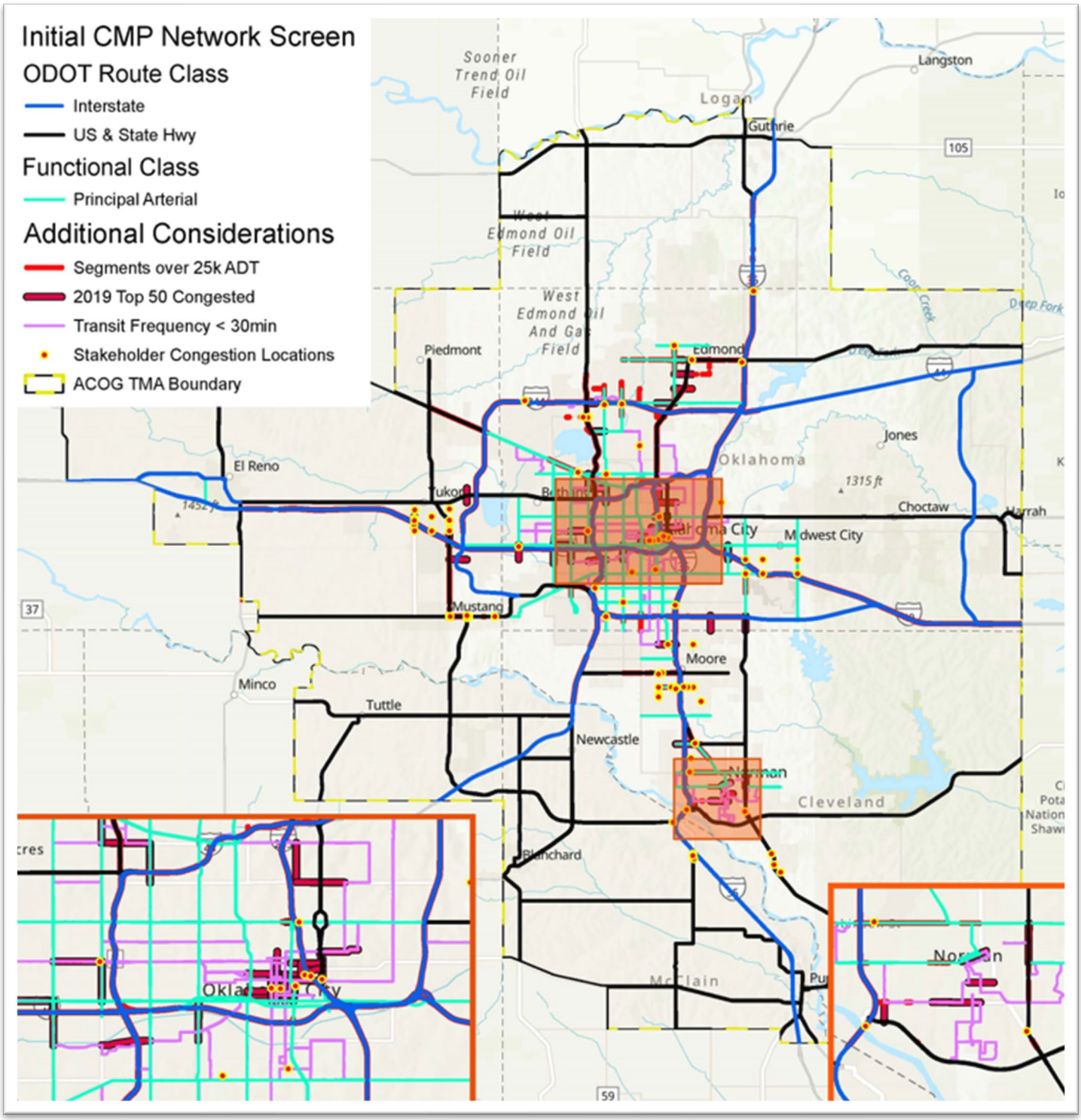
In addition, **Figure 5** shows the aggregated information of previous 2019 congested corridors, the roadway segments of 25,000 ADT, network segments with high transit frequency of less than 30 minutes, and the stakeholder identified top congested locations.

Figure 4: **Encompass 2045 Congested Corridors Map**[7]



[7] Encompass 2045 Congested Corridors Map

Figure 5: **Initial 2025 CMP Network Screening Components**



4.2 CMP NETWORK REFINING

After defining the CMP Network, as described above, it was then refined to focus on specific segments and links experiencing congestion issues. To complete the refinement, ACOG purchased traffic data including speed, congestion metrics, trip purpose, and more from the firm Streetlight. Streetlight captures traffic metrics by collecting data from various sources, including mobile devices, GPS systems, and connected vehicles. These data are then aggregated to reflect the number of vehicles traveling on a particular route over a specified period. Understanding traffic volume helps in analyzing flow and identifying congested areas.

The congestion metric within the Streetlight data is a Free Flow Factor (FFF). The Free Flow Factor is defined as the ratio of the average trip speed during a specific time period, or "Day Part" (e.g. 3pm-4pm) to the maximum average trip speed observed during any hour in the entire data period (e.g. 2am-3am).

$$\text{Free Flow Factor} = \frac{\text{Average Speed (Day Part)}}{\text{Max Average Speed (Any Hour)}}$$

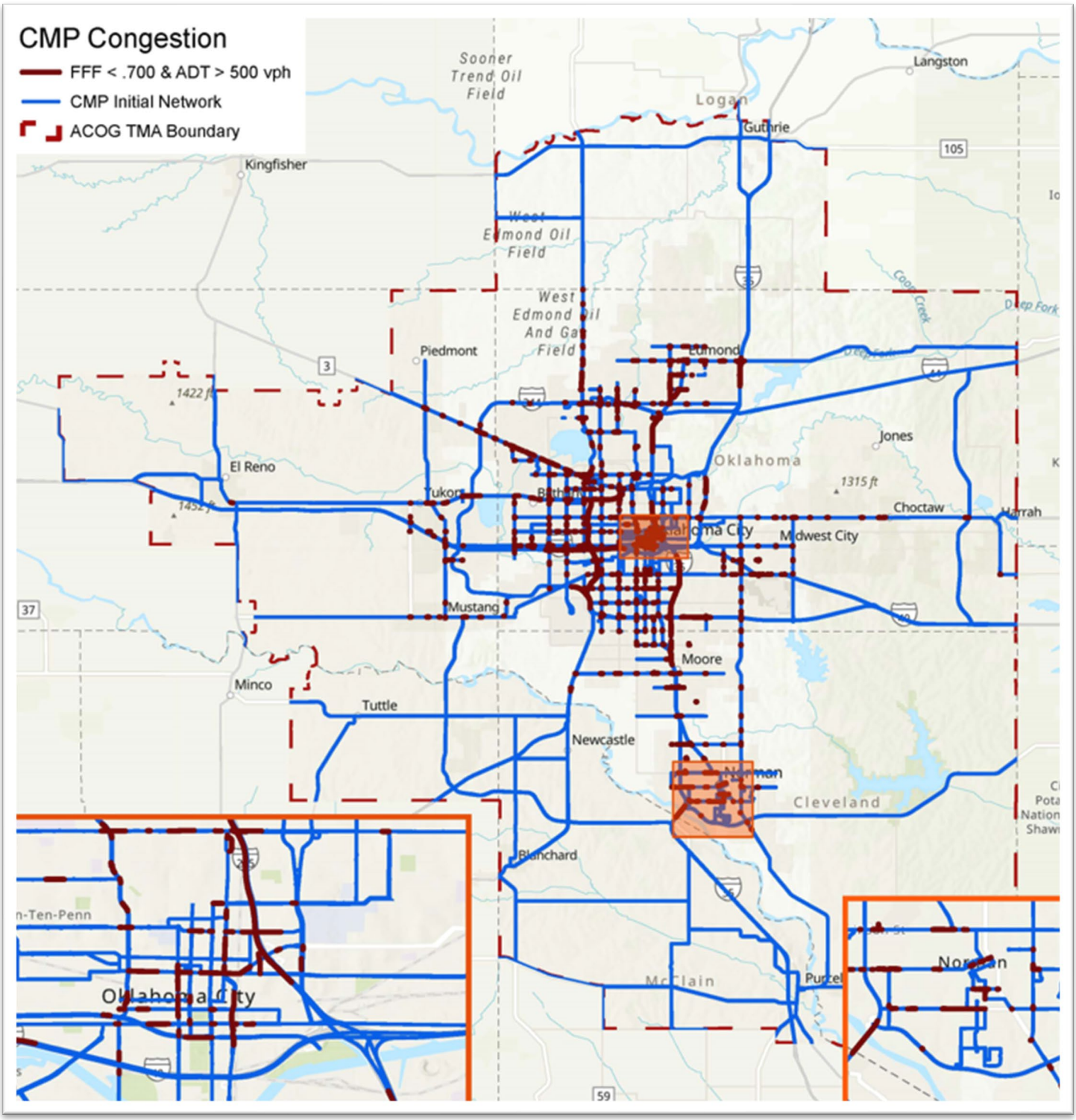
This analysis means that a value close to 1 indicates little to no congestion, while a lower value suggests greater congestion. The Streetlight analysis of FFF is different from the previously used CMP metric, Travel Time Index (TTI), which compares travel time, instead of speed. An example of comparison is - Streetlight value of 0.5 means, on average, vehicles were going half as fast as during the free flow condition, which is equivalent (but not equal to) a TTI of 2.0. For the purpose of identifying congestion across the CMP Network with Streetlight data, a FFF of 0.7 is utilized as the threshold for congestion.

Additional screening criteria include:

- minimum hourly traffic volume of 500 vehicles
- segment length of at least 100 feet

According to conventional traffic engineering standards, roadways typically accommodate between 1,000 and 2,000 vehicles per hour, per lane. These factors were implemented to ensure segments, such as highway median turnarounds and other sections subject to externalities, were excluded from the definition of a congested segment within the region. **Figure 6** illustrates the CMP segments with a FFF of less than 0.7 and ADT greater than 500 vehicles per hour.

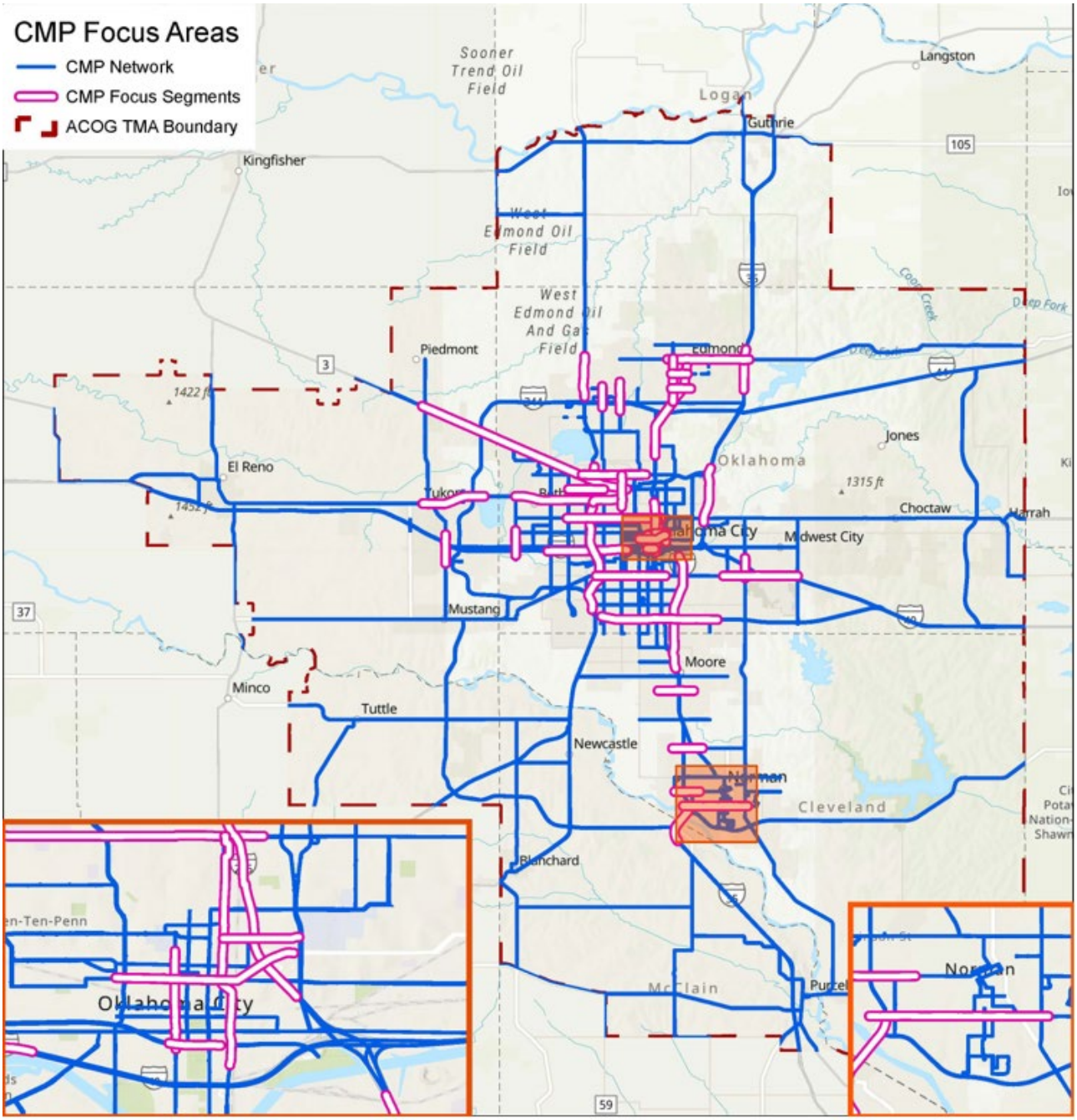
Figure 6: **Congested Streetlight Segments of the 2025 CMP Network**



4.3 CMP FOCUS SEGMENTS

Using the CMP Network and refined congested Streetlight Segments, ACOG then identified specific and logical roadway segments across the region. The creation of the CMP Focus Segments balances congested segments, logical termini, staff and stakeholder input. Having a manageable number of focus segments is important for data collection and monitoring activities, developing strategies and prioritization of the 2025 segments. **Figure 7** shows the CMP Network, along with the Focus Segments, based upon the above criteria.

Figure 7: CMP Focus Areas



4.4 OBJECTIVES

The CMP mirrors elements of ACOG's transportation planning process. The development of regional goals within ENCOMPASS 2045 lead directly to the objectives for the CMP, responding to the vision of that regional transportation plan. The stated objectives follow guidance by being specific, measurable statements developed in collaboration with a broad range of regional partners. The objectives were defined to focus on specific aspects of regional connectivity and associated congestion. The 2045 Encompass Goals and associated CMP Objectives are shown below.

ENCOMPASS 2045 GOALS AND CMP OBJECTIVES

CONNECTIVITY

Goal: Develop connections among all types and modes of transportation

CMP Objectives:

- Provide efficient connections within and between modes and facilities
- Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices
- Implement a Complete Streets policy for the region and encourage member communities to adopt a Complete Streets policy
- Support and expand an interconnected bus and commuter rail transportation system in the region

ECONOMIC STRENGTH

Goal: Promote economic vitality through enhanced mobility

CMP Objectives:

- Invest in improvements that enhance the efficiency of the existing transportation system
- Improve accessibility to regional employment centers
- Invest in transportation that supports tourism, commerce, and economic activity
- Increase efficiency of goods movement by truck, rail, water, air, and pipeline

EQUITY & OPTIONS

Goal: Provide transportation options and access for the movement of all people and goods

CMP Objectives:

- Provide transportation services and improvements that support a multimodal system
- Expand and maintain a safe, secure, and accessible public transportation system
- Expand and maintain accessible and connected pedestrian and bicycle facilities
- Avoid, minimize, or mitigate negative human health and environmental effects.

HEALTHY COMMUNITIES

Goal: Improve the connection between land use and transportation to enable residents to live healthier lives and reduce environmental impact from vehicle travel

CMP Objectives:

- Improve, enhance, and expand the ability for residents to walk, bike, or use public transportation
- Encourage use of alternative energy and cleaner-burning fuels to improve the region's air quality
- Reduce the potential negative impacts transportation projects have on the environment and human health
- Better connect land use and transportation decision-making

PERFORMANCE

Goal: Increase the efficiency and reliability of the transportation system

CMP Objectives:

- Invest in Intelligent Transportation Systems (ITS) and other improvements that enhance the efficiency of the existing transportation system
- Improve the resiliency and reliability of the existing transportation system
- Increase roadway capacity for vehicles, bicycles, pedestrians, and transit where needed
- Sustainably fund transportation projects while continuing to leverage additional resources

SAFETY & SECURITY

Goal: Provide a safe and secure transportation system for all users

CMP Objectives:

- Improve design, construction, and maintenance of infrastructure to reduce the number and severity of crashes, injuries, and fatalities of all users
- Increase awareness of the public on safety issues and skills
- Collaborate with area communities and stakeholders on transportation system safety and security strategies
- Improve situational awareness, understanding, and collaboration in the area of cybersecurity across the region

SYSTEM PRESERVATION

Goal: Maintain and improve the quality of the transportation system

Objectives:

- Invest in projects that preserve and enhance the existing transportation infrastructure
- Encourage policies and procedures that preserve traffic operations and safety
- Explore new or improved transportation technologies
- Decrease unnecessary bridge and roadway wear and tear

MULTIMODAL PERFORMANCE MEASURES

The CMP plays a critical role in identifying congestion issues, evaluating potential solutions, and integrating strategies into the region's Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP). Section 5 of this CMP builds upon earlier chapters by advancing the discussion of multimodal performance measures, outlining congestion management needs, and preparing for the development of strategies in subsequent phases.

This document recognizes congestion in Central Oklahoma cannot be addressed solely through roadway capacity expansion. Instead, it highlights the importance of multimodal performance metrics that assess how well the overall transportation system—across driving, transit, walking, bicycling, and freight—meets regional mobility, accessibility, and sustainability goals. By aligning with federal guidance and national best practices, the CMP provides ACOG and its partners with the tools to prioritize investments, track progress over time, and deliver transportation solutions that balance efficiency, equity, and livability.

Modern urban regions, such as Oklahoma City, face challenges in managing congestion as travel demand grows and infrastructure ages. Addressing congestion is no longer just a matter of expanding roadways for vehicles; it requires a holistic, multimodal approach. Multimodal performance measures are at the heart of an effective CMP. They provide a quantitative and qualitative framework for assessing how well the entire transportation system serves its users and meets regional mobility goals. By integrating these measures, agencies can better identify problems, allocate resources, evaluate strategies, and track progress toward a more efficient, equitable, and sustainable transportation future.

5.1 DEFINING MULTIMODAL PERFORMANCE MEASURES

Performance measures are metrics used to evaluate how well a transportation system is functioning. A multimodal approach recognizes congestion affects and is affected by more than just automobiles - public transit, bicycles, pedestrians, freight vehicles, and other modes must be considered to gain a complete picture of mobility.

