CONGESTION
MANAGEMENT
PROCESS

TECH MEMO 2

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TECH MEMO 2

1. INTRODUCTION

The Congestion Management Process (CMP) is developed through a collaborative and data-driven approach which contributes to a larger strategy for the ACOG region. Technical Memorandum 2 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 for the 2020 TMA, shown in **Figure 1**, 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 the final 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.
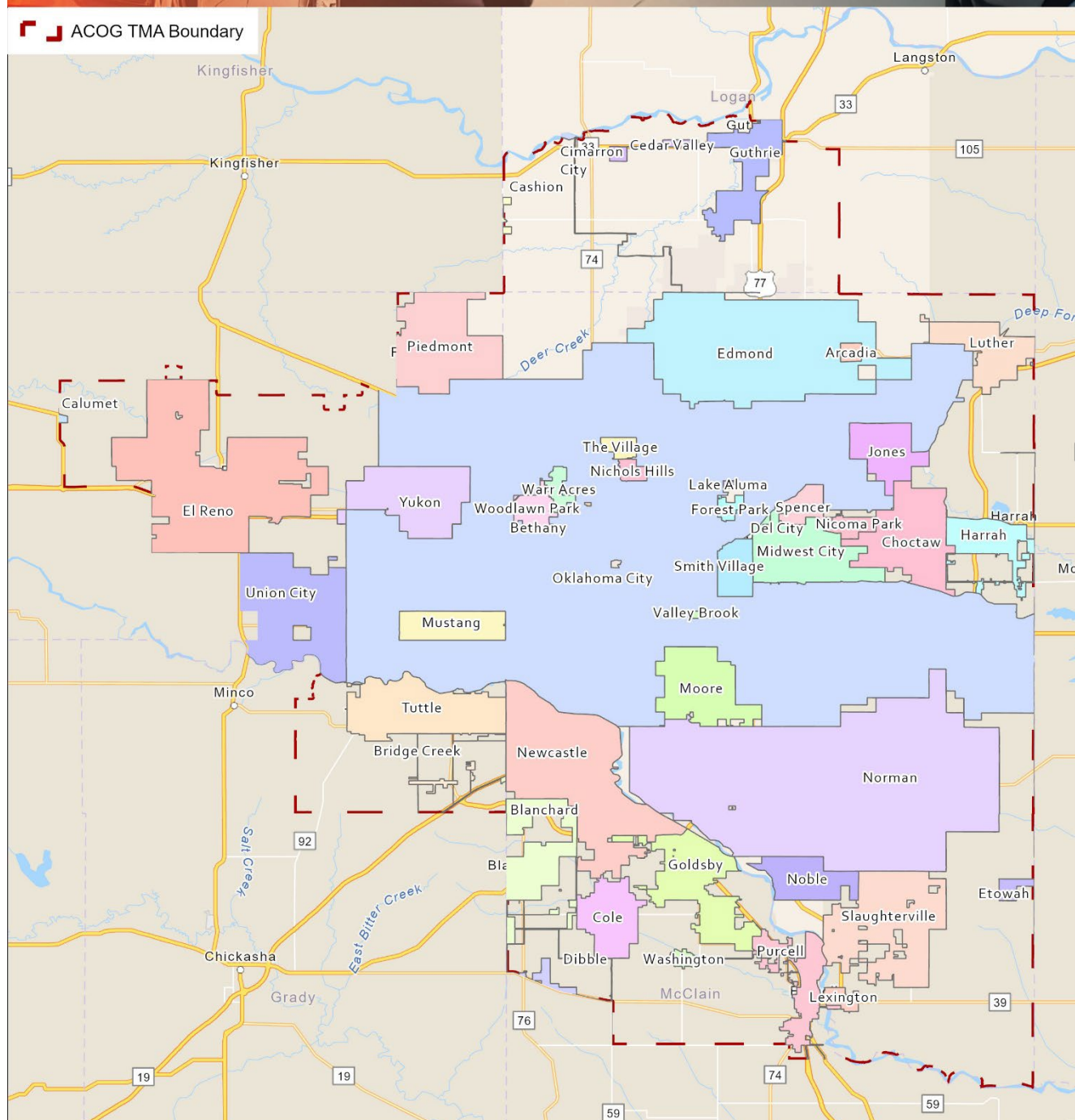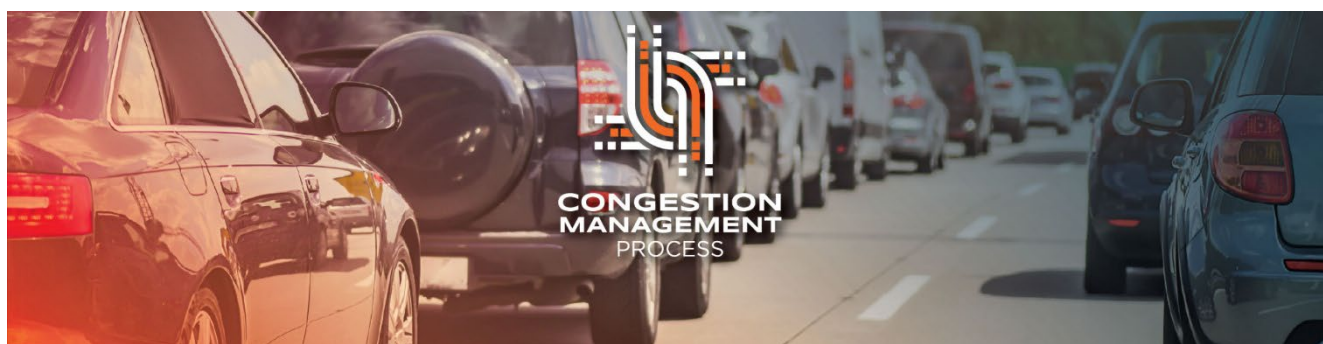
Figure 1: ACOG TMA & City Boundaries

