2025 CONGESTION MANAGEMENT PROCESS

FOR THE SHREVEPORT / BOSSIER CITY, LOUISIANA
METROPOLITAN PLANNING AREA (MPA)

Northwest Louisiana Council of Governments (NLCOG) / ADOPTED:

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This document was prepared by:
The Northwest Louisiana Council of Governments (NLCOG)
In cooperation with
The Louisiana Department of Transportation and Development (LADOTD)

This plan updates the Congestion Management Process (CMP) adopted xxx, 2025, for the NLCOG Metropolitan Planning Area (MPA) encompassing Caddo, Bossier, DeSoto, and Webster Parishes in Louisiana.

State Project No. and Federal Project No.

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This document was publicized for public comment on xxx, 2025, to be reviewed and adopted by the NLCOG Metropolitan Planning Organization's Transportation Policy Committee on xxx, 2025.

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Congestion Management Process (CMP)

Record of Adoption

ITEM	Date(s)
TCC/NLCOG Staff Developed Congestion Mitigation Projects – Recommendations to MPO Policy Committee	**11.01.2025 – 11.18.2025**
Introduction to the MPO Transportation Policy Committee (TPC)	**11.21.2025**
Draft CMP Document Public Comment Period	**12.01.2025-12.15.2025**
Adopted by Resolution: MPO Transportation Policy Committee (TPC)	**12.19.2025**

Table of Contents:

APPENDICIES:

NLCOG's CMP 2025 UPDATE OUTLINE

Chapter 1- Introduction – The purpose of the CMP (based on federal requirements), NLCOG's approach to CMP development, maintenance, and integration of a Performance Based Planning (PBP) requirements/best practices within the CMP, and a survey of the primary causes of congestion.

Chapter 2 - CMP Update 2025 Overview and Public Engagement – The Federal eight-step CMP is outlined, and a general overview of the process is provided. Regional goals and objectives derived from the adopted MTP (04.2021) are utilized in the CMP. NLCOG's public outreach efforts are described focusing on the successful deployment of an online public survey. A summary of the technical and analytical modifications to the 2021 CMP effort is provided.

Chapter 3 – Study Area-Network Identification – A description of the area of application and transportation network used for the CMP process is provided.

Chapter 4 - Development of Performance Measures – A summary of congestion related Performance Metrics/Measures are established. Performance Metrics are calculated utilizing the traffic flow datasets identified in Chapter 3 and they are used to monitor the effectiveness of the CMP. Further, documentation of the source(s) of traffic flow datasets employed and their statistical significance during the System Performance determinations.

Chapter 5 - Congested Corridor Determinations – This chapter describes how congested corridors and their respective study segments are identified employing the performance metrics identified in Chapter 4.

Chapter 6 - Congested Corridor Prioritization and Recommended Mitigation Projects – Utilizing a NLCOG Staff produced prioritization scheme "Severely Congested" determined sub-corridors are ranked by improvement need. NLCOG Staff in concert with TCC members recommended improvement projects that mitigate severely congested sub-corridors. The highest three prioritized sub-corridor improvements are detailed (Airline Dr. / Bert Kouns Industrial Loop / Kings Hwy).

Chapter 7 – Regionally Effective CMP Improvement Strategies – This chapter lists the various improvement strategies that can be used to reduce/minimize congestion along the identified sub-corridors.

Chapter 8 - System Performance Monitoring Plan and the Role of the CMP – The overview of the monitoring plan oversees the modal data to be collected in the region, the system performance monitoring of congestion, and the evaluation of the efficiency and effectiveness of implementation actions. CMP's role in the MPO Transportation Planning Process, as well as, an overall summary of the 2025 CMP update effort is provided.

CHAPTER 1 – CMP INTRODUCTION

PURPOSE OF THE CONGESTION MANAGEMENT PROCESS (CMP)

The CMP process is required in accordance with the 23rd Code of Federal Regulations, section 450.320, in the Federal Register, under the U.S. Department of Transportation. A CMP provides state Department of Transportations and MPOs with an empirically derived methodology and rational framework for addressing congestion. Federal rules require that a CMP area and network be defined by each MPO. In air quality non-attainment areas, projects that increase capacity for Single Occupancy Vehicles (SOV's) must be derived from a CMP.

The Congestion Management Process (CMP) is a management system and process conducted by Metropolitan Planning Organizations (MPOs) to improve traffic operations and safety utilizing strategies that reduce travel demand or the implementation of operational improvements. The public will typically benefit from having a functional CMP in place because it can improve travel conditions through the development of low-cost improvements or strategies.

The Federal Highway Administration (FHWA) defines a CMP as "a systematic approach collaboratively developed and implemented throughout a metropolitan region, which provides for the safe and effective management and operation of new and existing transportation facilities through the use of demand reduction and operational management strategies."

Further, Census defined metropolitan areas with more than 200,000 population, are classified as Transportation Management Areas (TMAs – i.e., NLCOG) and must maintain a Congestion Management Process plan. The intent of the CMP plan is to inform decisionmakers concerning the status, a "snapshot", of travel performance along identified study corridors and provide them with recommended strategies to improve highly congested roadway corridors/intersections. Improvement projects/strategies developed through the CMP plan will align and support NLCOG's adopted Performance Based Planning Measures and the travel performance Targets established within the MPO's four Parish Metropolitan Planning Area (MPA).

Projects identified through the CMP process may also be added to future updates of the MPO's Metropolitan Transportation Plan (MTP) should they require additional funding or a longer time frame for implementation.

Figure 1.0: I-20 Reconstruction Project looking East towards Industrial Dr.; Source LADOTD, December 2024

The CMP mirrors the elements of the NLCOG's transportation planning process. The strong similarities between the activities in both the CMP and the overall transportation planning process facilitate the integration of the CMP into the planning process. The development of regional objectives for the CMP responds to the goals and vision for the region established early in the transportation planning process. Through the development of the 2025 CMP update, NLCOG will utilize the regional transportation goals and objectives derived from the recently adopted (04.2025) *"Northwest Louisiana Metropolitan Transportation Plan (MTP) Update – 2045"*. The regional goals / objectives formulated through this effort identified congestion and its impacts throughout the public outreach process (as documented in a subsequent section).

PERFORMANCE BASED PLANNING (PBP) AND THE CMP

With the 2012 passage of the Federal surface transportation legislation, "Moving Ahead for Progress in the 21st Century Act" (MAP-21), performance-based planning (PBP) has taken on even greater significance. With the passage of the BIL/IIJA in 2023, performance-based planning continues to emphasize a more comprehensive performance-based approach to their decision-making.

The legislation requires the U.S. Department of Transportation, in consultation with states, MPOs and other stakeholders, to establish performance measures in these areas (as shown in Figure 1.1).

To monitor the performance of the transportation system, and the effectiveness of programs and projects as they relate to the National Goals, a series of performance measures were established in the areas of safety (PM1), infrastructure condition (PM2), and system performance (PM3). These measures are outlined in 49 USC 625 and 23 CFR 490.

As it relates to the development of the CMP, identified improvement strategies/projects will directly affect the "Congestion Reduction" measure but could potentially cause secondary impacts on all the other performance measures as outlined in Figure 1.1.

SAFETY
To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

INFRASTRUCTURE
To maintain the highway infrastructure asset system in a state of good repair.

CONGESTION REDUCTION
To achieve a significant reduction in congestion on the National Highway System.

SYSTEM RELIABILITY
To improve the efficiency of the surface transportation system.

FREIGHT MOVEMENT
To improve the National Highway Freight Network, strengthen rural communities' access to national and international trade markets, and support regional economic development.

SUSTAINABILITY
To enhance the performance of the transportation system while protecting and enhancing the natural environment.

REDUCED PROJECT DELAYS
To reduce project costs, promote jobs, 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.

Figure 1.1 – Federal/State/MPO Performance Goals

An Objectives-Driven, Performance-based Approach

The CMP is intended to use an objectives-driven, performance-based approach to planning for congestion management. Utilizing congestion management objectives and performance measures, the CMP provides a mechanism for ensuring that investment decisions are made with a clear focus on desired outcomes. This approach involves screening of strategies using objective criteria, relying on system performance data, analysis, and evaluation. In turn, this approach can help to demonstrate which congestion management strategies are most effective over time, assess why they work (or do not), and help practitioners to target individual strategies to those locations where they may be most successful at reducing congestion. In some regions, the CMP may function as a primary mechanism for an objectives-driven, performance-based approach to integrating management and operations (M&O) strategies into the planning process. The connections provide opportunities for conducting the CMP in conjunction with, or completely integrated with, the overall metropolitan transportation planning process.

PRIMARY CAUSES OF CONGESTION

The process of congestion management begins by understanding the cause of the problem. Six major causes of congestion are identified: bottlenecks are the largest cause of congestion nationally, followed by traffic incidents and bad weather. Adverse weather cannot be controlled, however, their negative impacts upon performance can be mitigated through roadway and technology improvements. Policies and improvements can be implemented directly to control traffic incidents and bottlenecks. Due to the lack of comprehensive local studies on the causes of congestion, these national data are widely used in CMPs. The data suggests that local causes are likely to be similar, with bottlenecks and traffic incidents typically being the top two causes of congestion.

Figure 1.2 – Primary Causes of Congestion

Detail of Primary Causes (Congestion)

- **Bottlenecks** – points where the roadway narrows or regular traffic demands (typically at traffic signals) cause traffic to back up; these are the largest source of congestion and typically cause a roadway to operate below its adopted level of service standards. "Recurring Congestion" occurs at bottlenecks as a result deficient roadway geometrics, inefficient/poor system operations (TS&O) or safety issues occurring at a specific location and/or time of day.
- **Traffic Incidents** – crashes, stalled vehicles, debris on the road; these incidents cause about one quarter of congestion problems. "Non-Recurring Congestion" is typically associated with traffic incidents since these random events occur at various locations and times throughout the roadway network.
- **Work Zones** – for new road building and maintenance activities, such as resurfacing roadways; caused by necessary activities, but the amount of congestion caused by these actions can be reduced through a variety of strategies.
- **Weather Conditions** – cannot be controlled, but travelers can be notified of the potential for increased congestion and signal systems can adapt to improve safety.
- **Poor Traffic Signal Timing** – the faulty operation of traffic signals or green/red lights where the time allocation for a road does not match the volume on that road; poor signal timings are a source of congestion on major and minor streets.
- **Special Events** – cause "spikes" in traffic volumes and changes in traffic patterns; these irregularities either cause or increase delay on days, times, or locations where there usually is none.

Recurring versus Non-recurring Congestion

Congestion is also characterized as either recurring (congestion that occurs at a predictable time of day or day of the week, such as the evening rush hour), or non-recurring (congestion that is unpredictable and results from a temporary disruption such as a crash, a work zone, or inclement weather). Understanding the causes contributing to congestion on each roadway facility, and whether the congestion is recurring or non-recurring, is crucial in selecting effective congestion management strategies.

WHAT ARE THE COSTS OF CONGESTION?

Congestion costs us more than just our time. According to the Federal Highway Administration, traffic congestion can result in the following costs:

Personal time costs – Time is money - according to the Texas Transportation Institute, the time value of delay is $19.64 per person-hour or $30.26 per vehicle-hour. For trucks, the cost is higher at $55.24 per vehicle hour. (with far greater costs when supply chains are impacted).

Fuel costs – In 2019, million gallons of extra fuel were consumed due to congestion in the metro area alone. Wasted fuel also produces emissions. that are harmful to human health and to global climate.

Vehicle maintenance and depreciation costs – Most notably, tires and brake systems experience greater wear in stop-and-go traffic.

Freight and supply chain costs – The rise of 'just-in-time' supply chain management strategies means that trucks often deliver goods as they are needed - making delays far more costly.

Costs to household services – Plumbers, electricians, HVAC technicians, and on-call trades of all kinds can make fewer calls per day when delayed by traffic, leading to loss of productivity and higher prices for customers.

Costs to emergency services – Medical, fire, and police services may be delayed from attending to emergency situations. This can have far greater than just monetary costs.

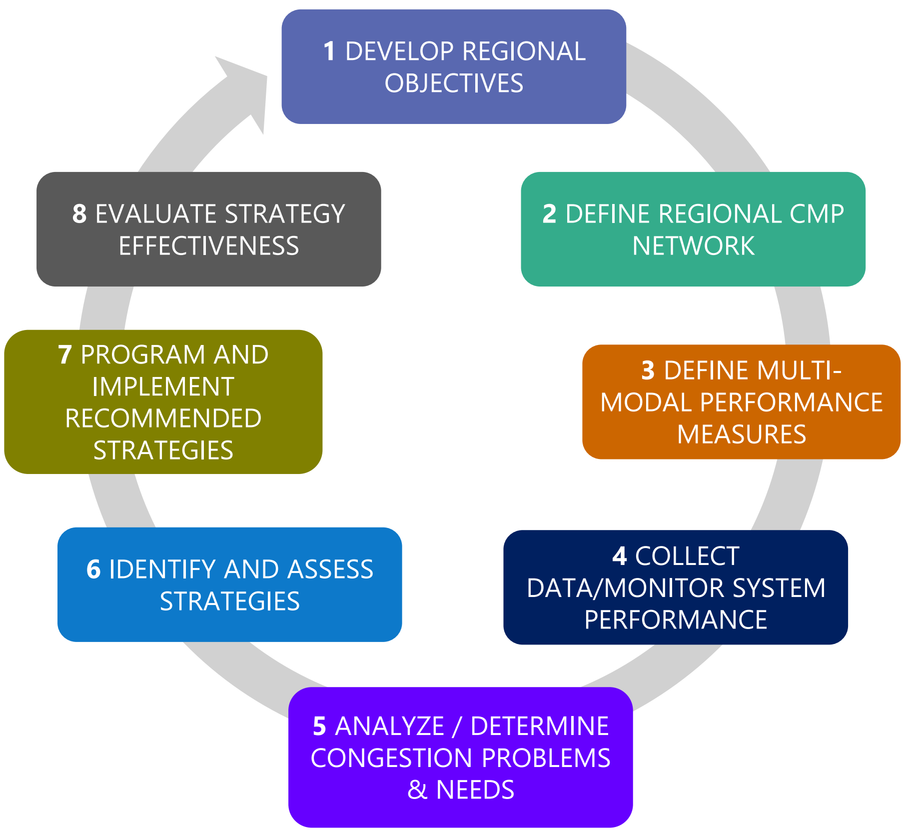
Costs to regional economic vitality – Congestion on commuter routes can reduce employment opportunities for workers and make commercial development undesirable. Higher transportation costs are passed onto other sectors of the economy.

CHAPTER 2 – CMP PROCESS / PUBLIC OUTREACH

FHWA CONGESTION MANAGEMENT PROCESS

FHWA's Congestion Management Process: A Guidebook (April 2011) provides guidance and recommended best practices regarding the MPO's development and implementation of the congestion management process. This guidebook includes an eight-step process that summarizes the key parts of a continuous congestion management process.

Figure 2.0 - Federal Eight Step Congestion Management Process



1. Objectives should be identified to assist in accomplishing Congestion Management goals.
2. CMP must be in both geographic and system elements to be analyzed.
3. The CMP defines the metrics by which it will monitor congestion.
4. A data collection methodology is determined to analyze and evaluate the data used to define congestion.
5. The CMP must define how network performance is analyzed to determine the congestion's scope and present the findings.
6. A "toolbox" of congestion mitigation strategies that best improves local network conditions is provided.
7. Outline a structure to implement congestion mitigation strategies within the planning process.
8. A plan to monitor the recommended strategies is provided.

REGIONAL GOALS SETTING WITHIN THE CMP FRAMEWORK

The NLCOG 2045 MTP Goals (Values) represented a synthesis of previous planning efforts, current scoring criteria, and national performance goals. These proposed goals were crafted to help create a unified regional perspective on long-range transportation planning and inform the project scoring and public involvement processes.

For the CMP 2025 update, a series of goals were developed to guide the process of monitoring congestion and improving the mobility of people and goods. The goals are presented below. They will be utilized as a tool for selecting strategies and performance measures for strategy monitoring and evaluation.

Figure 2.1 – MTP 2045 Update Goals (Values) – Applicable to the CMP 2025 Update

RECENT OUTREACH EFFORTS MTP 2045/RATP/SF4A:
PUBLIC ENGAGEMENT OUTCOMES AND THE CMP 2025 UPDATE

As required by the BIL/IIJA, 23 CFR §450.316, MPOs must provide opportunity for the **public** to comment on the development and content of the MTP, TIP, and any other revisions to major plans (Including the CMP – emphasis added) (**public** defined: under citation [1201(i)(6)(A)]).

Over the last three years, NLCOG has conducted multiple public and stakeholder outreach efforts to better understand the community's transportation challenges, needs, and opportunities. As mentioned before, this includes the recently adopted Regional Active Transportation Plan (RATP) and the Safe Roads For All (SF4A) Plan. A detailed account of public engagement strategies used in developing the NLCOG 2045 MTP, RATP, and SF4A plans included online visioning exercises, public surveys, stakeholder meetings, and the virtual public comment platform.

MTP 2045 Update Public Engagement:
http://www.nlcog.org/pdfs/LRTP2045/Chapter%203%20-20Public%20Engagement.pdf

Regional Active Transportation Plan (RATP) Public Outreach Effort:
https://www.nlcog.org/pdfs/library/Active_Transportation_Plan/RATP_Final_Plan_reduced.pdf

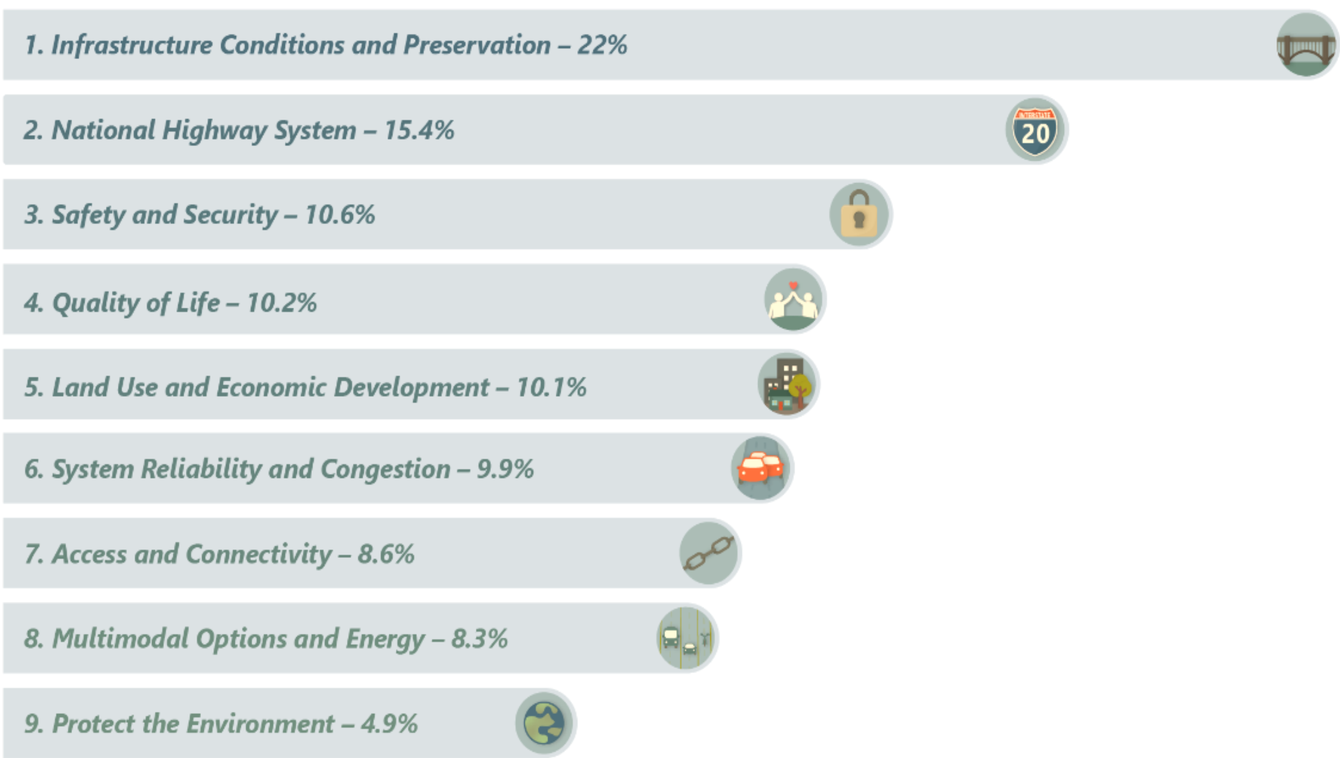
Safe Roads for All (SF4A) Plan Public Engagement:
https://www.nlcog.org/pdfs/library/SS4A/20250217_NLCOG%20SS4A%20Plan%20Reduced%20Size.pdf

It's reasonable to conclude, the RATP, SF4A, and the MTP – 2045 Update public outreach efforts yielded a regional vision and goals that would be similar, if not identical, to the ones generated through a unique CMP public outreach effort. This assumption is based upon the recency (RATP and SF4A) and relevancy of the MTP public outreach initiatives.

From these comprehensive public solicitation undertakings, system reliability/congestion, when prioritized against other regional transportation issues, survey respondents felt congestion was somewhat concerning but not nearly as critical as condition/preservation or safety regarding the region's transportation network.

However, from the public responses gathered, congestion/delay issues are "spot specific" and not corridor or regionally systemic. The public's concerns are substantiated through the documented "MTP Update 2045 – Chapter 4 Multi-modal Analysis" Travel Demand Model (TDM) existing conditions determinations. The MTP Update found that poorly performing roadways, because of vehicle delay, are primarily located around individual roadway sections/signalized intersections or roadways that have 2 or 3 inadequately spaced signals (e.g., near Interstate ramp facilities).

