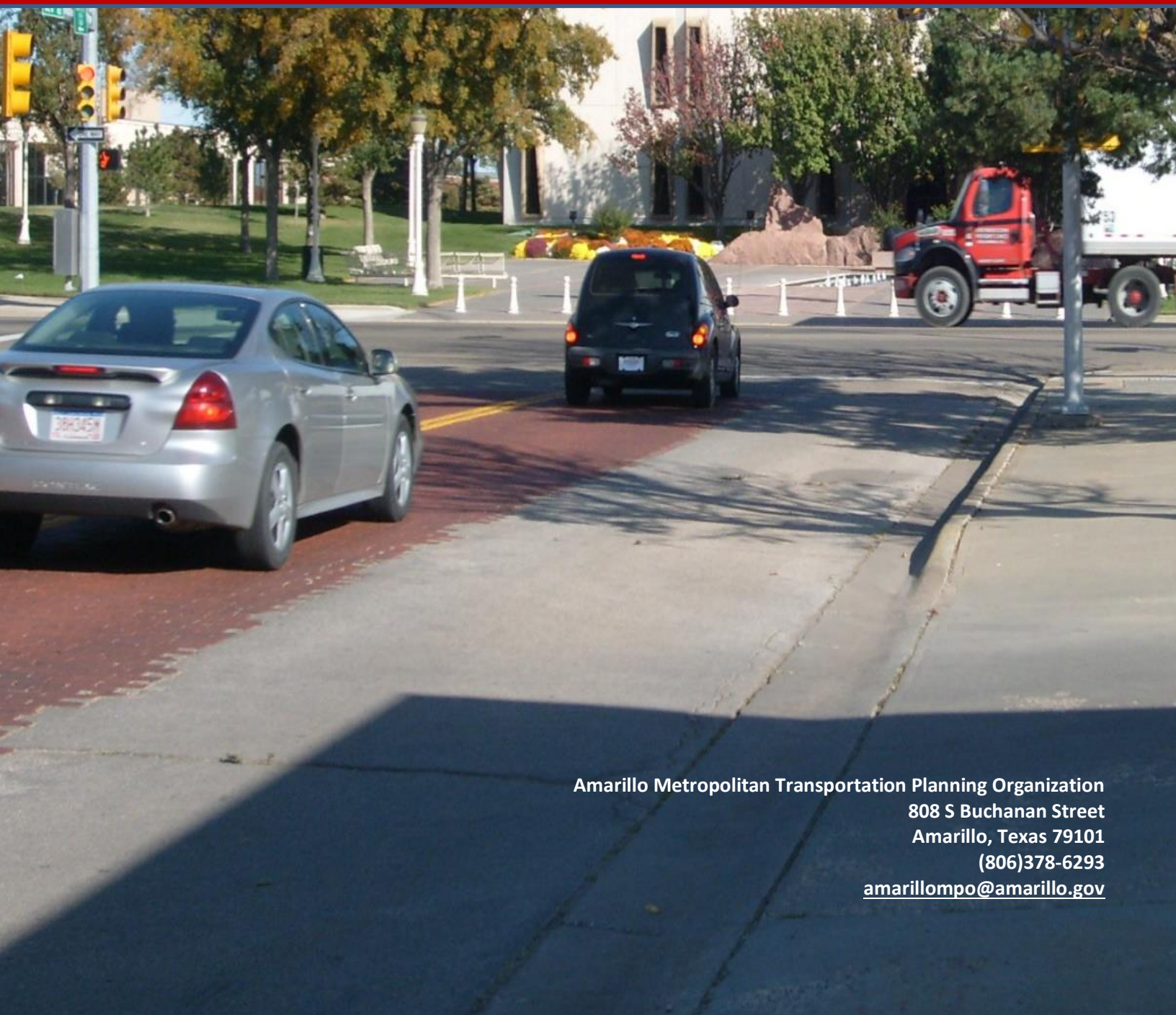
CMP

CONGESTION MANAGEMENT PROCESS

APPROVED BY THE TRANSPORTATION POLICY COMMITTEE – NOVEMBER 14, 2024



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Adopted on November 14, 2024

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The preparation of the document has been financed in part with through grant funding from the Federal Highway Administration of the United States Department of Transportation.

APPROVED BY THE POLICY BOARD ON NOVEMBER 14, 2024

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Chapter 1. Introduction

This document presents the 2024 Congestion Management Process (CMP) for the Amarillo Metropolitan Planning Organization (MPO) planning area. It outlines the assumptions, methodologies, performance measures, and potential congestion mitigation strategies. The concept of Metropolitan Planning Organizations (MPOs) was established in the 1960s as part of the Federal-Aid Highway Act of 1962, which required urban areas with populations of 50,000 or more to create MPOs to ensure federal transportation funds were spent in line with local priorities. In response to these federal requirements, the Amarillo MPO was formed to serve as the policy-making body responsible for coordinating transportation planning for the Amarillo urbanized area, including the city of Amarillo and its surrounding regions.

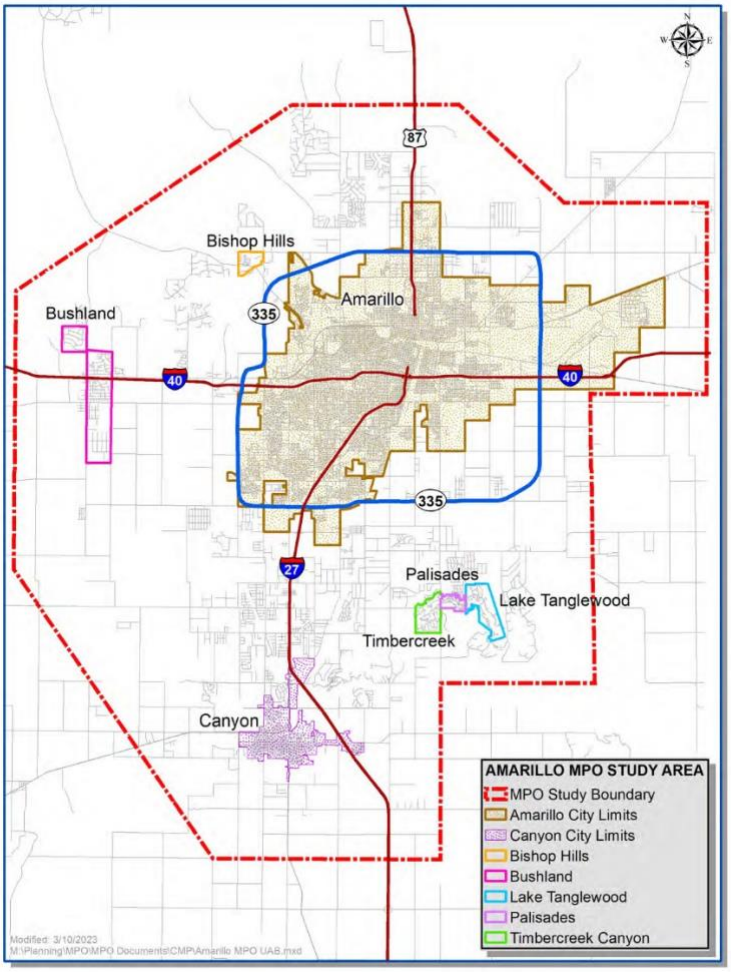


Figure 1: Map of Amarillo Area MPO Boundary

Congestion Management Process (CMP)

Congestion management involves implementing strategies to enhance the performance and reliability of transportation systems by alleviating the adverse effects of congestion on the movement of people and goods. A Congestion Management Process (CMP) is a systematic approach to managing congestion, providing accurate information on transportation system performance, and evaluating alternative strategies to address congestion in accordance with state and local requirements. The CMP aims to develop transportation system performance measures and congestion management strategies that can be integrated into the regional Metropolitan Transportation Plan (MTP) and the Transportation Improvement Program (TIP).