2. 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.

2.1 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 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 2** on the following page.
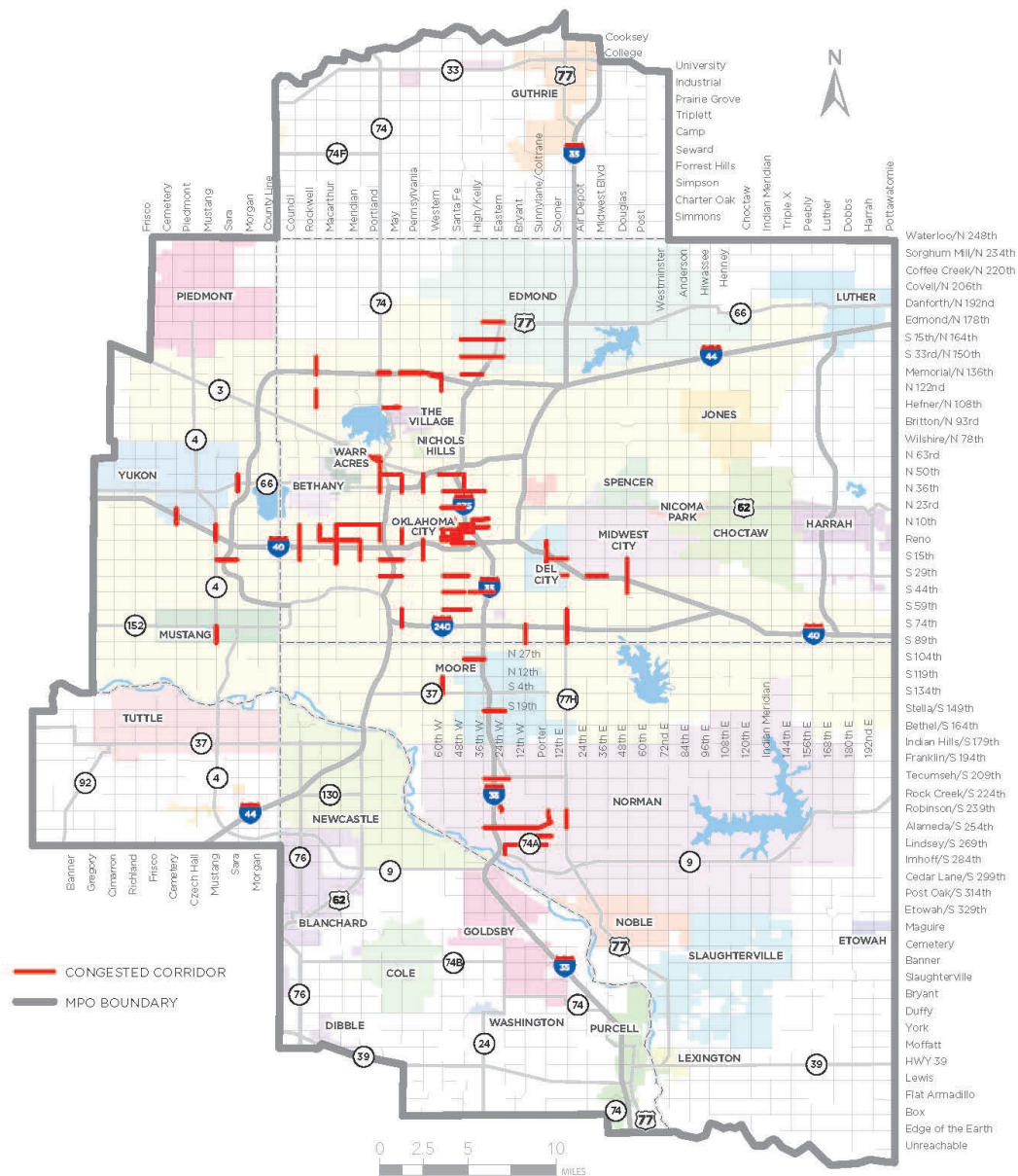
Figure 2: ENCOMPASS 2045 Congested Corridors Map[1], Source: ENCOMPASS 2045, Pg 41 Regional Congestion + Safety Goals