A robust set of multimodal performance measures typically includes:

- **Travel Time and Reliability:** Average and peak hour travel times, on-time performance, and variability for all modes.
  - **Level of Service (LOS):** Quality of service rankings for roadways, transit, sidewalks, and bike lanes.
  - **Volume-to-Capacity Ratios:** The ratio of observed demand versus infrastructure capacity for each mode.
- **Person Throughput:** The number of people (not just vehicles) moving through a corridor per unit of time.
- **Accessibility:** The ease with which people can reach desired destinations by various modes.
- **Mode Share:** The percentage of travelers using each mode (auto, transit, bike, walk, etc.).
- **Safety Metrics:** Crash rates, severity, and risk exposure for all users.
- **Environmental Impact:** Emissions, energy use, and noise generated by each mode.
- **Equity and Inclusion:** The system's ability to serve disadvantaged and mobility-limited populations.
- **Customer Satisfaction:** Perceptions and attitudes of users toward the available modes.

5.2 CMP GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

The objectives and performance measures for the ACOG CMP are presented in **Table 3.** The objectives are shown in relation to the seven goal areas of the ACOG LRTP, Encompass 2045. The table reflects the Goal Area from the LRTP, the CMP Objective, and the performance measures to support the objective. ACOG is looking to have consistency between the two plans.

Table 3 also shows performance measures in two-tiered categories. These categories represent the prioritization of the performance measures based on their perceived effectiveness in measuring the impact of CMP strategies and the availability of data to support measurement.

- **Tier 1** - Performance Measures are readily available and recommended for short-term implementation.
- **Tier 2** - Performance Measures may not be readily available and are recommended for phasing in overtime, due to limitations of currently available data and existing processing constraints.

Table 3: LRTP Encompass 2045 Goals and CMP Goals and Performance Measures

7 Goal Areas	CMP Objective	Performance measures
1-Connectivity	• Provide efficient connections within and between modes and facilities • Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices • Implement a Complete Streets policy for the region and encourage member communities to adopt a Complete Streets policy • Support and expand an interconnected bus and commuter rail transportation system in the region	**Tier 1** - Pedestrian Composite Index - Bicycle Composite Index **Tier 2** - Bicycle Network Analysis (BNA) score[8] - Miles of area operating under a Local Complete Streets policy - Network Completeness Analysis - Route Directness Analysis (from transit routes) - Network Quality Analysis (intensive)
2-Economic Strength	• Invest in improvements that enhance the efficiency of the existing transportation system • Improve accessibility to regional employment centers • Invest in transportation that supports tourism, commerce, and economic activity • Increase efficiency of goods movement by truck, rail, water, air, and pipeline	**Tier 1** - Congestion intensity (Free Flow Factor) - Reliability (buffer index) - Mode share for all trips - Person or vehicle hours of delay - Truck Free Flow Factor - User cost (as a function of delay) **Tier 2** - Vehicle Miles Traveled (VMT) per capita. - Person Miles Traveled (PMT)
3-Equity & Options	• Provide equitable transportation services and improvements that support a multimodal system • Expand and maintain a safe, secure, and accessible public transportation system • Expand and maintain accessible and connected pedestrian and bicycle facilities • Avoid, minimize, or mitigate negative human health and environmental effects on Environmental Justice populations	**Tier 1** - Total miles of sidewalk and bicycle paths/lanes. - Percent of population and jobs located within ¼-mile of transit. **Tier 2** - Miles of sidewalk and bicycle paths/lanes added within ¼-mile of transit stop

[8] BNA Score

Table 3: **Continued**

4-Healthy Communities	• Improve, enhance, and expand the ability for residents to walk, bike, or use public transportation	**Tier 1** - Transit ridership per revenue vehicle hour - Mode share for commuter trips. - Annual air quality index reading for the region
	• Encourage use of alternative energy and cleaner-burning fuels to improve the region's air quality	
	• Reduce the potential negative impacts transportation projects have on the environment and human health	
	• Better connected land use and transportation decision-making	
5-Performance	• Invest in Intelligent Transportation Systems (ITS) and other improvements that enhance the efficiency of the existing transportation system.	**Tier 1** - Lane miles severely congested. - Travel time ratio (morning/afternoon peak vs. midday travel times). - Lane-miles covered by ITS services and devices including cameras, Dynamic Message Signs, Service Patrols and advanced signal coordination **Tier 2** - Person or vehicle hours of nonrecurring delay - Duration of congestion
	• Improve the resiliency and reliability of the existing transportation system.	
	• Increase roadway capacity for vehicles, bicycles, pedestrians, and transit where needed.	
	• Sustainably fund transportation projects while continuing to leverage additional resources.	
6-Safety & Security	• Improve design, construction, and maintenance of infrastructure to reduce the number and severity of crashes, injuries, and fatalities of all users	**Tier 1** - Number of crashes by severity for vehicle crashes, vehicle-bicycle crashes, and vehicle-pedestrian crashes - Fatality and serious injury crash rate per 100M VMT **Tier 2** - Response and/or incident clearance time
	• Increase awareness of the public on safety issues and skills	
	• Collaborate with area communities and stakeholders on transportation system safety and security strategies	
	• Improve situational awareness, understanding, and collaboration in the area of cybersecurity across the region	
7-System Preservation	• Encourage policies and procedures that preserve traffic operations and safety	**Tier 1** - Percent of roadways above PCI 70 - Number of bridges in poor quality or worse **Tier 2** - Percent of sidewalks above PCI 90 - Percent of trails above PCI 90 - Percent of signals that have had timing reviewed in the past 3 years - Truck Route adherence
	• Explore new or improved transportation technologies	
	• Decrease unnecessary bridge and roadway wear and tear	

5.3 DESIGN & COLLECT DATA FOR MULTIMODAL PERFORMANCE MEASURES

Data to support the CMP can be derived from multiple sources. Understanding the type and availability of data collected is essential in analyzing the CMP network, as the data is used to accurately and efficiently calculate the system's performance. For the 2050 CMP, some sources provide data that could be used more often in analysis than other sources.

The project team reviewed applicable data sources and recommended the following data be used to support the CMP. Data sources for specific measures are shown in **Table 4.**

Table 4: **CMP Data Sources and Measure Alignment**

Data	Data Source	Description	Applicable Measures
Streetlight	Streetlight™	-Vehicle-probe speed data -Free flow data	-Free Flow Factor -Speed -Average Daily Traffic
ACOG Travel Model Outputs	ACOG	-Congestion Speed -Volume -Capacity -Vehicle Miles Traveled (VMT)	-Level of Service -User Cost -Vehicle Hours of Delay (VHD) -Reliability (Buffer Index) -Average Trip Distance
Crash Data	ODOT, FARS	-Crash severity -Crash frequency -Collision type -Bicycle/Pedestrian involvement	-Serves as base information for multiple measures
Roadway Shapefiles	ODOT	-Roadway alignments -Traffic Counts -Functional classification	-Serves as base information for multiple measures
Demographic Shapefiles	ODOT	-Population -Employment -Transit information	-Percent of population and jobs located within ¼ mile of transit
Transit Data	CART EMBARK, CityLink	-Monthly ridership counts -Ridership per revenue hour	-Transit ridership per revenue hour -Miles of sidewalk and bicycle paths/lanes added within ¼-mile of transit stop
Annual Air Quality Ratings	ACOG/ODEQ	-Ozone levels -Status of meeting NAAQS	-Annual Air Quality Index
Mode Split	US Census	-Traveler mode split	-Mode share for commuter trips
Bicycle/Pedestrian Network	ACOG	-Pedestrian Composite Index -Bicycle Composite Index -Sidewalk location/condition -Bicycle path/lane location/condition	-Total miles of sidewalk and bicycle lane/path -Miles of sidewalk and bicycle paths/lanes added within ¼-mile of transit stop
ITS Network	ACOG/ ODOT	-Location/type of ITS Devices -Location for future deployments	-Total miles of network covered by ITS Devices

Details of the seven goal areas from the LRTP, Encompass 2045, are listed below. Information includes Tier 1 and Tier 2 measures and resources.

CONNECTIVITY

The CMP Tier 1 and Tier 2 performance measures will be used to determine if the ACOG region is meeting its goals for Connectivity and at what level. **Figure 8 and 9** show the Pedestrian Composite Index (PCI) and the Bicycle Composite Index (BCI) for the ACOG region.

Tier 1 Performance Measures

- Pedestrian Composite Index
  - Index used to determine the priority of building more walkable facilities. The Pedestrian Composite Index is a number between 0 and 1, representing the necessity of sidewalks by considering locations of pedestrian generators and pedestrian deterrents.
- Bicycle Composite Index
  - Index used to determine the priority of building more biking facilities. Similar to PCI, Bicycle Composite Index is a number between 0 and 1, representing the necessity of sidewalks by considering locations of generators and deterrents.

Tier 2 Performance Measures

- Miles of area operating under a Local Complete Streets policy
  - Inventory of area recently adopted or codified a policy to encourage, support or require complete streets (streets accommodating multiple modes) to be developed during reconstruction or new construction.
- Network Completeness Analysis
  - A comparison of existing bike and pedestrian facilities and planned facilities.

Figure 8: **Pedestrian Composite Index (PCI)**

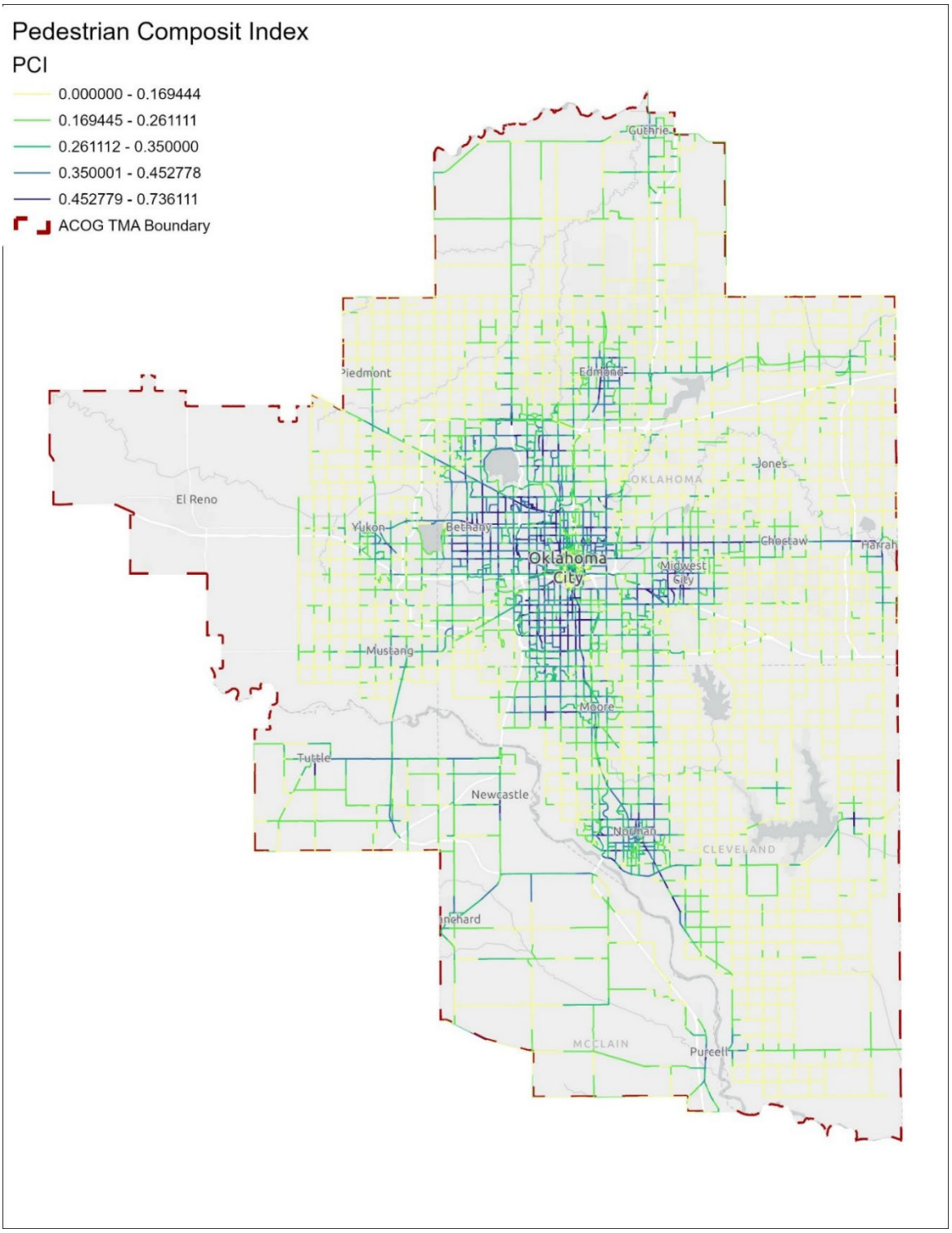
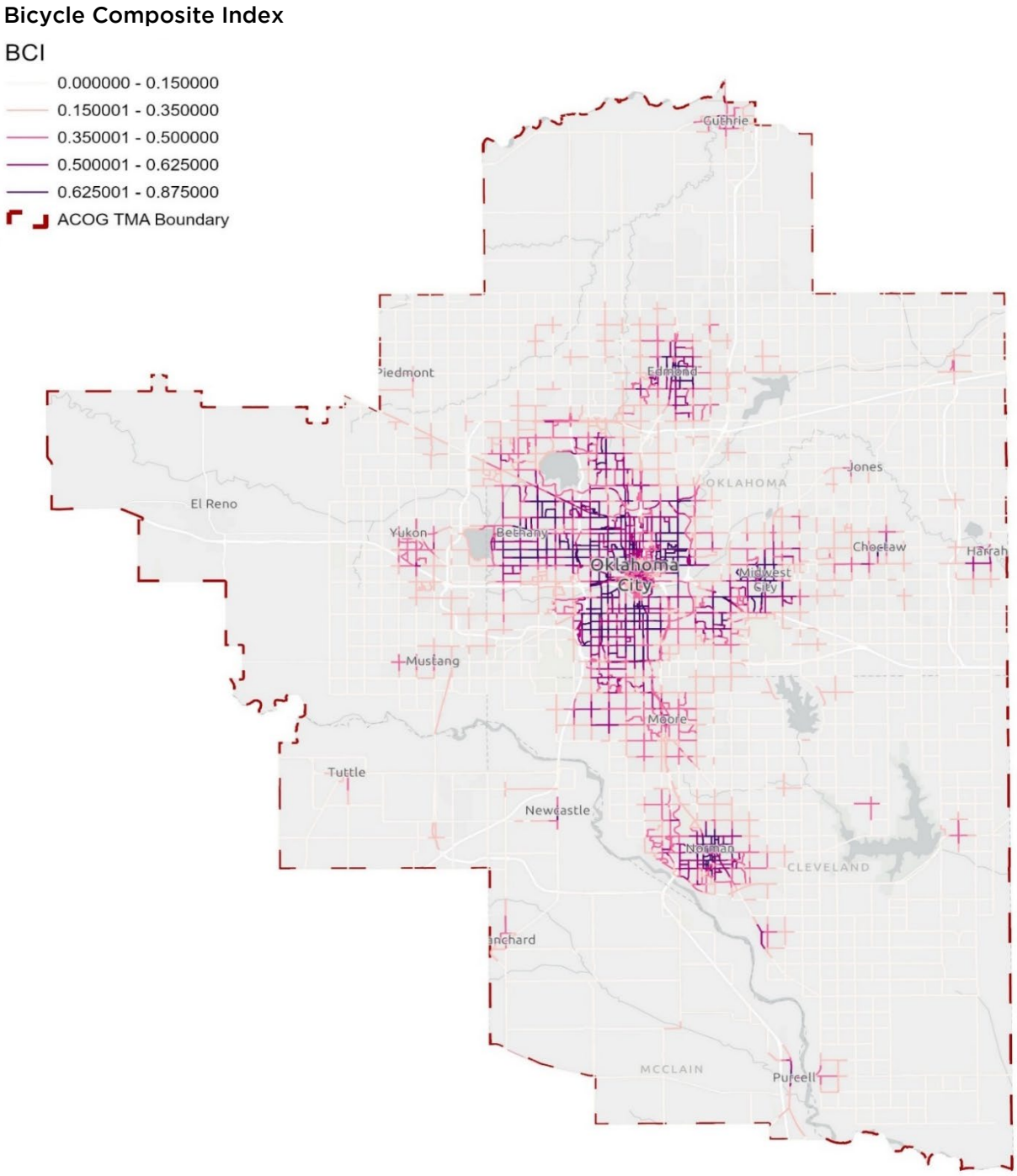


Figure 9: **Bicycle Composite Index (BCI)**



ECONOMIC STRENGTH

The CMP Tier 1 and Tier 2 performance measures for ACOG to determine the level of meeting the Economic Strength goals are described below. **Table 5** shows the methodology for calculating performance for Tier 1 Performance Measures.

Tier 1 Performance Measures

- Congestion intensity (Free Flow Factor)
  - The congestion intensity measure uses free flow factor to determine the severity of congestion. When the free flow factor is closer to 1, there is little congestion on the corridor, however when the free flow factor is lower, the congestion level is more severe.
- Reliability (buffer index)
  - The buffer index represents the extra time most travelers add to their average travel time when planning trips to ensure on-time arrival at their destination. The buffer index is calculated as the difference between the 95th percentile travel time (near worst case) and the average travel time, divided by the average travel time.
- Mode Share for Commuter Trips
  - The mode share is a common outcome measure used to determine the effectiveness of efforts to reduce the dependence on automobiles. Mode share can be identified by using the US Census Means of Transportation to Work data.
- Person or Vehicle Hours of Delay
  - The delay measurements are based on the 2010 travel model output which is assumed to be able to represent the 2015 traffic condition. The person hours of delay can be calculated by multiplying the local vehicle occupancy rate of 1.2 persons per vehicle by the vehicle hours of delay.
- Truck Free Flow Factor
  - Truck Free Flow Factor is ratio of the average trip speed for a day to the maximum average trip speed in any hour during the entire data period.
- User Cost (as a function of delay)
  - The user cost of delay is the value of time multiplied by the hours of delay. The United States Department of Transportation (USDOT) utilizes an Hourly Value of Travel Time Savings for general travel time, for all purposes, as $21.10 based on the 2025 Benefit Cost Guidance (Update 2, May 2025).

Tier 2 Performance Measures

- Vehicle Miles Traveled (VMT) per Capita
  - VMT per capita is the total number of miles traveled by motor vehicles in the ACOG region divided by the population of the region.
- Person Miles Traveled (PMT)
  - PMT is a calculation of miles traveled in the ACOG region by mode by occupancy. For example, a person using a single occupancy vehicle, driving alone, traveling 5 miles would yield 5 person-miles traveled. A transit vehicle traveling 1 mile, carrying 40 passengers would yield 40 person-miles traveled.