CMP is mandatory in metropolitan areas with populations exceeding 200,000, known as Transportation Management Areas (TMAs). Federal regulations also mandate that CMPs be developed as an integral part of the metropolitan transportation planning process. The Congestion Management System (CMS) was introduced by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and has been upheld through subsequent transportation authorization laws, including the current Investment Infrastructure Jobs Act (IIJA). The CMP will be an ongoing process, fully integrated into metropolitan transportation planning, a "living" document, continually evolving to address performance measure results, community concerns, objectives of the MPO, and updated information on congestion issues.

The Amarillo Metropolitan Planning Organization (MPO) was designated as a Transportation Management Area (TMA) due to the 2020 Census. The Census revealed that the Amarillo metropolitan area had grown significantly, adding 4,105 residents between 2015 and 2020, which represented an increase of 1.6% to the total population. According to Titles 23 and 49 of the United States Code (U.S.C.), any Urbanized Area (UZA) with a population over 200,000 is required to be identified as a TMA. Therefore, the growth in Amarillo's population as revealed by the 2020 Census led to its designation as a TMA. This designation has implications for transportation planning and funding, and it reflects the ongoing growth and development of the Amarillo area.

The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities…using travel demand reduction and operational management strategies. The development of a congestion management process should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and TIP.

23 CFR 450.320(a) and (b). Metropolitan Transportation Planning, Final Rule, February 14, 2007.

Federal and State Requirements

The federal and state requirements for the Congestion Management Process (CMP) in Transportation Management Areas (TMAs) are outlined in 23 CFR § 450.322. Here are the key points:

- Integrated Management and Operation: The CMP must provide for the safe and effective integrated management and operation of the multimodal transportation system. This includes new and existing transportation facilities eligible for funding under Title 23 U.S.C. and Title 49 U.S.C. Chapter 53 using travel demand reduction, job access projects, and operational management strategies.
- Multimodal System Performance Measures: The development of a CMP should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the Transportation Improvement Program (TIP).
- Congestion Management Objectives: The CMP must define congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods.
- Monitoring and Evaluation: The CMP includes methods to monitor, evaluate the performance of the multimodal transportation system, identify the underlying causes of recurring and non-recurring congestion, identify and evaluate alternative strategies, provide information

supporting the implementation of actions, and evaluate the effectiveness of actions.

- Demand and Operational Management Strategies: Consideration should be given to strategies that manage demand, reduce single-occupant vehicle (SOV) travel, improve transportation system management and operations, and improve efficient service integration within and across modes, including highway, transit, passenger and freight rail operations, and non-motorized transport.
- Periodic Assessment: The CMP must include a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures. The results of this evaluation should be provided to decision-makers and the public to guide the selection of effective strategies for future implementation.

These requirements ensure that the CMP is a comprehensive and effective tool for managing congestion and improving the overall transportation system in TMAs.

Amarillo Congestion Management Process

The Congestion Management Process (CMP), as outlined in federal regulations, is designed to be a systematic approach that ensures the coordinated management and operation of the multimodal transportation system. Congestion occurs when there is an excess of vehicles on a roadway segment at a particular time, leading to slower-than-normal speeds and often resulting in stop-and-go traffic. Causes of congestion can include physical bottlenecks, traffic incidents or accidents, work zones, weather conditions, traffic control devices, special events, and routine daily traffic fluctuations.

The effects of roadway congestion can significantly impact lost time, lost income, and reduced safety. These impacts can be measured in terms of production costs, such as the expenses associated with wasted fuel. While congestion also affects quality of life, this impact is harder to quantify in monetary terms. Roadway congestion has several negative consequences.

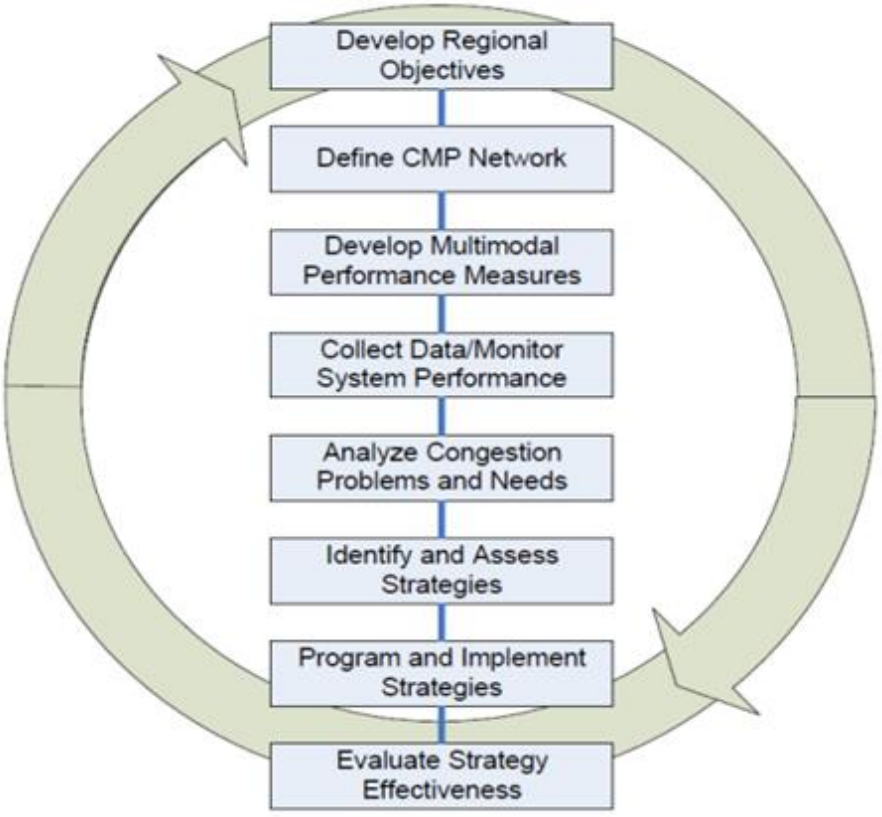
- Wasted fuel – Each year, millions of gallons of fuel are wasted because of roadway congestion. This represents billions of dollars in losses to both commercial and private interests. The costs associated with wasted fuel are typically passed on to the consumer.
- Diminished quality of life – Every minute wasted in congestion reduces the available time for family, friends, errands, hobbies, exercise, and other life pursuits. In addition, evidence has suggested that increases in commuter times can negatively affect involvement in community affairs.
- Lost economic productivity – As traffic congestion grows, material storage and delivery systems can be easily disrupted, raising transportation and manufacturing costs while reducing productivity. The costs associated with lost productivity are often passed on to the consumer.