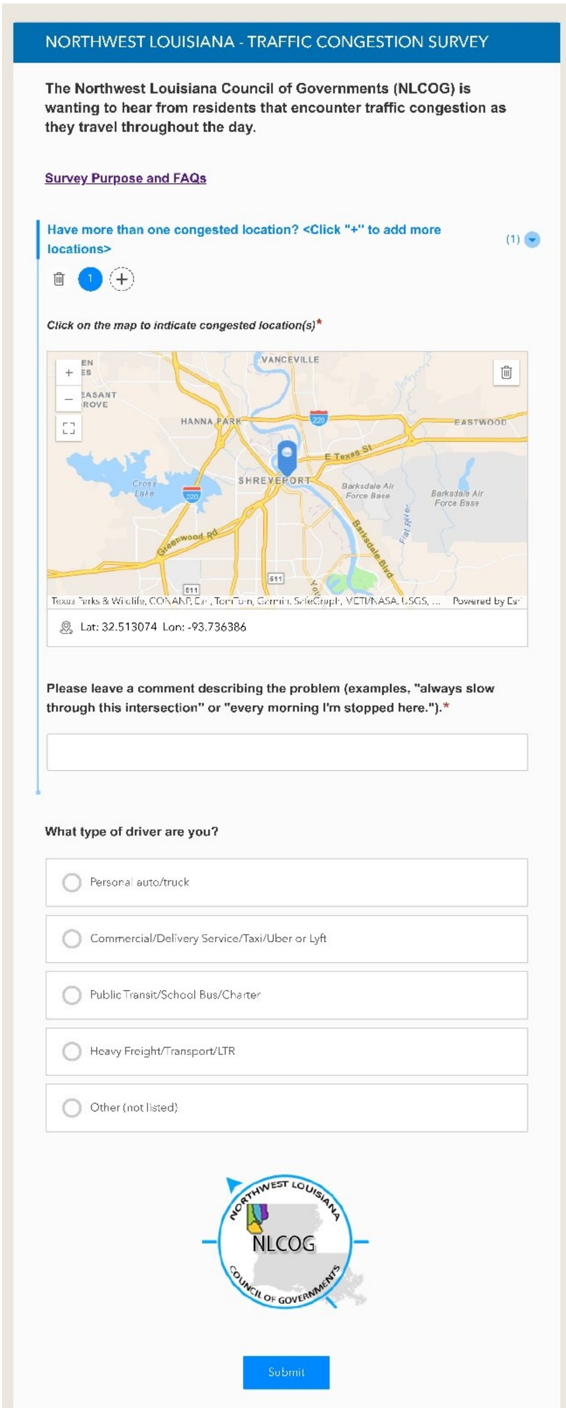
Figure 2.2 – Results MTP 2045 Update Regional Transportation Goals Prioritization



"Quality of Life is providing adequate transportation so that average citizens can travel from home to work to school to play while spending an acceptable amount of time traveling including sitting in traffic."
– One of the Public Comments Received

FOCUSED OUTREACH – NORTHWEST LOUISIANA CONGESTION SURVEY

As documented in previous sections, over the past three years, NLCOG has performed extensive public outreach. However, NLCOG has not directly solicited the public's input regarding roadway/intersection congestion throughout the four Parish area.



Utilizing the ArcGIS Online platform, NLCOG developed a straightforward, easy to use, online survey (Survey 123 within the ArcGIS Platform). The purpose of the online survey is to collect public input concerning the geographic location (through the survey's street map) of the congestion, the user's interpretation (opinion) of the traffic issue, and the type of driver. NLCOG believes that an online survey is one of the most efficient means to obtain public feedback given the extensive use of mobile devices across all economic, racial, and age strata. Pinpointing the geolocation of congestion and traffic issues, as provided by the online survey user was the primary intent of survey design.

Focused Public Engagement

Within the last two years, NLCOG has adopted two regional plans whose scope consisted of soliciting the public's input across the four Parish MPA area. The Regional Active Transportation Plan (RATP) and the Safe Roads For All (SF4A) had robust engagement efforts and collected meaningful data for each respective plans' focus (i.e., Alternative Transportation and Safety needs). NLCOG's 2025 update of the Congestion Management Process (CMP) Plan will be no different in its approach to public engagement. NLCOG developed an online survey that solicits public feedback concerning traffic congestion.

Online Survey Response Metrics

The online congestion survey was rolled out to the public July 15th, 2025, and remained open until August 18th, 2025. Overall, 101 survey responses were received.

101 — Survey Responses

163 — Congested Locations Mapped

3 — Avg. Daily Responses

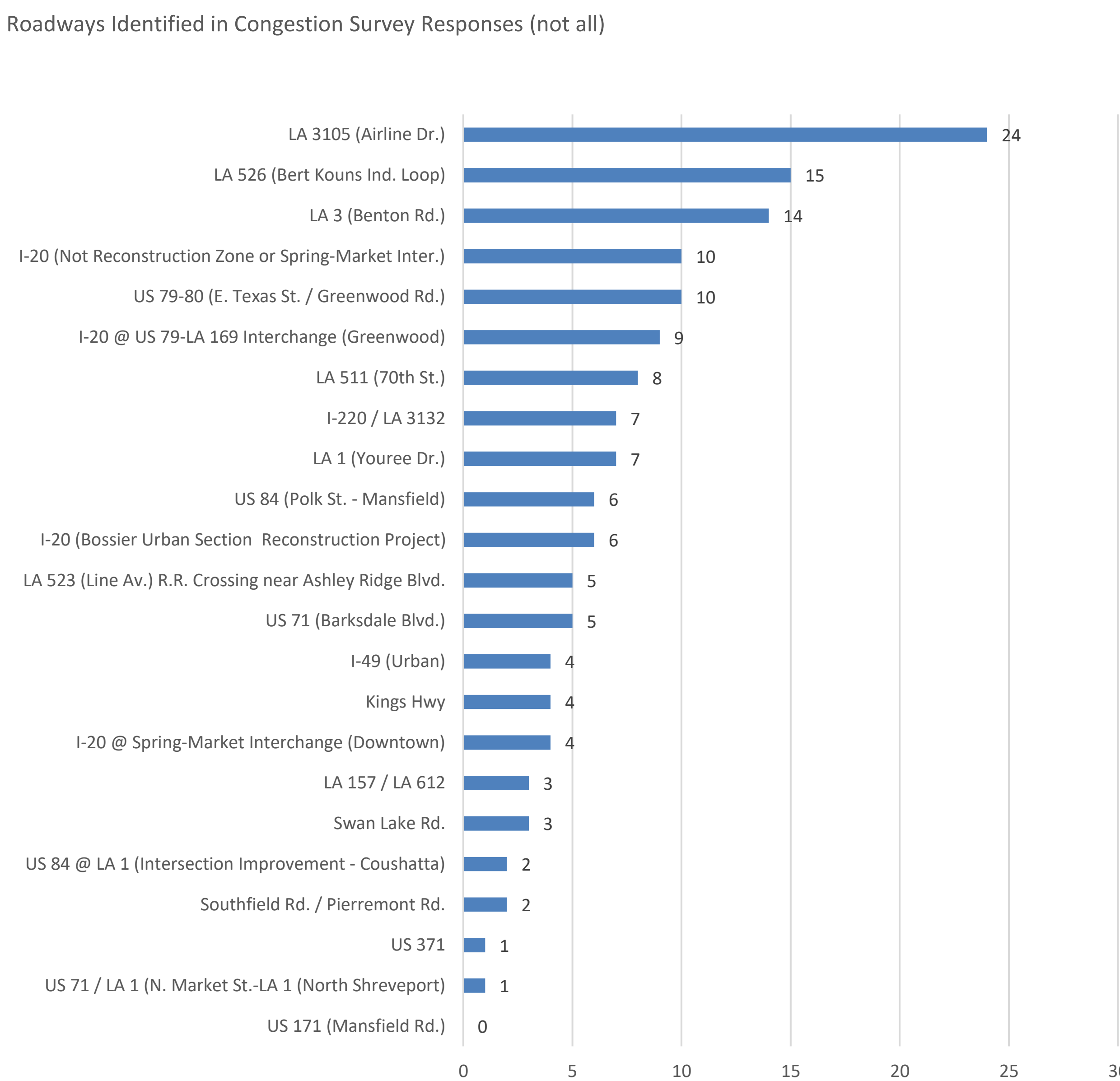
Over sixty percent of the total surveys received located more than one congested location through the survey interface. Listed below, the survey asked respondents to identify their driver type from the selection provided. Overwhelmingly, Personal auto/truck driver type was selected by respondents (expected), however, the survey received notable participation from our law enforcement community. The purpose of collecting this datapoint is to obtain various opinions/perspectives concerning the location and severity of congestion. A survey that exhibits a high level of diversity (in this case = driver type), produces better (defensible) results.

Table 2.0 – Online Congestion Survey Driver Type

Survey Question: What driver type are you?	Count	Percentage
Personal auto/truck	80	79.2%
Commercial/Delivery Service	2	2.0%
Taxi/Uber or Lyft	0	0%
Law Enforcement/Emergency Services	8	7.9%
Public Transit/School Bus/Charter	6	5.9%
Heavy Freight/Transport/LTR	0	0%
Other (not listed)	5	5.0%

The chart below presents survey results that specifically identify roadways and interchanges / intersections that received the most responses. From the roadway Speed Reduction Factor analysis performed in Chapter 5, the online survey responses that located congestion aligned closely with the moderate-severely congested corridors listed below. For instance, parts of the LA 3105 (Airline Dr.) Study Corridor during the PM Peak period (4p-6p) are severely congested which is confirmed by the online survey responses below.

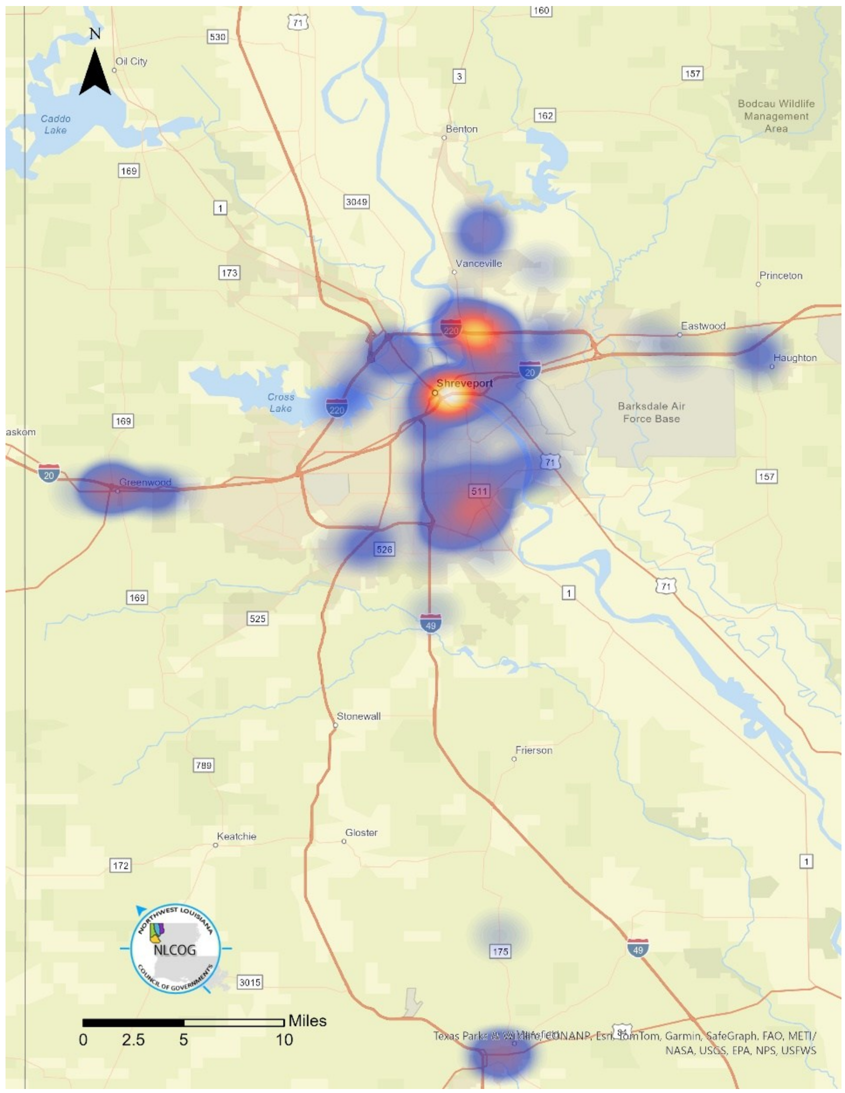
Figure 2.3 – Occurrence of Roadways Identified Through the Online Congestion Survey



Online Survey Results – "What Did We Learn"

The Survey 1-2-3 app. has the functionality to map the congested locations that survey respondents pinpointed through the survey interface. The geo-referenced survey data is brought into NLCOG's ArcGIS Pro interface to produce a "heat" map of congested roadways across the Northwest Louisiana region.

Figure 2.4 – Online Survey Response Locations – Heat Map Graphic



The heat map graphically shows the density of congested locations identified through the online survey. Orange to near white heat map color-scale indicates multiple survey response congested locations.

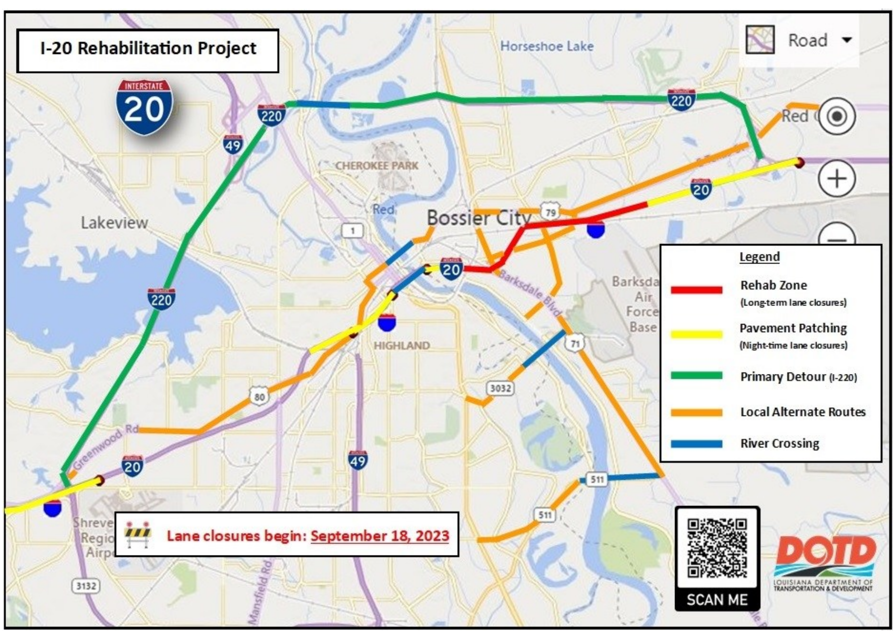
Specifically, the orange-white color is found along I-20 near downtown and the current I-20 reconstruction project. Further, located along the Airline Dr. (LA 3105} and Benton Rd. (LA 3) near their interchange with I-220 is a prevalent amount of congestion and traffic delay according to the survey. There are two unexpected locations identified through the online survey that did not stand out in the Speed Reduction Factor (SPF) data analysis.

First, survey respondents in Desoto Parish overwhelmingly identified US Hwy 84 (Polk St. in the town of Mansfield) between the LA 175 (Lake St.) intersection west to US Hwy 171 as being heavily congested during certain times of the day. Further, during heavy rainfall events the current roadway drainage can't keep up with the runoff, and it partially overruns the travel surface. Combined with an above average amount of heavy-vehicle traffic, a rough railroad crossing, and narrow lane widths cause delays for many residents.

Another location that is surprising is the railroad crossing on LA 523 (Line Av.) between Dumbarton Dr. and Ashley Ridge Dr. in southeast Shreveport. There are a notable number of survey responses identifying this railroad crossing as being problematic due to the train stoppages, sometimes over 30 minutes, blocking traffic. Although this is a local law enforcement issue rather than a roadway performance issue it is important to recognize and correct this frustrating issue.

Another notable trend within the urbanized area of Shreveport is best exemplified by the primary travel corridor US Hwy 171 (Mansfield Rd.). In 1996, NLCOG developed its first Congestion Management Process (CMP) Plan, the US Hwy 171 or Mansfield Rd. corridor, specifically between the LA 3132 interchange south to LA 526 (Bert Kouns Industrial Loop) was identified as one of the top three congested roadway segments in Northwest Louisiana. In the interim, travel demand has decreased significantly due to loss of population and business closures, redevelopment farther south along the corridor as well as roadway improvements such as installation of traffic signal technology/coordination (ITS - Intelligent Transportation Systems).

ACCOUNTING FOR REGIONALLY SIGNIFICANT CHANGES IN TRAVEL BEHAVIOR: I-20 RECONSTRUCTION PROJECT (BOSSIER CITY)



Beginning September 18th 2023, the I-20 rehabilitation project will fully remove and replace the eastbound and westbound lanes of I-20 from near Hamilton Road to Industrial Drive in Bossier City. The full rehabilitation portion of the project is approximately 3.6 miles, with an additional seven miles of concrete pavement repair. Construction is expected to take approximately two years to complete. During the rehab work, one lane will be closed in each direction.

From a travel and freight corridor perspective, I-20 serves as a “Lifeline” for residents of North Louisiana. Specifically, the scheduled reduction of one of the two directional travel lanes throughout its two-year construction cycle creates a significant degradation of performance in the form of increased travel delay, stopped traffic and more vehicular incidents/crashes. In essence, this reconstruction project alters the travel behavior for drivers who not only reside in Northwest Louisiana but those that are traveling through the region.

HOW DOES THIS CURRENT PROJECT IMPACT THE CMP ANALYSIS

NLCOG will utilize the July 2022 through July 2023 INSIGHT/Insight roadway data to analyze roadway performance as opposed to the currently available 2025 data. Developing the analysis with 2022-2023 data eliminates the significant change in travel behavior the I-20 Reconstruction Project has imposed upon Northwest Louisiana's highest volume roadway.

2025 CMP IMPROVEMENTS AND MODIFICATIONS TO THE 2021 CMP

NLCOG has greatly improved its traffic performance analytical capabilities through the technological improvements the INSIGHT/Insight probe data analysis platform has undertaken over the last four years. As provided below, the 2025 CMP Update incorporates analytical improvements as compared to the 2021 CMP Plan.

2025 CMP STUDY IMPROVEMENTS

2021 CMP Specification	2025 CMP Improvement
Study Area / NLCOG 20-Year UZA Boundary	Study Area / Entire NLCOG MPA (4-Parish area)
Study Corridors / within 20-Year UZA	Study Corridors / within 4-Parish area
Intersections: poorest performing identified	Intersections: recommended mitigation strategies within the context of the study sub-corridor
Not Available	Improvement project need (Priority Scheme) includes public input derived from online survey
Recommended Cong. Mitigation Strategies/Projects: Narrative provided	Recommended Cong. Mitigation Strategies/Projects: Corridor and Intersection project descriptions with advanced metrics and graphics

However, to be efficient and produce appropriate flow data for use in congested corridor/segment determinations, establishing analysis assumptions from the outset is vital.

MODIFICATIONS TO THE CMP STUDY METHODOLOGY

2025 CMP Study Methodology Modifications
1) Accounting for the regional travel behavior changes of the I-20 Reconstruction project, NLCOG will configure their roadway analysis to utilize July 2022 – July 2023 (prior to the establishment of the I-20 construction zone and described in detail in Chapter 2) performance data as opposed to the practice of using the best available/current data (i.e., 2025).
2) Data collected through the online congestion survey will serve as one of the criteria in the determination roadway improvement need (i.e., Prioritization)

CHAPTER 3 – ESTABLISH STUDY AREA / NETWORK

CMP STUDY AREA DETERMINATION

The CMP Study Area includes the transportation system that is to be evaluated and monitored and where congestion management policies, procedures and physical improvements need to be applied.

Figure 3.0 – NW Louisiana's Defined CMP Study Area (4-Parish MPA outlined in blue)

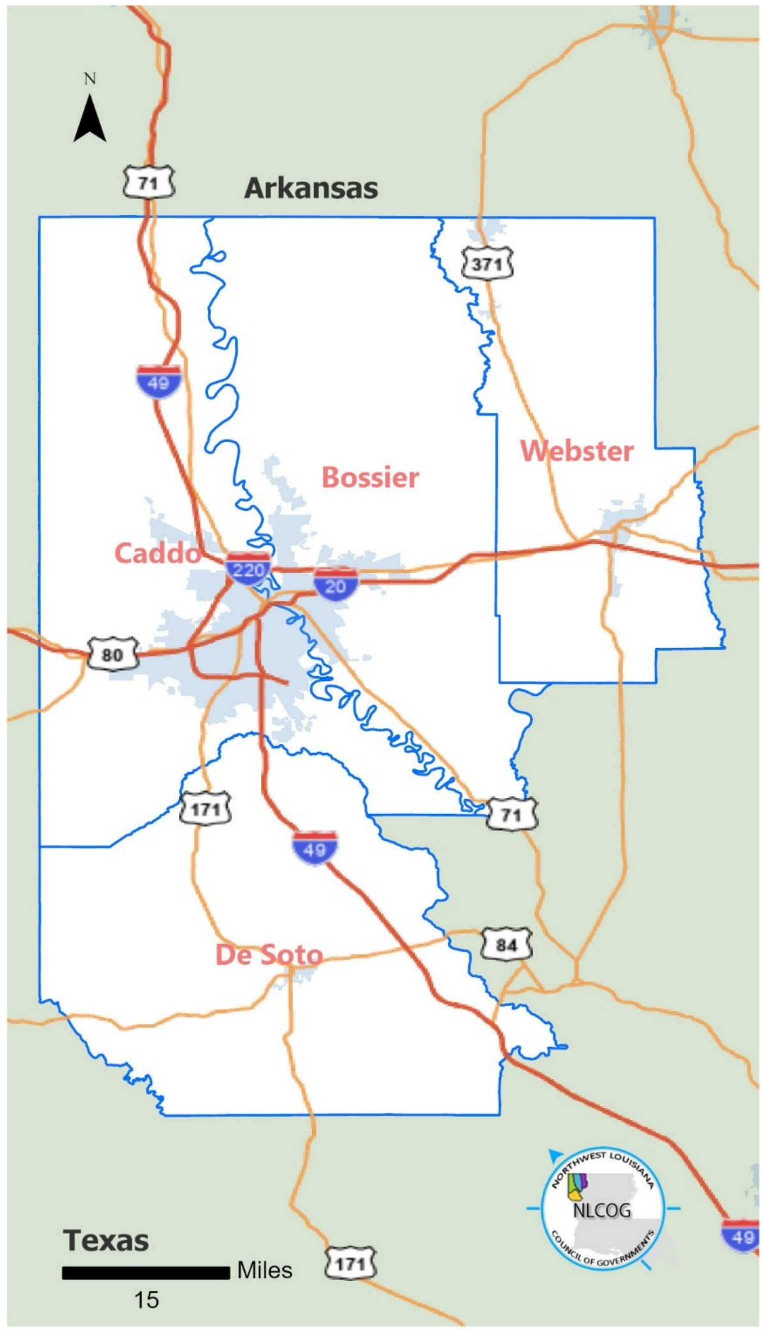


Table 3.0 – Daily Vehicle Mile Traveled (VMT) By NLCOG Parish

Parish	Weekday VMT*
Bossier	4,000,965
Caddo	7,117,346
Desoto	1,840,136
Webster	1,422,526
4-Parish VMT:	14,380,973

Source: NLCOG's INSIGHT/Insight data traffic flow metrics and data analysis environment, Network Performance Analysis for each respective MPA Parish for analysis year 2022.

