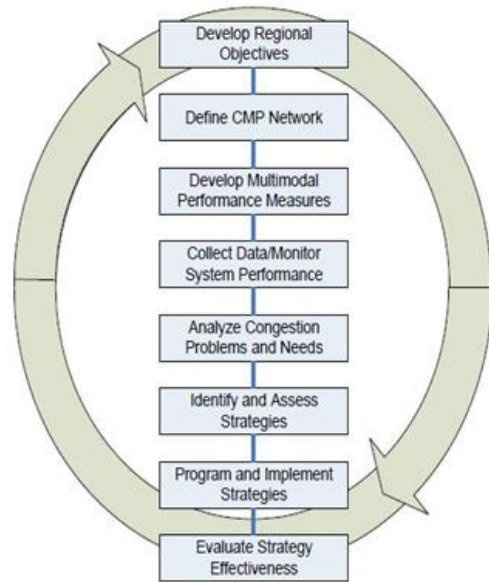


## CONGESTION MANAGEMENT PROCESS

The Congestion Management Process (CMP) enables MPOs and their operating agency partners to measure performance, manage data, and analyze alternative strategies in a systematic manner. The CMP also enables MPOs to base congestion management strategies on defined objectives; this process allows regions to focus on the most congested areas and achieve maximum benefit by targeting their investments.

KTMPPO became a TMA in July 2012. As a TMA, KTMPPO developed a CMP within 18 months of the TMA designation with assistance from CDM Smith, Inc. in September 2012. In 2016, KTMPPO, with assistance from Alliance Transportation Group, updated the CMP. The content of the CMP was based on federal regulation and is modeled after Federal Highway Administration's *Congestion Management Process: A Guidebook* which includes the steps and components listed below.



1. **Develop Regional Objectives** – This step in the process answers the questions: "What is the desired outcome?" and "What do we want to achieve?" It may not be feasible or desirable to try to eliminate all congestion, and so in this step it is important to define the regional objectives for congestion management that are designed to achieve the desired outcome. Some MPOs also define congestion management principles, which shape how congestion is addressed from a policy perspective.
2. **Define Network** - This step in the process involves answering the question, "What components of the transportation system are the focus?" and involves defining both the geographic scope and system elements (e.g., freeways, major arterials, transit routes) that will be analyzed in the CMP.
3. **Develop Performance Measures** – In this step in the process, the CMP addresses the question, "How do we define and measure congestion?" This step involves developing

performance measures to be used to measure congestion on both a regional and local scale. These performance measures should support the regional objectives.

4. **Collect Data/Monitor System Performance** - After performance measures are defined, the next step in the process is to collect and analyze data to determine, "How does the transportation system perform?" Data collection may be on-going, and involve a wide range of data sources from various planning partners.
5. **Analyze Congestion Problems and Needs** - Using available data and analysis techniques, in the next step in the process the CMP should address the questions, "What congestion problems are present in the region, or are anticipated?" and "What are the sources of unacceptable congestion?"
6. **Identify and Assess Strategies** - Working together with the MPO's planning partners, in the next step in the process the CMP should address the question, "What strategies are appropriate to mitigate congestion?" This step involves both identifying and assessing potential strategies, and may include efforts conducted as part of the development of the Metropolitan Transportation Plan (MTP), corridor studies, or project studies.
7. **Program and Implement Strategies** – This step involves answering the question, "How and when will solutions be implemented?" The step typically involves: including strategies in the MTP; determining funding sources; prioritizing strategies; allocating funding in the TIP; and, ultimately, implementing the strategies.
8. **Monitor Strategy Effectiveness** – This step should assess, "What have we learned about implemented strategies?" This step will be tied closely to monitoring system performance and is designed to inform future decision making about the effectiveness of transportation strategies. From the lessons learned in this step, the process begins again in a continuous process of monitoring and improving congestion management processes within the region.