- Reduced safety – Frustrated drivers can exhibit higher risk and aggressive driving behaviors, increasing the potential for crashes. Highway interchanges that require weaving maneuvers on congested roadways also pose significant safety hazards.
- Slowed emergency response – Delays caused by roadway congestion can severely impact response times in emergency situations and add additional safety risk to both roadway users and emergency responders.
- Degraded air quality – In general, vehicles emit far more pollutants that contribute to ground level ozone and smog during stop-and-go traffic than under free flow conditions. Greenhouse gas emissions also increase because of roadway congestion.
- Decreased system reliability – Reliability of the transportation system begins to decrease as roadway congestion grows to absorb longer periods of time and more stretches of highway. To arrive at a destination on time, extra buffer time needs to be allocated, which can decrease market access and competitiveness.
- Increased spending on infrastructure – When local, state, and federal governments must allocate an increasing number of resources to simply keep pace with growing roadway demand, fewer funds are available for transportation initiatives and other government services.

The Amarillo MPO Congestion Management Process (CMP) follows the guidelines outlined in the Federal Highway Administration's Congestion Management Process: A Guidebook. The chart below illustrates the step-by-step procedure, highlighting the continuous nature of the CMP. This eight-step process includes the following actions:

- Develop Regional Objectives for Congestion Management: Define what the region aims to achieve regarding congestion management, including specific, measurable objectives.
- Define the CMP Network: Identify the transportation network to be analyzed, including roadways, transit routes, and non-motorized facilities.
- Develop Multimodal Performance Measures: Establish measures that will be used to monitor and evaluate the performance of the transportation system in relation to congestion.
- Collect Data/Monitor System Performance: Gather data on current conditions and monitor system performance over time using the identified performance measures.
- Analyze Congestion Problems and Needs: Use the collected data to identify areas of congestion, determine the severity and causes, and pinpoint where improvements are needed.
- Identify and Assess Strategies: Develop and evaluate a range of strategies to address identified congestion issues. Strategies can include operational improvements, demand management, and policy changes.

- Program and Implement Strategies: Prioritize and select strategies for implementation, integrate them into the region's transportation improvement program (TIP), and allocate funding.
- Evaluate Strategy Effectiveness: After implementing strategies, assess their effectiveness in meeting the congestion management objectives and adjust as necessary.



Source: FHWA Congestion Management Process Guidebook

GOALS	OBJECTIVES
Safety Protect life and property from unintentional harm by developing policies, programs, and projects to support safer roadways and intersections, reduce fatalities, injuries, and improve mobility.	**Safety** 1.1 Reduce pedestrian crash rate by planning and enhancing connected pedestrian infrastructure. 1.2 Reduce the number of fatalities and serious injuries. 1.3 Increase bicycle safety education.
Performance Assess metrics to ensure the current and future ability of people and freight to travel to destinations on the network efficiently.	**Performance** 2.1 Reduce congestion and improve travel time reliability to sustain adequate levels of service for all modes of transportation. 2.2 Plan and enhance intersections through analysis of corridor and network signalization to ensure traffic is flowing efficiently.
Resiliency Plan for and provide a continued high level of service in the face of disruption or unexpected conditions, such as weather events, major incidents (or crashes), and infrastructure failures.	**Resiliency** 3.1 Prioritize transportation projects that add capacity or otherwise improve existing infrastructure. 3.2 Reduce stress and wear on existing infrastructure by improving system operations and developing vehicle demand reduction strategies.
Efficiency Providing reliable, affordable, and safe transportation, connecting residents to jobs, goods, healthcare, education, and recreation.	**Efficiency** 4.1 Plan transportation systems that align with development trends to stimulate regional and local economic development. 4.2 Plan for and provide mobility for current and future freight traffic volumes.
Connectivity Plan for and improve interregional connectivity of I-40, I-27, Loop 335 by enhancing the integration and connectivity of the transportation system across all modes by connecting neighborhoods, commercial, employment areas, and community facilities.	**Connectivity** 5.1 Prioritize projects that improve connectivity of the transportation system for all users and modes of travel. 5.2 Encourage projects that provide connectivity. 5.3 Plan projects that provide connectivity to existing and future employment, and education points.
Responsible Funding Plan for and require responsible financial stewardship and seek out innovative ways to fund projects.	**Responsible Funding** 6.1 Seek both traditional and alternative project funding sources and innovative funding mechanisms. 6.2 Be a good steward of category grant funds. 6.3 Leverage all available funds with additional funds from other entities and partners.
Enhance Natural Environment To improve the transportation system's efficiency while preserving and enhancing the natural environment.	**Enhance Natural Environment** 7.1 Reducing greenhouse gas emissions and minimizing fuel consumption. 7.2 Fewer traffic delays mean less idling, which leads to improved air quality and reduced noise pollution. 7.3 Supports ecosystems, preserves natural habitats, and contributes to overall resilience.
Economic Development Encourage development in the Amarillo & Canyon region by prioritizing projects that align with current and future commercial, residential, and economic growth areas.	**Economic Development** 8.1 Plan for broader connection for all modes of transportation to economic development and land use. 8.2 Leverage transportation assets to support economic growth and vitality. 8.3 When evaluating and prioritizing projects, take economic implications into account. 8.4 Partner with local agencies and businesses that will expand job creation and retention.

Chapter 2: Congestion Management Data

Federal regulation 23 CFR 500.109 defines congestion as unsatisfactory system performance due to extended travel times and delays, with severity, extent, and duration as its main components. The Congestion Management Process (CMP) for the Amarillo MPO establishes performance measures to examine congestion, laying the foundation for understanding local congestion perceptions.

The CMP identifies congestion hotspots and causes, primarily on roads within Amarillo MPO's planning area, facilitating targeted transportation planning. The overall congestion impact is determined by the interplay of severity (peak problem magnitude), extent (geographic area or affected motorists), and duration (length of congestion experience). Increases in one element led to increases in the others, affecting more motorists and facilities. The Amarillo MPO Policy Board considers this congestion data when prioritizing and funding projects.

Data Collection & Monitoring

The Amarillo MPO's Congestion Management Process (CMP) utilizes several key quantitative data sets for analysis, including INRIX, Travel Demand Models (TDM), Crash Records Information System (CRIS), and traffic counts. The baseline traffic counts for the CMP are derived from data collected within the City of Amarillo. Since 1985, a program has been in place to ensure that every traffic link within Amarillo is counted at least once every two years. The City of Amarillo traffic count program covers approximately 350 links.

Additional traffic count information, such as interstate highway traffic volumes, is provided by the TxDOT Amarillo District. Defining the CMP Network involves specifying the geographic boundaries and transportation system components that form the foundation of the analysis and the process itself. Efforts to improve traffic conditions in the region focus on the CMP Network, and the level of congestion on this network serves as an indicator of overall regional congestion.