**[VMT is calculated by multiplying the amount of daily traffic on a roadway segment by the length of the segment, then summing all the segments' VMT to give you a total for the geographical area of concern. Source TxDOT]*

For NLCOG, the established four (4) Parish Metropolitan Planning Area (MPA) will serve as the CMP 2025 defined Study Area.

CMP STUDY NETWORK IDENTIFICATION

Initially, all transportation infrastructures, contained within the study area, are considered through the CMP. Consistent with federal guidelines, the NLCOG CMP covers a multimodal transportation network. In addition to evaluating congestion on the roadway network, the NLCOG CMP will evaluate transit, bicycle/pedestrian/trail, and freight movement networks within its designated area of application. described below.

CMP Network Screening Criteria

A two-level screening process is utilized to identify potentially congested corridors for detailed study.

Screening Level 1 – Through the INSIGHT/Insight platform, NLCOG has the ability to analyze the entire road network within the 4-Parish Metropolitan Planning Area (MPA). NLCOG will initially focus on corridors that are Federally identified as being on the National Highway System (NHS). A corridor that is a designated NHS roadway provides multiple advantages concerning the CMP study. Readily available travel time and volume data, by vehicle type, from NLCOG's INSIGHT/Insight user license provides the basis of statistically significant source of traffic flow data.

Screening Level 2 – Daily AADT data provides context as to which Parishes are exhibiting characteristically urbanized type traffic flow as opposed to their rural counterparts.

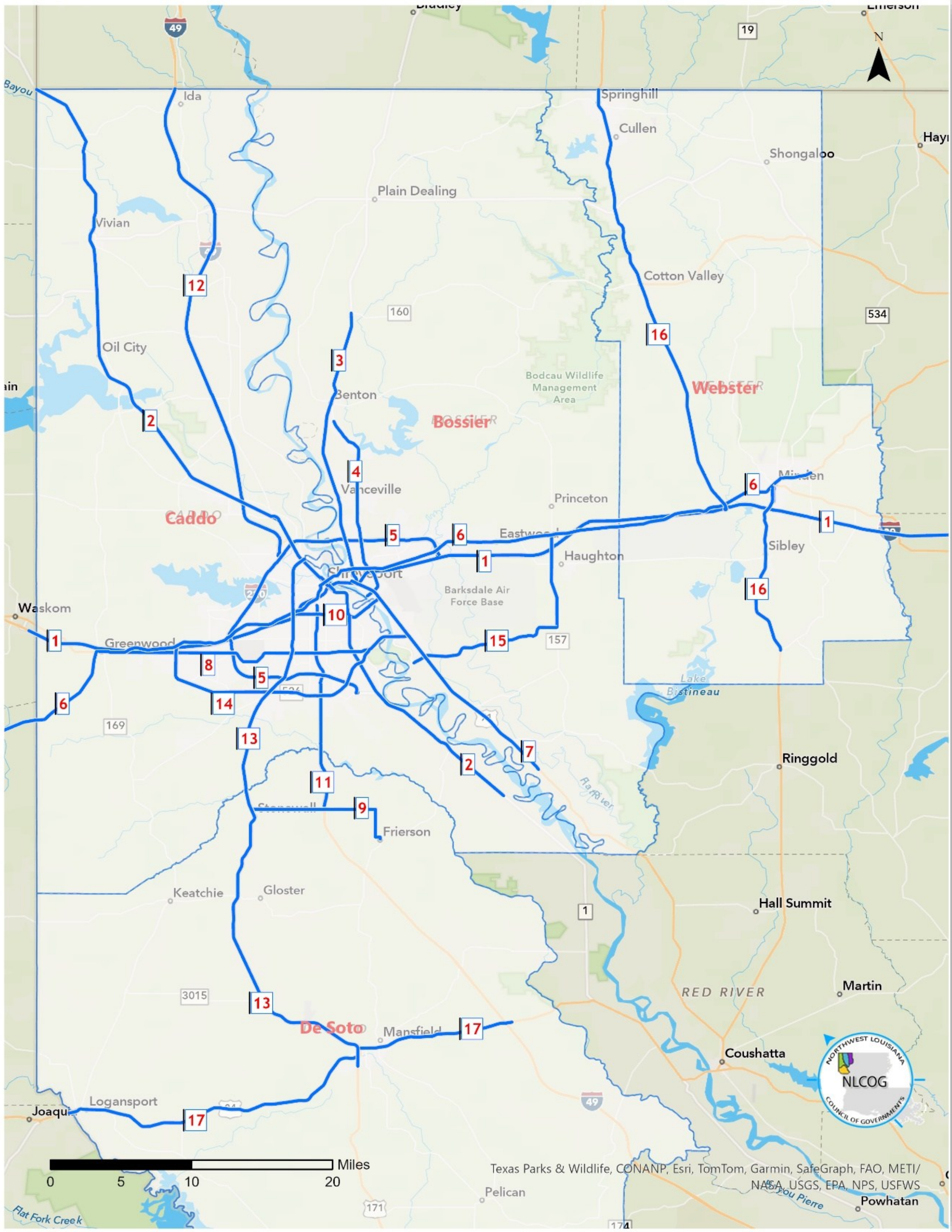
URBAN
- CADDO/BOSSIER PARISHES
- Study Corridors Exhibiting +7,500 AADT

RURAL
- DESOTO/WEBSTER PARISHES
- Study Corridors Exhibiting +2,500 AADT

The difference between "Urban" and "Rural" traffic congestion is an important distinction and the priority scheme will account for this disparity. Caddo and Bossier Parishes contain higher density land development, more activity centers, and exhibit overall much higher daily traffic volumes as compared to Desoto and Webster Parishes. The project needs assessment will prioritize roadway AADT based upon the "Urban" or "Rural" criteria listed below.

Study Segments Defined: The physical extent of a roadway study segment is dependent upon the vehicular access provided. Limited access, grade separated facilities, where vehicles can enter/exit at interchanges (i.e., Interstates / Freeways) have study segments located between those interchanges. Surface streets (i.e., Arterials and Collectors), with cross street intersections, have study segments defined by the length of roadway between major points of conflict (i.e., typically signalized intersections).

Figure 3.1 – Defined CMP Study Area – Study Network (17 Corridors – in Blue / w Map ID#)



The following table (3.1) summarizes the 17 CMP Study Corridors that met the network screening criteria as located in the CMP Study Area (Figure 3.2). The distinction is made between the total length of CMP study corridor mileage and the study corridor mileage that is identified on the National Highway System (NHS) since it has a bearing upon the selection of appropriate source traffic flow data.

Table 3.1 – NLCOG's CMP Study Corridors and Extents

Map ID	Corridor Name	Length (miles)	NHS* (miles)	Corridor Extents
1	I-20	54.1	54.1	Texas S.L. – Bienville P.L. (LA 532)
2	LA 1/Youree/ Spring-Market	61.8	23.4	Texas S.L. – Ellerbe Rd (South - Port of Caddo-Bossier)
3	LA 3/ Benton Rd	19.5	13.1	LA 160 (North of Benton) – I-20 (Bossier City)
4	Airline Dr	13.4	3.8	Burt Blvd – A.R. Teague Pkwy
5	I-220/LA 3132	27.8	27.8	I-20 (Bossier City) – Flournoy-Lucas (LA 523)
6	US Hwy 79-80/ E. Texas/Greenwood	53.4	30.0	Texas S.L. – LA 531 (East of Minden)
7	US Hwy 71/ Barksdale Blvd	15.2	5.3	Old Minden Rd (Bossier City) – LA 157
8	LA 511/70th St	18.0	7.4	US Hwy 79-80 – US Hwy 71 (Barksdale Blvd)
9	LA 3276/Stonewall-Frierson Rd	7.5	0.0	US Hwy 171 – Wallace Lake Rd
10	Kings Hwy/S'port-Barksdale Hwy/ Westgate	5.7	2.4	Hearne Ave – US Hwy 71 (Barksdale Blvd)
11	I-49 (Urban)	14.6	14.6	I-20 – LA 3276 (Stonewall-Frierson Rd)
12	I-49 (North)	35.7	35.7	Arkansas S.L. – I-220 (Shreveport)
13	US Hwy 171/ Mansfield/ Hearne	41.2	41.2	N. Market St (LA1-US Hwy 71) – Shell St (Mansfield)
14	LA 526/ Bert Kouns	16.0	16.0	US Hwy 79-80 – LA 511 (70th St.)
15	LA 157/LA 612	15.8	0.0	US 79-80 (Princeton) – US 71 (Sligo Rd-Parkway H.S.)
16	US Hwy 371/ LA 159	33.1	0.0	Arkansas S.L. – I-20 and I-20 – US Hwy 79-80
17	US Hwy 84	29.3	19.5	Texas S.L. – I-49
	Totals:	**462.1**	**294.3**	**CMP Corridor Mileage Not NHS: miles**

** Source: US DOT/FHWA National Highway System map of Shreveport, LA; rev. 10.01.2020*

CHAPTER 4 – DEVELOPMENT OF CMP PERFORMANCE MEASURES / DATA SOURCES

Study Corridor Segment and System-wide PERFORMANCE MEASURE Background

The calculation of performance along the CMP Study Area's corridors (17) is achieved utilizing two levels of analysis. First, the CMP will determine study corridor performance at the segment level or the most detailed, granular, level of performance. The intent of this level of analysis is to "pinpoint" the location of vehicle delay or speed reduction, through performance indices, along the CMP's Study Corridors.

CMP Corridor Segment PERFORMANCE DETERMINATIONS

Traditionally, determining vehicle delay, by corridor segment, has been achieved through the calculation of travel time indices. Observed vehicle travel time data per study segment and direction of travel is compiled for both peak travel and off-peak time periods. Previous CMP efforts have utilized a Travel Time Index (TTI) to measure corridor segment performance.

Travel Time Index (TTI):

Travel Time Index (TTI) is the ratio of Average Travel Time in peak hours to Free-Flow Travel Time. In other words, the Travel Time Index represents the average additional time required for a trip during peak times in comparison with that trip duration in no-traffic condition. For calculating Free-Flow Travel Time, divide the road length by maximum speed limit of the road.

$$TTI = \frac{Average\ Travel\ Time}{Free\ Flow\ Travel\ Time}$$

ALL CALCULATED DATA METRICS IN THIS CMP FOLLOW THE FEDERAL GUIDANCE METHODOLOGY REFERENCED BELOW.

National Performance Measures for Congestion, Reliability, and Freight, and CMAQ Traffic Congestion: General Guidance and Step-by-Step Metric Calculation Procedures

The guidance presents recommended steps for calculating the National Highway System performance metrics (23 CFR 490.511), the Truck Travel Time Reliability metrics (23 CFR 490.611), and the Peak Hour. Further, NLCOG will apply the same methodology found in the Federal guidance utilizing the MPO's INSIGHT data subscription as the source of traffic flow data (i.e., directional study segment: All vehicle volumes/travel time/travel speed by Peak period and all weekdays (M-F)) for the current CMP update. Please note, the referenced guidance details a process to calculate the SRF for the National Performance Management Research Data Set (NPMRDS). NLCOG will apply the same methodology for SRF calculation employing our procured INSIGHT data/application user license.

The calculated performance metric to determine roadway segment traffic congestion levels is defined as a Speed Reduction Factor (SRF). This means that when the Speed Reduction Factor is close to 1, there is little congestion on the corridor. The lower the Free Flow Factor, the greater the congestion.

Speed Reduction Factor (SRF*):

(Calculated index used in FHWA's guidance to measure the level of traffic congestion)

$$\text{Speed Reduction Factor (SRF)} = \frac{\text{Average Peak Period Speed (mph)}}{\text{Free Flow Speed (mph)}}$$

**The TTI and the SRF are essentially the same indices, one utilizes average segment travel time (i.e., TTI) while the other employs average travel speed (i.e., SRF) in its calculation.*

LEVELS OF CONGESTION (by the SRF metric):

(FHWA guidance (please refer to Appendix B) – as determined through the calculation of the SRF per respective roadway segment)

Freeways:

- No to Low Congestion. Speed reduction factor ranging from 90 percent to 100 percent.
- Moderate Congestion. Speed reduction factor ranging from 75 percent to 90 percent.
- Severe Congestion. Speed reduction factor less than 75 percent.

For Non-freeways:

- No to Low Congestion. Speed reduction factor ranging from 80 percent to 100 percent.
- Moderate Congestion. Speed reduction factor ranging from 65 percent to 80 percent.
- Severe Congestion. Speed reduction factor less than 65 percent.

Source: MAP-21 Measures for Congestion, Reliability, and Freight Step-by-Step Metric Calculation Procedures, FHWA Guidance (2018)

CMP analysis methodology and assumptions utilizing the INSIGHT datasets/application

INSIGHT/Insight derives additional metrics for the identified CMP 2025 study road segments. This includes metrics defined as follows:

Network Performance Metrics

- **Average Travel Time:** Average time it takes vehicles to travel along a segment
- **Average Speed (Segment Metrics):** Segment length / average travel time
- **Average Speed (Spot Metrics):** Speed of vehicles reported at a specified location
- **Free Flow Speed:** Maximum average segment speed in any one hour of the day
- **Free Flow Factor (Speed Reduction Factor):** Average segment speed / free flow segment speed
- **Vehicle Miles Traveled:** (Segment length) x (vehicle volume)
- **Vehicle Hours of Delay:** (VMT ÷ average segment speed) - (VMT ÷ free flow speed)
- **Speed Percentiles:** 5th, 85th, and 95th percentile average speeds.

Carefully developing the analysis settings, through the INSIGHT online application, is critical to the data type, breadth, and format of the traffic flow datasets. NLCOG established parameters within the INSIGHT environment, as provided below, to ensure analysis consistency across all Study Corridors in the determination of Speed Reduction Factors (SRFs).

Vehicle Class: All Vehicle types (no need for vehicle class-axle adjustment factors)

Total Number of Days*: July of 2022 through July of 2023; 365 days of data (year)

Days of Week: Weekdays (Mon.-Fri.) and All days of the week; Overall, since weekend travel is less than weekday travel, Monday-Friday traffic flow data is utilized for congestion determinations.

Analysis Time Periods:** AM Peak (6:00a-9:00a), Mid-day (11:00a-1:00p) and PM Peak (4:00p-6:00p); **please note, federal guidance calls for four-hour Peak Periods, however, in comparison to other metropolitan areas Shreveport/Bossier City exhibits **acute** Peaks and adding an additional hour to the analysis would only dilute the segment SRF values, thus, a three-hour Peak Period is preferred.

INSIGHT TRAVEL-TIME DATA VALIDATION RESEARCH / DOCUMENTATION

NLCOG Staff took advantage of the availability (procured through the MTP 2045 Update effort) of the INSIGHT traffic flow data/analysis application. The INSIGHT product provided full coverage of the entire CMP Study Corridor mileage. However, to ensure that the travel-time datasets that were produced through the INSIGHT application are valid and statistically significant NLCOG Staff requested any validation or substantiation independent research INSIGHT has performed pertaining to their traffic flow datasets. Appendix A provides an example of one of the white papers INSIGHT has undertaken concerning validation of their data.

Planning for Reliability

In the past, congestion planning relied heavily upon indirect measures of congestion, such as volume-to-capacity ratios. While useful for infrastructure planning, these proxy measures are not a direct measure of traveler experience or perception, and they do not account for the non- recurring congestion that makes up *more than half* of all traffic delay.

Today, the broad availability of travel time data allows for more direct measures of traveler experience. Many of the measures used in this report are measures of travel time reliability.

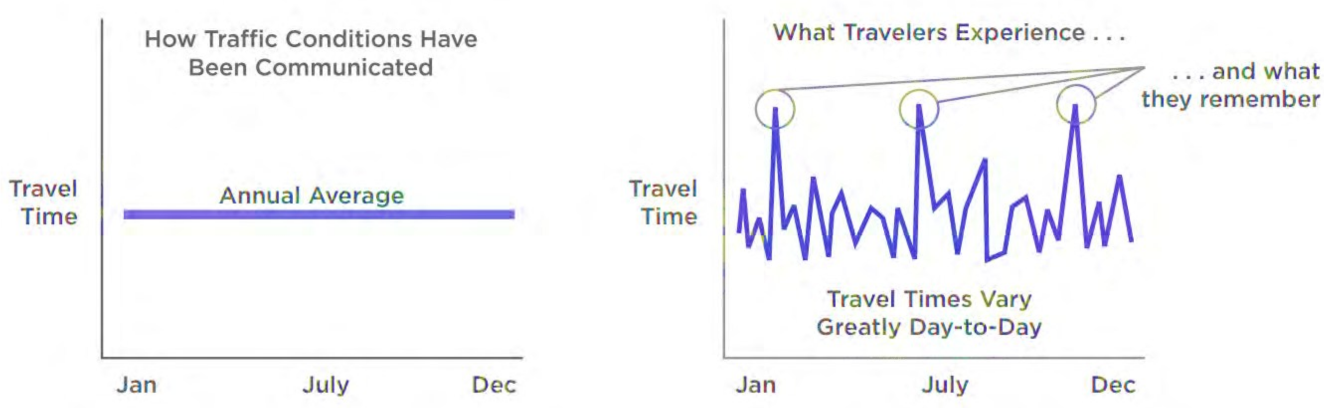
Federal guidance emphasizes the importance of planning for reliability. In 2015, the Federal Highway Administration published *Incorporating Reliability into the Congestion Management Process: A Primer.* This publication details national best practices on using reliability-based performance measures and strategies. These practices have been integrated into this CMP update.

Data Issue: Travel Time Reliability as Compared to Annual Average Travel Time Data

The variation in travel time for the same trip, from day to day, is highly variable or unpredictable. Travel times make it difficult for commuters to get to work on time, for travelers to reach appointments or events on time, **for** transit buses to maintain their schedules, and for freight shippers to plan shipments. Uncertainty over travel times leads to ineffective travel decisions that waste time and money.

Average travel times do not effectively communicate congestion issues. If a traveler must reach their destination by a certain time, then they must budget far more than the average travel time to ensure on-time arrival. Graphically (Figure 4.0), illustrates the limitations of basing transportation improvement decisions upon normalized traffic flow data.

Figure 4.0 – Averaging (Normalizing the data) versus Daily, Observed Traffic Flow Data



NLCOG's approach to help overcome the normalization of flow data and better capture the variability of day-to-day corridor travel time/speed is to tune the INSIGHT performance analysis by day type and time-period. The 2025 CMP utilized analysis parameters Weekdays (Monday-Friday) and three time periods (AM Peak: 6a-9a / Mid-day 11a-1p / PM Peak 4p-6p) to best capture daily variability. The goal of this analysis approach is to capture the worst-case performance of the study corridor during its three peak-periods and day type analyzed.

CHAPTER 5
CONGESTED CORRIDOR / SEGMENT DETERMINATIONS THROUGH SRF

Congested Corridor/Sub-Corridor Speed Reduction Factor (SRF) Determinations

Utilizing the SRF performance metric and the federally prescribed SRF ranges outlining the level of congestion, locating underperforming study segments is feasible. NLCOG will routinely monitor, as described in Chapter 8, **SRF levels** in determining network through segment level of service. Further, future CMP evaluations will provide NLCOG with data to better identify locations of recurring congestion and insight into other regional travel behavior phenomenon (e.g., the effect of autonomous vehicle technology upon the local transportation network).

Federal Guidance: Study Corridor Congestion Levels Defined

Provided below is a descriptive summary of the Federally prescribed congestion level ranges as outlined in Chapter 4.

> No to Low Congestion Levels: Segment speed reduction does not fall below 90% for Interstate/Freeway facilities and 80% for non-Freeway roadway segments. Generally, non-congested corridors do not need to be addressed by the CMP; however, the "Severely Congested" category will typically require one or more congestion-relieving strategies (project, mobility improving program, etc.).

>> Approaching Congestion (Moderate): Corridors that are not congested but have segments that exhibit speed reduction (compared to Free Flow travel speed of the segment) of between 65% to 80% for non-Freeway facilities and between 75% to 90% for Interstates/Freeway segments.

>>> Severely Congested: Corridors/Segments that exhibit this level of performance, below 75% SRF for Freeway facilities and 65% non-Freeway segments, are flagged as candidates for appropriate congestion mitigation projects/strategies first. The performance of these flagged segments requires immediate attention, especially if multiple segments or sub-corridor areas are determined at this level. From a traffic flow perspective, if left unattended over a significant period time long distances of poorly performing segments will potentially lead to the entire corridor failing.