Table 5: **Tier 1 Performance Measurements for Economic Strength Goal**

Goal Area/ Performance Measure	Calculation Method		2016 Results	Current Results	Data Source
Congestion Intensity	(Peak travel time/free-flow travel time)		Varies by Route	Varies by Route	Streetlight
Reliability (Buffer Index)	95Th percentile travel time for CMP Focus Network		Varies by Route	Varies by Route	FHWA NPMRDS
Mode Share for Commuter Trips	Research / Lookup Data	Car, Truck, Van - Drive Alone	82.20%	76.70%	2023 ACS 5-year Estimates Means of Transportation to Work *may have COVID impact
		Car, Truck, Van -2+	10.93%	10.42%	
		Transit, Railroad	0.50%	0.59%	
		Bicycle	0.28%	-	
		Walked	1.54%	-	
		Taxi, Motorcycle, Others	1.13%	-	
		Work at Home	3.42%	8.37%	
Person or Vehicle Hours of Delay	((VMT/Congestion Speed) – (VMT/free-flow speed)) x 1.2 persons/vehicles	Interstate & Freeway	120,865	*TBD*	Streetlight
		Turnpike	15,024	*TBD*	
		Principal Arterial	68,428	*TBD*	
		Total	204,317	*TBD*	
Truck Free Flow Factor	Truck FFF Percentages across all Streetlight Segments (weekday Average)		N/A	Under 0.55: 15.9% 0.55-0.7: 23.7% 0.7-0.85: 50.5% Over 0.85: 9.8%	Streetlight
	Truck FFF Percentages across CMP Focus Network (weekday Average)		Weighted Average TTI for Truck Routes: 1.05	Under 0.55: 13.5% 0.55-0.7: 24.5% 0.7-0.85: 49.3% Over 0.85: 12.8%	
	Max Congestion among all the monitored segments		Max TTI for Truck Routes: 2.89	Min FFF for CMP Focus segment 0.09	
User Cost (as a function of delay)	Vehicle hours of delay x value of time ($21.10 Dollar/Hours)	Vehicle Delay Cost	$3,573,841	*TBD*	Streetlight
	Person Hours of Delay x Value of Time ($20.99 Dollar/Hours)	Person Delay Cost	$4,288,610	*TBD*	

EQUITY & OPTIONS

To adequately measure efforts made towards the Equity and Options Goal, the CMP will use the following Tier 1 and Tier 2 performance measures. **Table 6** shows the methodology for calculating performance for Tier 1 Performance Measures.

Tier 1 Performance Measures

- Total Miles of Sidewalk and Bicycle Paths/Lanes
  - Inventory data on the total mileage of pedestrian and bicycle infrastructure for the ACOG MPO TMA.
- Percent of population and jobs located within ¼-mile of transit.
  - GIS overlay of existing transit service routes into the population and employment files that can be obtained from the US Census Bureau.

Tier 2 Performance Measures

- Miles of Sidewalk and Bicycle Paths/Lanes Added Within ¼-mile of Transit Stop
  - Measure to evaluate the expansion of the bicycle and pedestrian network's connectivity to transit services.

Table 6: **Tier 1 Performance Measurements for Equity and Options Goal**

Goal Area/Performance Measure	Calculation Method		2016 Results	Current Results	Data Source
Miles of Sidewalks and Bicycle Routes	GIS Tabulation	Miles of Sidewalks	3,512.5	*ACOG sending data*	ACOG Generated Shapefile
		Miles of Bicycle Routes	415	699.2	
Percent of population and jobs located within ¼-mile of all transit.	GIS Buffer	Population Percentage	49.2%	24.6%	2022 Census on the Map, ACOG Generated Shapefile
		Employment Percentage	72.5%	53.9%	
Percent of population and jobs located within ¼-mile of 30-min headway transit.	GIS Buffer	Population Percentage	N/A	17.2%	2022 Census on the Map, ACOG Generated Shapefile
		Employment Percentage	N/A	41.0%	

HEALTHY COMMUNITIES

The CMP Tier 1 performance measures are listed below and indicate the level the ACOG region is meeting its goals for Healthy Communities. **Table 7** shows the detailed data.

Tier 1 Performance Measures

- Transit Ridership per Revenue Vehicle Hour
  - Transit ridership can indicate a shift in the active transportation characteristics of a region. An increase in ridership per revenue hour may indicate a more active population.
- Mode Share for Commuter Trips
  - Mode split for journeys to work or school (when tracked over time) can be used to evaluate the tendency of the population to utilize more active transportation modes.
- Annual Air Quality Index (AQI)

- The AQI provides information relating to the level of pollution in the air that can negatively impact sensitive populations. Reducing SOV trips can also increase the quality of air. The Oklahoma Department of Environmental Quality (DEQ) provides daily forecasts and updates for pollutants and particulate matter in the air. Currently, the ACOG MPO TMA region is not in a non-attainment zone for all National Ambient Air Quality Standards (NAAQS).

Table 7: **Tier 1 Performance Measurements for Healthy Communities Goal**

Goal Area/Performance Measure	Calculation Method		2016 Results	Current Results	Data Source
Transit Ridership per Revenue Vehicle Hour	Transit Ridership/Revenue Hours	Citylink	15.9	5.4	Transit Agencies
		EMBARK (COTPA)	16.9	11.1	
		CART	19.3	*	
Mode Share for Commuter Trips	Research/ Look-Up	Car, Truck, Van -Drive Alone	82.20%**	76.70%	2023 ACS 5-year Estimates Means of Transportation to Work
		Car, Truck, Van -2+	10.93%**	10.42%	
		Transit, Railroad	0.50%**	0.59%	
		Bicycle	0.28%**	-	
		Walked	1.54%**	-	
		Taxi, Motorcycle, Others	1.13%**	-	
		Work at Home	3.42%**	8.37%	
Annual Air Quality Index Reading for the Region	Research/ Look-Up	Ozone	39.1	37	Oklahoma DEQ[2]
		Fine Particulates (PM 2.5)	35.8	45	
		Oxides of Nitrogen (NO_x)	27.8	12	
		Oxides of Sulfur (SO_x)	1.0	-	
		Carbon Monoxide (CO)	4.3	9	
		Coarse Particulates (PM 10)	17.0	12	

* This transit agency now contracts with EMBARK for day-to-day operations.

** These figures were pulled from the 2010 Census Journey to Work

PERFORMANCE

Regional goals for system performance focus on enhancing both the efficiency and reliability of the transportation network. To assess congestion levels within the CMP network, both model-based assignments and actual travel time data are used. While model assignments offer insights into overall network operation and areas of congestion, the four-step travel model relies on numerous assumptions and may not provide a detailed analysis. Therefore, it is essential to evaluate network performance using real-world travel data, which reflects more accurate traffic conditions. The CMP Tier 1 and Tier 2 performance measures for the region are listed below and shown in **Table 8.**

Tier 1 Performance Measures

- Lane Miles Severely Congested
  - Severe congestion is defined as a segment with a Free Flow Factor under 0.7, which equates to a 1.4 TTI. This information is derived from the Streetlight segment level data.
- Travel Time Ratio (morning/afternoon peak vs. midday travel times)
  - The ratio of congested travel time to free flow travel time for morning and evening periods on the CMP network.
- Lane-Miles Covered by ITS Services and Devices Including Cameras, Dynamic Message Signs, Service Patrols and Advanced Signal Coordination
  - Inventory of the existing ITS devices or services that have been deployed in the ACOG MPO TMA.

Tier 2 Performance Measures

- Person or Vehicle Hours of Nonrecurring Delay
- Duration of Congestion
  - This is a measure of how long the congestion exists on the roadway. The Congestion Management Problem and Needs analysis Methodology 1 (Corridor Average Congestion) is one fashion of calculating this performance measure.

Table 8: **Tier 1 Performance Measurements for Performance Goal**

Goal Area/Performance Measure	Calculation Method		2016 Results*3	Current Results	Data Source
Lane Miles Severely Congested	The percentage of segments in the CMP network with a FFF of 0.7 or lower.	Interstate & Freeway (%)	AM: 226.32 (24%) PM: 80.87 (9%)	7-8am: 12.9% 5-6pm: 34.4%	Streetlight
		Turnpike (%)	AM: 9.46 (4%) PM: 0.43 (0.2%)	N/A	
		Principal Arterial (%)	AM: 39.39 (3%) PM: 23.61 (2%)	7-8am: 7.1% 5-6pm: 25.1%	
		Total (%)	AM: 275.17 (11%) PM: 104.91 (4%)	7-8am: 8.2% 5-6pm: 26.7%	
Free Flow Factor (morning/ afternoon peak vs, midday travel times)	Average travel time during congestion period/ Free flow travel time	Travel time/FFF	*TBD*	*TBD*	Streetlight
	Weighted Average = Segment FFF x Segment Length / Total Length	Weighted Average for CMP Network	1.09*	*TBD*	
	Max FFF = Max FFF among all the monitored segments	Max FFF for CMP Network	2.89*	*TBD*	
Lane Miles Covered by ITS Services and Devices Including Cameras, Dynamic Message Signs, Service Patrols and Advanced Signal Coordination	GIS Measurements	Cameras	249	174**	ACOG/ ODOT
		DMS	23	23**	
		Speed Stations	60	60**	
		Total Devices	332	257**	
		Total Mileage Covered by ITS Devices	162	-122**	

* These figures were calculated using Time Travel Index (TTI).

** These numbers are based on ODOT facilities only.

SAFETY & SECURITY

The CMP Tier 1 and Tier 2 performance measures will identify the level the ACOG region is meeting its Safety and Security goals. Data for evaluating the Safety and Security of the ACOG CMP network are readily available from ODOT's crash data and statistics website.[9] **Table 9** shows the information.

Tier 1 Performance Measures

- Number of Crashes by Severity for Vehicle Crashes, Vehicle-Bicycle Crashes, and Vehicle-Pedestrian Crashes
  - Crash information by severity can be found through the Oklahoma DOT's data and statistics website. Information relating to fatalities can be found through the FARS system if not readily available from ODOT.
- Fatality and Serious Injury Crash Rate per 100M VMT
  - Fatality and serious injury rates can be calculated for specific segments of the CMP network based upon the information collected from ODOT and FARS.

Tier 2 Performance Measure

- Response and/or Incident Clearance Time
  - The length of time that it takes for first police, fire, and/or tow operators to respond to an incident or the duration of an incident from the time the incident begins to the time in which normal conditions are restored to the system.

Table 9: Tier 1 Performance Measurements for Safety & Security Goal

Goal Area/Performance Measure	Calculation Method	2016 Results	Current Results	Data Source
Number of Crashes by Severity for Vehicle Crashes, Vehicle-Bicycle Crashes, and Vehicle-Pedestrian Crashes	ODOT Data	Varies	Table 2.8	ODOT Crash Data Website, FARS
Fatality and Serious Injury Crash Rate per 1M VMT	Formula Based for Segments or Intersections	Location specific Intersection formula: Rate = (#of Fatal and Serious Injury Crashes x 1,000,000)/(ADT x 365) Segment formula: Rate = (# of Fatal and Serious Injury Crashes x 1,000,000)/(Length of segment in miles x ADT x 365)		ODOT Crash Data Website, FARS

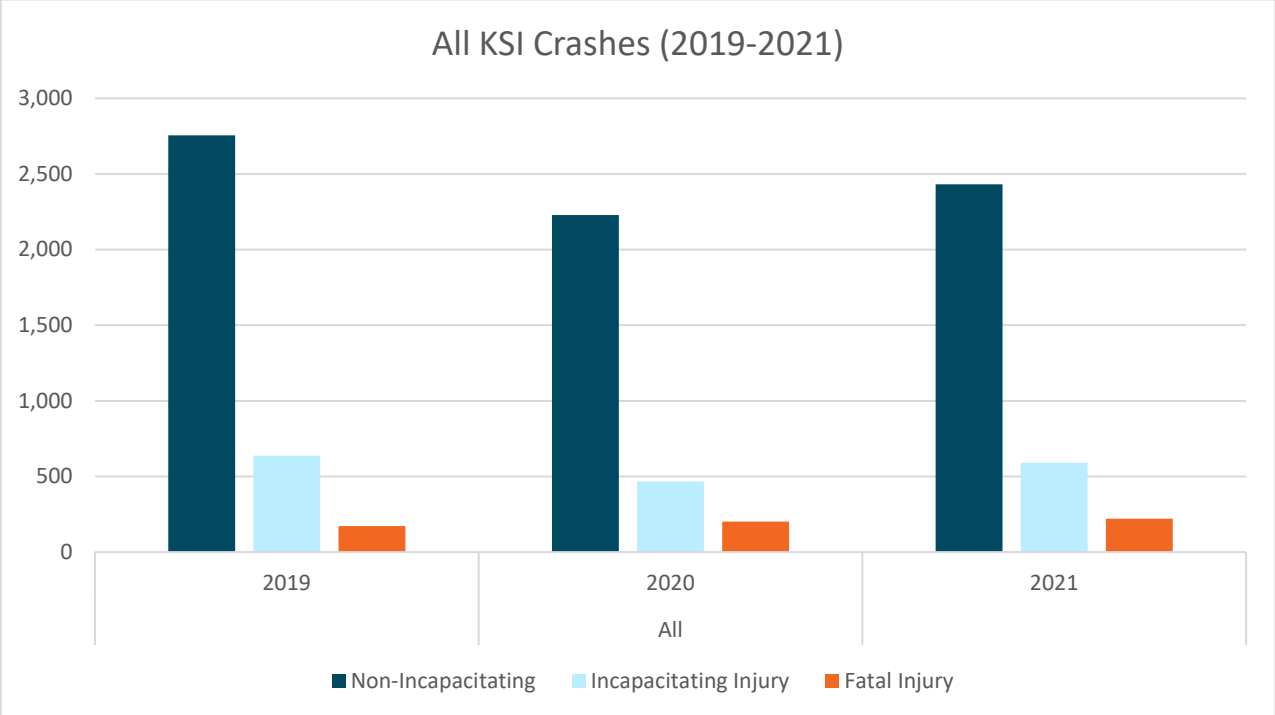
[9] https://oklahoma.gov/highwaysafety/data/current-crash-data.html

ACOG crash data from 2019 to 2021 are shown in **Table 10 and Figure 10,** which summarizes the number of non-incapacitating, incapacitating, and fatal injury crashes by severity in the ACOG MPO TMA from 2019 to 2021. The severity levels follow the traditional "KABCO" scale developed by the National Safety Council (NSC) including the fatal injury (K), incapacitating injury (A), non-incapacitating (B), while not including the possible injury (C) and property damage only (O).

Table 10: **Number of Crashes in the ACOG MPO TMA by Severity Level (2019-2021)**

Collision Type	Recent Years	Property Damage Only	Possible Injury	Non-Incapacitating	Incapacitating Injury	Fatal Injury	Total	Past Total	
All	2019	39	144	2,756	638	173	3,750	2012	26,242
	2020	28	130	2,228	467	201	3,054	2013	27,278
	2021	36	146	2,431	592	221	3,426	2014	26,384
Pedestrian	2019	16	89	105	66	29	305	2012	243
	2020	16	84	72	63	38	273	2013	235
	2021	16	95	102	73	40	326	2014	199
Bicycle	2019	23	55	67	24	6	175	2012	125
	2020	12	46	43	14	4	119	2013	113
	2021	20	51	40	13	5	129	2014	199

Figure 10: **All KSI Crashes from 2019 to 2021**



SYSTEM PRESERVATION

System Preservation is a critical component of this congestion management process, focusing on maintaining and improving the existing infrastructure to ensure its safety, reliability, and longevity. Together, the following measures provide a comprehensive view of the system's current state, guiding effective maintenance and investment strategies to support long-term preservation goals. Table 11 shows the Tier 1 measures.

Tier 1 Performance Measures

- Percent of Roadways Above PCI 70 (currently only have ODOT data)
  - The amount of roadways with a Pavement Condition Index score of 70 or above. These roadways are in poor condition or worse.
- Number of Bridges with Poor Sufficiency Rating
  - The number of bridges in the region with sufficiency ratings below 50 and between 50-81. These cut off points correspond to the ACOG STBG project scoring, and based on data available from ODOT's Open Data GIS database.

Tier 2 Performance Measures

- Percent of Sidewalks Above PCI 70
  - Percentage of sidewalks in disrepair or poor conditions. Presences of heaved or significant vertical displacement between panels.
- Percent of Trails Above PCI 70
  - Percentage of trails in disrepair or poor conditions. Presences of heaved or significant vertical displacement between panels.
- Percent of updated signal timings.
  - Percentage of intersection Signals that Have Had Timing Reviewed in the Past 3 Years.
- Truck Route Adherence
  - Percentage of thru truck traffic that does not utilize/follow identified truck routes.

Table 11: **Tier 1 Performance Measurements for System Preservation Goal**

Goal Area/Performance Measure	Calculation Method	Current Results	Data Source
Percent of Roadways Above PCI 70	GIS Tabulation	*ACOG sending data*	ACOG
Number of Bridges with Poor Sufficiency Rating	Below 50	On System: 131 Off System: 516	ODOT GIS[6]
	50-81	On System: 326 Off System: 584	

IMPLEMENTING MULTIMODAL PERFORMANCE MEASURES

Implementing multimodal performance measures is essential for advancing a data-driven and equitable approach to congestion management in the ACOG region. Regular analysis and accessible reporting, such as dashboards and infographics, empower decision-makers and the public to track progress, identify trends, and prioritize investments that enhance mobility, accessibility, and sustainability across the region.

6.1 DATA COLLECTION AND MANAGMENT

Robust multimodal performance measurement relies on high-quality data. Agencies should invest in automated counters, sensor networks, mobile data, and integrated data management platforms. GIS mapping enables spatial analysis of congestion, accessibility, and equity.

6.2 ANALYSIS AND REPORTING

Performance measures should be analyzed regularly and reported in accessible formats. Dashboards, maps, and infographics help decision-makers and the public understand congestion issues and progress. Comparative analysis between corridors and time periods is valuable for trend identification.

6.3 INTEGRATION WITH STRATEGY DEVELOPMENT

Multimodal performance data informs CMP strategy selection. Agencies can prioritize projects to improve throughput, accessibility, safety, and environmental outcomes across all modes. Scenario modeling and performance forecasting support decision-making.

6.4 CONTINUOUS IMPROVEMENT

The CMP should be a living process, with performance measures guiding strategy updates and investments. Agencies must review measures periodically, adapt to emerging technologies (such as micro-mobility and autonomous vehicles), and respond to shifting travel patterns.

Continuous improvement is at the heart of effective multimodal performance measurement. As travel patterns shift and new technologies emerge, agencies must periodically review and adapt their performance measures to ensure relevance and accuracy. By integrating these measures into strategy development and investment decisions, the Congestion Management Process remains a dynamic tool, guiding the region toward more efficient, equitable, and resilient transportation solutions that respond to evolving community needs.