Stakeholder Congestion Location Input

In addition to the above analysis for the CMP Network, a survey was administered to members of the ACOG 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. Survey results, shown in **Figure 3** below, included dozens of hot spots throughout the region, beyond the initial CMP Network. This stakeholder-driven approach not only made the CMP Network more robust but also ensures congestion solutions can be tailored to the needs of the communities. **Figure 4** 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.
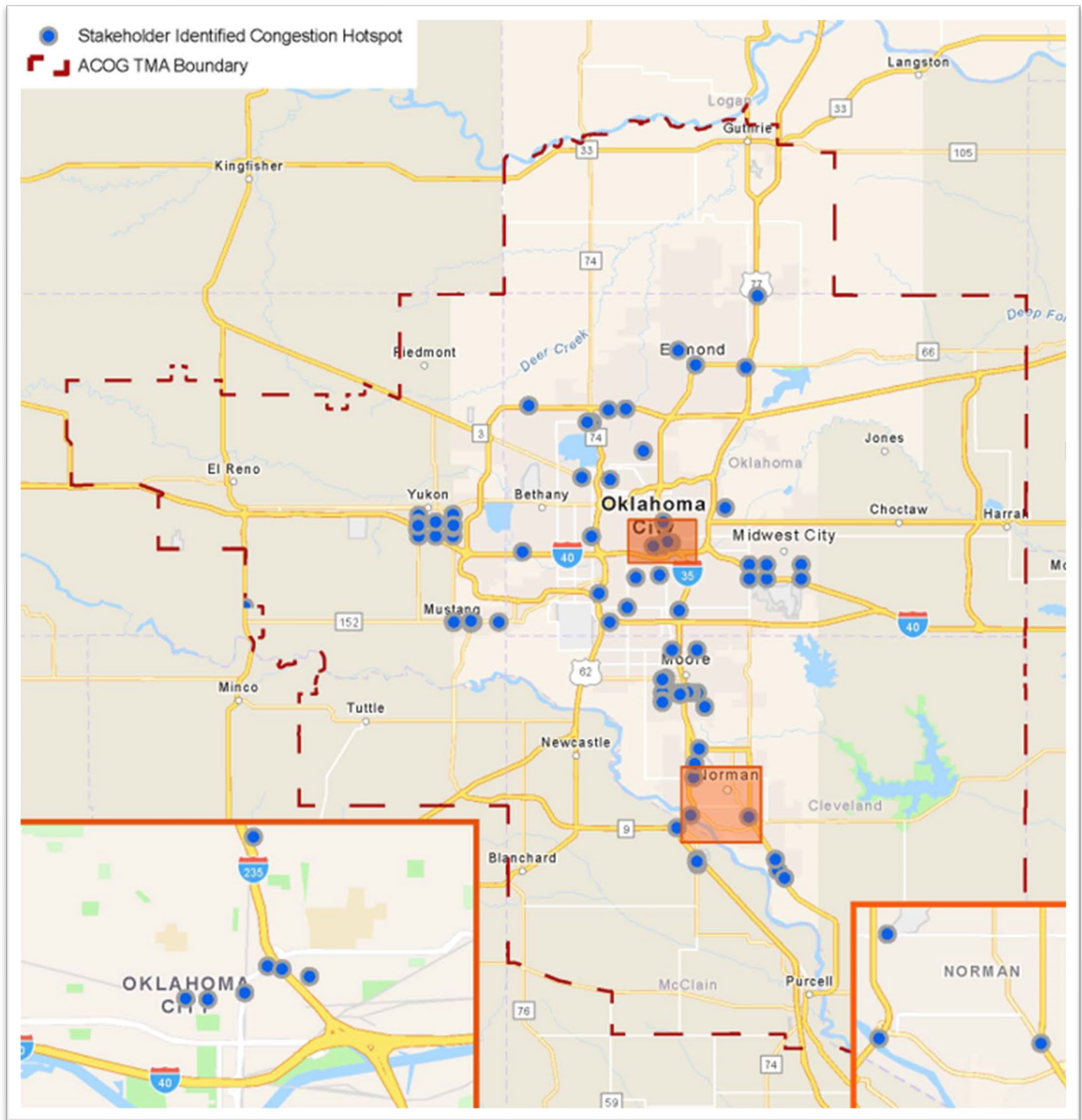
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[1] https://encompass-2045-acog.hub.arcgis.com/maps/4a11411b493f4ccbbf124a563fa272cc