Types of Available Data/Data Sources:

- Commuting trip data (U.S. Census Journey to Work files)
- Truck and business trip data, categorized by industry
- Commodity Flow Survey (CFS) data
- Professional and service activity data
- Travel time and variability data (used to estimate ADT, commuting times, and travel time variance)
- Inventory and logistics costs (especially costs related to perishability)

Congestion Data Sources

The Amarillo MPO uses various technological tools for identifying congestion, including:

- INRIX introduced its own set of tools in mid-2023, made available to Texas MPOs through a licensing agreement with the Texas Department of Transportation (TxDOT). INRIX, a private company, provides roadway analytics using both fixed sensors and real-time in-vehicle data collection. It collects and provides speed and travel time information from various sources, including GPS, cell phones, and in-car navigation systems. The data includes average speeds in 15-minute increments for each section of its roadway network. By using actual speed information instead of estimates, INRIX data reduces the need for physical travel time runs.
- Congestion Management Process Assessment Tools (COMPAT) is a web-based tool utilized by the Amarillo MPO for its Congestion Management Process. COMPAT, designed to aid MPOs, is instrumental in performance-based planning, corridor analyses, and roadway performance reporting. It uses the Texas 100 statewide dataset, produced annually for the Texas 100 Most Congested Road Segments report, derived from INRIX speed data and traffic volumes from the Texas Department of Transportation's (TxDOT) roadway inventory file. The Amarillo MPO leverages COMPAT to monitor roadway performance on their CMP network, provide regional performance profiles and maps, and visualize roadway performance for selected corridors.
- National Performance Management Research Data Set (NPMRDS), developed by HERE and procured by the Federal Highway Administration (FHWA), uses crowd-sourced GPS data to provide travel times across key transportation networks. This data is linked to specific road segments using a network of segments known as Traffic Message Channels (TMCs). The Amarillo MPO applies this integrated data to pinpoint needs along all CMP corridor segments and carry out comprehensive before-and-after analyses.
- Travel demand model (TDM) is a computational tool used to estimate future travel patterns and transportation system usage based on factors like population growth, land use changes, economic activity, and transportation infrastructure developments. For the Amarillo MPO, the TDM aids the Congestion Management Process (CMP) by identifying congestion hotspots, evaluating improvement strategies, supporting data-driven decisions, forecasting future conditions, and facilitating public engagement. By simulating travel patterns, the model helps pinpoint areas of potential congestion, assess the effectiveness of mitigation strategies, and ensure efficient resource allocation. Additionally, it provides a robust analytical basis for planning and policy decisions, predicts the impact of demographic and infrastructure changes on future travel demand, and visually communicates challenges and solutions to the public and stakeholders. Through this, the Amarillo MPO can more effectively manage and mitigate congestion, enhancing transportation system performance and planning for future growth.
- Crash Records Information System (CRIS) is a centralized database used to collect, manage, and analyze crash data in Texas. It is maintained by the Texas Department of Transportation (TxDOT)

and serves as the state's official repository for motor vehicle crash reports. CRIS compiles information from crash reports submitted by law enforcement agencies and allows authorized users to access detailed data, including the date, location, and cause of crashes, as well as information about the vehicles and people involved.

Data Prioritization Process

A composite evaluation criterion was developed to prioritize congestion hotspots across the CMP network. Each segment represents a weighted measure of congestion, based on the data collected. Other evaluation criteria include traffic volume, safety (including crashes and rear-end collisions), school locations, transit routes, and public need identification, each scored differently to reflect its significance.

Chapter 3: Identify Congestion Problems & Needs

Define CMP Network

For the Amarillo Metropolitan Planning Organization, the Congestion Management Process (CMP) network is a specifically chosen collection of transportation routes and corridors. These have been pinpointed for consistent observation and control of traffic congestion. This network forms an integral part of a broader congestion management strategy, which is designed to identify, address, and mitigate traffic congestion within our metropolitan region. This strategy is a proactive approach to ensuring smoother and more efficient travel for all.

Recurring Congestion	Non-Recurring Congestion
High Traffic Volume	Accidents
Bottlenecks	Road Closures
Traffic Signals	Weather Conditions
Intersections	Construction Delay
Roadway Incidents	Vehicle Breakdowns
Construction Zones	Detours
School Zones	Special Events
Public Transit Stops	Unusual Traffic Patterns

Figure 2: Table Types of Congestion

Evaluation Criteria

To prioritize congestion hotspots, evaluation criteria were developed, and each segment of the CMP network was assigned a congestion score. This score reflects a weighted measure of congestion based on both quantitative and qualitative data. Additional criteria considered include traffic volume, safety, school locations, transit routes, and public need identification.

Congestion Measures

The Amarillo Area MPO employs two primary methods to identify areas of congestion. First, a public survey is conducted, allowing residents to highlight locations they perceive as congested, which addresses both current and future congestion concerns. The results of this survey are then compared with average daily traffic counts provided by the City of Amarillo and TxDOT to identify roadways experiencing higher levels of congestion. In addition to these immediate observations, the MPO uses traffic models provided by TxDOT and takes citizen complaints into account to identify facilities that may develop congestion issues in the future.

These areas are closely monitored, and traffic counts are regularly conducted to assess whether a facility is nearing a congested state. Using this composite data, the MPO developed evaluation criteria to prioritize congestion hotspots. Each segment of the CMP (Congestion Management Process) network is assigned a congestion score, reflecting a weighted measure based on the collected data. Additional criteria include traffic volume, safety data such as crashes and rear-end collisions, proximity to schools, transit routes, and public feedback. These criteria are weighed to ensure accurate prioritization of congestion hotspots for targeted improvements.

Multimodal Performance Measures

The Amarillo Area Metropolitan Planning Organization (MPO) uses a variety of tools and data sources to assess multimodal performance measures, particularly in addressing congestion and ensuring a safe, efficient transportation network. Through real-time traffic analytics from INRIX, the MPO tracks vehicle speed, congestion, and travel times to identify bottlenecks and prioritize improvements. COMPAT provides additional transportation data, such as traffic counts and road characteristics, allowing for a detailed analysis of various travel modes and congestion levels.

The MPO also leverages the National Performance Management Research Data Set (NPMRDS), which provides travel time data for both passenger and freight movements, enabling the evaluation of

travel reliability and congestion trends. The Travel Demand Model (TDM) helps predict future travel patterns and assess how different modes, such as cars, buses, and bicycles, will perform under varying congestion scenarios. Meanwhile, the Crash Records Information System offers crash data that highlights areas where congestion may impact safety.

Public surveys are another critical element, offering insights into user experiences with congestion and transportation services. By integrating these tools and data, the Amarillo Area MPO can effectively develop performance measures to guide strategies for reducing congestion and improving multimodal travel efficiency across the region.