## GOALS AND OBJECTIVES

The objectives define what the MPO wants to achieve regarding the congestion management process, and are an essential part of an objectives-driven, performance-based approach to

planning for congestion management. These objectives will also serve as one of the primary points of connection and coordination between the CMP and the MTP. The MPO developed goals and objectives for the 2013 CMP based on existing KTMPO planning documents and national best practices. The 2016 CMP Update maintains the same goals and objectives, which guide the actions necessary to maintain a safe efficient and convenient transportation system throughout the KTMPO region. The MPO will continue working to promote projects and policies that support the stated vision, goals, and objectives of this 2016 CMP Update. Goals and objectives can be found in Appendix \_\_\_ of the 2045 MTP.

### Congestion Data Sources

The KTMPO CMP employs three main quantitative data sets (NPMRDS, INRIX, and KTMPO TDM) and one qualitative data set (Google Traffic) for analysis. Supplementary data sources include crash data (CRIS) and a public survey for further analysis.

**Exhibit 9.1: Survey Response- Worst Congestion Locations**

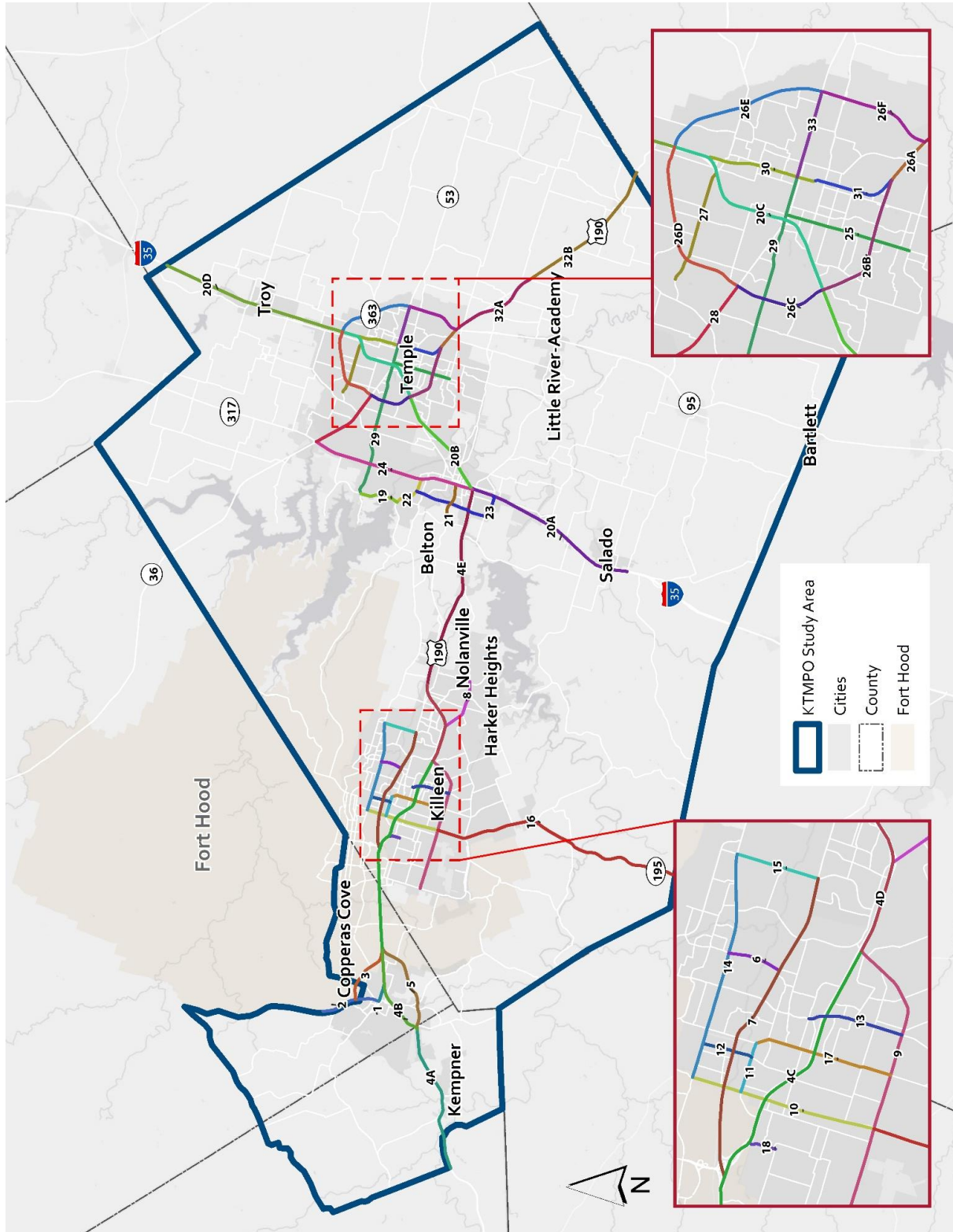
Intersection	Segment
WS Young @ US 190	W. Adams Ave. (Temple)
FM 2410 @ US 190	WS Young Dr. (Killeen)
Trimmier Rd @ US 190	Trimmier Rd. (Killeen)