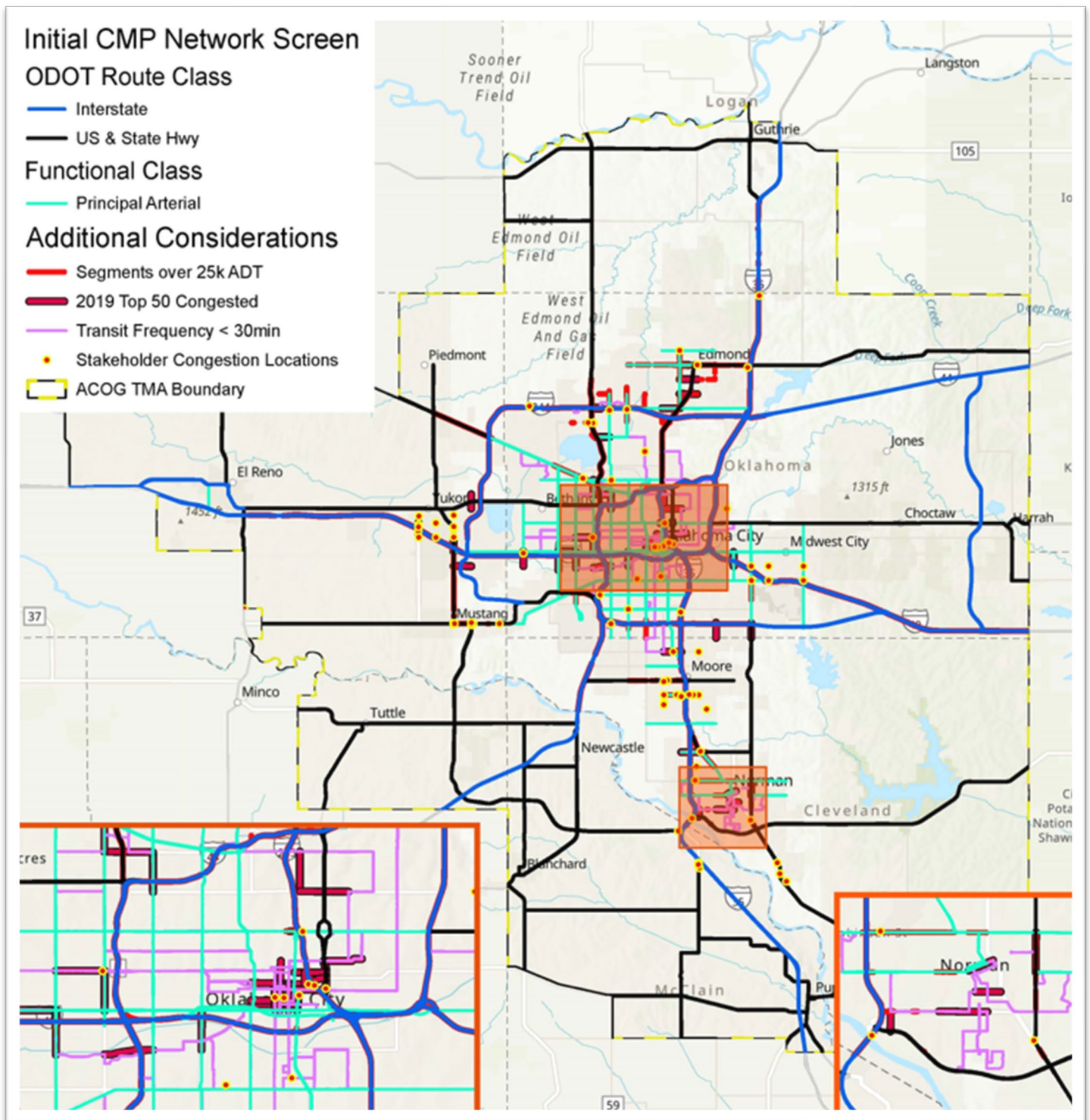*Figure 3: 2025 Stakeholder Input - Congestion Hotspots*