Identification of Congested Areas

The Amarillo Area Metropolitan Planning Organization (MPO) identifies congestion using performance measures that focus on travel time reliability, traffic volume, and delay analysis. By collecting data on traffic patterns, the MPO evaluates the average travel times on key corridors and compares them to expected travel times during peak and off-peak hours. These metrics help to identify bottlenecks and areas where traffic flow is consistently hindered. Additionally, the MPO uses vehicle counts and congestion indices to monitor and assess roadway performance, guiding strategies for improving transportation infrastructure and reducing congestion.

Planning Time Index 80

Planning Time Index 80	Road	From	To
1.513	S Washington St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
1.465	S Western St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
1.421	Georgia St S	Amarillo Blvd / IH 40B	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
1.391	US 287	US 60 / Amarillo Blvd	S. 14th Ave
1.329	FM 2590	W Loop 335 S	US-60 W
1.327	Western St	W Amarillo Blvd / IH 40B	IH 40
1.277	S Buchanan St / US 60 / US 287	Amarillo Blvd / IH 40B / US 60	IH 40 / US 287
1.27	SL 335 / FM 2590	W Amarillo Blvd / IH 40B	Hollywood Rd / FM 2186*
1.268	Hillside Rd	Coulter St S	S Western St
1.259	Bell St	IH 40	Hollywood Rd / SL 335

Figure 3: Planning Time Index 80 (Texas' Most Congested Roadways - Mobility Division)

** New Location (Helium Rd) SL 335 Now open as viable alternate route*

The Amarillo Area MPO uses the Planning Time Index (PTI) 80 as a key performance measure to

evaluate congestion. PTI 80 represents the ratio of the 80th percentile travel time to the free-flow travel time. A PTI of 1.25 or higher indicates that, during congested conditions, a driver would need to plan for a travel time 25% longer than during free-flow conditions. For roads with a PTI above 1.25, it means congestion is significant, and travel time becomes less predictable. This measure helps the MPO identify corridors where delays are frequent and travel reliability is compromised, guiding potential improvements to traffic flow.

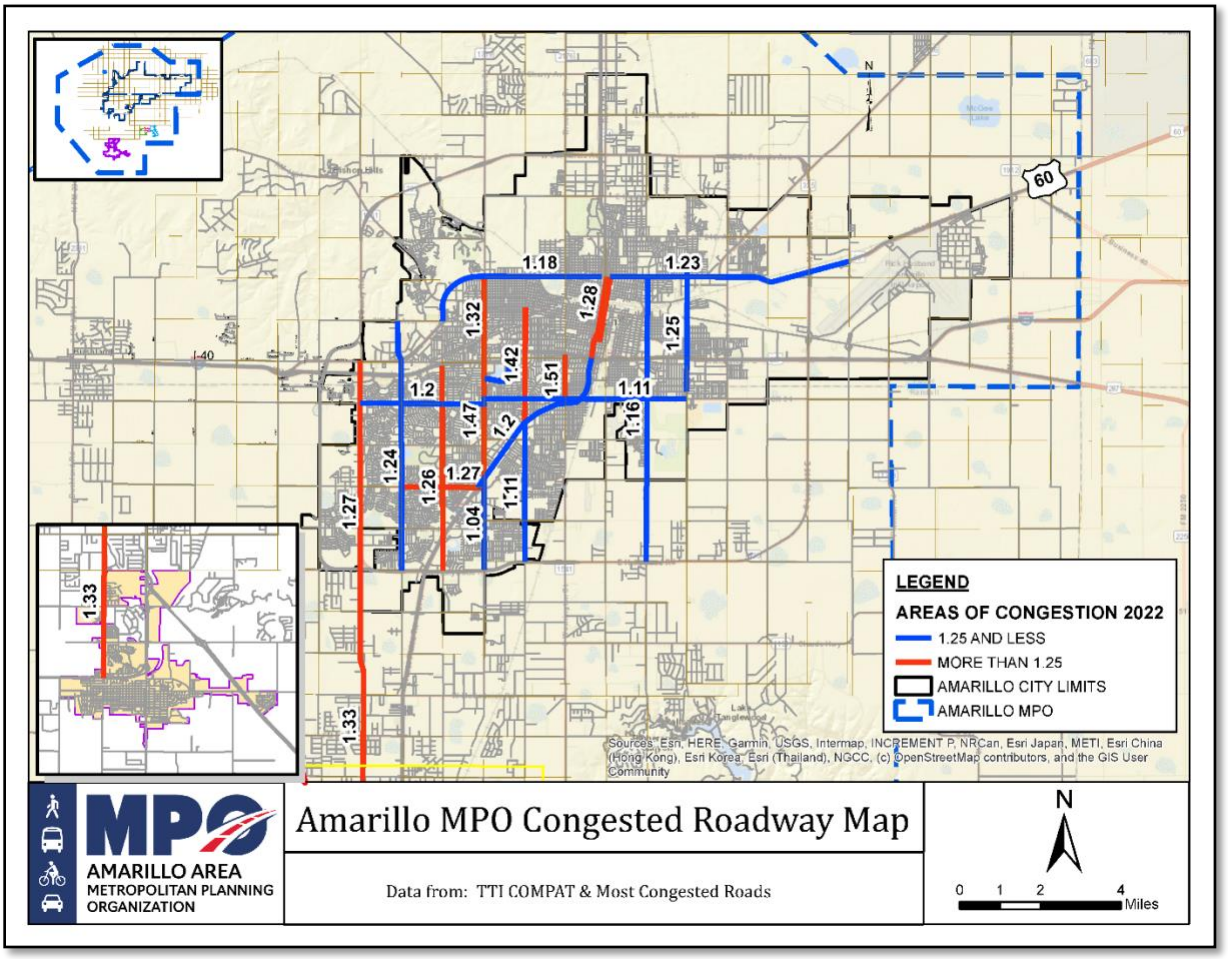


Figure 4: Travel Time Index (Texas' Most Congested Roadways - Mobility Division)

Safety Data

Safety data plays a crucial role in impacting congestion for the Amarillo Area MPO. High accident rates or frequent incidents on specific roadways can contribute to delays and increased congestion, especially if accidents cause lane closures or disruptions in traffic flow. By analyzing crash data, the MPO

can identify hazardous areas or intersections prone to accidents, which in turn helps prioritize safety improvements, such as better signage, intersection redesign, or the addition of traffic calming measures. Reducing accidents not only improves safety but also enhances overall traffic flow, mitigating congestion in the long term.

TXDOT 2024 PERFORMANCE MEASURE TARGETS ADOPTED BY AMARILLO MPO	
Number of Fatalities	3,046
Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)	1.14
Number of Serious Injuries	17,062
Rate of Serious Injuries per 100 million VMT	6.39
Number of Non- Motorized Fatalities and Non-Motorized Serious Injuries	2,357

Figure 5: TxDOT 2024 Performance Measures Evaluation Report

Person - Hours of Delay

The Amarillo Area MPO uses Person Hours of Delay (PHD) as a key metric to assess congestion by calculating the total time lost due to traffic delays for all individuals traveling on a roadway. This measure helps quantify the impact of congestion by considering both the number of vehicles and the average occupancy per vehicle.