Table 5.0 – CMP Study Corridors "Severe" and "Moderate" Congestion Determinations

Map ID	Corridor Name	Study Length (Lane miles)	Worst Peak Period	Severe Congestion Mileage (% Total)	Moderate Congestion Mileage (% Total)	Overall Corridor Congestion SRF Rank*
1	I-20	122.7	PM Peak	1.2 (1.0%)	5.2 (4.2%)	**6**
2	LA 1/Youree/ Spring-Market	84.7	PM Peak	0.8 (0.9%)	12.0 (14.2%)	**7**
3	LA 3/ Benton Rd	26.5	Mid-day	0.2 (0.9%)	2.9 (11.1%)	**8**
4	Airline Dr	13.7	PM Peak	0.9 (6.5%)	4.0 (29.0%)	**2**
5	I-220/LA 3132	55.4	Mid-day	0.0 (0.0%)	3.8 (7.0%)	**13**
6	US Hwy 79-80/ E. Texas/Greenwood	82.3	Mid-day	1.8 (2.2%)	10.0 (12.1%)	**5**
7	US Hwy 71/ Barksdale Blvd	22.8	Mid-day	0.1 (0.5%)	0.7 (3.3%)	**9**
8	LA 511/70th St	21.9	PM Peak	0.7 (3.4%)	6.2 (28.1%)	**4**
9	LA 3276/Stonewall-Frierson Rd	10.4	NONE	0.0 (0.0%)	0.0 (0.0%)	**15**
10	Kings Hwy/S'port-Barksdale Hwy/ Westgate	5.6	PM Peak	1.7 (30.7%)	2.1 (36.5%)	**1**
11	I-49 (Urban)	21.3	NONE	0.0 (0.0%)	0.0 (0.0%)	**15**
12	I-49 (North)	71.3	NONE	0.0 (0.0%)	0.0 (0.0%)	**15**
13	US Hwy 171/ Mansfield/ Hearne	79.3	PM Peak	0.2 (0.2%)	5.2 (6.5%)	**10**
14	LA 526/ Bert Kouns	26.6	PM Peak	1.3 (4.7%)	6.3 (23.7)	**3**
15	LA 157/LA 612	17.0	AM Peak	0.03 (0.2%)	0.7 (4.0%)	**11**
16	US Hwy 371/ LA 159	46.5	AM Peak	0.06 (0.1%)	6.2 (13.4)	**12**
17	US Hwy 84	31.1	Mid-day	0.0 (0.0%)	1.1 (3.6%)	**14**
	Totals:	**739.1**	**Miles**	**9.0**	**66.4**	

***Overall Study Corridor Rank is determined by the percentage of the corridor operating under "Severe" conditions and if identical, considering the "Moderate" congested percentage; Note: analysis performed prior to the kickoff of the I-20 Reconstruction Project within Bossier City (09.2023)**

OVERALL STUDY NETWORK/CORRIDOR SRF FINDINGS

CMP STUDY NETWORK

From an overall CMP Study Network standpoint, SRF findings show that 1.2% of all study corridors, by study lane mileage, are operating at a "Moderate" to "Low-No" congestion levels. There are 9.0 miles, out of a total lane mile analysis length of 739.1 miles, where segment performance is determined to be "Severely Congested".

Total Lane Miles Studied	**SRF "Severe" (miles)**	**SRF "Moderate" (miles)**	**SRF "Low-No" (miles)**
739.1	**9.0** **(1.2%)**	**66.4** **(9.0%)**	**663.7** **(89.8%)**

Is congestion an issue for Study Area roadway users given the updated SRF determinations?

NLCOG can justify the SRF system-wide performance determinations and validate the findings by referencing the FHWA PM3 analysis (undertaken during the 2045 MTP) which provided that the Metropolitan Planning Area (MPA) **NHS roadways, within NLCOG's four Parish MPA, are performing at an above average level based upon the TTR measures of LOTTR and TTTRI. NLCOG believes that the overall roadway network is outperforming other metropolitan peer road systems not only in the percentage of "Severely Congested" length but also in its level of performance (please refer to the INRIX discussion following).**

Although NLCOG's SRF determinations include study corridors that are non-NHS roadways, nearly all the "Severe" and "Moderate" congested roadway mileage is located along the NHS designated system. Another performance marker NLCOG can utilize is the comparison of our metropolitan area to other areas as it pertains to congestion and performance metrics.

HOW DOES NORTHWEST LOUISIANA COMPARE - STUDY AREA DATA/PEER RANKINGS

INRIX, an internationally recognized transportation data analysis consultant/developer, in 2024 developed their Global Traffic Scorecard which provides three years of transportation data for a more granular and holistic analysis of mobility within the world's most-congested areas. It provides travel delay comparisons, costs of congestion to drivers and regions, and commuting trends based on the unique travel patterns within each metro area.

Figure 5.0 presents INRIX's findings regarding the Shreveport Metropolitan Area's congestion ranking, hours lost to congestion and the cost of congestion per driver annually from the aforementioned methodology. Figure 5.1 lists peer metropolitan areas by INRX's congestion ranking metric.

Figure 5.0 – INRIX Analysis of Metro. Areas (Worldwide) - Congestion Rankings

INRIX Overview (2024) * - Shreveport, LA Metropolitan Area (Urbanized Area)

Congestion Rank Worldwide	Congestion Rank in United States
764 (945 TOTAL)	184 (295 TOTAL)
Hours Lost in Congestion	**Cost of Congestion Per Driver**
12	$215

* Source: https://inrix.com/scorecard-city/?city=Shreveport%20LA&index=763

Figure 5.1 – INRIX / Congestion Rankings of Peer Metro. Areas (descending order of congestion impacts upon drivers – the higher the ranking the higher the impact)

New Orleans, LA	#24
Baton Rouge, LA	#26
Little Rock, AR	#82
Mobile, AL	#183
Shreveport, LA	#184
Lubbock, TX	#274

From the INRIX rankings and performance metrics, the impacts congestion has upon drivers in the

Shreveport metropolitan area are low compared to surrounding metro. areas and the country (Shreveport ranks 184 out of 295 areas studied in the United States).

CMP 2025 INDIVIDUAL CORRIDOR SRF FINDINGS

Out of the 17 study corridors, only four of the corridors exhibited over 1.0 mile of "Severely Congested" performance. Study corridors I-20 (1.2 miles), US Hwy. 79-80 (1.8 miles), Kings Hwy. (1.7 miles), and LA 526 (1.3 miles) during the PM-Peak period of 4:00p-6:00p contained the largest amount of the poor performance determined. Of note, I-220, LA 3132 (Inner Loop Expressway), I-49 (North), and I-49 (Urban Section), Interstate/Freeway type roadways do not exhibit any "Severely Congested" flow levels. I-20 (Eastbound between I-49 and the Red River Bridge during the PM Peak) performs at a "Severely Congested" levels.

The non-freeway roadway facilities contain a minimal amount of "Severe" and "Moderate" level of congestion when examining all three peak periods of SRF data. The study corridors determined to have the highest percentage of SRF "Severe" and "Moderate" roadway mileage are listed below.

Figure 5.2 – Top Five Congested Study Corridors – "Severe" and "Moderate" (by Corridor Percent)

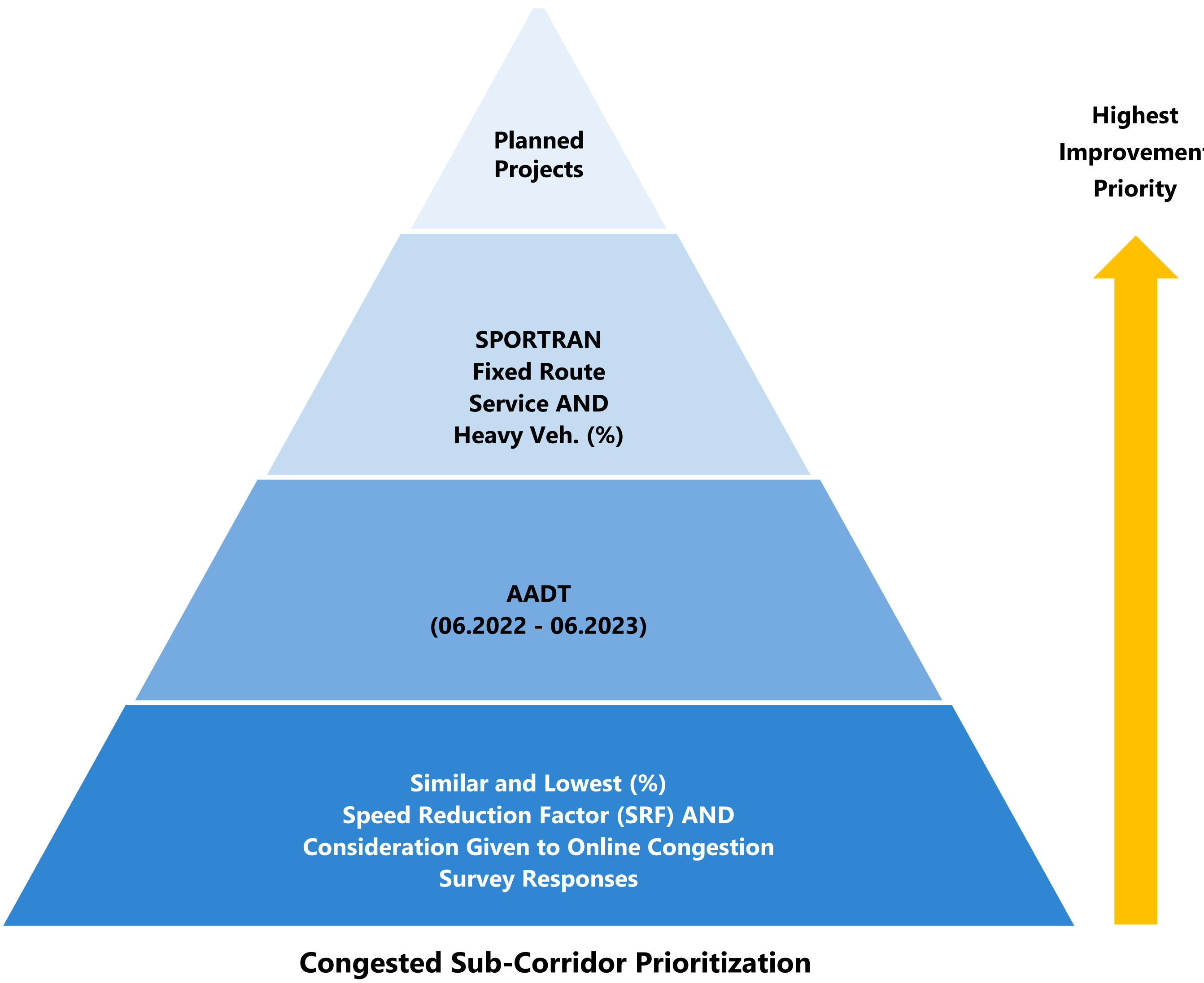
Study Corridor	Moderate	Severe
Kings Hwy/S'port-Barksdale Hwy/Westgate	36.5%	30.7%
Airline Dr (LA 3105)	29.0%	6.5%
LA 526/Bert Kouns Industrial Loop	23.7%	4.7%
LA 511/70th St	28.1%	3.4%
US Hwy 79-80/ E. Texas St/Greenwood Rd	12.1%	2.2%

However, the lack of debilitating congestion does not preclude NLCOG Staff from ignoring the existing, albeit minor, corridor congestion. NLCOG is committed to maintaining and improving the level of roadway performance into the future.

CHAPTER 6
CONGESTED CORRIDOR PRIORITIZATION

Locating roadway segment delay, through the SRF, is the first step in the process of prioritizing low performing segments and ranking them as candidates for improvement. From the Study Corridor analysis performed in Chapter 5, none of the corridors exhibited moderate to severe (by SRF) congestion across their entire lengths during the peak periods analyzed. Going forward, NLCOG will prioritize congested roadway sections, or sub-corridors, for recommended improvements. Figure 6.0 illustrates the hierarchy of considerations during the ranking of congested study segments.

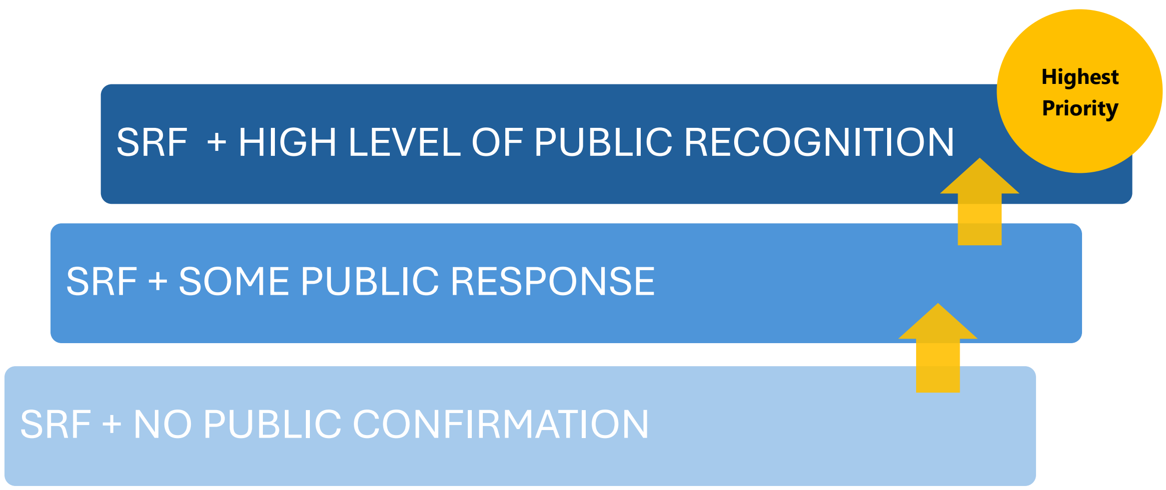
Figure 6.0 – CMP Sub-Corridor Prioritization Scheme



Speed Reduction Factor (SRF) and Online Congestion Survey Responses

Congested segments with similar Speed Reduction Factors (SRF) can vary tremendously regarding their need for roadway improvement. New for the CMP 2025 prioritization scheme is the incorporation of Northwest Louisiana's Congestion Survey responses. The public input gathered through the survey will provide roadway location and descriptive information as it pertains to congestion. The online survey contains a map feature that allows users the ability to mark the location where they encounter daily congestion and delay. The public's input combined with network SRF data provides NLCOG with powerful, base-level, metrics in the determination of congested roadway prioritization needs. The baseline, hierarchy for improvement need is outlined below.

Figure 6.1 – Congestion Survey Responses Integrated into Improvement Prioritization



From the Congestion Survey, given the number of total locations identified (163), if a section of the Study Corridor contains three or more mapped comments it is considered in the "High Level of Public Recognition" tier. The combination of the roadway's "Severe" Speed Reduction Factor (SRF) and public confirmation from the online survey makes a compelling case for a sub-corridor in critical need of congestion mitigation.

Study Segment(s) Traffic Volume (AADT)

Once the SRF and level of public response is determined, the amount of volume (adjusted to AADT) along the congested segment(s) is obtained for all roadway segments along each respective study corridor (July 2022-July 2023). Why are AADTs considered in the improvement prioritization scheme?

An example illustrates the importance of AADT data regarding priority. A transportation improvement project programmed for a congested segment that carries 20,000 vehicles daily provide significantly more benefit to the transportation system as compared to an improvement upon a facility that carries 5,000 vehicles daily.

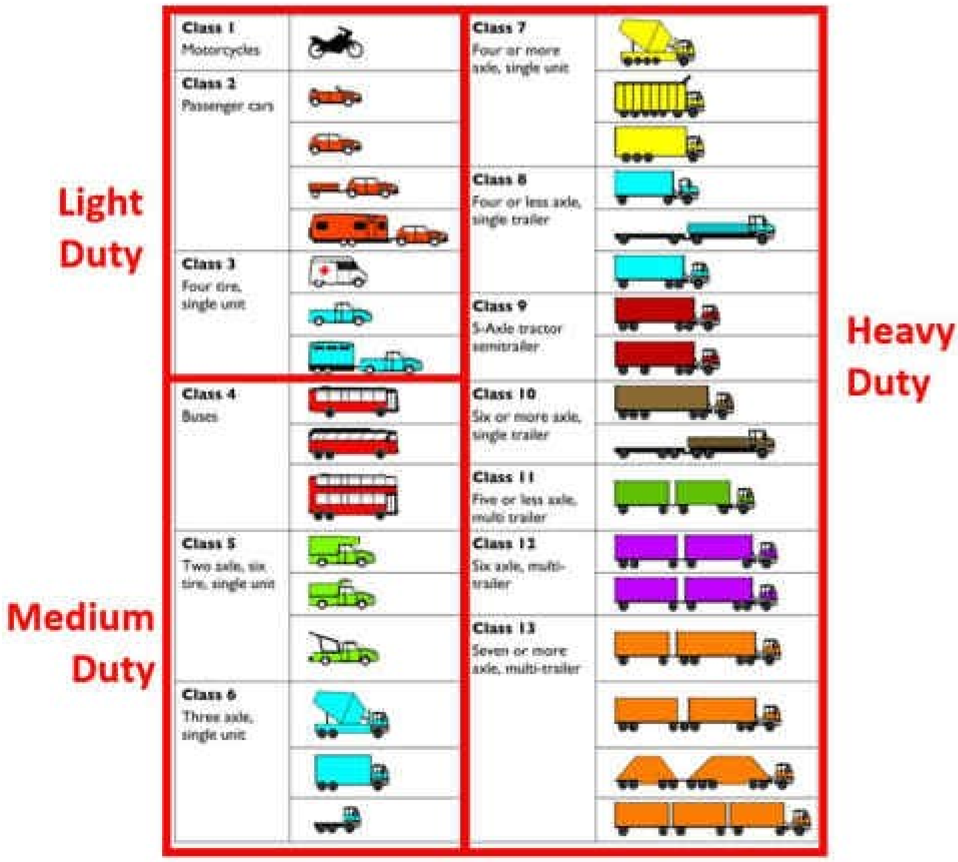
When prioritizing highly congested corridors and intersections, ultimately, the higher the segment's AADT, the more impact an improvement project will have upon the overall transportation network, thus **increasing** its priority versus other similarly congested segments.

Presence of Transit Service AND Level of Heavy/Medium Duty Vehicles

Congestion significantly degrades transit's ability to provide efficient and economical service to its patrons. Heavily congested CMP study sections reduce fuel efficiency and increase both vehicle emissions and patron delay. The intent of a Transit Impact Rating is to identify sections that are crucial to transit service. Further, sections which are experiencing high levels of congestion and directly impact transit service are prioritized higher than those sections which do not handle transit operations. If transit service is present, then the priority of the poor performing segment(s) increases. Since the presence of fixed route transit service is found in Caddo and Bossier Parishes ("Urban"), this prioritization level will NOT apply to those congested roadways identified in either Desoto or Webster Parishes.

The amount of Heavy/Medium duty vehicles along a roadway plays an important part in the overall performance of that roadway. Roadway facilities that carry high percentages of heavy/medium duty vehicle volumes typically exhibit reduced performance due to the size and weight of those vehicles compared to automobiles. As the percentage of large-duty vehicles increase, roadway delay increases because of their physical size (length/width), slower acceleration/deceleration characteristics, and reduced maneuverability (turning). **Priority will be given to sub-corridors that exhibit 10% or more heavy/medium duty vehicles during their peak periods.**

Figure 6.2 – STREETLIGHT/Insight Data Vehicle Class Definitions v. FHWA 13 Veh. Classes



STREETLIGHT/Insight provides vehicle by type flow data that is categorized by three vehicle weight classes (as shown in Figure 6.3) per study segment. For reference, the three Insight classes are compared to the Federal recognized 13 FHWA Vehicle Classifications.

Identified Improvement Projects (along or adjacent to congested segment(s))

At this level of screening, if a poorly performing segment has a planned improvement project aimed at mitigating congestion and/or improving its level of safety, the need (i.e., priority) for the project decreases versus other candidate projects given all other factors being equal.

CMP 2025 SUB-CORRIDOR PRIORITIZATION AND RANKING

By integrating the six ranking criteria (SRF, Survey Responses, Presence of Transit, Heavy-Medium Duty Vehicle Percentage, AADT, and Planned Location-Specific Improvements) into a local prioritization scheme, a well-balanced and robust prioritization scheme is achieved.

Table 6.0 – Prioritized Sub-Corridor/Segments Improvement Project Matrix

Sub-Corridor Name	Lowest SRF* Segment (Overall Rank)	Sub-Corridor Survey Responses (Tier)	Peak Period AADT (Rank)	Fixed Route Transit Service	Heavy Veh. (%)	Exist (TIP) Proj.	Prioritize Final (Rank)
Kings Hwy/S'Port Barksdale Hwy: Holly St.-Gilbert Dr.	0.552 (1)	4 (High)	3,357 (8)	▲	▼ (3%)	▲	**3**
LA 3105/Airline Dr: Beene Blvd – Melrose Dr	0.554 (2)	15 (High)	5,937 (2)	▲	▼ (4%)	▲	**1**
LA 526/Bert Kouns Ind. Loop: Fern Av-LA 1 (Youree Dr)	0.645 (3)	9 (High)	5,366 (4)	▲	▼ (7%)	▲	**2**
LA 511/70th St: Fern Av-LA 1 (Youree)	0.607 (4)	2 (Moderate)	4,300 (6)	▲	▼ (4%)	▲	**5**
***US Hwy 79-80/E Texas St: @ LA 3 Signal. Intersection @ Bellevue Rd Signal. Intersect. @ Pines Rd Signal. Intersection**	0..627 0.598 0.563 (5)	6 (High)	3,224 4,470 1,033 (9)	▲ (LA 3 Only)	▼ (8%)	▲	**8**
I-20 (Eastbound): I-49-Traffic St Exit (Downtown)	0.663 (6)	6 (High)	6,845 (1)	▼	▲ (21%)	▲	**4**
LA 1/Youree Dr/Spring-Market: LA 511 (70th St)-LA 526	0.573 (7)	5 (High)	4,598 (7)	▲	▼ (5%)	▲	**7**
LA 3/Benton Rd: Tilman Dr-Greenacres Bv	0.620 (8)	12 (High)	5,655 (3)	▲	▲ (10%)	▲	**6**
***US Hwy 71/Barksdale Bv: Westgate (BAFB) Signal Intersect.**	0.554 (9)	2 (Moderate)	5,078 (5)	▼	▼ (8%)	▲	**9**
***US Hwy 171/Mansfield Rd: LA 511 (70th St) Signal Intersect.**	0.568 (10)	0 (None)	1,977 (10)	▲	▼ (6%)	▲	**10**

*Segment SRF = Average Travel Speed / Free Flow Travel Speed; a SRF value of 1.0 indicates No congestion present

Table 6.1 – Top Three Sub-Corridors in Need of Congestion Mitigation Improvement Projects

Corridor Name / Extents (by cross street)	*Segment Length (feet)*	*Deficient Peak Period*	*Online Survey Responses Identifying Sub-Corridor*	*Priority*
Airline Dr (LA 3105) / Beene Blvd – Melrose Dr	4,470 ft.	PM	15	1
Bert Kouns Ind. Loop (LA 526) / Youree Dr (LA 1) – Fern Ave	4,100 ft.	PM	9	2
Kings Hwy / Holly St – Gilbert Ave	3,190 ft.	PM	4	3

Table 6.1 NLCOG regrouped and summarized the sub-corridor needs, prioritized by SRF+Online Survey Responses/AADT/Presence of transit service and Medium-Heavy Duty Vehicle percentages/programmed improvements, for the entire CMP Study area. The defined Airline Dr (LA 3105) sub-corridor is prioritized as having the greatest need for improvement. Chapter 7's intent is to develop regionally effective congestion mitigation strategies or projects that, over time, have a meaningful impact upon these congested corridors.