The public survey was essential in determining the location and other characteristics of region congestion. KTMPO received 222 unique survey responses. The survey revealed that many of the respondents perceived daily congestion to be a significant problem in the region, and mostly caused by roadway construction, inadequate road capacity, or ineffective traffic signals. Respondents also identified locations where congestion was the worst (Exhibit 9.1) and provided information about each respondent’s commuting patterns and strategies to avoid congestion.

### CONGESTION DATA SOURCES

Defining a CMP Network involves specifying the geographic boundaries and transportation system components that are the basis of analysis and foundation of the congestion management process. Efforts to improve traffic conditions in the region begin on the CMP Network, and the level of congestion on this network serves as a gauge for overall congestion in the region. The updated CMP Network (Exhibit 9.2) reflects the overlapping data coverage from the four congestion datasets mentioned previously, as well as information gathered from the congestion survey.

**Exhibit 9.2: Updated CMP Network**



## IDENTIFYING PERFORMANCE MEASURES

The Federal CMP requirements do not mandate specific performance measures that must be used during the process. Identifying appropriate congestion performance measures is up to each MPO. Although there are a wide range of performance measures available, it was determined by KTMPO that those selected for this 2016 CMP Update must be understandable, outcome-oriented, and supported by readily available data sources.

The 2013 CMP recommended several performance measures. The 2016 CMP Update evaluated the 213 performance measures to determine whether the old performance measures meet current standards and need for quantifiable measurement. Performance measures used for the 2016 CMP include the following:

### *Congestion Measures*

#### Travel Time Index

- ▶ Average Daily
- ▶ Maximum

#### Delay

- ▶ Average Daily
- ▶ Peak Period
- ▶ Annual Hours of Delay

#### V/C Ratio (Current and Future)

- ▶ Average Daily
- ▶ Peak Period

### *Supplemental Measures*

#### Transit Availability

#### Crash Rate

#### Rear-end Crash Rate

## EVALUATION CRITERIA

Through data conflation, evaluation criteria was developed to prioritize congestion hotspots. Each segment of the CMP network was given a congestion score that represents a weighted measure of congestion as determined through the quantitative and qualitative congestion data collected for the network. Other evaluation criteria include traffic volume, safety (crashes and

rear-ended crashes), school locations, transit routes, and public need identification. Each of these criteria had different weights as show in Exhibit 9.3.

**Exhibit 9.3: Evaluation Criteria Weighting**

Criteria		Weight
Congestion Rank		30%
Volume		20%
Safety	Crashes	15%
	Rear-End Crashes	10%
Transit		15%
School		5%
Public Input		5%
<b>Total</b>		<b>100%</b>

These weights were then used to prioritize the congestion hotspots for both highways and arterials. The ranked list of highways and arterials are listed in Exhibit 9.4 and 9.5 respectively.