Person -Hours of Delay	Road	From	To
389,433	S Washington St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
292,794	S Western St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
236,304	Georgia St S	Amarillo Blvd / IH 40B	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
120,802	US 287	US 60 / Amarillo Blvd	S. 14th Ave
325,306	FM 2590	W Loop 335 S	US-60 W
121,797	Western St	W Amarillo Blvd / IH 40B	IH 40
37,541	S Buchanan St / US 60 / US 287	Amarillo Blvd / IH 40B / US 60	IH 40 / US 287
50,797	SL 335 / FM 2590	W Amarillo Blvd / IH 40B	Hollywood Rd / FM 2186*
17,917	Hillside Rd	Coulter St S	S Western St
17,961	Bell St	IH 40	Hollywood Rd / SL 335

Figure 6: Person -Hours of Delay (Texas' Most Congested Roadways - Mobility Division)

** New Location (Helium Rd) SL 335 Now open as viable alternate route*

By analyzing PHD, the MPO can identify corridors with significant delays, prioritize congestion

management strategies, and implement solutions such as optimizing signal timing, improving roadway capacity, or enhancing alternative transportation options. This data-driven approach helps reduce overall travel time and improves the efficiency of the transportation network.

Truck Person - Hours of Delay

The Amarillo Area MPO uses Truck Person Hours of Delay (Truck PHD) to specifically measure the impact of congestion on freight and commercial vehicles. This metric calculates the total time lost by truck drivers due to traffic delays, which is particularly important for assessing the efficiency of freight movement on key corridors. Since trucks are essential for regional and national goods movement, congestion affecting them can lead to economic inefficiencies. By analyzing Truck PHD, the MPO can identify freight bottlenecks, prioritize improvements on truck-heavy routes, and implement strategies to improve traffic flow and reduce delays for the trucking industry, ultimately supporting regional economic growth.

Truck - Hours of Delay	Road	From	To
18,672	S Washington St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
21,784	S Western St	IH 40	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
11,581	Georgia St S	Amarillo Blvd / IH 40B	Marshall Formby Memorial Hwy / IH 27 / US 87 / US 60
5,652	US 287	US 60 / Amarillo Blvd	S. 14th Ave
23,214	FM 2590	W Loop 335 S	US-60 W
10,200	Western St	W Amarillo Blvd / IH 40B	IH 40
3,180	S Buchanan St / US 60 / US 287	Amarillo Blvd / IH 40B / US 60	IH 40 / US 287
5,433	SL 335 / FM 2590	W Amarillo Blvd / IH 40B	Hollywood Rd / FM 2186*
839	Hillside Rd	Coulter St S	S Western St
1,995	Bell St	IH 40	Hollywood Rd / SL 335

Figure 7: Truck Hours of Delay (Texas' Most Congested Roadways - Mobility Division)

** New Location (Helium Rd) SL 335 Now open as viable alternate route*

Chapter 4: Congestion Mitigation Strategies

Assess Strategies

Once a roadway is identified as congested, the MPO develops strategies to mitigate the congestion. Each area is assessed individually, with evaluations conducted to determine what specific actions can be implemented to alleviate the issue. Potential strategies may include:

- Traffic operational improvements
- Intersection modifications
- Signage enhancements
- Roadway striping
- Signal synchronization
- Transit improvements

Prioritization of Congestion Hotspots

A composite evaluation criterion was developed to prioritize congestion hotspots across the CMP network. Each segment received a congestion score representing a weighted measure of congestion, based on the data collected. Other evaluation criteria include traffic volume, safety (including crashes and rear-end collisions), school locations, transit routes, and public need identification, each weighed differently to reflect its significance.

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

These weights were applied to prioritize congestion hotspots for both highways and arterials. The data was collected using the Compat tool from TTI. Below is the ranked list of highways and arterials:

Segment ID	Description	Priority Rank
SL0335-KG	Loop 335 from I-40 NE to I-27 S	1
FM2590-KG	Soncy/FM 2590 from I-40 to Hwy 60 in Canyon	2
IH0040-KG	I-40 & Bell to Interchange	3
IH0027-KG	I-27 & 45th to Interchange*	4

* Under Construction

Implementing Mitigation Strategies

Loop 335

Improving Loop 335 around Amarillo is expected to significantly mitigate congestion in several ways:

- Bypass Traffic: Loop 335 will serve as a bypass for thru traffic, diverting vehicles that do not need to enter the city. This will reduce the volume of cars on local roads, alleviating congestion in the downtown area and other heavily trafficked zones.
- Improved Connectivity: The loop will enhance connectivity between various parts of Amarillo and surrounding areas, allowing for more efficient travel. This can lead to reduced travel times for residents and commuters.
- Access to Major Highways: Loop 335 will connect to major highways like I-40, I-27 and US Highway 87, facilitating easier access for long-distance travelers and freight, further relieving pressure on local roadways.
- Traffic Distribution: By providing an alternative route, Loop 335 can help distribute traffic more

evenly across the roadway network, reducing bottlenecks and improving overall traffic flow.

- Encouragement of Local Development: The new infrastructure may stimulate economic development along its route, potentially reducing reliance on congested urban roads as new businesses and services emerge.
- Safety Improvements: The loop is designed to reduce conflicts between local and through traffic, which can lead to fewer accidents and smoother traffic flow.
- Overall, Loop 335 is anticipated to create a more efficient transportation system in the Amarillo area, leading to reduced congestion and improved travel experiences for residents and visitors alike.

FM 2590

The Amarillo Area Metropolitan Planning Organization (MPO) has implemented several measures to mitigate congestion on FM 2590. Key initiatives include:

- Upgrades to FM 2590, including widening segments to increase capacity and accommodate higher traffic volumes.
- Traffic Signal Optimization: Installation of improved traffic signals and synchronization to enhance flow and reduce waiting times at intersections along the route.
- Safety Enhancements: Implementing safety measures such as better signage, enhanced lighting, and the addition of turn lanes to minimize conflicts and improve overall traffic management.
- Public Engagement: Conducting community outreach and gathering input from residents to identify specific congestion issues and prioritize solutions.
- Coordination with Local Authorities: Collaborating with city and county officials to align transportation planning with local development and zoning plans, ensuring that growth does not exacerbate congestion.

IH 40

These efforts collectively aim to improve traffic flow, enhance safety, and provide a more efficient transportation experience for users of FM 2590. The Amarillo Area Metropolitan Planning Organization (MPO) has also undertaken several initiatives to mitigate congestion on IH 40. Key actions include:

- Capacity Expansion Projects: Initiatives to widen segments of IH 40 to accommodate increasing traffic volumes, especially in heavily congested areas.
- Interchange Improvements: Upgrading key interchanges to enhance traffic flow, reduce bottlenecks, and improve safety for merging and diverging traffic.
- Traffic Signal Coordination: Implementing advanced traffic signal systems along access roads and intersections that connect to IH 40 to optimize traffic flow and reduce delays.
- Incident Management Strategies: Developing plans for quick response to accidents and breakdowns, which can significantly impact traffic flow on IH 40. This includes partnerships with local emergency services for timely clearance of incidents.
- Public Transit Enhancements: Improving local transit options to reduce the number of vehicles on the highway, encouraging more residents to use public transportation.
- Community Planning: Collaborating with local jurisdictions to ensure that land use and development plans align with transportation goals, aiming to reduce demand on IH 40 through thoughtful urban planning.