CHAPTER 7
REGIONALLY EFFECTIVE CMP MITIGATION STRATEGIES / RECOMMENDED IMPROVEMENT PROJECTS (3)

REGIONAL CONGESTION MANAGEMENT STRATEGIES

This section of the CMP Update identifies and evaluates the strategies intended for mitigating existing and future congestion along prioritized "Severely Congested" sub-corridors (multiple segments). Through Chapter 7, alleviation strategies are provided (please refer to Appendix C – comprehensive survey of congestion mitigation strategies) which consider physical deficiencies (i.e., geometrics), travel demand, land-use, and fiscal issues. The intent of the recommended strategies is to supply decision-makers with cost-effective improvements aimed at reducing congestion. Improvements are not only developed to improve performance along a specific high priority section; they must benefit the entire network.

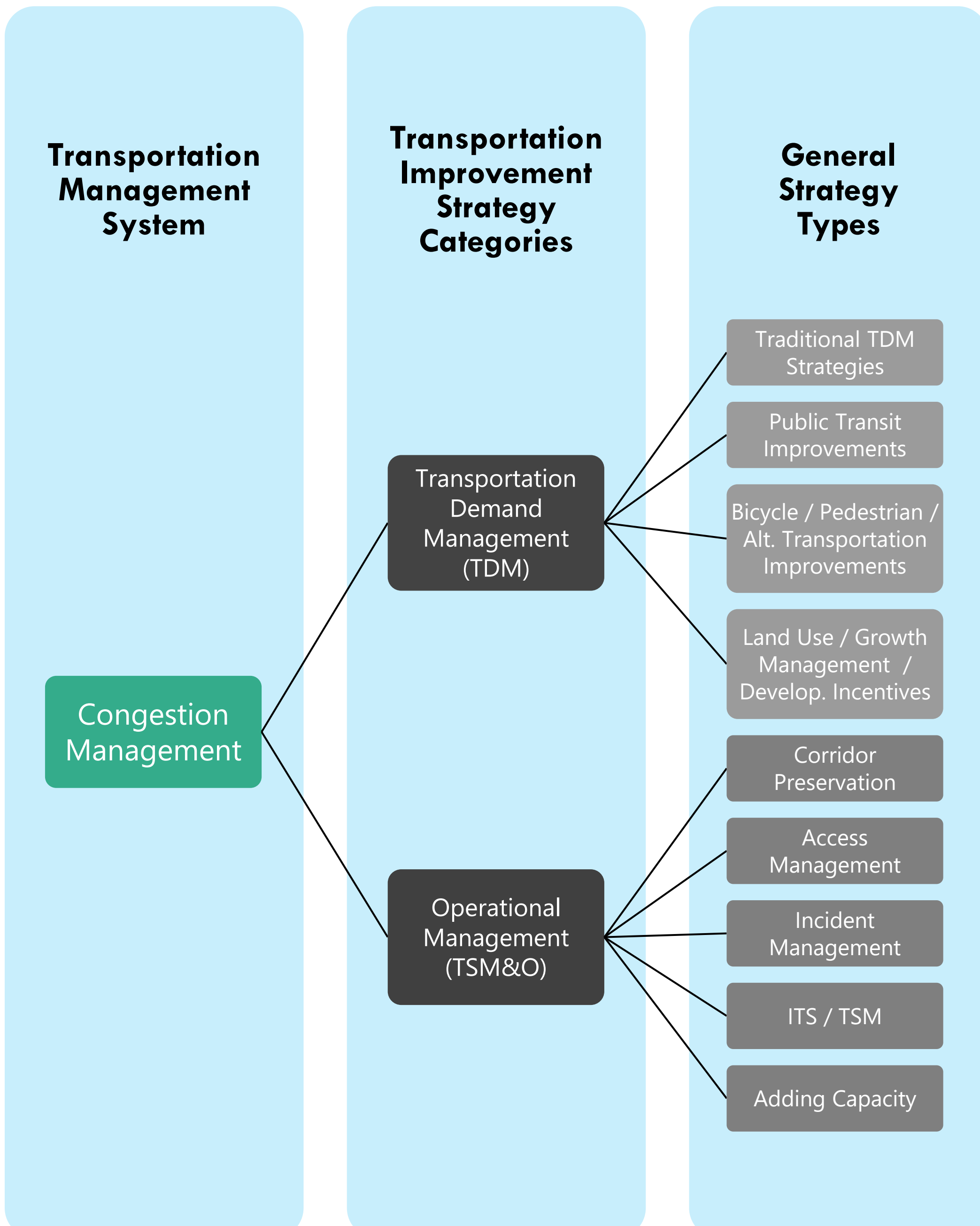
Effective CMP Improvement Strategies/Projects Considerations

- Improvement strategy/project costs
- Appropriateness of recommended strategy/project – improvement scope aligns with congestion level and extents
- Previously implemented improvement strategy/project upon the local roadway system
- Current local political willingness to implement the improvement (critical consideration)

Improvement Strategy/Project Recommendation Process

Once congested sub-corridors are selected for review, they are selectively screened to identify mitigation strategies appropriate to reduce congestion and secondarily improve its safety characteristics. The CMP Strategy Matrix (found in Appendix C) is used to address recurring congestion. The congestion mitigation strategies that are identified as having the greatest potential benefit are then evaluated in greater detail to determine the most effective improvement strategy/project. NLCOG Staff makes these improvement recommendations to the MPO's Technical Coordination Committee (TCC – comprising of professional staff working in multi-modal, local planning and engineering endeavors). Once the TCC members accept the overall CMP document, along with the recommended improvement strategies/projects, it is recommended to the MPO's Transportation Policy Committee (TPC – comprised of locally elected/appointed officials) for Introduction and then consideration for adoption. are made for the projects or programs to be implemented. Appendix C provides a full range of potential congestion mitigation strategies. These strategies can be grouped into the following broad categories as presented in Figure 7.0.

Figure 7.0 – Congestion Management: Widely Implemented Improvement Strategy Types



CMP 2025: IMPROVEMENT STRATEGY/PROJECT RECOMMENDATIONS FOR SEVERELY CONGESTED SUB-CORRIDOR LOCATIONS (TOP THREE)

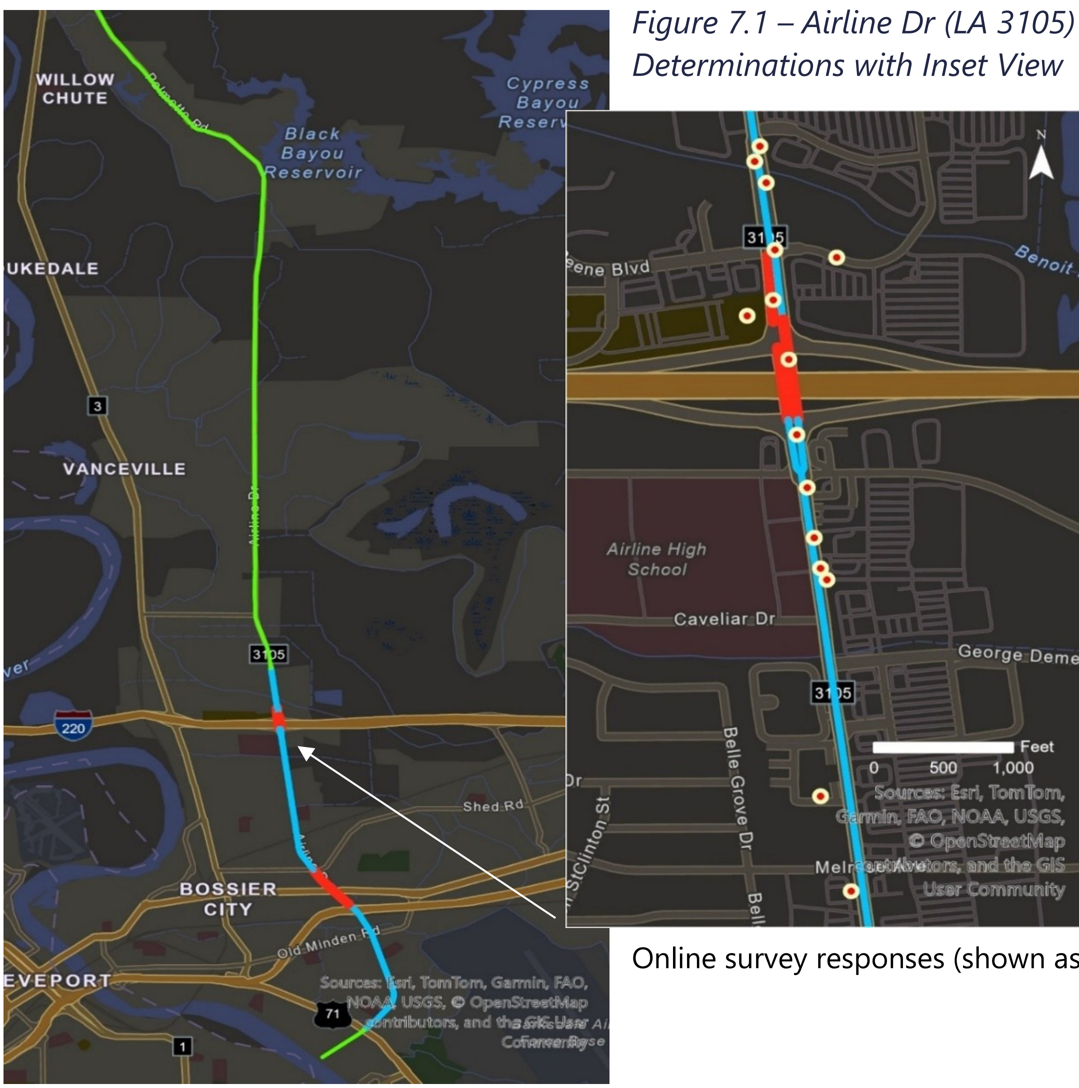
Provided below are the top three prioritized congested sub-corridors within the CMP's Study Area. Recommendations are compiled by NLCOG Staff in coordination with the appropriate local jurisdiction.

Priority 1: Airline Dr (LA 3105) Corridor PM-Peak / Beene Blvd to Melrose Dr

2022-2023 SRF and Performance Analysis (Source: Streetlight/Insight)

Lowest SRF (i.e., Highest Congested Segment): Northbound between I-220 ramp signals
Poorest Performing Peak Period: PM Peak (4p-6p)
[Non-Freeway Severe Congested = Red segments; Blue = Moderate Congestion; Green = Little]

Figure 7.1 – Airline Dr (LA 3105) SRF Determinations with Inset View



Online survey responses (shown as red points)

Corridor Speed Reduction Factor (SRF) Determinations

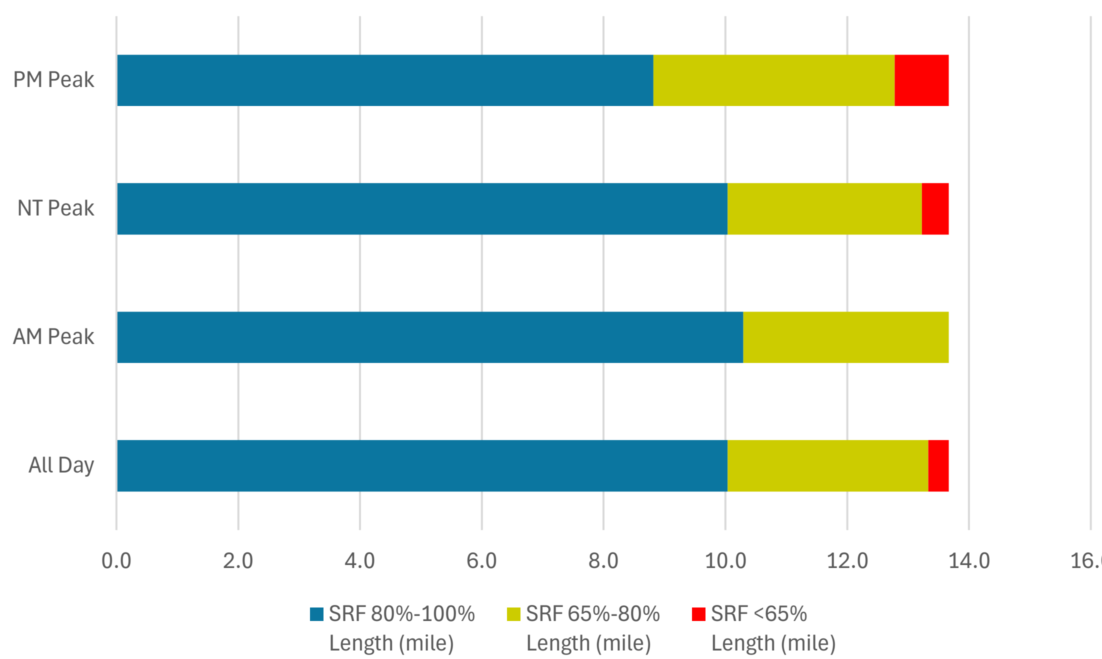
Day Part	Average Daily Vol	Avg Corridor Speed (mph)	VHD*	SRF 80%-100% Length (mile)	Low-No Congestion	SRF 65%-80% Length (mile)	Moderate Congestion	SRF <65% Length (mile)	Severe Congestion
All Day	21,304	31.6	1,562.4	10.0	73.4%	3.3	24.1%	0.3	2.5%
AM Peak	3,258	33.5	222.5	10.3	75.3%	3.4	24.7%	0.0	0.0%
NT Peak	4,182	30.5	342.1	10.0	73.4%	3.2	23.4%	0.4	3.2%
PM Peak	3,288	29.6	302.4	8.8	64.5%	4.0	29.0%	0.9	6.5%

*VHD: Vehicle Hours of Delay

Average Vehicle Delay Over the Entire Study Corridor by Peak

Average Vehicle Delay (mins.:secs.)	04:24	All Day
	04:06	AM Peak (6a-9a)
	04:55	NT Peak (11a-1p)
	05:31	PM Peak (4p-6p)

Congested Mileage By SRF Level and Time of Day



Sub-Corridor/Segment Causal Factors Contributing to Congestion

Physical Deficiencies – Inadequate signalized intersection spacing around the I-220 ramp signals and Viking Dr intersection; inadequate turning bay lengths at some signalized intersections; large amount of private property access out onto Airline Dr provides much of the conflict along the entire corridor.

Future Sub-corridor Travel Demand – A significant amount of continuous residential development is anticipated both north and south of this sub-corridor which will exacerbate the congestion if it is not addressed.

Land Use Factors – Above average amount of private property access located along the entire congested section serving large retail, entertainment, and commercial uses. This section serves as the primary retail and commercial development for Bossier Parish.

Recommended Congestion Mitigation Strategies and/or Improvement Projects

In consultation with Bossier City's Engineer's staff and LADOTD District 04 Traffic Engineering staff, an appropriately scaled and cost-effective congestion mitigation project was developed.

Long Range (Recommended Improvement(s): Three years ago, LADOTD performed a congestion mitigation study for the Airline Dr corridor that's "Severely Congested". LADOTD Headquarters developed some of the "out of the box" innovative strategies and projects recommended through the remediation plan. Ultimately, the proposed improvement project that was advanced forward is detailed on the following pages.

Figure 7.2 – Airline Dr (LA 3105) Potential Improvement Project Extents

PHASE I Summary
(Beene Bv-I-220 Ramp)

- Focus on LA 3105 SB flow
- Widen: SB Beene to Viking
- 4 intersections, no driveways
- Dual lefts onto I-220

Phase I focuses on the north end of the corridor, particularly the southbound traffic flow.

Phase I improvements entail extensive channelization to maximize the movement of traffic through each signalized intersection. Maximum flow through this area given the constrained ROW, consists of two-through travel lanes (all signalized intersections), two-lane, left turn movements from Airline Dr onto I-220 at the ramp signals. Additionally, channelization creates dedicated right turn lanes onto the cross streets and ramp access onto I-220 from Airline Dr.

Preliminary Improvement Project Specifications:

Estimated Const. FFY 2029	Airline Dr (LA 3105)	Greenacres Blvd to Melrose Ave	Widening / Reconfigure Lanes / Channelization / Turning Bay Capacity	Scope: Preliminary Schematic Figs. 6.5 and 6.6	Cost of Improvement Package: T.B.D.
2050 MTP Program: Committed (2026-2030)			NLCOG Fund Programs: STBG>200K, CRP>200K		

Figure 7.3 – Phase I Geometry (I-220 Ramp north to Beene Blvd / Airline Dr (LA 3105)

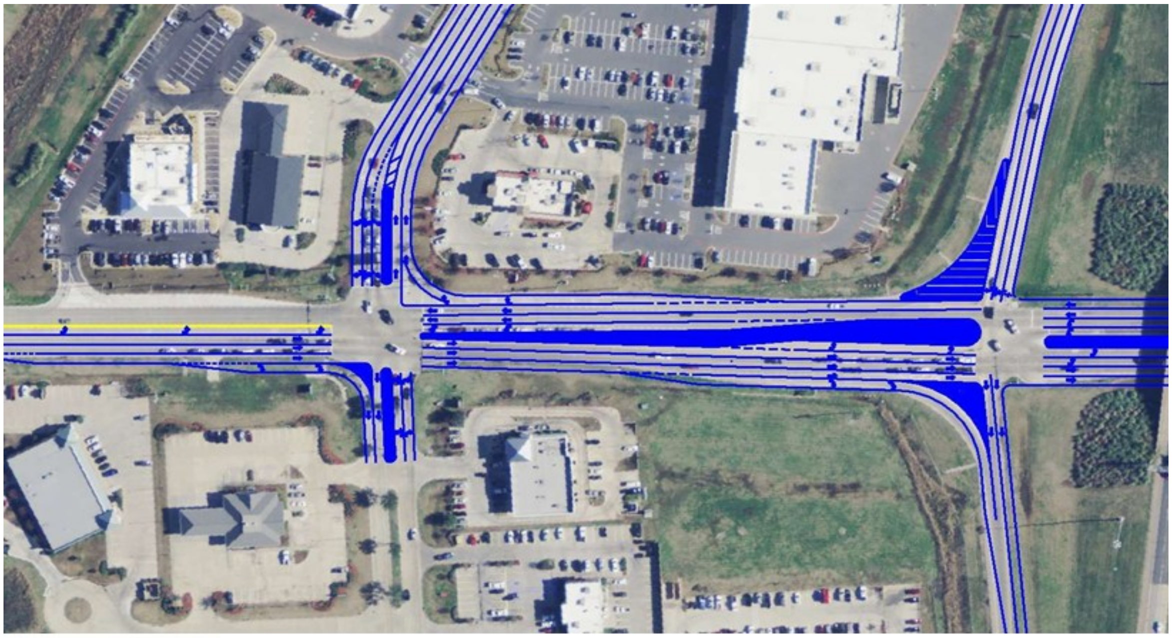


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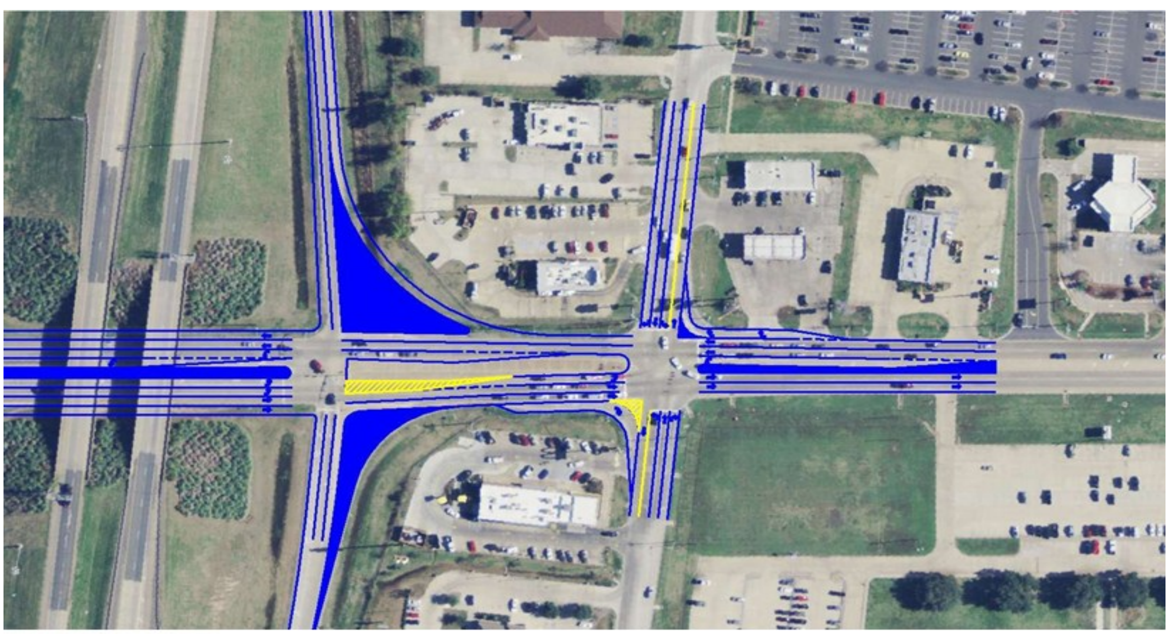
Figure 7.4 – Phase I Geometry (I-220 Ramp south to Viking Dr / Airline Dr (LA 3105)