**Exhibit 9.4: Final Prioritized List of Congestion Hotspots—Highway**

Segment ID	Description	Priority Rank
4C	US 190 - SH 9 TO FM 3470/STAN SCHLUETER LOOP	1
4D	US 190 - FM 3470/STAN SCHLUETER LOOP TO BUSINESS 190	2
4E	US 190 - BUSINESS 190 TO IH 35	3
20A	IH 35 - SALADO (FM 2268) TO US 190	4
20C	IH 35 - S LOOP 363 TO N LOOP 363	5
26B	LOOP 363 - SPUR 290 TO IH 35 S	6
20B	IH 35 - US 190 TO S LOOP 363	7
20D	IH 35 - N LOOP 363 TO FALLS COUNTY LINE	8
26C	LOOP 363 - IH 35 S TO SH 36	9
26A	LOOP 363 - US 190 TO SPUR 290	10
16	SH 195 - WILLIAMSON COUNTY LINE TO FM 3470/STAN SCHLUETER LOOP	11
32B	US 190 SE - PRITCHARD RD TO MILAM COUNTY LINE	12
4A	US 190 - FM 1715 TO BUSINESS 190	13
28	SH 36/AIRPORT RD - LOOP 363 TO SH 317	14
32A	US 190 SE - LOOP 363 TO PRITCHARD RD	15
26E	LOOP 363 - IH 35 N TO SH 53	16
26D	LOOP 363 - SH 36 TO IH 35 N	17
26F	LOOP 363 - SH 53 TO US 190	18

### Exhibit 9.5: Final Prioritized List of Congestion Hotspots—Arterials

Segment ID	Description	Priority Rank
17	TRIMMIER RD - FM 3470/STAN SCHLUETER LOOP TO HALLMARK AVE	1
9	FM 3470/STAN SCHLUETER LOOP - SH 201/CLEAR CREEK RD TO US 190	2
4B	US 190 - US 190 BYPASS W TO US 190 BYPASS E	3
14	RANCIER AVE - FORT HOOD ST TO ROY REYNOLDS DR	4
10	FORT HOOD ST - FM 3470/STAN SCHLUETER LOOP TO RANCIER AVE	5
24	SH 317 - US 190 TO SH 36	6
7	BUSINESS 190 - US 190 TO ROY REYNOLDS DR	7
23	LOOP 121 - IH 35 TO LAKE RD	8
10	FORT HOOD ST - FM 3470/STAN SCHLUETER LOOP TO RANCIER AVE	5
13	WS YOUNG DR - ILLINOIS AVE TO FM 3470/STAN SCHLUETER LOOP	9
1	AVE D - N 1ST ST TO BUSINESS 190	10
29	FM 2305/ADAMS AVE - FM 2271 TO 3RD ST	11
8	FM 2410 - US 190 TO WARRIORS PATH	12
25	FM 1741/S 31ST ST - CANYON CREEK DR TO SH 53/ADAMS AVE	13
18	WILLOW SPRINGS RD - US 190 TO WATERCREST RD	14
2	FM 116 - AVE D TO ELIJAH RD	15
22	LAKE RD - FM 2271 TO SH 317	16
31	SPUR 290/S 1ST ST - S LOOP 363 TO AVE E	17
21	FM 93/NOLAN VALLEY RD - WHEAT RD TO SH 317	18
30	SPUR 290/3RD ST - AVE E TO IH 35	19
11	HALLMARK AVE - FORT HOOD ST TO TRIMMIER RD	20
6	38TH ST - BUSINESS 190 TO RANCIER AVE	21
12	N 2ND ST - HALLMARK AVE TO RANCIER AVE	22
27	INDUSTRIAL BLVD - OLD HOWARD RD TO IH 35	23
15	ROY REYNOLDS DR - BUSINESS 190 TO RANCIER AVE	24
33	SH 53/ADAMS AVE - 3RD ST TO E LOOP 363	25
19	FM 2271 - LAKE RD TO FM 2305/W ADAMS AVE	26

## PLAN MONITORING AND PERFORMANCE

Since the CMP is considered a “living” document, when updated data is available a reprioritization of the CMP network routes will be needed. In the summer of 2018, KTMPO reprioritized the CMP network segments. Updated NPRMDS, INRIX, and KTMPO TDM as well as new crash data were available. By using the same evaluation criteria as stated on page 6, a new list of highway and arterial prioritized hotspots were developed as shown in Exhibit 9.6 and 9.7.

Insert Updated CMP Network When Completed in Sept. 2018.

## CONCLUSION

An ongoing monitoring program is one of the key steps in implementing the FAST Act performance management strategy. It not only allows KTMPO to identify emerging problems on the transportation system, but it also allows the MPO to measure the outcomes of transportation investment decisions to determine if the planning process is being effective in addressing local transportation challenges. Learning what works and doesn’t work provides a basis for continuous improvement in the outcomes of the metropolitan planning process.