CHALLENGES AND CONSIDERATIONS

While multimodal performance measurement offers significant benefits, its implementation is not without challenges. Key considerations agencies must address, include the need for robust interagency coordination, resource constraints, meaningful community engagement, and the integration of technological advancements. Successful multimodal measurements depend on clear data-sharing protocols, common performance definitions, and a commitment to reflecting community values in both priorities and outcomes.

7.1 INTERAGENCY COORDINATION

Multimodal performance measurement requires collaboration across transportation, planning, transit, and public works agencies. Clear data sharing protocols and common performance definitions are key.

7.2 RESOURCE CONSTRAINTS

Comprehensive data collection and analysis can be resource-intensive. Agencies may need to phase in measures, prioritize high-impact corridors, and leverage technology for efficiency.

7.3 COMMUNITY ENGAGEMENT

Performance measures should reflect community values and goals. Agencies must engage residents, businesses, and advocacy groups in defining priorities and evaluating outcomes.

7.4 TECHNOLOGICAL ADVANCEMENTS

Emerging technologies, such as connected vehicles, real-time transit information, and crowdsourced reporting offer new opportunities to enhance multimodal performance measurement.

Navigating these challenges requires flexibility, collaboration, and innovation. Agencies must strategically phase in new measures, leverage technology to maximize efficiency, and foster ongoing dialogue with stakeholders to ensure that performance metrics remain aligned with regional goals. By proactively addressing resource limitations and embracing emerging tools, the region can build a more responsive and inclusive congestion management framework—one that supports continuous progress toward safer, healthier, and more connected communities.

CONGESTION MANAGEMENT PROBLEMS & NEEDS

Chapter 8 presents the analysis of congestion problems and needs of the CMP Focus Corridors. The analysis utilizes streetlight segment level data and aggregates the congestion metrics up to corridor levels. Three methodologies show a range of potential congestion characteristics for different corridors.

- Corridor Average Congestion
- Corridor Peak Hour Congestion
- Peak Hour Weighted Congestion

Based on the analysis, the 5pm-6pm hour was the highest peak congestion time throughout the region, particularly on roadways with regional significance. The CMP Focus Corridors were categorized in two buckets, Freeways (F) and Arterials (A). This categorization will play a role in approaches to solutions and helps better define the types of congestion experienced on different roadways.

8.1 METHODOLOGIES

METHODOLOGY 1 - CORRIDOR AVERAGE CONGESTION

This methodology focuses on congestion on the corridor across an average weekday, giving value to minor congestion seen on non-peak hours. **Figure 11** shows the results of Methodology 1.

- Average Severity of Congestion:
  - For each corridor, the average of Congestion (1 - Free Flow Factor) across all hourly columns is calculated.
    - This reflects how severe the congestion is, with higher values indicating more severe congestion.
- Worst Severity of Congestion:
  - For each corridor, the average of (1 - congestion value) across all hourly columns is calculated.
    - This reflects how severe the congestion is, with higher values indicating more severe congestion.
- Longevity of Congestion:
  - For each corridor, the number of hours where Free Flow Factor is < 0.85 (Congestion > 0.15) is counted.
    - This indicates how long the corridor experiences significant congestion.
- Normalization:
  - The two severity and one longevity scores is normalized to a 0-1 scale using Min/Max scaler for comparability.
- Composite Rank:
  - The final rank is the average of the 3 normalized severity and longevity scores.
    - Higher composite rank values indicate corridors with more severe and prolonged congestion.

Corridor Average Impact Results

This graph shows the distribution of average corridor congestion on each corridor across each hour of the day.

The darker red indicates higher congestion. Free Flow Factors greater than 0.85 are not shown on this graphic.

The graph highlights 5-6pm is the heaviest congestion hour for most corridors, and it is the hour with the most congested corridors.

Figure 11: Methodology 1 – Corridor Average Results

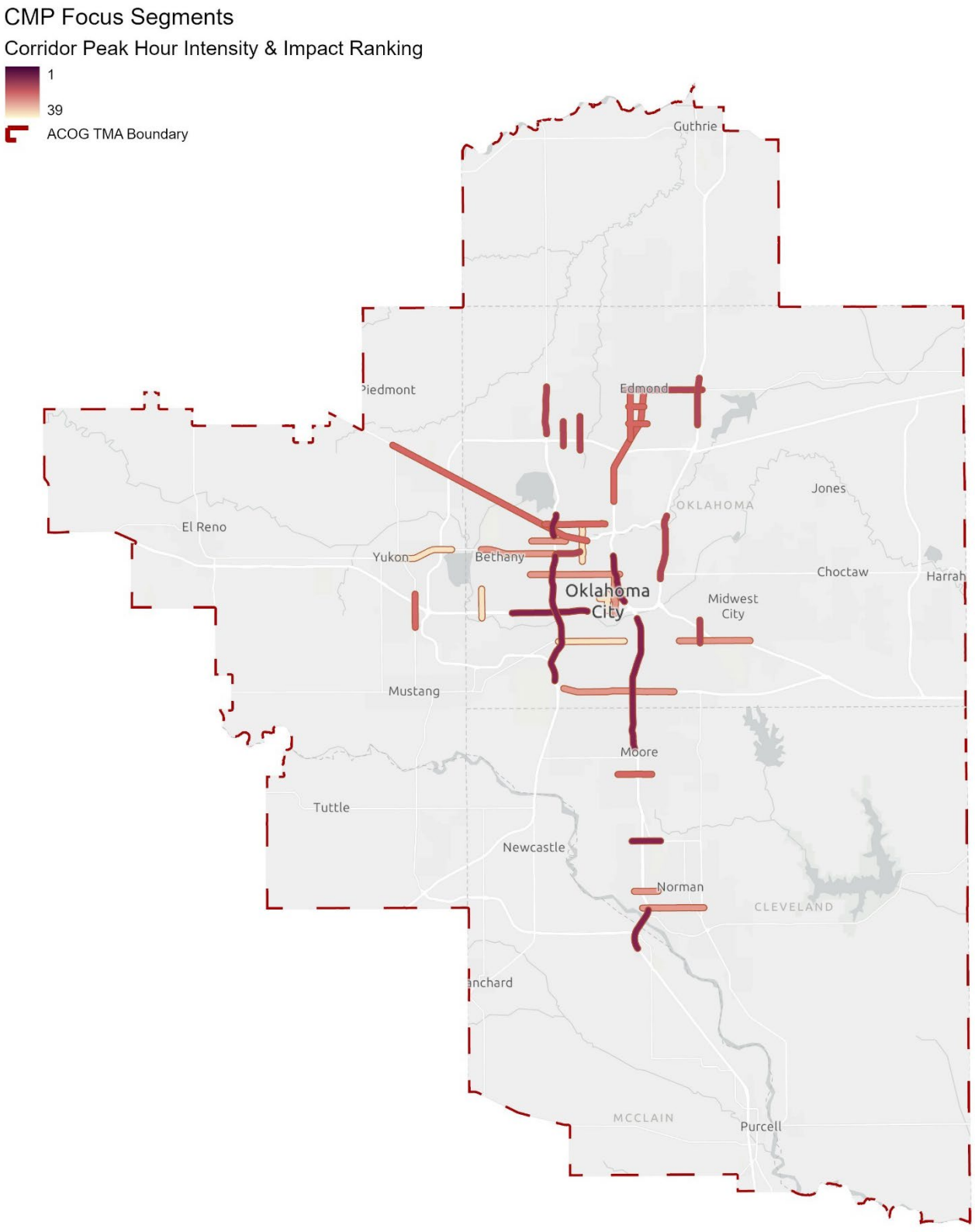
Corridor ID	Corridor Name	Corridor Type	Ranking	12am-1am	1am-2am	2am-3am	3am-4am	4am-5am	5am-6am	6am-7am	7am-8am	8am-9am	9am-10am	10am-11am	11am-noon	noon-1pm	1pm-2pm	2pm-3pm	3pm-4pm	4pm-5pm	5pm-6pm	6pm-7pm	7pm-8pm	8pm-9pm	9pm-10pm	10pm-11pm	11pm-12am
32	NW 4th/Harrison Ave	A	1							0.83	0.75	0.74	0.76	0.75	0.74	0.73	0.74	0.74	0.72	0.67	0.68	0.77	0.78	0.79	0.80	0.81	
19	Oklahoma City Blvd	A	2	0.64							0.84	0.84	0.83	0.83	0.81	0.78	0.78	0.80	0.79	0.77	0.73	0.72	0.77	0.79	0.72	0.77	
31	Walker Ave	A	3	0.83						0.84	0.74	0.77	0.77	0.75	0.75	0.74	0.71	0.73	0.76	0.75	0.74	0.75	0.76	0.81	0.80	0.77	
41	Sooner Rd	A	4								0.81	0.80	0.80	0.79	0.75	0.73	0.75	0.75	0.73	0.69	0.68	0.74	0.78	0.81	0.84		
5	Tecumseh Rd	A	5							0.83	0.74	0.73	0.76	0.76	0.74	0.73	0.75	0.73	0.71	0.71	0.70	0.76	0.81	0.83			
10	NW 50th St	A	6								0.81	0.79	0.80	0.79	0.78	0.77	0.78	0.77	0.74	0.74	0.73	0.77	0.80	0.82	0.84		
12	15th Street	A	7								0.79	0.77	0.80	0.80	0.78	0.75	0.77	0.77	0.74	0.73	0.70	0.80	0.84				
14	SW 29th St	A	8								0.82	0.80	0.82	0.83	0.81	0.81	0.81	0.80	0.77	0.73	0.74	0.77	0.80	0.83			
6	SE 29th St	A	9								0.84	0.83	0.83	0.82	0.78	0.76	0.78	0.78	0.75	0.75	0.75	0.78	0.81	0.84			
25	N May Ave	A	10										0.84		0.79	0.76	0.79	0.80	0.79	0.76	0.71	0.77	0.81				
22	W Main St	A	11									0.82	0.83	0.80	0.78	0.76	0.77	0.77	0.75	0.76	0.75	0.79	0.82	0.83			
28	N Portland Ave	A	12								0.77	0.78	0.82	0.83	0.83	0.83	0.83	0.82	0.79	0.76	0.72	0.80					
27	Shields Blvd	A	13	0.84								0.83	0.84		0.83	0.81	0.82	0.84	0.84	0.79	0.78	0.81	0.84	0.84			
30	NW 23rd St	A	14								0.84	0.80			0.82	0.79	0.80	0.80	0.75	0.76	0.76	0.79	0.82	0.83			
33	S Kelly Ave	A	15								0.84	0.81	0.83	0.82	0.80	0.79	0.80	0.80	0.79	0.77	0.74	0.82					
4	Pennsylvania	A	16											0.84	0.82	0.79	0.80	0.81	0.80	0.78	0.76	0.78	0.81	0.82			
24	NW 63rd	A	17								0.84	0.84			0.80	0.79	0.80	0.81	0.81	0.78	0.75	0.83					
38	SW 19th St	A	18										0.84		0.82	0.79	0.81	0.82	0.80	0.77	0.76	0.79	0.83	0.84			
26	W 33rd St	A	19								0.84	0.84	0.84	0.84	0.79	0.75	0.78	0.79	0.78	0.77	0.75	0.82					
23	NE 10th St	A	20										0.84	0.83	0.82	0.81	0.82	0.82	0.81	0.75	0.76						
18	E 2nd St	A	21									0.84			0.83	0.81	0.82	0.81	0.78	0.79	0.76	0.81	0.84				
40	I-35 - OKC to Moore	F	22								0.81	0.80							0.83	0.68	0.65						
9	I-44	F	23								0.80	0.81							0.84	0.71	0.65						
20	Lindsey St	A	24															0.84	0.82	0.81	0.80	0.82	0.84	0.83			
34	NW Expressway	A	25												0.84	0.83	0.84	0.84	0.83	0.82	0.79	0.83	0.84				
39	E Main/Hwy 66	A	26								0.83					0.84	0.84	0.83	0.82	0.82	0.80	0.83					
11	S Mustang Rd	A	27								0.81	0.84							0.84	0.81	0.78	0.83					
7	I-235	F	28																0.84	0.70	0.69						
2	I-40	F	29																	0.75	0.71						
35	Pennsylvania Ave - Central	A	30																0.83	0.82	0.81	0.84					
15	NW 39th	A	31									0.84							0.83	0.83	0.82						
8	S Council Rd	A	32																0.83	0.82	0.81						
36	I-35 Central	F	33																	0.81	0.77						
1	Hwy 77/Broadway Ext	A	34																		0.83						
17	I-44 - SH74 Thru Youngs Blvd	F	35																	0.83	0.78						
37	I-240	F	36																								
3	74/Lake Hefner Pkwy	A	37																		0.79						
21	I-35 South	F	38																		0.79						
16	I-35 North	F	39																		0.80						

METHODOLOGY 2 - CORRIDOR PEAK HOUR CONGESTION

This analysis focuses on the entire corridor average values in the peak hour. The average Free Flow Factors and corridor volumes are utilized, without accounting for the length of the corridor. **Figure 12** shows results of Methodology 2.

- Severity of Congestion:
  - For each corridor, the congestion is calculated (1- Free Flow Factor).
    - This reflects how severe congestion is, with higher values indicating more severe congestion.
- Intensity/Impact of Congestion:
  - For each corridor, multiply the Severity by the Average Daily Traffic experienced in that corridor.
    - This indicates how impactful the Severity of congestion is for the full corridor.

Figure 12: **Methodology 2 – Results Peak Hour Congestion**



METHODOLOGY 3 - PEAK HOUR WEIGHTED CONGESTION

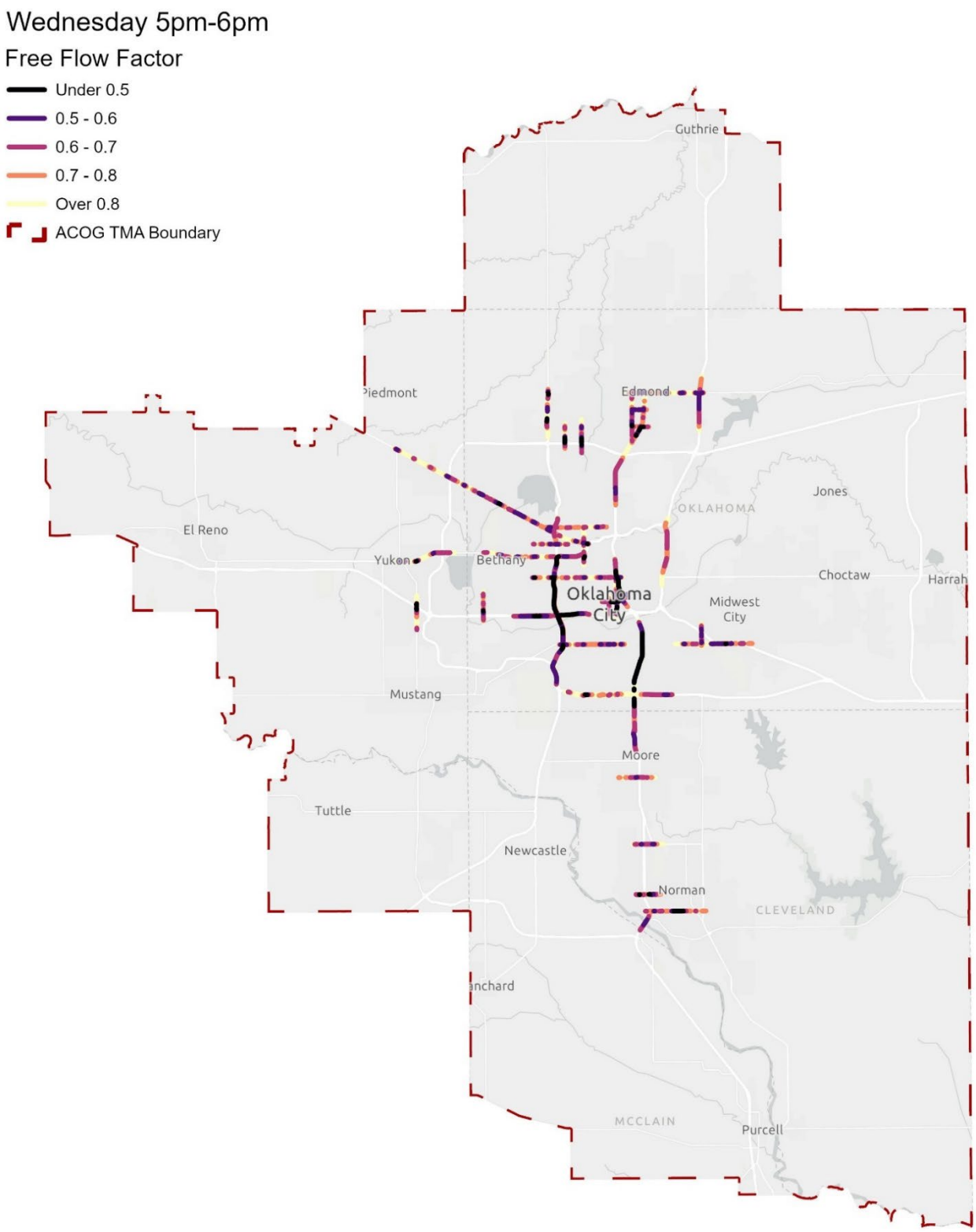
Methodology 3 analysis leverages the higher fidelity and variability of segments reported from streetlight which make up a CMP Focus Corridor. This more intensive analysis accounts for the differences in congestion metrics, volumes, and segment lengths before summing to the corridor level. **Figures 13 and 14** show methodology 3 results.

- Severity of Congestion:
  - For each segment, the congestion is calculated (1 - Free Flow Factor).
    - This reflects how severe congestion is, with higher values indicating more severe congestion.
- Portion of the Corridor
  - Determine what percentage each segment represents for the entire corridor
    - The total length of the corridor is calculated as the summation of the segment lengths.
- Impact of Congestion:
  - For each segment, multiply the Congestion Severity by the Average Daily Traffic experienced by that segment.
    - This indicates how many people are experiencing the Severity of congestion in the segment.
- Segment Level Weighted Congestion Impact:
  - For each corridor, sum the Congestion Impact across all segments in that corridor.
    - This indicates how impactful the Severity of congestion is for the full corridor.