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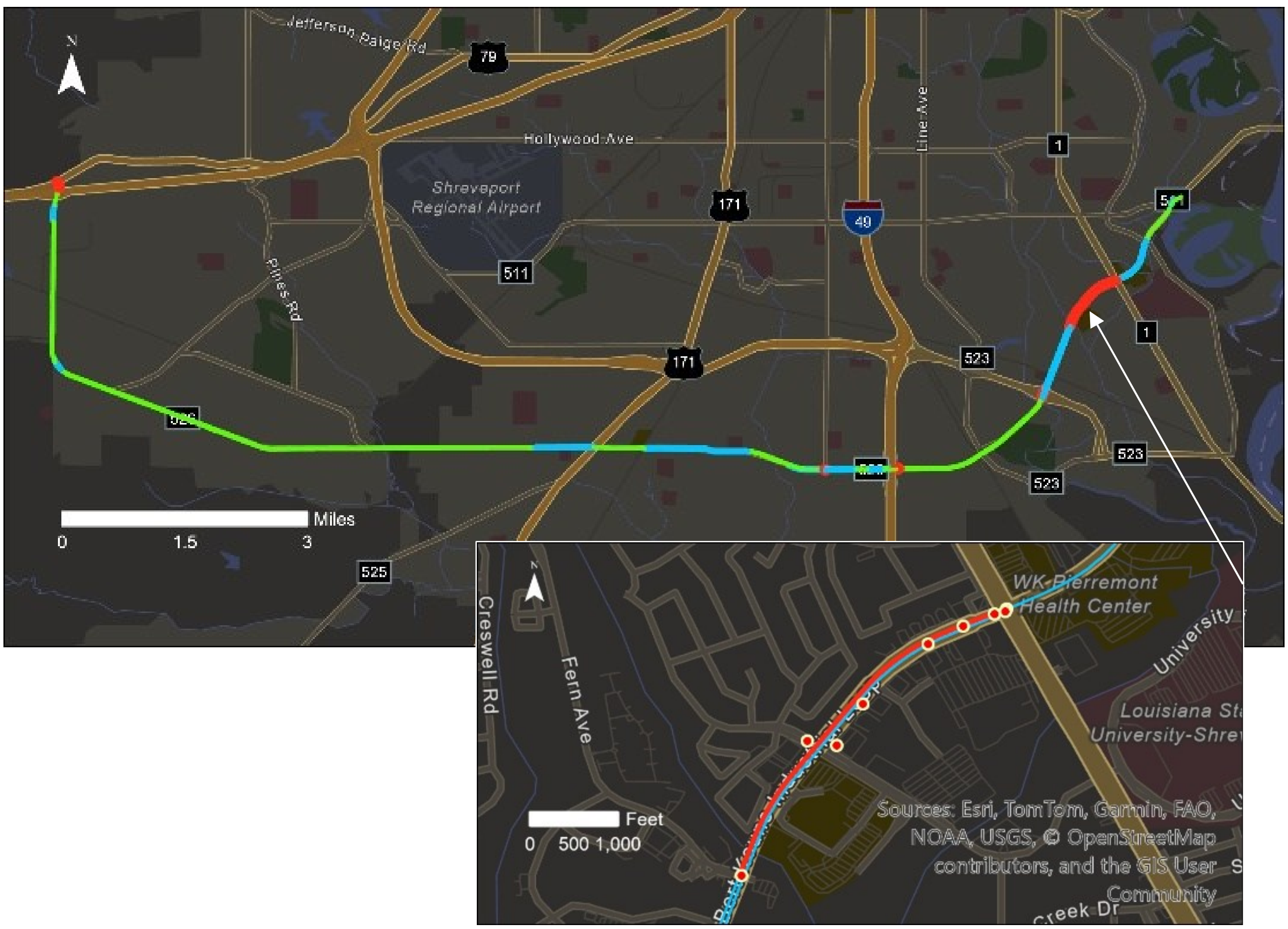
Priority 2: Bert Kouns Ind. Loop (LA 526) Corridor PM-Peak / Fern Ave to Youree Dr

2022-2023 SRF and Performance Analysis (Source: Streetlight/Insight)

Lowest SRF (i.e., Highest Congested Segment): 0.645 / Westbound (Youree Dr to Fern Ave)
Poorest Performing Peak Period: PM Peak (4p-6p)
[Non-Freeway Severe Congestion = Red segments; Blue = Moderate; Green = Little-No]

Figure 7.5 – Bert Kouns Industrial Loop (LA 526) SRF Determinations with Inset View



Online survey responses (shown as red points) identifying delay and congestion issues

SRF = (Average Segment Travel Speed) / (Segment Free Flow Travel Speed)
An SRF of 1.0 indicates NO congestion present; the SRF is also known as a "Congestion Percentage"

Corridor Speed Reduction Factor (SRF) Determinations

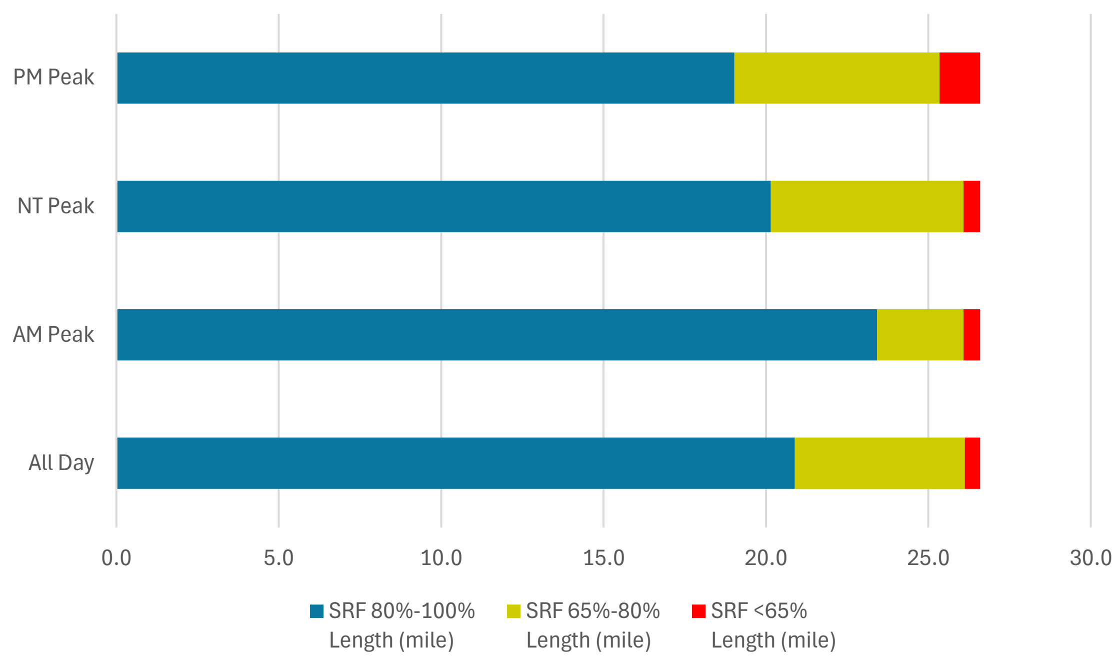
Day Part	Average Daily Vol	Avg Speed (mph)	VHD*	SRF 80%-100% Length (mile)	Low-No Congestion	SRF 65%-80% Length (mile)	Moderate Congestion	SRF <65% Length (mile)	Severe Congestion
All Day	11,734	38.1	1,191.8	20.9	78.6%	5.2	19.7%	0.5	1.8%
AM Peak	1,953	39.0	160.9	23.4	88.1%	2.7	10.0%	0.5	1.9%
NT Peak	2,279	37.3	277.5	20.2	75.8%	5.9	22.3%	0.5	1.9%
PM Peak	1,893	37.3	241.0	19.0	71.5%	6.3	23.7%	1.3	4.7%

*VHD: Vehicle Hours of Delay

Average Vehicle Delay Over the Entire Study Corridor by Peak

Average Vehicle Delay (mins.:secs.)		
	06:06	All Day
	04:57	AM Peak (6a-9a)
	07:18	NT Peak (11a-1p)
	07:38	PM Peak (4p-6p)

Congested Mileage by SRF Level and Time of Day



Likely Source(s) of Congestion

Physical Deficiencies – As with the Youree Dr (LA 1) sub-corridor, westbound LA 526 between the signalized intersections of Youree Dr. and Fern Ave., contains an inordinate amount of private property access directly onto LA 526. Further, this segment is over saturated , specifically during the PM-Period, as vehicles attempt to access the Highland Hospital campus, Walmart (and its outparcel retail/service businesses located adjacent to the roadway), and the high density residential located along Milicent Way.

Future Sub-corridor Travel Demand – With the continued growth of the Highland Hospital campus, Louisiana State University Shreveport (LSUS east of this segment accessed by the cross-street Milicent Way), and businesses south of this segment, congestion will continue to be an issue if it is not addressed.

Land Use Factors – Above average amount of private property access located along the entire congested section serving multiple businesses, big box retail development, entertainment, and a large medical center (Highland Hospital Campus). This section of LA 526 (Bert Kouns Ind. Loop) serves as the primary facility that links retail, medical, and education to the large south Shreveport residential areas.

Recommended Congestion Mitigation Strategies and/or Improvement Projects

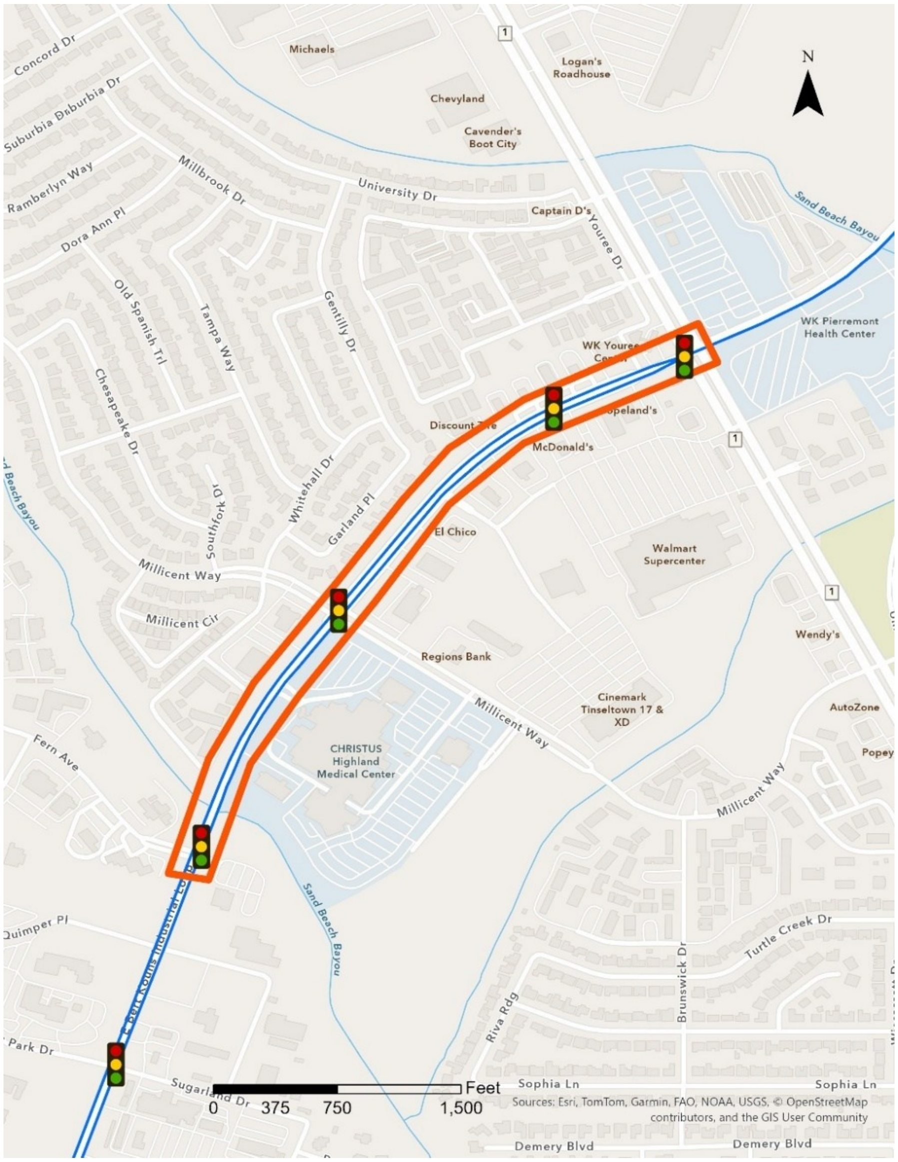
In consultation with LADOTD Traffic Engineering Staff, an appropriately scaled and cost-effective congestion mitigation project was developed.

Short-Range Improvement(s)

LADOTD District 04 (Traffic Engineering Staff) is currently We're looking into some timing changes along this corridor which should help. District Staff have recently reworked the timings to the west of this corridor, and the results from the field have shown that the new timings have reduced vehicle delay. More study is required to calculate a more definitive time reduction per vehicle, but the preliminary results are favorable along the Bert Kouns Industrial Loop corridor.

Long Range (Recommended Improvement(s):

Figure 7.6 – ITS Improvement (Bert Kouns Industrial Loop Adaptive Traffic Signals Project)



LADOTD is considering adaptive traffic signal system for this corridor (severe congested segment outlined in dark orange) which would entail current vehicle detection technology, instrumentation, upgrading the signal controller boxes, and communication/power equipment (both above and below ground)

From NLCOG's research, the cost breakdown factors discovered:

Average Costs:
$30,000 to $96,400 per intersection: A study in Florida found this overall range, including equipment, installation, training, and maintenance.

$40,000 to $65,000 per intersection: This range is frequently cited for the installation cost of the system itself.

Key Cost Influencers:
Detection Technology: The type of sensors used impacts cost. For example, video detection can lead to higher costs than magnetometer detection.

Existing Infrastructure: If the current controller cabinets are not large enough or if new conduit and wiring are needed for detectors, significant extra costs can be incurred.

System Complexity: Different adaptive systems have different price points. A more sophisticated system will have a higher initial cost.

Communication: A reliable communication system is necessary for the controllers to communicate with each other, and the cost to implement this varies depending on the existing infrastructure.

Preliminary Improvement Project Specifications:

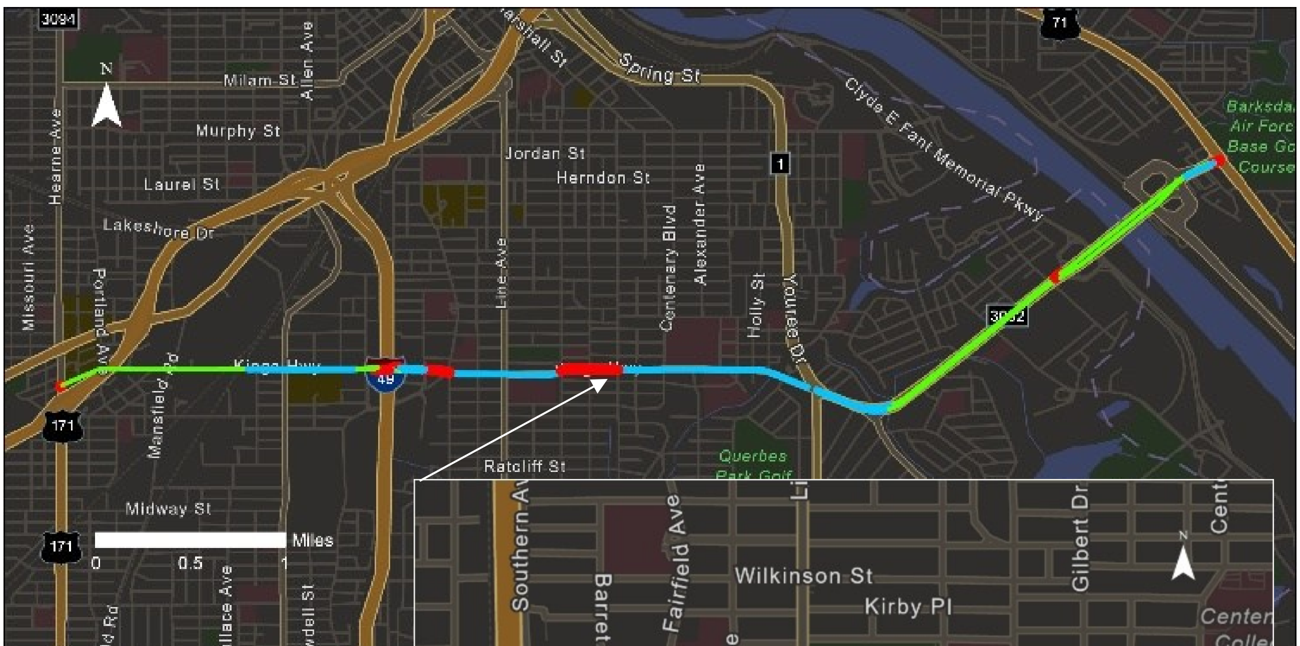
Estimated Const. FFY 2028	LA 526 Bert Kouns Ind. Loop	LA 1 (Youree Dr) to Business Park Dr	LADOTD Systems Management & Operations (TSM&O)	Scope: Five Signal. Intersections	Retrofit Prelim. Cost/Inter. $100,000	Est. Total Cost: $500,000
2050 MTP Program: Committed (2026-2030)			NLCOG Fund Programs: STBG>200K, CRP>200K			

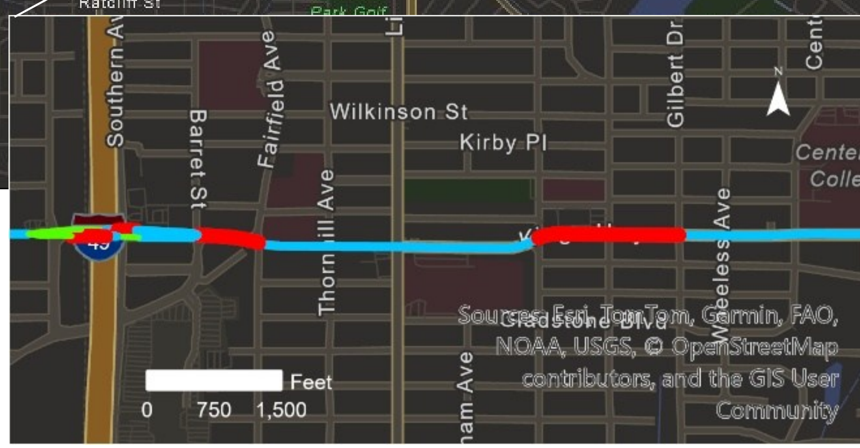
Priority 3: Kings Hwy-S'Port Barksdale Corridor PM-Peak / Gilbert Dr to I-49

2022-2023 SRF and Performance Analysis (Source: Streetlight/Insight)

Lowest SRF (i.e., Highest Congested Segment): 0.552
Poorest Performing Peak Period: PM Peak (4p-6p)
[Non-Freeway Severe Congested = Red segments; Blue = Moderate Congestion; Green = Little]

Figure 7.7 – Kings Highway SRF Determinations with Inset View





Online survey responses (shown as red points) identifying delay and congestion issues

SRF = (Average Segment Travel Speed) / (Segment Free Flow Travel Speed)
An SRF of 1.0 indicates NO congestion present; the SRF is also known as a "Congestion Percentage"

Corridor SRF Determinations

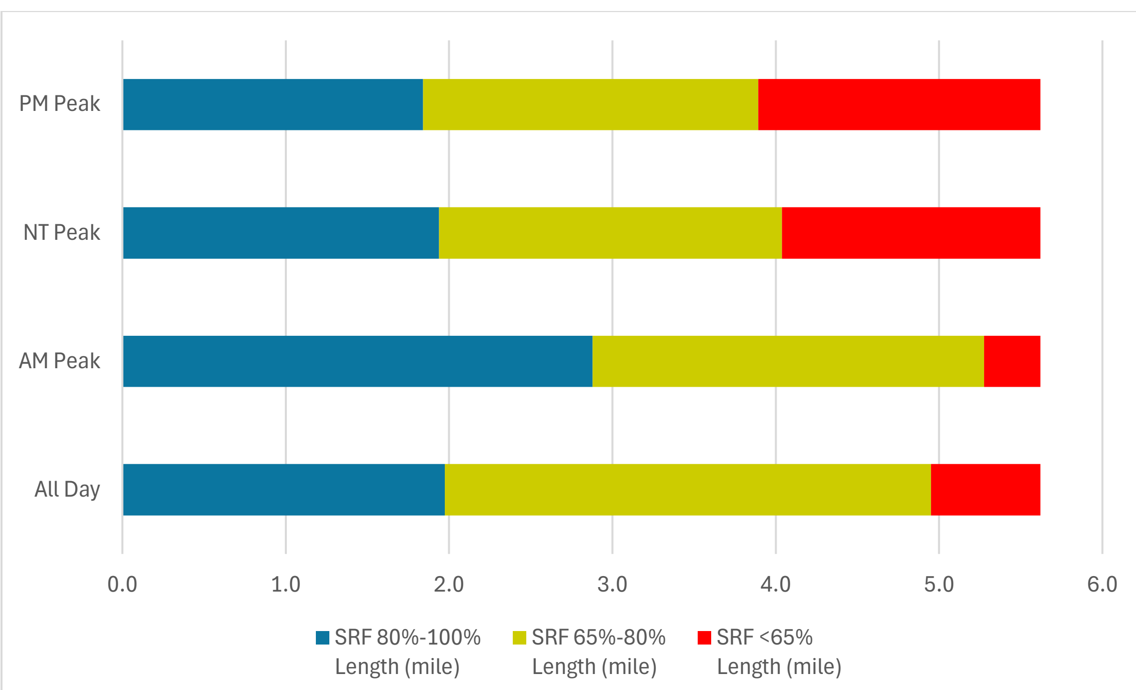
Day Part	Average Daily Vol	Avg Speed (mph)	VHD*	SRF 80%-100% Length (mile)	Low Congestion	SRF 65%-80% Length (mile)	Moderate Congestion	SRF <65% Length (mile)	Severe Congestion
All Day	9,328	30.9	544.8	2.0	35.1%	3.0	52.9%	0.7	11.9%
AM Peak	1,477	31.4	76.4	2.9	51.2%	2.4	42.7%	0.3	6.1%
NT Peak	1,946	30.5	128.9	1.9	34.5%	2.1	37.4%	1.6	28.1%
PM Peak	1,509	30.0	105.3	1.8	32.7%	2.1	36.5%	1.7	30.7%

*VHD: Vehicle Hours of Delay

Average Vehicle Delay Over the Entire Study Corridor by Peak

Average Vehicle Delay (mins.:secs.)		
	03:30	All Day
	03:06	AM Peak (6a-9a)
	03:58	NT Peak (11a-1p)
	04:11	PM Peak (4p-6p)

Congested Mileage By SRF Level and Time of Day



Likely Source(s) of Congestion

Physical Deficiencies – Through this area, Kings Highway has several geometric and safety deficiencies that contribute to its poor performance during the Mid-day and PM Peak periods. The cross-section of Kings Hwy is characterized as an undivided, four lane facility with multiple signalized intersections that are skewed or have limited sight distance. Lateral lane widths vary from 8 feet to 9 feet which reduces traffic flow (i.e., throughput). Private businesses, fronting the south side of Kings Hwy, with an inadequate amount of setback and front-facing parking, cause significant disruption to traffic flow. Driver safety is compromised by the 2 to 3 feet setback from the travel lanes of overhead power/communication poles. The siting of the poles is a hazard to at speed vehicles due to their proximity to the road.