These strategies collectively work to improve traffic flow, enhance safety, and reduce congestion on IH 40, making it a more efficient route for all users.

IH 27

The Amarillo Area Metropolitan Planning Organization (MPO) has taken several proactive measures to alleviate congestion on IH 27. Key initiatives include:

- Expansion Projects: Widening certain stretches of IH 27 to increase the number of lanes, which helps manage growing traffic volumes and reduces areas of congestion.
- Interchange Enhancements: Upgrading key interchanges to improve traffic flow, including the addition of dedicated turn lanes and better ramp designs for smoother merging.
- Signal Coordination: Optimizing traffic signals on adjacent roads to ensure better synchronization, reducing delays for vehicles entering and exiting IH 27.
- Promoting Public Transit: Expanding local public transportation options to encourage fewer personal vehicle trips, thereby lessening traffic load on the highway.
- Freight Traffic Management: Collaborating with local businesses and trucking firms to optimize freight routes and schedules, reducing the impact of heavy truck traffic during peak times.
- Engaging the Community: Actively involving residents in the planning process to gather insights on congestion challenges and prioritize effective solutions.

These strategies aim to enhance traffic flow, improve safety, and reduce congestion on IH 27, making it a more efficient corridor for all types of users.

Chapter 5: Evaluating Strategy Effectiveness

The Amarillo Area Metropolitan Planning Organization (MPO) has proactively begun implementing various strategies to mitigate congestion in the region, recognizing the growing traffic challenges it faces. Key initiatives include improved public transit services, which expand options such as increased bus frequencies and new routes to underserved areas, encouraging more residents to use public transportation and reducing the number of vehicles on the road. Additionally, the City of Amarillo Traffic Department has implemented active traffic management systems, featuring smart traffic signals and real-time traffic monitoring, allowing for adaptive signal control that adjusts timings based on current traffic flow, thereby alleviating bottlenecks during peak hours. Roadway improvements, including widening key roads and enhancing intersections, aim to facilitate smoother traffic flow and reduce delays.

The MPO also promotes carpooling and ridesharing through awareness campaigns and partnerships with rideshare services, decreasing the number of single-occupancy vehicles and fostering a community approach to commuting. Investments in bicycle and pedestrian infrastructure, such as bike

lanes and pathways, further encourage non-motorized transport options, reducing reliance on cars and easing congestion. To ensure the effectiveness of these strategies, the MPO has established a comprehensive evaluation framework that includes data collection and analysis from various sources like traffic volume counts and transit ridership statistics. Specific performance measures, such as average vehicle speeds and level of service at key intersections, are monitored regularly, providing quantitative insights into congestion levels.

The MPO engages the community through surveys and public meetings to gather qualitative feedback on congestion issues and the perceived effectiveness of its strategies, which is vital for adjusting approaches and enhancing community involvement. Furthermore, the MPO commits to regular reporting on congestion trends and the outcomes of its mitigation strategies, ensuring transparency for stakeholders to understand progress and areas needing improvement.

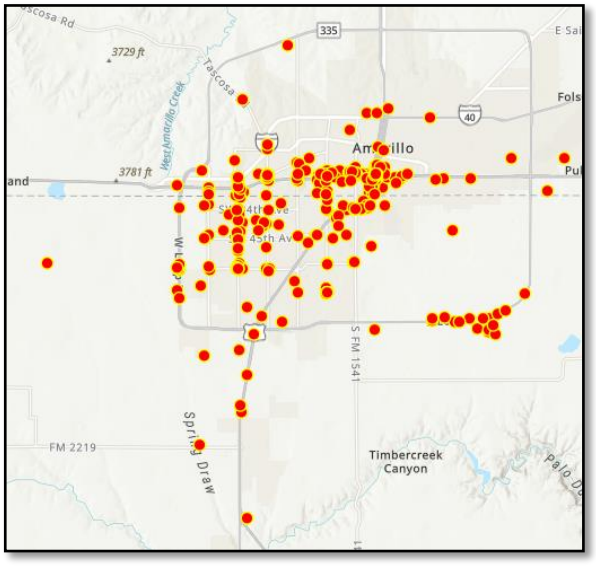
Through adaptive management, the MPO is prepared to adjust strategies based on evaluation findings, pivoting them to alternative solutions if certain measures are not yielding the desired results, thereby ensuring continuous improvement in managing congestion and creating a more efficient and sustainable transportation system for its growing population.

Survey Results

The Amarillo Area MPO put a traffic congestion survey out to the public to gather feedback on the congestion issues that caused the most problems. There were 373 respondents, and the information was invaluable. 92% of respondents expressed concern regarding traffic congestion in the Amarillo/Canyon metropolitan area. This suggests that improving traffic flow could be a priority for local authorities to enhance the overall commuting experience.

In assessing definitions of traffic congestion, the responses reveal diverse perspectives among commuters. 60% of respondents felt that congestion is characterized by taking too many traffic signal cycles to get through an intersection. Travel time being too long is a key indicator at 44%. The variability of travel times day-to-day and not being able to reach destinations were of concern.

Significant emphasis on roadway construction was cited as a primary cause of traffic congestion in the Amarillo/Canyon metro area, with 73% of participants. Ineffective or poorly timed traffic signals and inadequate roadway capacity also emerged as a major concern. Infrastructure issues play a pivotal role in congestion. Other factors included a lack of dedicated turn lanes and alternative transportation options, indicating a multifaceted problem that local planners may need to address to improve traffic flow and commuter experiences.



The survey reveals that a substantial majority of respondents encounter traffic congestion daily during peak travel periods, specifically from 7 AM to 9 AM and 4 PM to 6 PM. Additionally, many experience congestion daily during off-peak times, indicating that traffic issues are pervasive throughout the day. This data underscores the regularity of traffic challenges in the Amarillo/Canyon metro area, highlighting the need for effective solutions to alleviate congestion during both peak and off-peak hours. The map displays a high concentration of reported congestion points across various parts of Amarillo. The most significant congestion appears to be in the central and southwestern areas of the city, particularly around high-traffic zones and major intersections. Areas around I-40 and Amarillo Blvd are consistently congested. are likely where congestion is at its worst, as indicated by the clustering of pins. This visual representation identifies traffic patterns and helps detect problem areas for potential traffic management interventions.

The overwhelming majority of respondents, 99%, rely on personal cars as their primary mode of transportation, indicating a strong preference for private vehicle use in the Amarillo/Canyon metro area. Public transportation was notably absent from the responses, with no participants selecting it as a frequent option. Walking and carpooling or ridesharing received minimal representation, with only 0.53% and 0.53% respectively, while biking accounted for 1.87%. This data highlights a significant dependence on personal vehicles, suggesting potential challenges for developing alternative transportation options in the region.