Figure 4. Initial 2025 CMP Network Screening Components

2.1 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 5** illustrates the CMP segments with a FFF of less than 0.7 and ADT greater than 500 vehicles per hour.
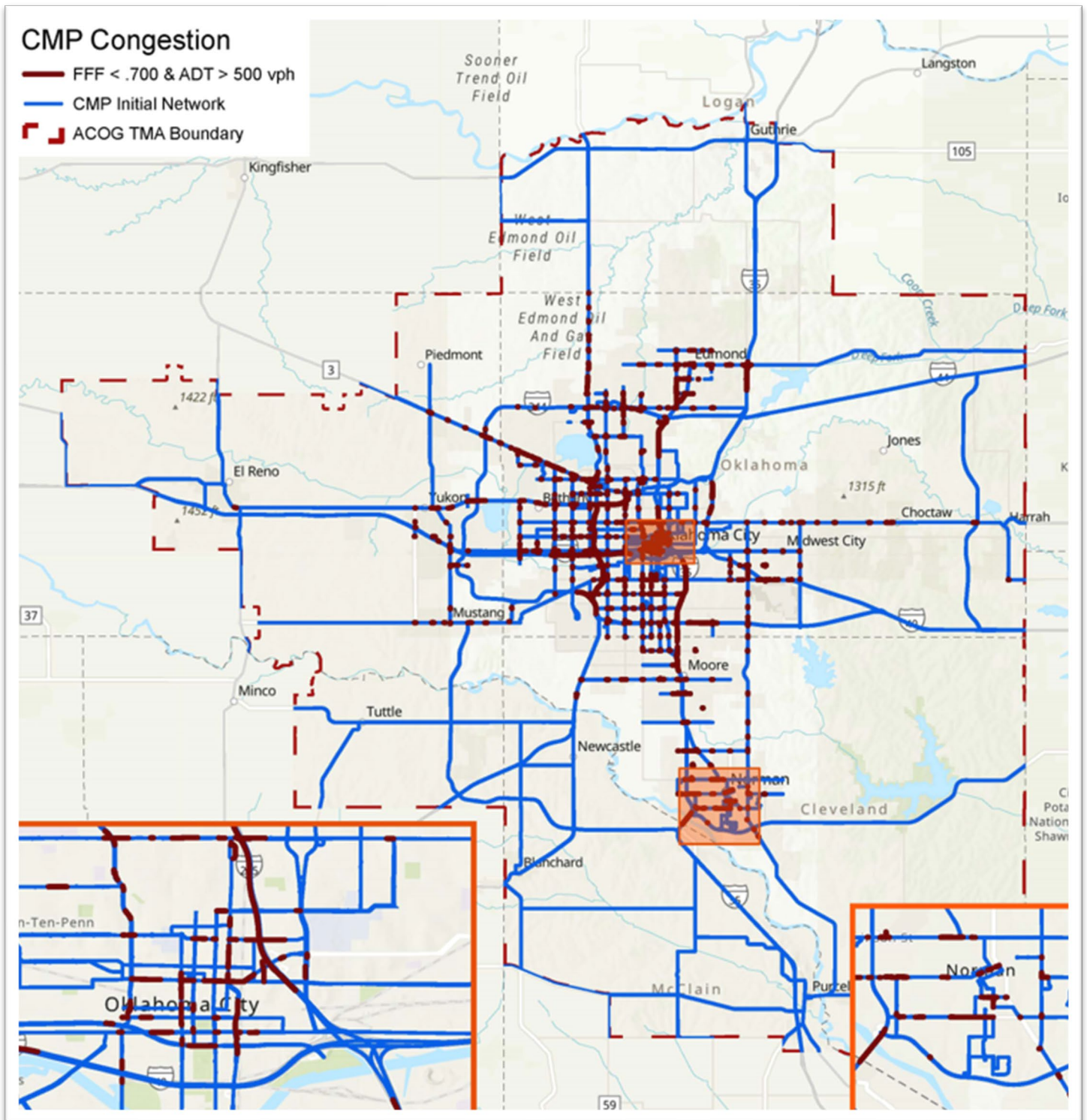
Figure 5: Congested Streetlight Segments of the 2025 CMP Network