Future Sub-corridor Travel Demand – Kings Highway serves as the primary thoroughfare for residents of Broadmoor, Highlands, and South Highlands neighborhoods, as well as the Centenary College campus. Although these are established, stable, urban core neighborhoods, in order to maintain the quality of life, residents enjoy, it is recommended that geometric, safety, and aesthetic improvements are programmed into NLCOG's Long-Range Transportation Plan (MTP 2050).

Land Use Factors – Small service/retail businesses and Centenary College campus (parking access) front Kings Hwy along the length of the sub-corridor. This section serves as the primary thoroughfare for the surrounding neighborhoods, Centenary's campus/on-near campus housing, and small food/retail/service businesses fronting Kings Highway.

Recommended Congestion Mitigation Strategies and/or Improvement Projects

In consultation with the City of Shreveport's Engineering Department (David Smith – City Engineer), a proposed improvement project has been developed.

The proposed improvement project would be programmed in the new TIP FFY2026-FFY2030, and the City of Shreveport is the charged local jurisdiction.

Preliminary Improvement Project Specifications:

Estimated Const. FFY 2028	Kings Hwy. Corridor	Holly St to Gilbert Dr	Road/Traffic Diet Improvement Project	Est. Project Cost: $12,000,000	Shreveport
2050 MTP Program: Committed (2026-2030)			NLCOG Fund Programs: STBG>200K, CRP>200K, TA		

Kings Corridor - Road/Traffic Diet Purpose Cross Section Details

Road diets This traffic calming treatment typically involves reducing the number of through lanes for automobile traffic. Often, this reduction of travel lanes occurs in conjunction with the introduction of a center-running two-way left turn lane. Road diets have been shown to slow traffic, reduce crashes, and enhance pedestrian safety. Road diets also open up additional space that can be used for bicycle facilities, widened sidewalks, parking, and transit amenities (e.g., bus pull outs).

This improvement project will reconfigure the current a four-lane undivided road cross-section into a two-lane roadway, utilizing the newly available space for features such as bus pullouts, pedestrian islands, and private parking access buffers.

The estimated total project costs include a conservative budget for utility relocation costs including the removal of above ground power poles to buried underground power distribution. Even more critical and costly is the upgrade of the underground water and sewer infrastructure including the capacity to handle more run-off from the new roadway design than what currently exists.

Kings Corridor – Plan View of Potential Design with Parking/Bus Pullouts*

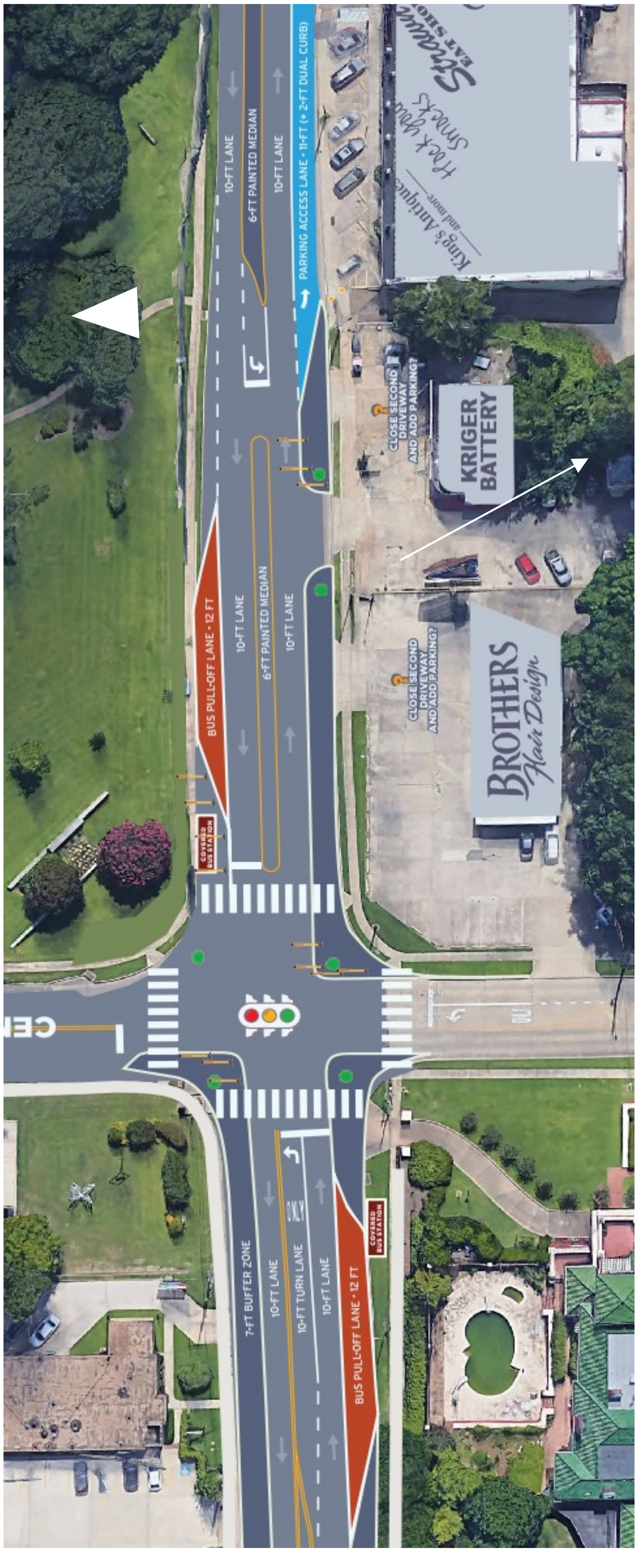


Figure 7.8 – Kings Highway Congestion Mitigation Project: Road/Traffic Diet and Additional Geometric/Safety Features

Since this improvement project is in its preliminary stages, the City of Shreveport is in the process of fine tuning the ultimate "Road Diet" design configuration for the sub-corridor under study. For reference, the schematic (left) dimensions lane widths, bus pull outs (orange shaded), parking access buffers (cyan shaded). Lane configurations, cross walks, and business names are also indicated on the graphic. For context, this preliminary plan represents a portion of the overall improvement project in the vicinity of the Centenary Blvd. signalized intersection.

*Source: City of Shreveport preliminary cross-section of a Road/Traffic Diet treatment that is being considered

CHAPTER 8
CMP MONITORING / PROJECT EVALUATION AND RELATION TO THE MPO PLANNING PROCESS

Introduction

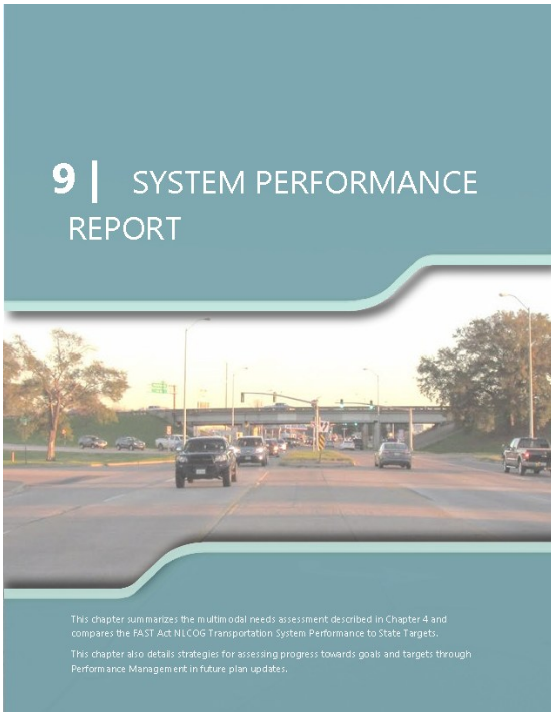
FHWA guidelines call for CMPs to include provisions to monitor the performance of strategies implemented to address congestion. Regulations require "a process for periodic assessment of the efficiency and effectiveness of implemented strategies, in terms of the area's established performance measures. If we look back at the CMP Process Framework illustrated in Chapter 2 (Fig. 2.1), improvement evaluation and CMP monitoring efforts are the last step in the Congestion Management Process cycle. The intent of this step is to assist in determining whether operational or policy adjustments are needed to make the current strategies work more efficiently. Further, it provides information about how various strategies work to implement future approaches within the CMP study area.

TRAFFIC FLOW DATA APPROPRIATE FOR CMP ANALYSIS AND CONGESTION DETERMINATIONS

The following lists data NLCOG staff will maintain and update periodically to support the CMP. Observed Traffic Flow Data (INSIGHT Data), Adjustments and Calculated Data Metrics Utilized to Determine Roadway Congestion Levels for the CMP Update.

DATA	SOURCE	Updated (Last)	CMP Performance Indices or Improvement Project Prioritization or Other Purpose
CMP Network / Travel Time-Speed Data	NLCOG	INSIGHT data: (Continuous)	SRF (segment) TT Reliability (network)
Traffic Count Data (AADT / Level of Service / V/C / VMT)	INSIGHT data user license (4-Parish MPA) / LADOTD / NLCOG	INSIGHT data: (Continuous) / LADOTD: routine counts / NLCOG: project specific	Project Prioritization: (MTP / CMP / ITS / Safety / Freight Plan. / TIP)
Travel Time Data (All vehicles. And Freight movements)	INSIGHT data user license (MPA)	INSIGHT data: (Continuous)	CMP: SRF (segment) TT Reliability (network) / Project Impacts and Prioritization:
Incident-Crash Data / (VMT)	LA CRASH Database / (CARTS)	Continuous	MPO PM1 Performance Measures and Target setting / Safety project prioritization
Bicycle and Pedestrian Inventory	INSIGHT data user license (MPA) / Local Entities / NLCOG	INSIGHT data: (Continuous) Local Sources: (October 2017)	MTP Project Prioritization
Transit Ridership	SPORTRAN	February 2022	Transit PM - TAMP
Transit Routes and Stop Locations	SPORTRAN	February 2022	Transit PM - TAMP
Regional ITS Architecture	NLCOG	May 2017	MTP Project Prioritization
Transportation Systems Management & Operations	Local Entities / NLCOG	May 2021	MTP Project Prioritization

NLCOG'S PM3 SYSTEM PERFORMANCE & FREIGHT RELIABILITY PERFORMANCE REPORT



NLCOG regional transportation performance reporting is accomplished primarily through TIP and MTP planning processes, which include targets for applicable TPM measures (including PM3: System and Freight Reliability Measures). As a key tool in the maintenance of NLCOG's CMP report the PM3 Systems Report will be updated.

The schedule for preparing the Federally required (designated Metropolitan Planning Area MPA – 4 Parish area) System Performance Report is in conjunction with the Update of the MPO's Metropolitan Transportation Plan (MTP).

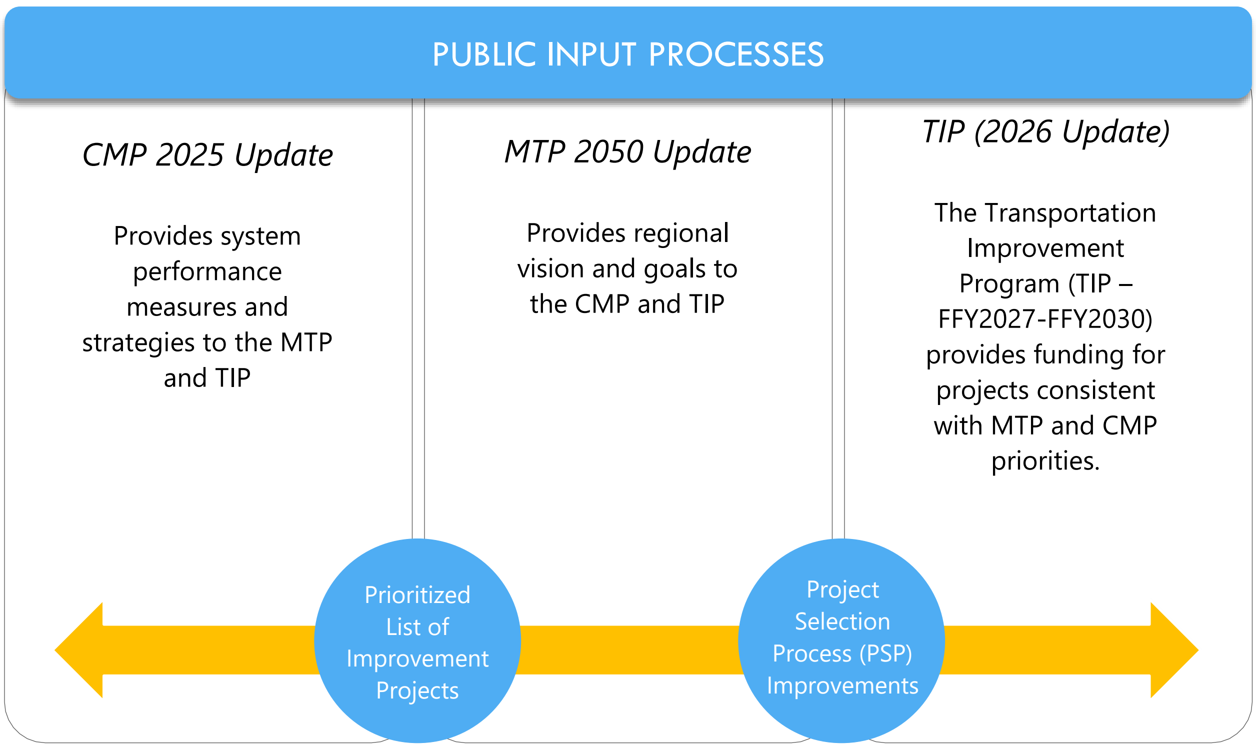
NLCOG'S congestion management process (CMP) Reporting

The CMP report will track the effectiveness of the implemented strategies, to the extent possible with the available project level data, and conditions of the multimodal transportation system. The same set of quantifiable performance measures established for the CMP as established in Chapter 4 of this report will be used to measure system performance at corridor and system levels. Data collection and performance monitoring are ongoing with the various periodic assessments of roadway, transit, bicycle/pedestrian/trail, and freight network performance in the region. However, this CMP also identifies the need for a process that supports the routine tracking of the effectiveness of the implemented congestion mitigation strategies and the multimodal transportation system in Northwest Louisiana.

CMP RELATION TO THE MPO TRANSPORTATION PLANNING PROCESS

NLCOG's CMP is one component in the overall MPO Transportation Planning Process. Figure 8.1 provides a graphical representation of how the CMP fits into overall MPO planning process. From this process, the CMP provides recommended transportation improvement strategies/projects based upon rationally developed performance measures and a need-based prioritization scheme utilized in the development of the MPO's Metropolitan Transportation Plan (MTP) update.

Figure 8.1 – NLCOG's (MPO) Transportation Planning Process and the CMP's Role



Performance measures and target setting are defined and adopted within the MPO's Metropolitan Transportation Plan (MTP). As identified MTP improvement projects are being prioritized through the Project Selection Process (PSP), the MPO's TCC evaluates projects on a performance-based scoring system. Once a funding source is secured per respective project, the top ranked projects are scheduled into the four-year Transportation Improvement Project (TIP). As noted in Figure 8.1, public input and comments are an integral part of the entire MPO Transportation Planning Process and is represented along the entire sequence of the process diagram. Ultimately, programmed projects progress through the prescribed project delivery process (per LADOTD) and are Let for Construction or Implementation. Implemented improvement projects/strategies are evaluated through the Systems Performance Report which is undertaken through the update of the MPO's Metropolitan Transportation Plan (MTP).

CMP Improvement Project Potential Funding Sources

Once the Congestion Management Process (CMP) recommended projects and strategies have been evaluated the output information can be used to propose projects for inclusion in the Northwest Louisiana's Metropolitan Transportation Plan (MTP) 2050 update and the corresponding TIP. Programming of CMP strategies into the TIP will be coordinated through the TCC in cooperation with the implementing agency and will be funded through federal, state, or local funds.

Responsibility for the implementation of specific congestion management strategies lies with the State of Louisiana and/or local jurisdictions. While the MPO does not receive any special funds for congestion mitigation, funding for recommended CMP improvements will be identified in the upcoming update of our current four-year TIP. The new TIP will replace the current TIP starting in FFY 2027 (Northwest Louisiana Metropolitan Planning Area TIP (2027-2030)). Other sources of funding available include transportation enhancement funds, which can be used to improve non-motorized transportation facilities, and Federal Transit Administration (FTA) Section 5307 funds, and JARC funds.

Future MPO Actions Regarding CMP Maintenance

Following through on the recommendations of the CMP, will require NLCOG staff to perform periodic traffic flow data collection activities (i.e., travel times), as well as occasional traffic surveillance. Working with SPORTRAN (primary transit provider for the urban area), LADOTD, major employers and our standing TCC, NLCOG will be able to rationally develop CMP projects for implementation.

During the annual development of the Unified Planning Work Program (UPWP), CMP monitoring and maintenance activities will be included, and any additional special projects needed to carry the CMP objectives forward will be included.

- Update the CMP on a **four-year cycle** PRIOR to the development of the forthcoming Metropolitan Transportation Plan (MTP) update.
- Utilize the required Transportation Systems Status Report data and findings (PM3 determinations) within the update of the CMP.
- Follow data collection methodology for updating travel times on study corridors.
- Continuing dialogue with the TCC members concerning mitigation project development
- The Network System Performance Report will serve as a resource for evaluation of the impact of congestion mitigation projects (updated every four years through the MTP update).

CMP 2025 SUMMARY OF FINDINGS AND RECOMMENDED IMPROVEMENTS

The Congestion Management Process (CMP) is a federally required, performance-based framework designed to monitor, measure, and address congestion on metropolitan transportation networks. For NLCOG, the CMP plays a central role in supporting the Metropolitan Transportation Plan (MTP) by providing data-driven insights into operational deficiencies, travel-time reliability trends, and mobility challenges throughout the four-parish region.

The public engagement component of the CMP uses online surveys, mapping tools, and community outreach events to capture the lived experiences of drivers, residents, and businesses. With 101 survey responses and 163 unique congestion points identified, public feedback aligned closely with technical Speed Reduction Factor (SRF) findings.

Seventeen major corridors were analyzed for congestion severity using Speed Reduction Factor (SRF) metrics. Kings Highway, Airline Drive (LA 3105), Bert Kouns Industrial Loop (LA 526), and US Highway 79-80 showed the highest levels of recurring congestion. In addition to the SRF metric, public input, AADT, the presence of fixed route transit and freight activity, and the existence of planned/programmed improvement projects were combined to produce a prioritized list of sub-corridors in critical need of congestion mitigation.

Recommended strategies include Intelligent Transportation Systems (ITS), access management, signal timing optimization, multimodal connectivity improvements, and incident management enhancements. These solutions address both recurring congestion and localized mobility challenges.

The CMP employs STREETLIGHT/INSIGHT probe-based speed and travel-time datasets, crash data from Louisiana CRASH, traffic volumes from DOTD, transit ridership data, and multimodal infrastructure inventories. Ongoing monitoring ensures that future updates reflect changing travel patterns and system performance trends.

Final recommendations highlight priority corridors for near-term investment, emphasizing Airline Drive, Bert Kouns Industrial Loop, and Kings Highway. Proposed improvements aim to enhance safety, reduce delay, improve multimodal access, and support long-term regional mobility. These projects will be prioritized for inclusion into NLCOG’s 2050 MTP Update Plan.