Figure 13: Methodology 3 – Segment Level Peak Hour Intensity and Impact Rankin

Corridor ID	Corridor Name	Type	Ranking	5pm Average Daily Segment Traffic	Congestion Severity	Segment level volume weighted congestion
2	I-44	F	1	4,165	0.348	1400.7
8	I-235	F	2	4,335	0.307	1287.8
7	I-35 - OKC to Moore	F	3	3,884	0.350	1241.3
1	I-40	F	4	3,857	0.290	1190.6
3	74/Lake Hefner Pkwy	F	5	4,128	0.205	879.3
16	I-35 Central	F	6	2,466	0.229	559.6
21	I-35 South	F	7	2,694	0.211	541.0
41	Tecumseh Rd	A	8	2,005	0.300	541.0
17	I-35 North	F	9	2,861	0.198	540.2
15	Hwy 77/Broadway Ext	A	10	2,137	0.173	534.1
37	I-44 - SH74 Thru Youngs Blvd	F	11	2,484	0.222	516.9
5	Sooner Rd	A	12	1,611	0.318	499.0
30	N May Ave	A	13	1,760	0.291	449.8
28	N Portland Ave	F	14	1,725	0.278	433.2
23	E 2nd St	A	15	1,826	0.244	418.2
24	S Kelly Ave	A	16	1,501	0.262	407.0
26	W 33rd St	A	17	1,612	0.254	398.4
25	15th Street	A	18	1,338	0.299	387.9
33	SW 19th St	A	19	1,638	0.237	385.8
38	NW 63rd	A	20	1,572	0.253	383.4
9	NW Expressway	A	21	1,811	0.211	378.5
27	Pennsylvania	A	22	1,864	0.241	342.7
34	S Mustang Rd	A	23	1,777	0.219	341.3
36	I-240	F	24	1,873	0.153	334.3
22	W Main St	A	25	1,214	0.253	301.8
10	NW 50th St	A	26	1,151	0.274	262.3
6	SE 29th St	A	27	1,128	0.254	259.5
4	NW 23rd St	A	28	1,087	0.242	256.8
40	Lindsey St	A	29	1,217	0.200	253.9
13	Shields Blvd	A	30	1,123	0.224	239.5
35	S Council Rd	A	31	1,268	0.188	237.0
11	NW 39th	A	32	1,325	0.180	214.2
20	E Main/Hwy 66	A	33	1,068	0.205	197.8
14	SW 29th St	A	34	773	0.257	193.8
18	NE 10th St	A	35	581	0.244	178.9
32	NW 4th/Harrison Ave	A	36	520	0.322	176.8
39	Pennsylvania Ave - Central	A	37	942	0.191	174.1
19	Walker Ave	A	38	569	0.265	151.4
31	Oklahoma City Blvd	A	39	555	0.267	120.0

Figure 14: **Methodology 3 – Segment level Peak Hour Intensity Map**



8.2 SUMMARY ANALYSIS

It is recommended for Methodology 1 and Methodology 3 for congestion analysis because each provides unique and complementary insights into corridor performance.

- Methodology 1, Corridor Average Congestion Ranking, evaluates the severity and longevity of congestion across all hours of a typical weekday. By averaging congestion metrics over time, this approach captures not only peak-hour bottlenecks but also persistent, lower-level congestion that can impact overall mobility. It normalizes severity and duration scores, allowing for a composite ranking that highlights corridors with both acute and chronic congestion issues. This broader perspective is valuable for identifying corridors that may not have the worst peak-hour congestion but still experience significant delays throughout the day.
- Methodology 3, Peak Hour Weighted Congestion, offers a more granular and intensive analysis by leveraging segment-level data. It accounts for differences in congestion, traffic volumes, and segment lengths, then aggregates these impacts to the corridor level. This method is particularly effective at pinpointing where most people are affected by severe congestion during the highest demand periods. By weighting congestion by both severity and the number of travelers affected, it provides a robust measure of the true impact on users, ensuring that high-volume segments receive appropriate attention in planning and investment decisions.

Together, these methodologies provide a comprehensive understanding of congestion patterns. Methodology 1 ensures that persistent, off-peak congestion is not overlooked, while Methodology 3 focuses resources on the most critical peak-hour problems. This dual approach supports more effective prioritization of strategies and investments, helping agencies address both daily operational challenges and acute congestion hotspots for a more efficient and equitable transportation system. **Figure 15** summarizes the three methodologies.

Figure 15: Final CMP Focus Corridor Rankings

Corridor ID	Corridor Name	Type	Methodology 1 Corridor Average Impact	Methodology 2 Corridor Peak Hour Congestion	Methodology 3 Weighted Peak Hour Congestion
2	I-44	F	23	1	1
8	I-235	F	28	3	2
7	I-35 - OKC to Moore	F	22	2	3
1	I-40	F	29	4	4
3	74/Lake Hefner Pkwy	F	37	5	5
16	I-35 North	F	39	9	6
21	I-35 South	F	38	7	7
41	Tecumseh Rd	A	5	6	8
17	I-35 Central	F	33	8	9
15	Hwy 77/Broadway Ext	A	34	23	10
37	I-44 - SH74 Thru Youngs Blvd	F	35	10	11
5	Sooner Rd	A	4	12	12
30	N May Ave	A	10	11	13
28	N Portland Ave	F	12	13	14
23	E 2nd St	A	21	15	15
24	S Kelly Ave	A	15	19	16
26	W 33rd St	A	19	16	17
25	15th Street	A	7	17	18
33	SW 19th St	A	18	21	19
38	NW 63rd	A	17	18	20
9	NW Expressway	A	25	22	21
27	Pennsylvania	A	16	14	22
34	S Mustang Rd	A	27	20	23
36	I-240	F	36	26	24
22	W Main St	A	11	25	25
10	NW 50th St	A	6	24	26
6	SE 29th St	A	9	27	27
4	NW 23rd St	A	14	28	28
40	Lindsey St	A	24	30	29
12	Shields Blvd	A	13	29	30
35	S Council Rd	A	32	32	31
11	NW 39th	A	31	31	32
20	E Main/Hwy 66	A	26	33	33
14	SW 29th St	A	8	34	34
18	NE 10th St	A	20	39	35
32	NW 4th/Harrison Ave	A	1	36	36
39	Pennsylvania Ave - Central	A	30	35	37
19	Walker Ave	A	3	37	38
31	Oklahoma City Blvd	A	2	38	39

CONGESTION STRATEGY FRAMEWORK

Effectively managing congestion requires a clear framework that connects data-driven analysis with coordinated, multimodal solutions. As travel patterns evolve and the region continues to grow, the CMP provides a structured approach for identifying the most appropriate strategies to address congestion across diverse contexts. This framework emphasizes making the best use of the existing transportation system by leveraging operations, technology, transit, and active transportation improvements, while ensuring that any future capacity projects are grounded in demonstrated need and aligned with regional and federal goals. By organizing strategies into cohesive categories and illustrating how they work together, the CMP helps guide agencies toward investments that improve mobility, enhance safety, strengthen reliability, and support an accessible multimodal network.

9.1 PURPOSE OF IDENTIFYING MULTIMODAL STRATEGIES

Managing congestion effectively calls for coordinated multimodal strategies that enhance mobility, reliability, and safety. The updated CMP focuses on operational efficiency and optimizing the system with multimodal investment, prioritizing these approaches over expanding roadways. This aligns with national standards, federal requirements, and the region's goals for sustainability, economic growth, and equitable access.

9.2 STRATEGY INTERCONNECTIONS

The congestion management strategies in this CMP were developed to support both the regional priorities outlined in Encompass 2045 and the federally required framework for managing congestion in Transportation Management Areas. Encompass 2045 emphasizes a transportation system that is safe, efficient, equitable, and multimodal. The CMP directly advances these priorities by focusing first on strategies that optimize the existing network, such as traffic operations, transit enhancements, travel demand management, and bicycle and pedestrian improvements before considering roadway capacity expansion. This ensures that regional investments support the goals of improving mobility, expanding travel options, reducing crashes, and promoting healthier, more connected communities.

These strategies also meet the federal expectations established in 23 CFR 450.320, which require MPOs to apply a systematic, performance-based approach to identifying and addressing congestion. The CMP incorporates federal performance measures related to safety, reliability, freight movement, and environmental outcomes, and uses data-driven analysis to pinpoint congested locations and select appropriate strategies. By linking CMP findings to both the Metropolitan Transportation Plan and the TIP, the region ensures that federally funded projects, especially those adding capacity, are consistent with the CMP and include consideration of multimodal or operational solutions.

Together, this alignment strengthens the region's ability to manage congestion cost-effectively while advancing long-term regional goals. The CMP becomes not only a federal requirement, but a practical tool for guiding investment decisions, improving system performance, and supporting the broader vision of Encompass 2045.

STRATEGY IDENTIFICATION PROCESS

The process for identifying strategies took place through review of peer agency, Federal, and Encompass 2045 strategies. Additionally, stakeholders were engaged and challenged to review the existing strategies from the 2016 CMP and provide feedback related to strategy feasibility within their respective jurisdictions. Ensuring that the congestion management toolbox aligns with existing policy as well as real-time feasibility within member jurisdictions is key in this process.

10.1 EXISTING STRATEGIES - REVIEW

As part of the CMP update, stakeholder agencies were asked to review the regional congestion management toolbox and provide both a numerical effectiveness score, between 1 and 5 with 5 indicating high support for the strategy. Feedback was received from Edmond, Norman, Oklahoma City, ODOT, and Noble. Overall, the strategies with the strongest support were those providing practical, lower-cost operational improvements that can be implemented in the near-term and yield consistent, measurable benefits. Stakeholders emphasized strategies addressing signal coordination, access management, traffic operations, and targeted roadway improvements are most effective across a variety of roadway types.

Participants expressed mixed views on strategies relying on behavioral change or widespread public participation, such as ridesharing, telecommuting programs, or carsharing. While these strategies were recognized as potentially beneficial, their effectiveness was considered highly dependent on user adoption rates and the presence of supporting programs (e.g., Guaranteed Ride Home). Feedback on strategies, particularly HOV lanes, major transit expansion, and carsharing—are effective in higher-density corridors with significant demand. Jurisdictions with suburban or rural roadway networks noted these strategies provide limited congestion relief, compared to operational improvements.

Stakeholders also noted that short-term treatments such as shoulder running, or interim lane expansions can help manage congestion temporarily but do not fully address long-term capacity needs. Meanwhile, high-capacity transit received philosophical support, but scored lower due to concerns about feasibility, cost, and current ridership demand.

Overall, stakeholder comments on the previous strategies reflect a preference for scalable, cost-effective, and data-driven strategies that improve traffic flow and safety without requiring major capital investment or large-scale cultural shifts. These priorities help guide the refinement of the CMP toolbox, presented in the next chapter, and align future strategy selection with both regional conditions and local agency needs. Table 12 summarizes stakeholder feedback on previous strategies.

Table 12: **Stakeholder Feedback on Previous Strategies**

Strategy Category	General Support Level	Key Themes from Feedback	Applicability Notes
Traffic Incident Management	High (5)	High support. Alleviates congestion and improves safety.	Applicable on all roadway types.
Transit Rights-of-Way	High (5)	Increased travel time reliability; Reduced VMT; Stimulation of mixed use and high density land uses adjacent to corridor	Arterials and highways; scalable region-wide.
Signal Coordination & ITS	High (4–5)	Provides immediate flow benefits; strong value across jurisdictions.	Arterials and highways; scalable region-wide.
Access Management	High (4–5)	Highly effective for improving safety and reducing delays.	Best on arterials and suburban corridors.
Intersection Improvements	High (4–5)	Cost-effective congestion reduction at bottlenecks.	Applicable on all roadway types.
Minor Widening / Operational Improvements	High (4–5)	Affordable and impactful short-term improvements.	Applicable on highways and arterials; short-term.
Telecommuting & Flex Schedules	High (4-5)	Reduces peak demand but depends on employer uptake.	Effective across all facility types.
Transit Improvements / High-Capacity Transit	High (4–5)	Strong conceptual support.	Works in dense corridors with strong demand.
Ridesharing / Vanpooling	Medium (3–4)	Useful but participation varies; dependent on incentives.	Better for regional commuter corridors.
Carsharing	Medium (3)	Minimal impact in low-density areas; low adoption expected.	Most applicable in dense urban districts.
HOV Lanes	Low-Medium (2–3)	Only effective in very congested, high-volume corridors.	Limited to major freeway corridors.
Alternative Mode Events	Medium (3)	Helpful for awareness but limited congestion relief.	Best as supplemental TDM programming.
Shoulder Running / Interim Capacity	Medium (3)	Useful short-term fix but not a long-term congestion solution.	Highway corridors with physical constraints.

10.2 IDENTIFYING STRATEGIES

A main element of this updated CMP is to recommend solutions for managing congestion and meeting regional goals. Federal guidance suggests strategies should align with regional objectives, fit local needs, support other goals, and consider collaboration for assigning implementation responsibilities. CMP goals and actions help guide the selection of suitable strategies for specific congestion problems.

Agencies need to understand both current system operations and anticipated future needs or issues. Congestion management strategies may differ based on the following scenarios.

- The specific congestion issue or dimension that needs to be addressed
- The objectives to be accomplished by the deployed strategy
- Whether the strategy is to be implemented on a new or an existing facility
- The availability of right-of-way
- The current operational characteristics
- Environmental and societal concerns

The recommended strategies presented in the next chapter align with the Encompass 2045 goals and the CMP objectives. The strategies are feasible, actionable, and achievable through active collaboration among sponsoring and administering partners. In summary, this chapter established a framework for identifying and assessing the existing congestion management strategies. Insights from best practices, the previous ACOG CMP, and stakeholder feedback have informed the recommended toolbox strategies.

RECOMMENDED CONGESTION MANAGEMENT TOOLBOX

The congestion management strategies include a range of projects, actions, programs, and policies designed to mitigate traffic congestion within the ACOG transportation network. This chapter includes a tailored toolbox with different approaches aimed at addressing regional congestion issues, bottlenecks, and mobility requirements as identified through comprehensive data analysis.

ACOG's existing metropolitan transportation plan (Encompass 2045) and CMP prioritize demand management strategies that reduce or eliminate travel. Federal policy requires cost-effective congestion management approaches before considering expensive options that increase single-occupant vehicle capacity.

In accordance with 23 CFR 450.320 (c) 4[10], the following list of congestion management strategy types has been developed for the ACOG MPO TMA in concert with the Encompass 2045 and CMP guiding principles.

- Travel demand management (TDM) strategies that eliminate or reduce the need to make trips by motor vehicle.
- Strategies for integrating transportation and land use to promote mixed-use and transit-oriented development, increasing density and lowering reliance on motor vehicles.
- Technology solutions through the use of transportation systems management and operations (TSM&O) and intelligent transportation systems (ITS) to maximize the efficiency of the existing infrastructure.
- Public transit enhancements and projects make transit a more attractive and competitive mode of transportation in the ACOG MPO TMA.
- Bicycle and pedestrian improvements to enhance the reach of the public transportation system and encourage trips by nodes other than single occupancy vehicles.
- Improvements to roadways that include access consolidation and control, complete streets policies, restriping, and finally the addition of lanes or construction of new facilities where no other solutions can minimize or alleviate congestion effectively.

Each strategy type is detailed in **Table 13,** following the strategy types, outlines the congestion management toolbox, grouping strategies by category. Some are regional or system-wide, while others target specific corridors or projects. For each, potential congestion reduction, recommended analysis methods, and estimated costs (low, medium, high) are noted, along with implementation timeframes. The toolbox highlights companion strategies to optimize results when used together. The congestion management toolbox also includes alignment with Encompass 2045 project selection criteria. This ensures projects are aligned with the MTP and TIP processes, while simultaneously working towards congestion management

[10] eCFR :: 23 CFR 450.320 -- Development of programmatic mitigation plans.

12.1 SIX CONGESTION MANAGEMENT STRATEGY TYPES

1. TRAVEL DEMAND MANAGEMENT

Seven different Travel Demand Management (TDM) strategies are identified including:

1. Alternative work schedules
2. Telecommuting
3. Ridesharing
4. Alternative mode events
5. Employer incentive programs
6. Carsharing
7. Pricing strategies

These strategies generally have low to moderate costs and offer advantages like cutting down peak travel times and reducing the number of single-occupancy vehicle miles traveled (VMT). This can lead to several environmental benefits, such as better air quality and lower greenhouse gas emissions. While assessing the effectiveness of these methods regionally is challenging, they often yield better results in targeted areas like districts, business parks, or specific subareas. TDM strategies can also be successfully coordinated with public transit options, park-and-ride facilities, and land use, cycling, and pedestrian initiatives.

2. TRANSPORTATION AND LAND USE COHESION

Transportation and land use cohesion strategies are designed to optimize management of properties surrounding and connected to significant transportation infrastructure. These approaches involve revising planning and zoning regulations to promote development that aligns with the characteristics and requirements of the related transportation networks.

Previous strategies are:

- Encouraging infill development and densification,
- Promoting mixed-use development, and
- Creating guidelines to promote transit-oriented development.

Implementing land use policies effectively can cut down on single-occupant vehicle trips, since people living or working nearby have shorter distances to reach commercial areas and activity centers. The land use policies are also dependent upon the development and implementation pedestrian infrastructure strategies that enhance a traveler's ability to navigate an environment by walking (i.e. sidewalks, mid-block crossings, safe crossing infrastructure, etc.)

Generally, developing these strategies is affordable for the agency or jurisdiction, with costs remaining low to moderate. While policy creation can happen quickly, achieving full integration between land use and transportation takes longer because it depends on ongoing development and redevelopment. Working with private companies, public transit providers, and planners for biking and walking routes helps improve coordination between land use and transportation. Most of these land use approaches are not expensive and typically require new ordinances or economic incentives to motivate developers to get involved.

3. TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSM&O) AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

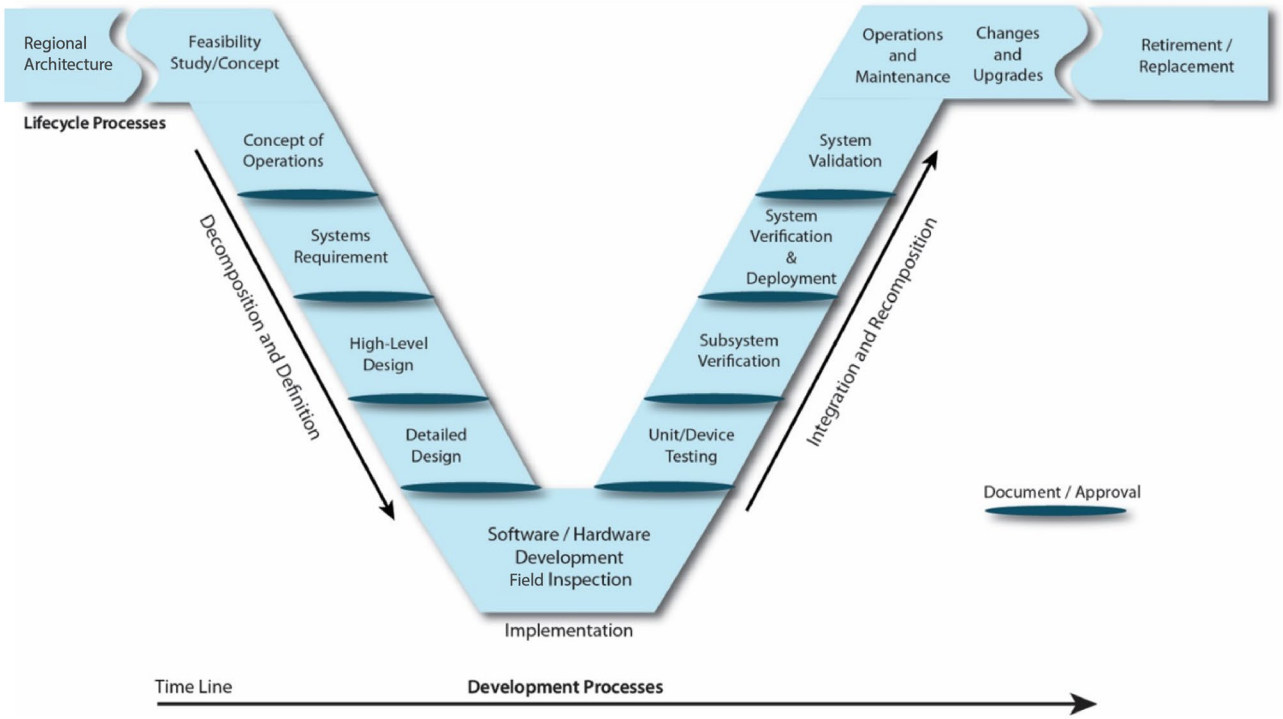
Transportation system management and operations (TSM&O) and intelligent transportation systems (ITS) use modern technologies to improve how well current transportation infrastructure works. These strategies aim to get the most use out of the existing network without building extra lanes or expanding physical capacity.