Most respondents were in the 79109-zip code, with 79118 and 79119, second and third, respectively. The data reveals a diverse representation of neighborhoods within the Amarillo area, showcasing the distribution of residents across different zip codes. This information is essential for understanding community demographics and planning future services and infrastructure to better meet the needs of residents in these areas.

Travel patterns show participants mostly travel to work, school, or shopping, according to the survey. The most common destination was 79109. This data highlights the key areas of activity within the Amarillo region and reflects the connectivity of different neighborhoods. Analyzing patterns can guide future transportation planning and infrastructure development, ensuring that all areas receive the

necessary support.

Reaching their most common destination from home without traffic congestion usually took 10 minutes, and sometimes 15 minutes. Interestingly, some participants noted that actual travel times can vary significantly due to congestion, and comments highlight the impact of traffic lights and road conditions. Overall, this feedback offers valuable insights into commuting experiences and expectations within the Amarillo MPO area.

To arrive on time, respondents usually allow an extra 10-15 minutes to get to the destination. This data highlights the varying strategies residents employ to navigate potential delays, reflecting a proactive approach to managing commuting schedules in the face of congestion. Respondents utilized a variety of strategies to avoid traffic congestion. A common approach is to leave home earlier to beat peak traffic times, with several adjusting schedules based on historical traffic patterns.

Other tactics include using alternate routes or backroads to bypass congested areas and using real-time traffic apps to identify and avoid delays. Additionally, a few respondents highlighted the importance of planning their trips around known construction zones and peak travel times. Overall, these insights reflect the attitudes among residents in the Amarillo area as they navigate traffic challenges.

Suggestions to reduce traffic congestion in the Amarillo/Canyon metro area included improved traffic signal coordination, additional roadway capacity to accommodate growing traffic demands, implement dedicated turn lanes, and encouraging projects to reduce roadway crashes. While improving transit services and promoting walking and biking received less emphasis, they still reflect a recognition of the importance of diverse transportation options. These insights provide valuable guidance for future planning efforts to enhance mobility in the region.

Volume/Capacity Ratio 2050 Predictions

The table below provides predictions for the Volume Capacity Ratio (VCR) of various roadway facility types across different area classifications, including the Central Business District (CBD), CBD Fringe, Urban, Suburban, and Rural, for the year 2050. It highlights how different road types, such as Developed and Urban Primary Arterials, Major Arterials, Interstate Ramps, Frontage Roads, Freeways, and Collectors, are expected to handle traffic volumes relative to their capacity.

Significant findings include higher VCRs for Developed Primary Arterials in CBD Fringe (0.732) and Suburban areas (0.718), while Urban Major Arterials demonstrate notable capacity usage in Rural areas

(0.826). Primary Arterial Collectors higher in Rural areas with a ratio of 1.122, whereas City Freeway Main Lanes and Rural Interstate facilities report low or negligible capacity ratios in less developed zones. This analysis, associated with the Texas Department of Transportation's Amarillo district, was generated as part of a 2050 forecast and completed on January 22, 2024. The insights are integral to infrastructure planning, addressing future traffic demand and capacity challenges.

Figure 8: Volume/Capacity Ratio 2050 Predictions

Facility Type	Area Type 1 CBD	Area Type 2 CBD Fringe	Area Type 3 Urban	Area Type 4 Suburban	Area Type 5 Rural
Developed Primary Arterial	0.563	0.732	0.448	0.718	0.000
Urban Primary Arterial	0.396	0.664	0.594	0.594	0.610
Developing Major Arterial	0.138	0.383	0.255	0.000	0.000
Urban Major Arterial	0.122	0.498	0.562	0.306	0.826
Interstate Ramps	0.000	0.704	0.327	0.500	0.367
Frontage Roads	0.000	0.688	0.576	0.598	0.447
Rural Interstate Main Lanes	0.000	0.669	0.633	0.549	0.000
Regular Ramps	0.000	0.627	0.342	0.374	0.320
Primary Arterial Collector	0.000	0.596	0.501	0.346	1.122
Major Arterial Collector	0.000	0.566	0.449	0.195	0.000
Rural Expressway	0.000	0.505	0.606	0.593	0.605
Urban Collector	0.000	0.410	0.526	0.542	0.000
Rural Freeway Main Lanes	0.000	0.363	0.441	0.775	0.517
City Expressway	0.000	0.356	0.412	0.409	0.000
Rural Freeway	0.000	0.215	0.000	0.000	0.248
Developing Collector	0.000	0.194	0.225	0.234	0.000
City Freeway Main Lanes	0.000	0.000	0.404	0.487	0.000
Rural Interstate	0.000	0.000	0.000	0.396	0.000

Scenario Name: 2050
Scenario Date: Wed Dec 6,2023 (11:19:20)
Scenario Directory: C:\TxDOT\AMA\2050\
Report File: C:\TxDOT\AMA\2050\OUTPUT\TEMP\REPORTS\HTML\Summary.html
Report Created on: Monday, January 22, 2024 (10:59 PM)
Scenario Description: New Scene
VALID10 Summary Type: Future Year | Capacity

CONCLUSION

In conclusion, the Amarillo Area Metropolitan Planning Organization's Congestion Management Process represents a comprehensive and forward-thinking approach to addressing the pressing challenges of traffic congestion in the region. By embracing a multifaceted strategy that includes improved public transit services, active traffic management, infrastructure upgrades, and the promotion of alternative modes of transportation, the MPO is laying the groundwork for a more sustainable and efficient transportation system. These initiatives not only aim to alleviate current congestion but also anticipate the future needs of a growing population, ensuring that the region remains accessible and vibrant.

The commitment to community engagement and data-driven decision-making underscores the MPO's dedication to creating a transportation network that serves all residents. By actively seeking public feedback and integrating it into their strategies, the MPO fosters a sense of among community members. This participatory approach not only enhances the effectiveness of the congestion management strategies but also builds trust and strengthens the bond between the MPO and the community it serves.

Furthermore, the establishment of clear performance measures and a robust evaluation framework ensures that the MPO can continuously assess the effectiveness of its strategies. This adaptability is crucial in a dynamic urban environment where traffic patterns and population needs are evolving. The MPO's willingness to pivot and refine its approaches based on data and community input demonstrates a commitment to ongoing improvement and innovation.

As Amarillo continues to grow, the MPO’s strategic initiatives will play a vital role in shaping the future of transportation in the region. By prioritizing sustainable practices, enhancing public transit, and promoting a culture of shared mobility, the MPO is addressing immediate congestion issues and contributing to a higher quality of life for all residents. The vision of a connected, efficient, and accessible transportation network is within reach, and the Amarillo Area MPO stands as a proactive leader in making this vision a reality.

Ultimately, the success of the Congestion Management Process will hinge on collaboration among local governments, transportation agencies, businesses, and the community. By fostering these partnerships and maintaining a steadfast focus on sustainable solutions, the MPO can navigate the complexities of urban mobility and create a transportation landscape that supports economic vitality, environmental stewardship, and social equity. With a clear roadmap to excellence, the Amarillo Area MPO is poised to transform congestion management into an opportunity for growth, resilience, and lasting positive change for generations to come.