2.2 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 6** shows the CMP Network, along with the Focus Segments based upon the above criteria.
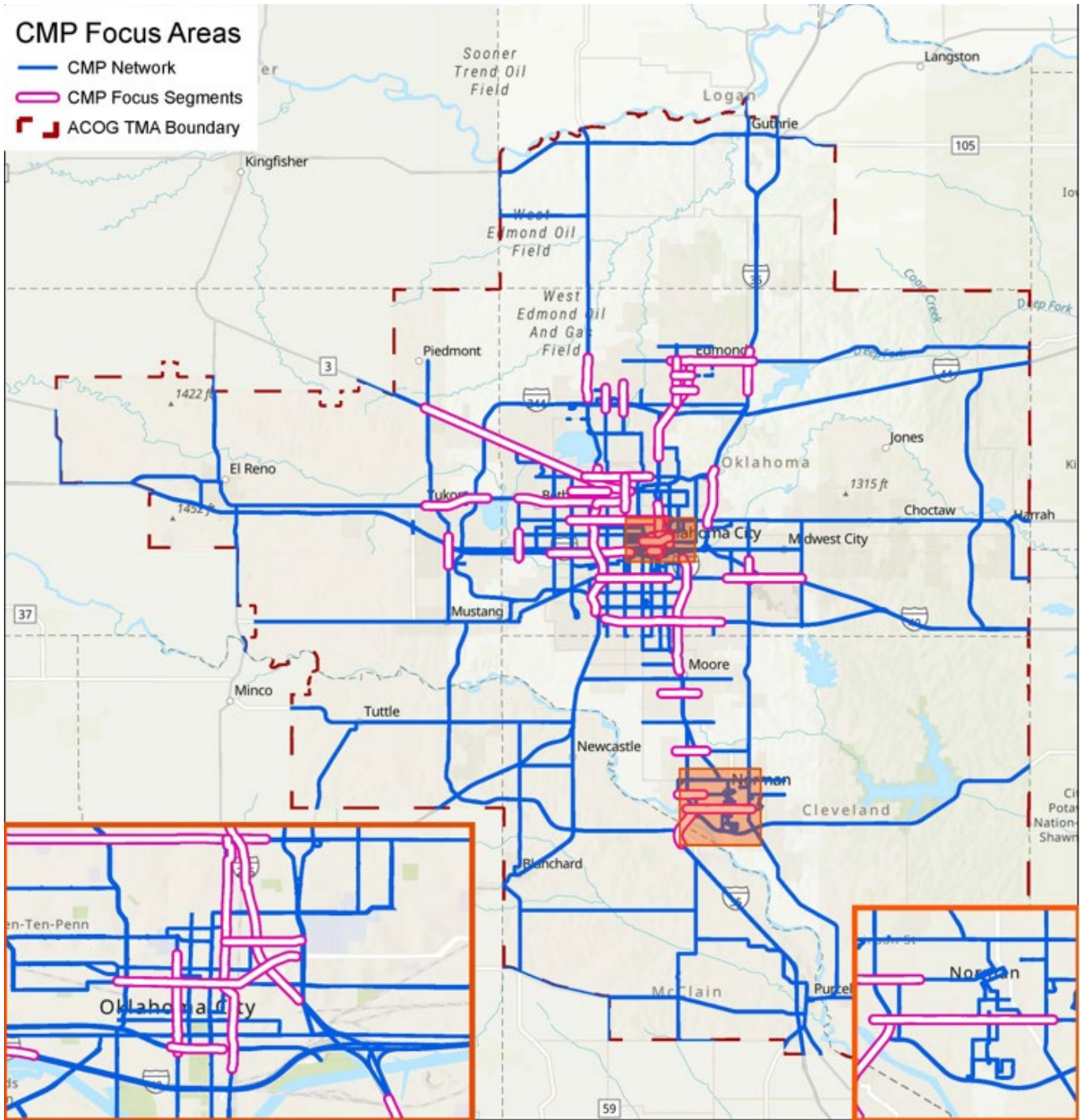

Figure 6: 2025 CMP Focus Segments

3. 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.

3.1 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 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

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

4. NEXT STEPS

The next steps for the CMP include Technical Memo #3, which includes multimodal performance measures and congestion management problems and needs.