Fourteen TSM&O/ITS strategies have been identified for the ACOG MPO TMA. These strategies rely heavily on coordinating with related initiatives to maximize effectiveness. An integrated network of ITS and TSM&O approaches significantly aids regional congestion reduction.

Examples of the strategies recommended for ACOG and the TMA include enhanced traffic enforcement, developing work zone management principles, enhancing the parking management program, speed harmonization, ramp metering, managed lanes, intersection enhancements for bicycles and pedestrians, formalizing a traffic incident management program and various communications and traffic monitoring improvements.

The costs associated with these improvements are generally considered low to moderate. Regional implementation of ITS infrastructure requires adherence to specific requirements in order to qualify for federal funding. When ITS deployments incorporate new technologies or involve multiple jurisdictions or agencies, a systems engineering process is mandated. While this procedure may extend the project timeline, it plays a crucial role in ensuring that the deployed technology aligns with the community's needs. A diagram of the systems engineering process is shown below in **Figure 16.**

Figure 16: **Systems Engineering "V" Diagram**[11]



Source: **Systems Engineering for Intelligent Transportation Systems, FHWA, 2025.**

4. TRANSIT

The Central Oklahoma region is served by three major transit systems, the Central Oklahoma Transportation and Parking Authority (COPTA) operates transit service under the name EMBARK and provides service to Oklahoma City and Norman. The city of Edmond is served by the transit service known as Citylink. Most of these transit routes operate with 30-minute frequency during peak hours (below the level to support spontaneous transit usage). Increasing the share of person

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trips taken on public transportation would lessen the number of vehicle trips and reduce congestion.

ACOG, in partnership with the regional transit providers, has developed a Long Range Transit Plan (LRTP) for the central Oklahoma region. The LRTP's vision statement is to: Develop an intentional plan for a cohesive network of transit services that supports growth, promotes economic mobility, enhances quality of life, and facilitates opportunity across Central Oklahoma. The planning effort, referred to as Connect Central Oklahoma, has identified the following four goals for the investment strategies developed within the plan:

- Provide communities with meaningful access to transit
- Create a compelling, reliable rider experience
- Offer competitive service options
- Utilize resources effectively

The tools within the CMP toolbox align with the proposed invest vision from the LRTP, leveraging strategies to support existing and future high-capacity transit solutions and regional connectivity through 10 public transportation strategies.

1. Expanding enhanced and express bus service,
2. Expanding Bus Rapid Transit (BRT),
3. Developing intersection queue jumps to improve transit travel times,
4. Providing enhanced amenities on vehicles or stops,
5. Increasing bus route coverage or frequency,
6. Developing new fixed guideway travel ways,
7. Implementing dedicated transit rights-of-way,
8. Establish strategic partnerships
9. Invest in transit-oriented development and mobility hubs, and
10. Increase reliable funding for long-term investments and sustainable operations.

Transit strategies vary in cost, with new transit routes and dedicated right-of-way generally being more expensive than boosting service frequency or improving bus stops. While grants often cover capital expenses, securing operational funding for expanded services can be challenging. These strategies help increase transit ridership, reduce vehicle miles traveled, and improve air quality. They are also effective when combined with bicycle, pedestrian, and land use initiatives that encourage less car use.

5. BICYCLE AND PEDESTRIAN

The bicycle and pedestrian network serves as an important extension of the primary public transportation system. This strategic approach explores methods to increase bicycle usage and promote walking trips. Three principal strategies have been identified: constructing new sidewalks and bicycle lanes on local streets, developing regional design guidelines that support bicycle- and pedestrian-friendly development, and expanding bicycle sharing programs. These initiatives are generally associated with low to moderate costs.

Bicycle and pedestrian policies are most effective when integrated with complementary measures, such as the adoption of complete streets policies, land use and transportation coordination strategies that support densification, and enhanced safety measures including improved enforcement.

The implementation of bicycle and pedestrian strategies offers significant benefits by reducing reliance on automobile travel, which consequently decreases vehicle miles traveled (VMT) and enhances regional air quality and congestion. The associated costs for these strategies typically remain low to moderate.

6. ROADWAY IMPROVEMENTS

Federal policy requires cost-effective congestion management strategies are considered before expanding single-occupant vehicle capacity. However, adding lanes or new facilities may sometimes be necessary. Roadway network improvements should be paired with supporting companion strategies.

Eight roadway improvement strategies for the ACOG MPO TMA region aim to enhance operations, address bottlenecks on current facilities, and support other transportation modes where appropriate. Strategies include:

1. Improved signage
2. Access management improvements
3. Turn restrictions at key intersections
4. Adopting local complete streets policies
5. Geometric design improvements to intersections and interchanges
6. Adding capacity through restriping activities or widening (if appropriate)
7. Addition of acceleration or deceleration lanes
8. The development of new arterials or expressways

The cost of roadway improvements varies depending on the strategy's type and complexity. These improvements usually target specific problem areas instead of entire corridors or regions. To achieve the greatest benefit, it's best to combine roadway enhancements with related strategies. For instance, when considering road widening or intersection upgrades, planners should also think about future transit needs and set aside space for possible bus service expansions. The following symbols show the estimated cost for the strategies identified in the toolbox below.

Cost Key

Symbol	Meaning
$	Low Cost
$+	Low to Moderate Cost
$$	Moderate Cost
$$+	Moderate to High Cost
$$$	High Cost

Table 13: Congestion Management Toolbox

1. Travel Demand Management							
Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/ Analysis Tools	Encompass 2045 Connection[2]
Alternative Work Schedules: Continue/expand existing programs to work with employers and employees to leave home and arrive at work location outside traditional peak demand periods.	-Reduced peak period VMT -Improved travel time	N/A	$	Existing	-Telecommuting -Ridesharing -Park & Ride Lots	-Traffic Counts -Participant Surveys	C10, C20, C22 [Performance | Economic Strength | Safety and Security | System Preservation]
Telecommuting: Continue/expand existing programs to work with employers and employees to allow for remote work, work-from-home, and other telecommuting options.	-Reduced peak period VMT -Reduced overall VMT -Reduced overall VHT -Reduced parking demand	N/A	$	Existing	-Alternative Work Schedules -Ridesharing -Park & Ride Lots	-Traffic Counts -Participant Surveys	C10, C20, C22, C14 [Economic Strength | Equity and Options | Performance | System Preservation]
Alternative Mode Events: Continue/expand existing programs to develop additional events that promote non-SOV work trips (e.g. Bike to Work Day, Carpool Day, Vanpool Day, etc.)	-Reduced peak period VMT -Reduced overall VMT -Reduced overall VHT -Reduced parking demand -Increased demand for walking, biking and transit	N/A	$	Existing	-Ridesharing -Managed Lanes -Park & Ride Lots -Transit Programs	-Participant Surveys -Boarding and Alighting Data	C10, C12, C14, C18 [Economic Strength | Equity and Options | Performance | System Preservation]

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/ Analysis Tools	Encompass 2045 Connection[3]
Ridesharing: Continue/expand existing programs to work with users to register and regularly utilize carpooling and vanpooling. Ridesharing programs are most effective when coupled with a guaranteed ride home program to allow for commuters who may have emergencies to know that they can respond immediately should their plans or ride partners' plans change.	-Reduced peak period VMT -Reduced peak period SOV trips -Reduced parking demand -Increased use of alternative modes	Freeway & Arterial	$	Existing	-Alternative Work Schedules -Telecommuting -Guaranteed Ride Home Programs -Managed Lanes	-Traffic Counts -User Logs -Participant Surveys	C10, C20, C22, C3 [Economic Strength | Equity and Options | Performance | System Preservation]
Carsharing: Continue/expand existing programs to deploy carsharing stations in the ACOG region. Currently, Enterprise Carshare, Zipcar, and TimeCar are operating in the ACOG region at limited locations.	-Reduced parking demand -Increased demand for walking, biking and transit	Arterial	$	Existing	-Ridesharing -Managed Lanes -Park & Ride Lots	-Traffic Counts -User Logs -Participant Surveys	C10, C15, C18, C12 [Economic Strength | Equity and Options | Performance | System Preservation]
Employer Incentive Programs: Marketing and reward program partnerships between transit operators and employers to encourage existing staff's use of transit through subsidies of transit fares provided to employees.	-Increased transit ridership -Reduced VMT -Enhanced travel time reliability	N/A	$	Short Term (1-5 years)	-Alternative Work Schedules -Alternative Mode Events	-Boarding and Alighting Data	C10, C17, C18, C12 [Economic Strength | Equity and Options | Performance | Connectivity]
Pricing Strategies: Consider the use of peak period and/or congestion pricing on the turnpike system in the ACOG region to assist in demand reduction on the network. Consider toll price reductions or free trips for HOV vehicles.	-Reduced peak period VMT -Reduced travel time for turnpike users	Freeway	$$	Existing	-Managed Lanes -Ridesharing	-Toll Revenue -Traffic Counts on Tollway	C20, C22, C3, C1 [Performance]

2. Transportation and Land Use Cohesion							
Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Design Guidelines for Transit-Oriented Development (TOD): Land use and development guidelines that encourage clustering housing units, employment and service centers around transit stations in walkable areas.	-Reduced VMT	Arterial	$	Short Term (1-5 years)	-Design guidelines for bicycle/pedestrian friendly development	-Site Impact Analysis -Land Use Changes Over Time	C2, C12, C15, C17 [Economic Strength | Performance | Connectivity | System Preservation]
Infill and Densification: Focus new development in the footprint of existing infrastructure rather than building new infrastructure in greenfield locations.	-Reduced VMT -Increased use of alternative modes	N/A	$$	Short Term (1-5 years)	-Improved Transit Stations/Stops -Enhanced Transit Amenities -Bike Sharing Programs -Carsharing	-Travel Demand Model -Site Impact Analysis	C12, C13, C2, C14 [Economic Strength | Performance | Connectivity | System Preservation]
Mixed-use Development: Comingling of residential, commercial and other service land uses in order to reduce the need for people to use vehicles to access goods and services.	-Reduced VMT -Increased use of alternative modes	N/A	$$	Short Term (1-5 years)	-Improved Transit Stations/Stops -Enhanced Transit Amenities -Bike Sharing Programs -Carsharing	-Travel Demand Model -Site Impact Analysis	C2, C12, C10 [Economic Strength | Performance | Connectivity | System Preservation]

3. Transportation Systems Management and Operations (TSM&O) and Intelligent Transportation Systems (ITS)							
Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Partnership with Private Commercial Traffic/Travel Applications: Identify and partner with commercial truck GPS/electronic logbook developers (Garmin, Rand McNally, Waze, etc.) to ensure accurate truck routing/alternate routing during road work/congestion/incident times.	-Increased travel time reliability -Reduction in work zone related incidents -Reduced delay due to incidents	Freeway & Arterial	$	Short Term (1-5 years)	-Traffic Incident Management (TIM) Program -Regional Traffic Management Center (TMC) -Enhanced Enforcement	-Inventory of Partnerships	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]
Enhanced Enforcement: Targeted deployment of enforcement personnel in areas that are prone to congestion and incidents.	-Increased travel time reliability	Freeway & Arterial	$	Short Term (1-5 years)	-Speed Harmonization -Work Zone Management -Service Patrols -Regional Traffic Management Center (TMC) -Traffic Incident Management (TIM) Program	-Crash Data	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]
Work Zone Management: ITS, Smart Work Zones and enforcement supported work zones for projects located on heavily traveled and/or incident prone roadways.	-Increased travel time reliability -Reduced VHT -Reduction in work zone related incidents	Freeway & Arterial	$	Short Term (1-5 years)	-Traffic Incident Management (TIM) Program -Enhanced Enforcement	-Crash Data -TOPS-BC	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Communications Networks and Roadway Monitoring Coverage: Communications and monitoring infrastructure (fiber, wireless, cameras speed detectors, etc.) required to support operational activities. Communications networks allow remote monitoring and surveillance of the CMP network and provide date for real time management of the transportation system. Information may also be provided to the media and public to assist in TDM and incident routing.	-Increased operational capability to monitor and respond to incidents on the network and provide traveler information	Freeway & Arterial	$+	Short Term (1-5 years)	-Regional Traffic Management Center (TMC) -Traffic Signal Coordination and Modernization -Traffic Incident Management (TIM) Program -Transit Programs	-Network Monitoring Inventory (data)	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]
Regional Traffic Management Center (TMC): Consider enhancing the existing control center for monitoring, communication and control of the CMP network. TMC's facilitate situational awareness, communication among owner agencies, response partners, execution of responses and coordination.	-Reduction in incident response time -Reduced delay due to incidents -Increased travel time reliability	Freeway & Arterial	$+	Medium Term (6-10 years)	-Traffic Incident Management (TIM) Program -Communications Networks and Roadway Monitoring Coverage -Enhanced Enforcement -Traffic Signal Coordination and Modernization -Managed Lanes	-Incident Duration -Incident Response Time -Incident Reduction -TOPS-BC -Miles of Network Covered by ITS Devices	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]
Traffic Signal Coordination and Modernization: Enhance signal detection and controller ability to respond to changes in traffic flow either in real time or by developing new signal timing plans. May also include transit signal priority to enhance transit system reliability and travel times.	-Reduced VHT -Reduced intersection delay -Increased travel time reliability -Improved travel time	Arterial	$$	Medium Term (6-10 years)	-Traffic Incident Management (TIM) Program -Communications Networks and Roadway Monitoring Coverage -Enhanced Enforcement -Traffic Signal Coordination and Modernization -Managed Lanes	-Incident Duration -Incident Response Time -Incident Reduction -TOPS-BC -Miles of Network Covered by ITS Devices	C19, C20, C21, C22 [Performance | Economic Strength]

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Parking Management Program: Examination and revisions to parking policies, prices and lot/garage locations to encourage efficient use of parking resources in high parking demand areas. May include mobile applications, electronic payment, wayfinding and other signage.	-Reduced VMT -Reduced CBD congestion -Reduced event-based parking congestion	Arterial	$	Short Term (1-5 years)	-Traffic Incident Management (TIM) Program -Enhanced Enforcement	-Crash Data -TOPS-BC	C19, C20, C21, C22 [Performance | Economic Strength | Safety and Security]
Speed Harmonization: Variable speed limits on segments of the network that approach areas of recurring congestion, bottlenecks, incidents, special events, and other conditions that affect traffic flow**.**	-Reduced VHT -Reduction in traffic incidents	Freeway	$+	Short Term (1-5 years)	-Regional Traffic Management Center (TMC) -Traffic Incident Management Program -Enhanced Enforcement -Communications Networks and Roadway Monitoring Coverage	-NMPRDS -Crash Data -TOPS-BC -Simulation Models	C19, C20, C21, C22 [Economic Strength | Performance |Safety and Security]

4. Transit

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Improved Transit Stations/Stops: Includes improvements in real-time scheduling, location of vehicles, arrival time, alternate routes and modes. Also included addition of bicycle and pedestrian infrastructure and amenities (bike lockers, bike racks, etc.) and connection to existing networks.	-Increased Transit Ridership -Reduced VMT -Increased travel time reliability -Increased use of alternative modes	Arterial	$+	Medium Term (6-10 years)	-New Sidewalks and Designated Bicycle Lanes on Local Streets -Bike Sharing Programs	-Bicycle Rack Locker Usage Information -Boarding and Alighting Data	C17, C18, C11, C15 [Economic Strength | Equity and Options | Performance | Connectivity]
Express Bus Service Expansion: Additional high speed, limited stop operations between two commuter points.	-Improved travel time -Reduced VMT -Enhanced travel time reliability	Freeway	$+	Short Term (1-5 years)	-Traffic Signal Coordination and Modernization -Regional Traffic Management Center (TMC) -Communications Networks and Roadway Monitoring Coverage	-Network Monitoring Inventory (data) -Boarding/Alighting Data -Mode Split -Transit Elasticity Model	C17, C20, C22, C1 [Economic Strength | Equity and Options | Performance | Connectivity]
Transit Intersection Queue Jump Lanes and Signal Priority: Addition of travel lanes at signalized intersections that allow buses to proceed before other vehicles (May require additional ROW).	-Improved travel time -Reduced VMT -Enhanced travel time reliability	Arterial	$+	Short Term (1-5 years)	-Traffic Signal Coordination and Modernization -Regional Traffic Management Center (TMC) -Communications Networks and Roadway Monitoring Coverage	-Network Monitoring Inventory (data) -Boarding/Alighting Data -Mode Split -TOPS-BC	C17, C19, C20, C22 [Economic Strength | Equity and Options | Performance | Connectivity]
Enhanced Transit Amenities: Transit vehicle transit shelter upgrades and replacements to provide users with a better rider experience to encourage more transit use.	-Increased transit ridership -Reduced VMT -Enhanced travel time reliability	Arterial	$$+	Short Term (1-5 years)	-New Sidewalks and Designated Bicycle Lanes on Local Streets -Bike Sharing Programs	-Boarding/Alighting Data	C17, C11, C18, C10 [Economic Strength | Equity and Options | Performance | Connectivity]

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Increasing Bus Route Coverage or Frequencies: Examine route structure for opportunities to enhance transit frequencies on primary transit corridors and/or expand transit service to areas that do not have transit coverage but are suitable for transit operation. May require investment in new buses (capital cost).	-Increased transit ridership -Reduced VMT -Enhanced travel time reliability	Arterial	$$+	Short Term (1-5 years)	-Regional Traffic Management Center (TMC) -Traffic Signal Coordination and Modernization	-Free Flow Factor -Boarding/Alighting Data -Travel Demand Model -Simulation Models -Transit Elasticity Model	C10, C17, C12, C18 [Economic Strength | Equity and Options | Performance | Connectivity]
New/Expanded Fixed Guideway Transit Travel ways: Exclusive Street travel ways (e.g. bus rapid transit) devoted to increasing the person-capacity of a travel corridor.	-Increased travel time reliability -Reduced VMT -Increased person throughput -Stimulation of mixed-use and high-density land uses adjacent to corridor	Arterial	$$+	Medium Term (6-10 years)	-Regional Traffic Management Center (TMC) -Traffic Signal Coordination and Modernization	-Boarding/Alighting Data -Travel Demand Model -Simulation Models -TOPS-BC -Transit Elasticity Model	C17, C15, C12, C10 [Economic Strength | Equity and Options | Performance | Connectivity]
Dedicated Transit Rights-of-Way: Reservation of travel lanes for transit operation. This may include bus-on-shoulder (BOS) operation during peak periods to enhance travel corridor throughput.	-Increased travel time reliability -Reduced VMT -Increased person throughput -Stimulation of mixed use and high density land uses adjacent to corridor	Arterial	$$+	Medium Term (6-10 years)	-Regional Traffic Management Center (TMC) -Traffic Signal Coordination and Modernization	-Boarding/Alighting Data -Travel Demand Model -Simulation Models -TOPS-BC -Transit Elasticity Model	C17, C20, C22, C15 [Economic Strength | Equity and Options | Performance | Connectivity]
Establish Strategic Partnerships: Collaborate with public agencies, private sector, non-profits to accelerate infrastructure, strengthen workforce, and expand access.	-Increased Transit Ridership -Reduced VMT -Enhanced travel time reliability	Arterial	$	Short Term (1-5 years)	-Regional Traffic Management Center (TMC) -Communications Networks and Roadway Monitoring Coverage	-Boarding/Alighting Data -Travel Demand Model -Simulation Models -TOPS-BC -Transit Elasticity Model	C17, C20, C22, C15 [Economic Strength | Equity and Options | Performance | Connectivity]
Investment in Transit Oriented Development (TOD) and Mobility Hubs: Strategic investment to create seamless, intuitive and attractive transit experiences.	-Reduced VMT -Increased person throughput -Stimulation of mixed use and high density land uses adjacent to corridor	Arterial	$$+	Medium Term (6-10 years)	-New Sidewalks and Designated Bicycle Lanes on Local Streets -Bike Sharing Programs	-Bicycle Rack Locker Usage Information -Boarding and Alighting Data	C17, C11, C18, C10 [Economic Strength | Equity and Options | Performance | Connectivity]

Increase Reliable Funding: Leverage local taxes, developer contributions, federal grants, and private investment to fuel long-term transit investments and sustainable operations.	-Increased Transit Ridership -Reduced VMT -Enhanced travel time reliability	Arterial/Free way	$	Short Term (5-10 years)	Regional Traffic Management Center (TMC) -Communications Networks and Roadway Monitoring Coverage	-Boarding/Alighting Data -Travel Demand Model -Simulation Models -TOPS-BC -Transit Elasticity Model	C17, C20, C22, C15 [Economic Strength | Equity and Options | Performance | Connectivity]

5. Bicycle and Pedestrian

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Design Guidelines for Bicycle/Pedestrian Friendly Development: Regional land use guidelines to specify maximum block lengths, building setback restrictions, streetscape examples and circulation patterns that can be easily codified into local land use ordinances to encourage alternative mode use.	-Increased mobility -Increased use of alternative modes -Increased bicycle/pedestrian safety	Arterial	$	Short Term (1-5 years)	-Design Guidelines for Transit Oriented Development (TOD) -Adoption of Local Complete Streets Policies	-Network Monitoring Inventory (data)	C6, C7, C18, C12, C14 [Economic Strength | Equity and Options | Connectivity]
Bike Sharing Programs: Expand the coverage of the Spokies system to encourage additional use of bicycle transportation.	-Increased mobility -Increased use of alternative modes -Increased bicycle/pedestrian safety	Arterial	$	Short Term (1-5 years)	-Improved Transit Stations/Stops -Enhanced Transit Amenities -Alternative Mode Events	-Network Monitoring Inventory (data)	C10, C15, C18, C12 [Economic Strength | Equity and Options| Performance | Connectivity]
New Sidewalks and Designated Bicycle Lanes on Local Streets: Enhance the visibility of bicycle and pedestrian infrastructure to increase the perception of safety. Restriping and potential use of cycle tracks and other enhanced bicycle ways should be considered in order to make bicycle travel more attractive to users.	-Increased mobility -Increased use of alternative modes -Increased bicycle/pedestrian safety	Arterial	$+	Short Term (1-5 years)	-Improved Transit Stations/Stops -Enhanced Transit Amenities -Alternative Mode Events	-Network Monitoring Inventory (data)	C6, C7, C18, C11, C12 [Economic Strength | Equity and Options | Performance | Connectivity]

6. Roadway Improvements							
Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Development of Access Management Policies: Planning and design principles that identify and restrict the access of adjacent parcels to a major thoroughfare to maximize traffic safety and mobility.	-Reduction of traffic incidents -Improved travel times -Decreased delay	Arterial	$	Short Term (1-5 years)	-Design Guidelines for Bicycle/Pedestrian Friendly Development -Design Guidelines for Transit Oriented Development	-Crash Data -NMPRDS -Travel Demand Model	C5, C8, C22, C16 [Economic Strength | Performance System Preservation]
Adoption of Local Complete Streets Policies: Planning and design principles that encourage the development of a roadway network that accommodates all users.	-Increased bicycle/pedestrian safety -Increased use of alternative modes	Arterial	$	Short Term (1-5 years)	-Design Guidelines for Bicycle/Pedestrian Friendly Development -Design Guidelines for Transit Oriented Development	-Crash Data -Travel Demand Model	C12, C18, C10, C15 [Economic Strength | Performance | System Preservation]
Roadway Signage Improvements: Enhancing wayfinding through the region with enhanced signage that complements the decision-making ability of the roadway user.	-Reduced delay due to indecision -Reduction in erratic lane changes and potential for crashes	Freeway & Arterial	$	Short Term (1-5 years)	-Acceleration/Deceleration Lanes -Enhanced Enforcement	-Network Monitoring Inventory (data) -Crash Data	C8, C16, C20 [Performance | System Preservation]
Increasing Lanes without Widening: Restriping existing facilities to take advantage of excess width in the highway cross-section.	-Increased throughput through additional capacity -Reduced congestion due to removal of bottlenecks	Arterial	$+	Medium Term (6-10 years)	-Intersection and Interchange Improvements	-Travel Demand Model -NPMRDS	C22, C20, C16 [Economic Strength | Performance | System Preservation]
Acceleration/Deceleration Lanes: Allowing vehicles (especially large vehicles) extra room to reach the proper speed prior to entering or exiting a high speed facility.	-Reduction of traffic incidents -Reduced vehicle delay due to slow moving vehicles in through lanes	Freeway	$+	Medium Term (6-10 years)	-Roadway Signage Improvements	-Travel Demand Model	C5, C8, C22, C20 [Performance | System Preservation]
Intersection and Interchange Improvements: Redesign of existing intersections and interchanges to allow for easier movement through the reduction of conflicts or the addition of through lanes.	-Increased throughput via additional vehicle capacity -Reduced congestion due to removal of bottlenecks	Freeway & Arterial	$+	Medium Term (6-10 years)	-Increasing Lanes without Widening -Roadway Signage Improvements	-Travel Demand Model -Simulation Models -NMPRDS -Intersection Capacity Analysis Tools	C5, C8, C22, C20, C16 [Economic Strength | Performance | System Preservation]

Project/Program	Congestion Impacts	Roadway Type	Cost	Timeframe	Companion Strategies	Data Sources/Analysis Tools	Encompass 2045 Connection
Increasing Lanes with Roadway Widening: Strategic expansion of roadway capacity by the addition of through lanes.	-Increased throughput via additional vehicle capacity -Reduced congestion due to removal of bottlenecks	Freeway & Arterial	$$+	Medium Term (6-10 years)	-Traffic Signal Coordination and Modernization -Increasing Lanes Without Widening -Roadway Signage Improvements	-Travel Demand Model -Simulation Models -NPMRDS	C22, C20, C3, C16 [Economic Strength | Performance | System Preservation]
New Arterials or Expressways: Addition of new major traffic moving routes to the regional transportation network.	-Increased throughput via additional vehicle capacity -Reduction in congestion due to removal of bottlenecks	Freeway & Arterial	$$$	Long Term (10+ years)	-Traffic Signal Coordination and Modernization -Increasing Lanes Without Widening -Roadway Signage Improvements	-Travel Demand Model -Simulation Models -NPMRDS	C1, C3, C22, C20 [Economic Strength | Performance | System Preservation]

HOW TO USE THE TOOLBOX

The toolbox is designed to assist ACOG, ODOT, and other project sponsors in identifying effective strategies for addressing congestion within the CMP network. It supports the selection of a suitable strategy or combination of strategies to benefit the specific location under evaluation. When a strategy demonstrates potential, it can be further analyzed using the regional travel demand model or additional analysis tools recommended in the toolbox.

For larger projects, especially those that are high-cost and involve capacity expansion, the toolbox should be utilized to identify alternative strategies for integration throughout the project development process. While CMP strategies typically do not yield significant capacity increases akin to conventional expansion efforts, incorporating demand management and operational strategies within capacity improvement projects may lengthen the facility's period of effectiveness before further capacity enhancements are required.

The toolbox also serves to inform project selection methodologies and metrics for the future Encompass 2050 and the ACOG MPO TMA Transportation Improvement Program (TIP). Placing greater emphasis on alternative transportation modes during future project selection strengthens the planning process and lays a robust groundwork for successful CMP implementation.

As technology and industry practices evolve, ACOG will continue to periodically review the toolbox. Regular updates to the strategies and methods are part of this ongoing process.

13.1 EVALUATING STRATEGIES

ACOG, ODOT, and local partners have access to various analysis tools to assess how congestion management strategies may reduce congestion. These tools help evaluate the effectiveness of proposed projects, identify impacts of different strategies (such as transportation demand management, land use coordination, TSM&O, and ITS), and screen options in ACOG's congestion management process. Below is a summary of each tool.

REGIONAL TRAVEL DEMAND MODEL

ACOG's traditional four-step Regional Travel Demand Model is currently being updated and may be used in the future to support a variety of analytical needs such as preparation of various system and subarea analyses, including the Long-Range Transportation Plan, transit projects, some ITS deployments, and other technical analyses.

Regional travel demand model outputs (VMT, VHT, and other measures) can be used to illustrate the location, duration, and extent of congestion for the region at baseline conditions. The travel demand model can then be used to forecast conditions for the future network including programmed TIP projects. A review of the forecast conditions allows ACOG and its partners to identify locations for the application of CMP toolbox strategies. Regional travel demand model outputs can also be used to assess the impact of alternative strategies such as the targeting of densified development to specific areas or corridors and the addition of capacity or a new roadway to the existing network.

Travel demand model outputs can be used as inputs into the Tool for Operations Benefit/Cost (TOPS-BC), and/or other tools to calculate a variety of performance measures, to evaluate the impacts of many of the types of the toolbox strategies and to help allocate benefits to subregions. Data outputs can include changes in travel times, speed, mode share or a reduction in trips.

SIMULATION MODELS

Micro- and meso-scale simulation models assess travel impacts for multimodal and roadway projects. Meso-simulation offers more detailed subarea analysis than regional models, but less

specificity than microsimulation, producing fluid-like traffic flow data such as speed and density without tracking individual vehicles. Microsimulation evaluates intersections, road segments, and strategies, reporting speed, flow, density, and delay, but is limited to small areas like corridors or specific projects. Simulation models effectively analyze traffic congestion buildup, dissipation, and duration, providing outputs to calculate measures such as vehicle/person miles or hours traveled, travel time, queue length, throughput, delay, emissions, and fuel consumption. Results help value individual or combined strategies.

TOOL FOR OPERATIONS BENEFIT COST ANALYSIS (TOPS-BC)

TOPS-BC is one of several benefit/cost evaluation tools designed for assessing transportation systems management and operations (TSM&O) strategies. As a spreadsheet-based application, it's relatively simple to use and accessible to a broad audience. TOPS-BC enables users to quickly analyze TSM&O projects even with limited data, offering approximate benefit/cost analyses. The tool sources data from the USDOT national benefit and cost databases, letting users incorporate national findings into local decision-making. Additionally, USDOT provides the ITS Benefits, Costs and Lessons Learned database, which helps professionals evaluate the value and expense of ITS implementations. Both the TOPS-BC spreadsheet and its user guide can be downloaded from FHWA's Planning for Operations website.

Given these features, TOPS-BC is recommended as a core component of the congestion management toolbox for ACOG and its planning partners. It offers users:

- The ability to investigate the expected range of impacts associated with previous deployments and analyze many TSM&O strategies
- A screening mechanism to help identify tools and methodologies for conducting a benefit-cost analysis based on analysis needs
- A framework and cost data to estimate the life-cycle costs of various TSM&O strategies
- A framework and suggested impact values for conducting simple sketch planning level benefit-cost analysis for TSM&O strategies.

VEHICLE EMISSIONS MODELING SOFTWARE

The U.S. Environmental Protection Agency (EPA) created spreadsheet models to analyze the travel and emissions effects of Transportation Demand Management (TDM) strategies for various contexts. Their MOBILE6 emission factor model, last updated in 2004, estimated emissions from a range of vehicles. In 2010, EPA replaced the MOBILE series with the Motor Vehicle Emission Simulator (MOVES), now the standard tool for vehicular emissions estimates. The most recent update of this simulator is MOVES5[12]. This is the EPA latest official Motor Vehicle Emission Simulator, designed to estimate emissions from cars, trucks, and other vehicles under a wide range of scenarios. It can be used to determine the emissions impacts of TDM strategies by modeling how changes in travel behavior, such as reduced vehicle miles traveled (VMT) or shifts to alternative modes, affect regional or project-level emissions, supporting both planning and regulatory analyses.

TRANSPORTATION DEMAND MANAGEMENT (TDM) EVALUATION MODELS

Vehicle emissions models are frequently paired with the Regional Travel Model for major regional programs, or with other tools such as the Center for Urban Transportation Research's TRIMMS tool or the TDM Effectiveness Evaluation Model for less significant strategies. These models help estimate how many commuters might change their travel methods or behaviors by participating in a program, and calculate related shifts in vehicle activity, such as reductions in vehicle miles traveled (VMT). This data is then applied to emissions models to determine the decrease in

[12] Latest Version of MOtor Vehicle Emission Simulator (MOVES) | US EPA

emissions from these commuter programs. Further details can be found in the EPA's publication, Commuter Programs: Quantifying and Using Their Emission Benefits in SIPs and Conformity.

INTERSECTION CAPACITY ANALYSIS TOOLS

Intersection capacity analysis tools can be used to identify performance issues at specific intersections or corridors. Throughput, signal timing, and turning movements can be examined to develop and/or evaluate potential solutions to intersection or corridor focused issues. These tools can be used to develop new signal timing plans or to evaluate geometric changes.

TRANSIT ELASTICITY MODELS

One quantitative approach to forecasting transit demand is the application of transit elasticity modeling. Elasticity measures the sensitivity of demand in relation to a specific variable. Various analytical tools are employed to estimate potential changes in demand. For short-term planning horizons involving a single variable change, elasticity models are generally effective and widely utilized in transit planning. However, for longer-term forecasts that consider multiple variables, more advanced modeling techniques may be required.

Within the transit industry, common rules of thumb suggest that the elasticity of transit ridership with respect to service hours is approximately 1.5; thus, a 10 percent increase in service hours is expected to result in a 15 percent rise in ridership. Additionally, non-commute trips typically display greater price sensitivity than commute trips. Elasticities for off-peak transit travel are generally 1.5 to 2 times higher than those observed during peak periods, as peak-period travel is predominantly comprised of commute trips.

IMPLEMENTING CMP STRATEGIES

This report outlines how CMP strategies were developed and how projects are programmed and implemented throughout the planning process. It explains the integration of CMP strategies into components like the Metropolitan Transportation Plan (MTP), Transportation Improvement Program (TIP), and Regional ITS Architecture, and details the CMP analysis process for different transportation investments.

14.1 INTEGRATION WITH THE METROPOLITAN TRANSPORTATION PLANNING PROCESS

The CMP is intended to work in concert with Encompass 2045 and the future MTP update, which is underway. CMP strategies should help shape project identification and prioritization in the MTP. The MTP provides long-term guidance for which CMP strategies should advance into programming and implementation. Specifics of the relationship to the general planning process are described below.

14.2 RELATIONSHIP TO ENCOMPASS 2045 AND FUTURE UPDATES

CMP strategies reinforce the goals of Encompass 2045, including performance, safety, equity, connectivity, economic strength, healthy communities, and system preservation. The CMP provides a shorter-term, tactical approach for achieving these long-range goals by ensuring that system management and operations improvements are considered early in project scoping.

The MTP serves as a comprehensive multimodal strategy that outlines regionally significant projects and programs to be funded by local, state, federal, and private sources. Projects aligned with the MTP may advance toward implementation through inclusion in the region's Transportation Improvement Program (TIP), proceeding through development stages such as environmental review, preliminary engineering, right-of-way acquisition, and actual construction or deployment.

The CMP is a critical component of long-range planning, closely linked to the MTP in several respects:

- The vision statement and goals articulated in the MTP establish the foundation for crafting congestion management objectives and performance metrics within the CMP.
- The CMP offers data on regional congestion, assisting ACOG in pinpointing corridors or segments that require further analysis through corridor studies.
- The CMP Toolbox provides an evaluative framework for transportation projects and programs aimed at maintaining or reducing recurring and non-recurring congestion. Recommended analytical tools assess how various mitigation strategies contribute to the achievement of regional objectives.
- The CMP establishes procedures for programming and implementing cost-effective congestion mitigation strategies, integrating them into the MTP evaluation and programming process and subsequently into the TIP. While the CMP does not directly allocate funding, it presents strategies that can be executed independently or as components of broader initiatives and scheduled for future MTPs and TIPs.
- After implementation, the CMP supports ongoing system monitoring, enabling assessment of overall system performance and evaluation of the effectiveness of applied congestion management strategies.

14.3 RELATIONSHIP TO REGIONAL ITS ARCHITECTURE

The ITS Architecture within the ACOG MPO TMA provides an institutional and operational framework for the integration of systems across agency boundaries. ACOG and ODOT have developed status reports to guide the implementation of ITS strategy and project deployment. CMP strategies, particularly TSM&O and ITS, must be consistent with the regional ITS architecture.

This ensures interoperability and appropriate deployment of technologies such as:

- Cameras
- Traffic detection systems
- Dynamic message signs
- Traffic management centers
- Incident response tools

The CMP also relates to this Regional Intelligent Transportation System (ITS) Architecture in the following ways:

- The Regional ITS Architecture and ITS Status Reports provide an important resource for identifying sources of data in the region that can support monitoring and reporting of congestion using CMP performance measures.
- The Regional ITS Architecture can identify technology-related solutions to some of the needs and deficiencies identified in the CMP. Furthermore, the Architecture's framework, including stakeholder and service packages involved, can provide a strategy for smooth deployment and integration of ITS related projects to address congestion.
- All ITS strategies implemented from the CMP Toolbox should be consistent with the Regional ITS Architecture. The Regional ITS Architecture and the CMP Toolbox should be reviewed for consistency and reconciled as necessary when updated.
- The integration of Regional ITS Architecture to different planning products can be defined as a separate process.

14.4 INCORPORATION INTO TIP AND PROJECT PRIORITIZATION

The TIP is a four-year plan listing top-priority MTP projects for the ACOG region, identifying federal, state, and local funding sources. Updated every two years, it includes a project selection process for STP-UZA funds, with ACOG staff and the ACOG MPO Technical Committee scoring and prioritizing projects using criteria approved by the ITPC. CMP strategies should be integrated throughout the TIP development and project selection process. The CMP relates to the TIP in the following ways:

- Providing system performance information for use by ACOG in evaluating projects nominated for inclusion in the TIP.
- Providing system performance information for project sponsors, which may influence their project applications for the TIP.
- The CMP Toolbox identifies alternative congestion management strategies that can be used to advance transportation projects through the selection process.
- The CMP Toolbox identifies potential analysis tools for evaluating project effectiveness in terms of their contribution to a reduction in congestion levels in the region.
- The current Surface Transportation Program Urbanized Area funding (STP-UZA) project evaluation criteria for the ACOG region includes components that relate to CMP performance measures, objectives and goals.

The STP-UZA evaluation criteria and selection process should strengthen the TIP's connection to the CMP by sharing more operational details about the ACOG transportation network. The next section suggests ways to update TIP procedures. The CMP gives ACOG and its partners useful data on congestion and solutions in the region.

EXISTING STP-UZA CRITERIA

The existing criteria used by ACOG and the ACOG MPO Technical Committee to evaluate and select STP-UZA projects in the ACOG region include several measures linked to the Congestion Management Process. These five out of seven total criteria include the following:

- Average Daily Traffic (ADT)
- Volume-to Capacity Ratio
- Accident Severity Rate
- Air Quality
- CMP Congestion Corridor

ANALYSIS OF CMP STRATEGIES

Section 15 explains how the CMP helps evaluate strategies for reducing congestion by using established objectives and performance measures. Projects suggested for both the CMP network and especially the CMP Focus Network should be analyzed to determine their ability to enhance travel within the ACOG transportation system. The CMP assessment process can be either quantitative or qualitative, measuring how effectively different strategies ease travel demand and congestion.

- At minimum, proposed CMP network projects should undergo a qualitative analysis to determine how congestion mitigation strategies reduce travel demand and congestion. These strategies should be considered before expanding capacity. Where applicable, conduct quantitative analysis with the tools listed in **Chapter 12.**
- Future MTP and TIP project evaluations may strengthen connections to the CMP. Project sponsors could report qualitatively on strategy benefits and provide quantitative data on congestion relief, trip reliability, and alignment with CMP goals.

15.1 QUALITATIVE STRATEGY ANALYSIS

The CMP analysis assesses how projects affect congestion based on CMP goals and performance measures. This helps ACOG determine if an investment will meet the congestion management objectives for the ACOG MPO TMA.

Qualitative assessments help compare projects based on:

- Alignment with CMP objectives
- Ability to improve mobility
- Cost and ease of implementation
- Environmental considerations
- Multimodal impacts
- Community support and context

15.2 QUANTITATIVE STRATEGY ANALYSIS

Quantitative tools evaluate measurable impacts and include:

- Travel Demand Model outputs
- Simulation models
- Tool for Operations Benefit–Cost (TOPS-BC)
- Emissions modeling
- Transit elasticity models
- Intersection capacity analysis models

15.3 RECOMMENDED ENHANCEMENTS TO PLANNING PROCESS

To strengthen integration of the CMP with other transportation planning processes, the chapter recommends:

- Adding CMP strategy results to TIP project pages
- Scoring ODOT projects with CMP metrics
- Documenting congestion benefits for federally funded projects
- Improving tracking of implemented strategies
- Updating CMP screening regularly

15.4 REFINEMENT TO CONSIDER FOR EXISTING PRIORITIZATION

The following proposed refinements to the existing prioritization build on the CMP focus network performance, system needs, and evaluations to inform TIP and regional project prioritization are intended to strengthen the linkage between identified system needs, implemented strategies, and measurable outcomes. Building on the CMP framework and existing TIP procedures, these updates emphasize performance-based decision-making, transparency, and consistency across future regional project selections.

STRENGTHEN PERFORMANCE-BASED EVALUATION

The existing criteria should be refined to more assess how proposed projects address documented system needs and contribute to regional performance goals. Project applications should demonstrate a clear connection to CMP-identified issues and include measurable outcomes tied to established performance measures (e.g., congestion, reliability, safety, or multimodal system efficiency). This strengthens the role of system performance information in project scoring and prioritization.

- Add explicit scoring elements that evaluate expected performance outcomes and the magnitude of benefit relative to identified needs.

INCORPORATE EFFECTIVENESS OF IMPLEMENTED STRATEGIES

For continuous improvement, the selection criteria should reflect lessons learned from previously implemented projects and strategies. Evaluations of past project performance—where data are available—should inform future investment decisions and help prioritize strategies that have demonstrated effectiveness.

- Include criteria that reward projects bult upon proven strategies or incorporating adaptive approaches based on prior performance evaluations.

ENHANCE MULTIMODAL AND OPERATIONAL FOCUS

While capital improvements remain important, consider criteria that should place greater emphasis on operational, low-cost, and multimodal solutions, where appropriate. This aligns project selection with the CMP's emphasis on a broad toolbox of congestion management strategies.

- Adjust weighting for operational and multimodal projects so the evaluation scores equitably alongside traditional capacity projects.

STRENGTHEN ALIGNMENT WITH REGIONAL GOALS AND FUNDING

Criteria could consider alignment with regional goals, while also considering eligibility and competitiveness for state and federal funding programs. Projects that demonstrate readiness, cost-effectiveness, and strong alignment with regional objectives should be prioritized.

- Refine criteria language to recognize projects that advance multiple regional goals and improve long-term funding competitiveness.

DASHBOARD DEVELOPMENT

As part of the ACOG CMP, a public-facing interactive dashboard was developed to support transparent, data-driven monitoring of congestion and system performance across the metropolitan transportation network. The dashboard serves as both a technical analysis tool and a public communication platform, providing real-time or near–real-time access to key congestion metrics, performance trends, and CMP goals. Monitoring and reporting dashboards are recognized as a best practice for evaluating strategy effectiveness over the life of a CMP and for improving accountability between the MPO and its member agencies.

The dashboard is intended to complement the CMP Final report by translating complex analytical outputs into an accessible, interactive format. By allowing users to explore congestion data spatially and temporally, the dashboard supports informed decision-making for transportation planning, project prioritization, and performance-based planning and programming. The dashboard homepage is shown below. The live link to the dashboard is:

https://experience.arcgis.com/experience/0933f32aecf141fe8f2bbf73b79e29f7

16.1 DATA FOUNDATION AND ANALYTICAL FRAMEWORK

Dashboard development began with the broader CMP framework, which defines the CMP network, congestion metrics, and performance thresholds. The CMP focus network includes a defined set of roadway links across the ACOG metropolitan area based on functional classification, historical congestion patterns, and stakeholder-identified problem locations. This focus network provides the spatial structure for performance monitoring and dashboard visualization within the ACOG MPO TMA boundary.

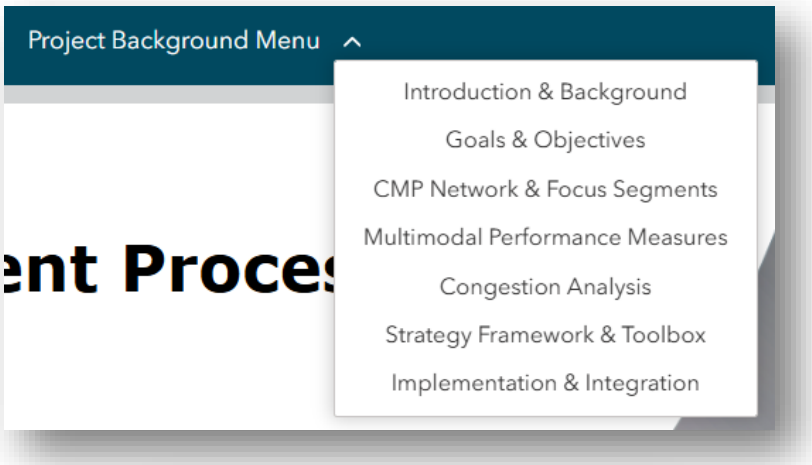
Key data inputs supporting the dashboard include StreetLight probe-based traffic data, corridor-level performance measures, and supporting GIS datasets. These datasets were used to calculate congestion and reliability metrics such as travel time, travel time reliability, and other indicators aligned with federal CMP guidance and peer MPO best practices. The dashboard reflects data-driven corridor analysis and performance monitoring. Data preparation was closely coordinated with the CMP technical analysis to ensure consistency between reported metrics, mapped congestion segments, and the dashboard outputs. Attention was given to data scalability, GIS performance, and reproducibility so that the dashboard can be updated as new data becomes available.

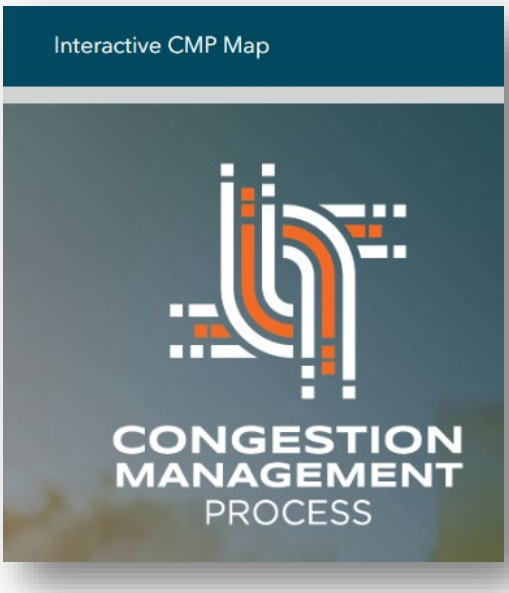
16.2 DASHBOARD DESIGN AND FUNCTIONALITY

The CMP dashboard was designed as an interactive, web-based application to maximize accessibility for both technical and non-technical audiences. Core design principles included clarity, usability, and transparency. Interactive elements allow users to explore congestion conditions within different maps, supporting both high-level system understanding and more detailed corridor-level analysis. Key dashboard components are listed below.

- Visualization of the CMP network and focus corridors
- Interactive performance charts and maps
- Filters to explore congestion by time period or facility type
- Supporting narrative text to explain metrics and CMP goals

The dashboard structure mirrors the CMP's framework. This alignment ensures users can clearly understand how congestion is defined, measured, and monitored within the CMP. The dashboard snippet below shows the options available to click on for additional information, along with the link to the interactive map.





16.3 STAKEHOLDER ENGAGEMENT AND COMMITTEE COORDINATION

Stakeholder engagement was a part of the dashboard development process. The dashboard concepts and preliminary versions were shared with ACOG staff, partner agencies, and stakeholder committees to provide an opportunity for feedback. Dashboard walkthroughs and discussions included demonstration of how the dashboard works, contents, and maps. Data included in the dashboard are CMP goals, strategies, and metrics. ACOG staff and committee feedback helped shape decisions related to the overall look, data metrics, and visualization clarity.

16.4 PUBLIC ACCESSIBILITY AND TRANSPARENCY

A key objective of the CMP dashboard is to enhance public accessibility to congestion and performance information in a simple and informative manner. The dashboard was configured for public viewing, allowing committee members, partner agencies, and the general public to access CMP data without specialized software or credentials. By providing open access to performance metrics and trends, the dashboard supports ACOG's commitment to transparency and data-informed planning. As a living tool, the dashboard can be updated to reflect new data, track changes in congestion over time, and support future CMP cycles, TIP screening, and long-range planning efforts.

16.5 ONGOING USE AND FUTURE ENHANCEMENTS

The CMP dashboard is designed to function as an ongoing performance monitoring tool, rather than a static project deliverable. However, the dashboard is also static and will be updated as often as ACOG has available data to report. Future updates may include additional performance measures, enhanced multimodal data, or expanded analytical capabilities as data availability and regional priorities evolve.

The dashboard provides a foundation for continuous evaluation of congestion management strategies and supports adaptive planning by enabling regular performance reviews. By integrating real-time or regularly updated data with an intuitive interface, the ACOG CMP dashboard strengthens the connection between analysis, policy, and implementation. It represents a practical application of performance-based planning principles and a key component of the CMP's long-term monitoring and reporting framework.

STRATEGIC ACTION PLAN

The CMP serves as a critical bridge between system monitoring, planning, and investment decision-making, ensuring congestion management strategies are reflected in the region's MTP, TIP, and related planning efforts. This Strategic Action Plan provides a structured approach for implementing the CMP by:

- Identifying clear integration points with regional transportation plans, including the MTP and TIP.
- Establishing a framework for updating the CMP in the event the ACOG MPO region is designated as an air quality nonattainment area.
- Recommending future data collection priorities aligned with the CMP performance measures

Together, these actions will help the CMP as an ongoing, adaptive process that informs regional decision-making and responds to evolving regulatory and performance needs.

17.1 NTEGRATION WITH REGIONAL TRANSPORTATION PLANS

METROPOLITAN TRANSPORTATION PLAN (MTP)

The MTP establishes the long-range vision, goals, and investment priorities for the ACOG region. The CMP is closely linked to the MTP by translating long-range goals into measurable, near- and mid-term performance outcomes related to congestion, reliability, and multimodal mobility. CMP objectives and performance measures have been explicitly aligned with the MTP goal areas to ensure consistency between planning frameworks and to support performance-based decision-making. Key integration points are listed below.

- **Goal and Objective Alignment:** CMP objectives and performance measures are mapped directly to the MTP's adopted goal areas, reinforcing shared priorities such as system efficiency, safety, equity, and economic vitality.
- **Data-Driven Corridor Identification:** CMP congestion analyses provide data to help identify corridors and subareas that may warrant further study or investment through MTP corridor studies or focused planning efforts.
- **Strategy Development:** The CMP Toolbox offers a menu of multimodal congestion management strategies—ranging from operational improvements to demand management—that support the MTP's emphasis on system management and optimization rather than capacity expansion alone.

Through these mechanisms, the CMP functions as a tactical complement to the MTP, ensuring that long-range goals are supported by actionable, performance-based strategies.

TRANSPORTATION IMPLEMENTATION PLAN (TIP)

The TIP represents the short-range, fiscally constrained implementation program for the region's highest-priority transportation investments. Integration of the CMP into the TIP is essential to ensure funded projects contribute meaningfully to congestion reduction and system performance improvements. The CMP supports TIP development and project prioritization by the following methods.

- **Providing Performance Context:** CMP system performance data inform ACOG staff and decision-makers as they evaluate projects nominated for TIP inclusion.
- **Supporting Project Applications:** Project sponsors can use CMP data and performance measures to strengthen the justification for proposed improvements.
- **Enhancing Evaluation Criteria:** CMP performance measures and objectives are already reflected in elements of the Surface Transportation Program–Urbanized Area (STP-UZA) project evaluation criteria, strengthening the linkage between congestion outcomes and funding decisions.
- **Applying the CMP Toolbox:** The CMP Toolbox identifies both congestion management strategies and analytical tools used to evaluate how proposed projects contribute to reducing recurring and non-recurring congestion.

As part of implementation, ACOG should continue to refine TIP procedures to further integrate CMP performance considerations, particularly for projects on CMP-identified corridors.

17.2 FRAMEWORK FOR CMP UPDATES UNDER AIR QUALITY NONATTAINMENT

While the ACOG MPO region is currently designated as in attainment for federal air quality standards, federal regulations require additional planning considerations should the region be designated as nonattainment. The CMP must be adaptable to respond to such a designation while maintaining continuity with existing performance-based practices.

TRIGGERS FOR CMP UPDATES

A CMP update should be initiated if the following occurs:

- The U.S. Environmental Protection Agency designates the ACOG MPO region in nonattainment or maintenance for a National Ambient Air Quality Standard (NAAQS).
- New federal or state guidance requires enhanced coordination between congestion management and air quality conformity.

KEY UPDATE ELEMENTS

In a nonattainment context, the CMP update should focus on the following:

- **Expanded Performance Measures:** Incorporating or emphasizing measures that reflect emissions-related outcomes, such as vehicle delay, travel time reliability, or person-throughput on congested corridors.
- **Strategy Emphasis:** Prioritizing strategies to reduce vehicle miles traveled (VMT), improve operational efficiency, and support mode shift, including transit, active transportation, and transportation demand management.
- **Plan Coordination:** Ensuring consistency between the CMP, MTP, TIP, and air quality conformity analyses by using shared data sources and assumptions where feasible.

17.3 IMPLEMENTATION APPROACH

- Updating performance measures and analytical methods as needed.
- Refining the CMP Toolbox to highlight strategies with demonstrated air quality benefits.
- Documenting how CMP findings support conformity determinations and related planning requirements.

This approach allows ACOG to remain compliant with federal requirements, while preserving the CMP's role as a flexible, performance-driven process.

17.4 FUTURE DATA COLLECTION NEEDS AND RECOMMENDATIONS

The effectiveness of the CMP depends on the availability of reliable, multimodal data tied directly to adopted performance measures. As congestion management priorities evolve, ACOG should continue to expand and refine its data collection program.

PRIORITY DATA NEEDS

Based on the CMP performance measures within this plan, future data collection efforts should focus on the items listed below.

- **Travel Time and Reliability:** Continued use of observed travel time data to monitor recurring and non-recurring congestion across the CMP network.
- **Multimodal Performance:** Enhanced data on transit travel times, service reliability, and ridership, as well as bicycle and pedestrian activity where feasible.

- **Freight Movement:** Data supporting evaluation of freight reliability and goods movement on key corridors.
- **Operations and Incidents:** Information on incidents, work zones, and weather-related disruptions to better understand sources of non-recurring congestion.

17.5 IMPLEMENTATION CONSIDERATIONS

To support long-term CMP implementation, ACOG should complete the following steps:

- Establish consistent update cycles for key datasets to align with MTP and TIP development timelines.
- Continue to coordinate with partner agencies, including ODOT and local jurisdictions, to leverage existing data sources.
- Document data assumptions and limitations to ensure transparency and repeatability in CMP analyses.

Over time, incremental improvements to data coverage and quality will strengthen the CMP's ability to inform investment decisions and track progress toward regional performance goals.

Summary Implementation Plan

Action Area	Key Actions	Responsible Parties
MTP Integration	Align CMP objectives and performance measures with MTP goals; Use CMP data to inform corridor studies	ACOG MPO staff Partner agencies
TIP Integrations	Incorporate CMP performance data into project evaluation; Apply CMP Toolbox in project development	ACOG MPO staff
Air Quality Readiness	Establish CMP update triggers and procedures for non-attainment designation	ACOG MPO staff
Data Collection	Expand and refine multimodal and reliability data tied to CMP measures	ACOG MPO staff Partner agencies