CMP Partners

NLCOG's Congestion Management Process was developed through a cooperative effort with members of the MPO's Technical Coordinating Committee (TCC). The Technical Coordinating Committee (TCC) provides planning and engineering guidance to the MPO's Transportation Policy Committee in dealing with issues of the MPO's transportation programs (i.e., CMP). The TCC's primary function is to interpret technical data and policy mandates. Further, the TCC is used by the MPO's Transportation Policy Committee to formulate the Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP). To integrate the CMP into the planning process the development of the CMP was discussed during the TCC meetings. The member agencies and groups represented on the TCC include:

- LADOTD -Planning/Programming
- LADOTD – District 04 Traffic Engineer
- Shreveport MPC
- Bossier City MPC
- Shreveport-Bossier Port Commission
- SPORTRAN (Shreveport/Bossier City 5307 Urban Transit Provider)
- Federal Highway Administration – LA Div.
- Caddo Parish Commission
- Desoto Parish Police Jury
- Webster Parish Police Jury
- Bossier City Traffic Engineering
- Federal Transit Administration – Reg. VI
- Caddo Parish Commission
- Shreveport Traffic Engineering

APPENDIX A
INSIGHT TRAVEL-TIME DATA VALIDATION RESEARCH:

DATA COMPARISON TO OTHER STATE DOT OBSERVED TRAVEL-TIME STUDIES


STREETLIGHT InSight
INSIGHT Speed Validation
Version 1.1
July 2025version 1.1

Speed Metric Summary

We are continuously improving our Metrics in order to bring the best results possible to our customers. INSIGHT's Speed Metric algorithm has been enhanced in order to improve speed accuracy on curves, and eliminate mode confusion near transit, higher speeds near freeways, and extreme outlier speeds. This paper demonstrates data validation for three of INSIGHT's available Speed Metrics: 85th percentile speeds, speed distributions and hourly speeds.

In order to validate INSIGHT's Speed Metric, we looked for the highest quality publicly available speed data published by state agencies for comparison. Specifically, we utilized speed reports provided by Washington State Department of Transportation (WSDOT)[1] which published 85th percentile speeds as well as speed distributions for select locations. To evaluate hourly speed data, we relied on data published by the California Department of Transportation's Performance Management System (PeMS)[2].

In total we utilized 202 sample locations from WSDOT and 71 sample locations from PeMS for this validation. Both state agencies used permanent loop counters to collect speed data. Permanent loop counters are prone to error, however, since some counters detect only speeds within a certain range or estimate speeds in cases of single (as opposed to dual) loop detectors. Meanwhile, INSIGHT speeds may be subject to error in scenarios where trip samples are limited, or road network configuration contributes to trip-locking challenges. In order to avoid atypical speeds that might have occurred in 2020 due to the COVID-19 pandemic, we compared INSIGHT's Speed Metric from 2019 to published speeds from the same year. All locations were uploaded as line segment zones and run as Segment Analyses within INSIGHT InSight®. INSIGHT® Speed Metrics are available in both the U.S. and Canada. Even though this validation just looks at locations from the U.S., the latest Metric improvements apply to Segment Analyses, Origin-Destination Analyses, and Origin-Destination through Middle Filter analyses run in both the U.S. and Canada.

85th Percentile Validation

Traffic engineers use the 85th percentile speed as a standard to set the speed limit at a safe speed, thus minimizing crashes and promoting uniform traffic flow along a corridor. For the sampled locations, INSIGHT's 85th percentile speeds had a strong correlation with an R^2 value of 0.91.

[1] https://www.wsdot.wa.gov/mapsdata/travel/speedreport.htm
[2] https://pems.dot.ca.gov/

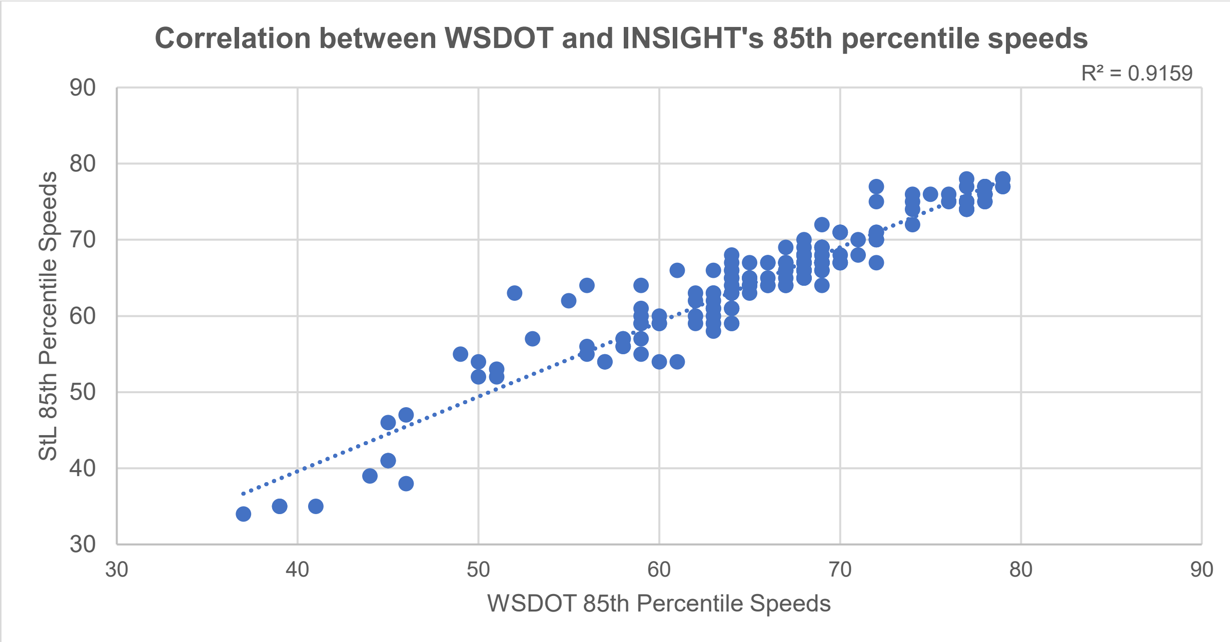


Figure 1: Scatter plot illustrating the correlation between WSDOT's 85th Percentile speeds and those reported by INSIGHT. The plot shows strong correlation with an R^2 of 0.91.

Table 1 highlights the difference between INSIGHT's 85th percentile speeds and WSDOT's reported values for the same locations over an entire day. Therefore, if WSDOT reports a speed of 70 mph and INSIGHT reports a speed of 71 mph, the difference is "1." Table 1 illustrates the distribution of those differences as percentiles, while Figure 2 illustrates the distribution as a histogram.

Bias - 50th Percentile Difference (mph)	25th Percentile Absolute Difference (mph)	50th Percentile Absolute Difference (mph)	75th Percentile Absolute Difference (mph)	95th Percentile Absolute Difference (mph)
-1	1	2	3	6

Table 1: Distribution of the difference between INSIGHT's reported 85th percentile speed and those reported by WSDOT for the same locations for an average day in April 2019. Two outliers were removed due to insufficient sample.

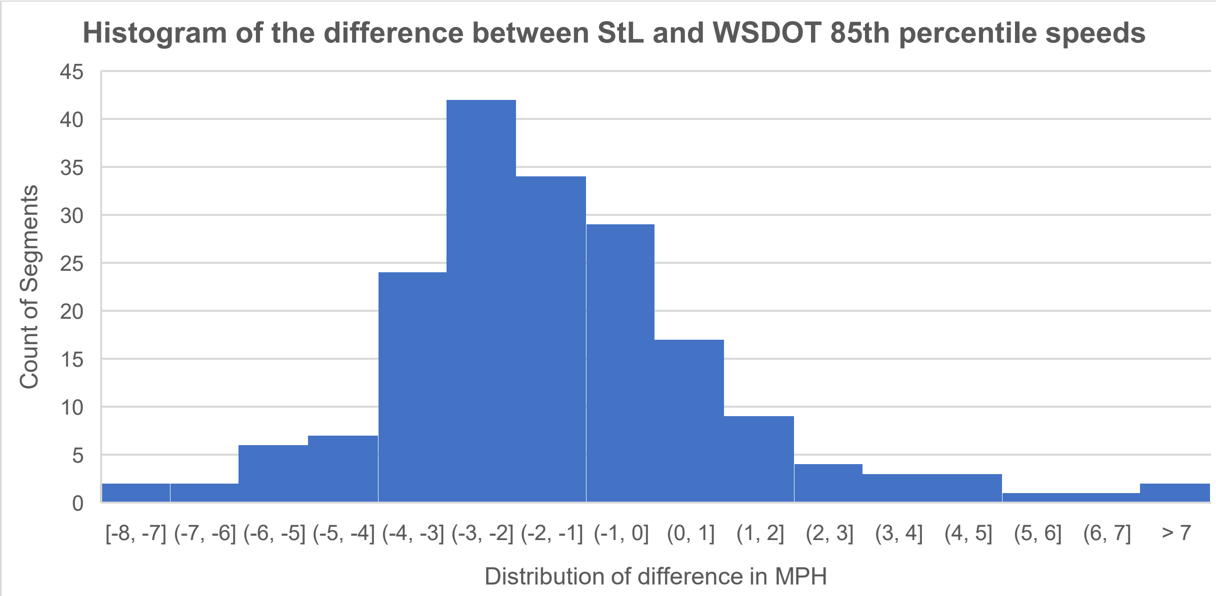


Figure 2: Histogram illustrating the difference between INSIGHT's reported 85th percentile speed and those reported by WSDOT for the same locations for average days in April 2019. The majority of locations are within 3 mph of WSDOT's published values.

Speed Distribution Validation

WSDOT also published the distribution of vehicle speeds over an average day at 5 mph intervals. INSIGHT evaluated similar speed distributions for the same locations across Washington State. The following figures illustrate the comparison between speed distributions at select locations. We look for the distribution between the two sources to have a similar shape, with highs and lows clustered around the same 5 mph bins.

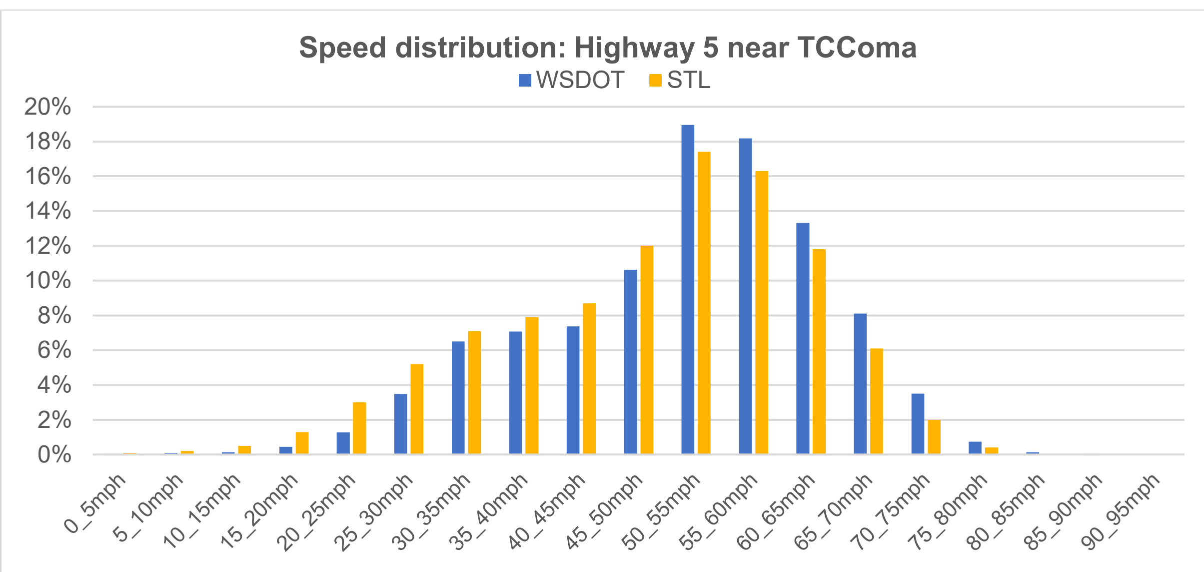


Figure 3: Comparison of speed distributions across 5 mph bins at a site on Highway 5 near Tacoma, Washington.

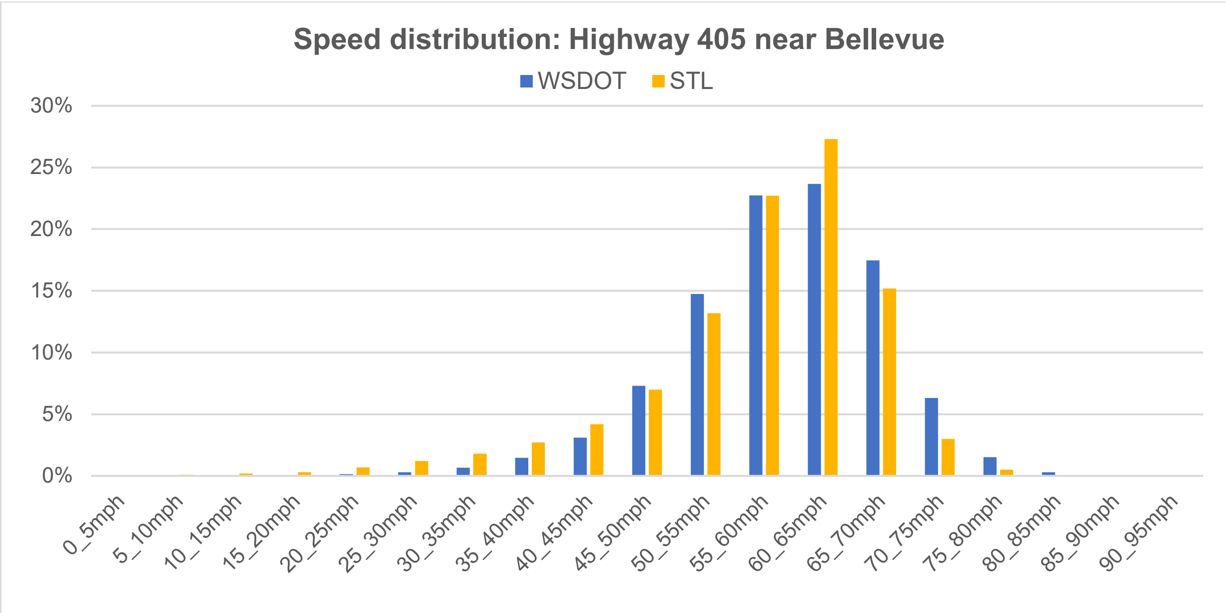


Figure 4: Comparison of speed distributions across 5 mph bins at a site on Highway 405 near Bellevue, Washington.

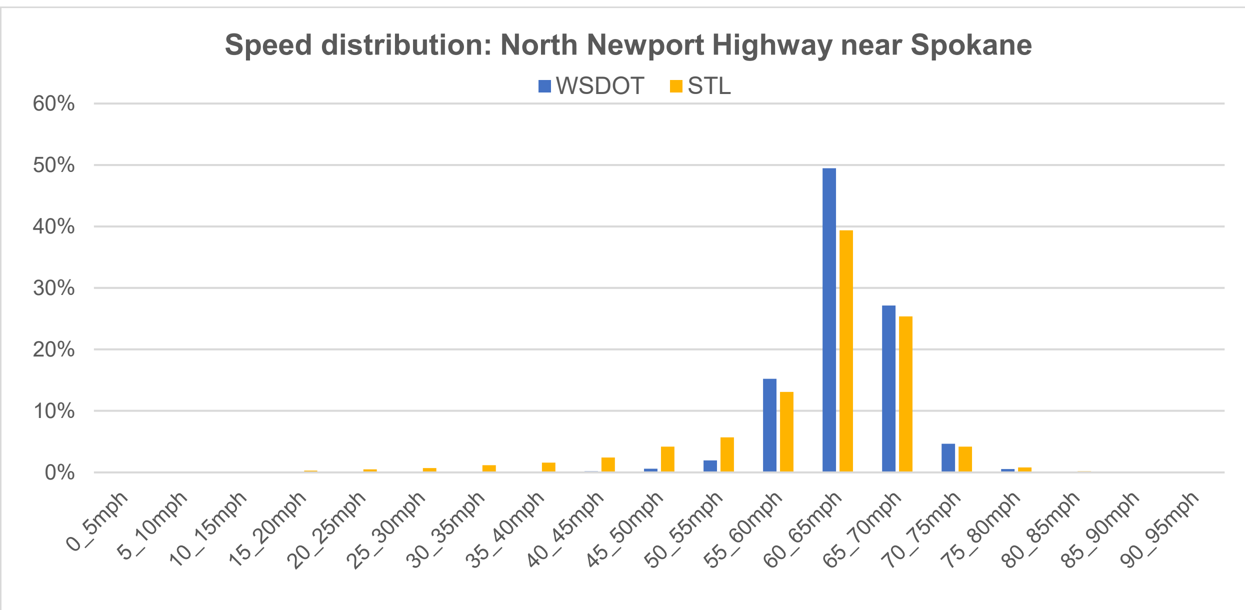


Figure 5: Comparison of speed distributions across 5 mph bins at a site on North Newport Highway near Spokane, Washington.

Hourly Speed Validation

The following validation compares 2019 PeMS speed metrics to average hourly speeds from INSIGHT. In the following figures, we compare hourly average speeds across the two sources for a select location on average weekdays and weekends across 2019. For the select site, both sources show slower speeds at the peak AM and PM hours during weekdays, and relatively consistent speeds across the day on average weekends.

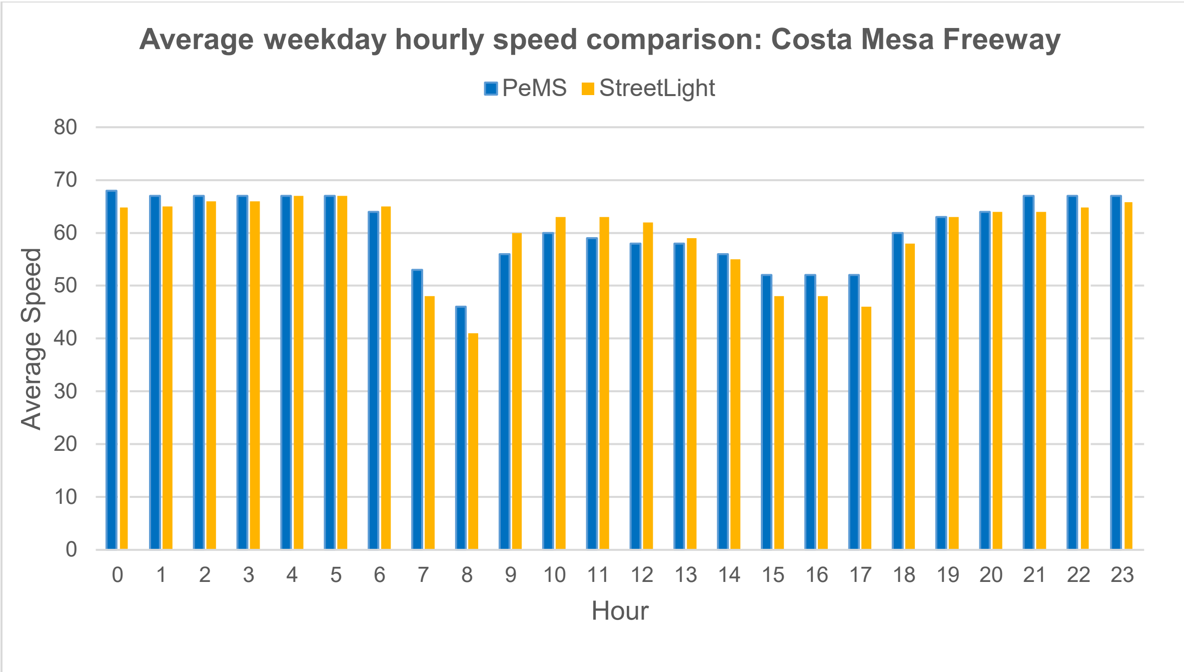


Figure 6: Comparison of average hourly speeds on weekdays at a site on Costa Mesa Highway in Orange County, California.

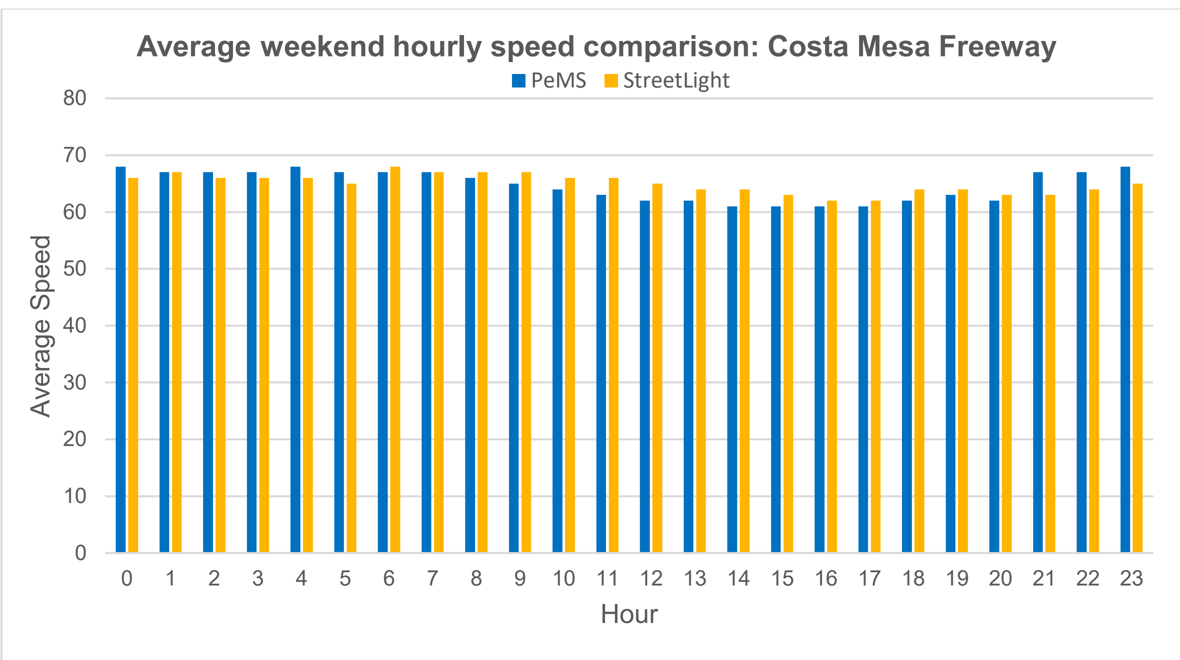


Figure 7: Comparison of average hourly speeds on weekends at a site on Costa Mesa Highway in Orange County, California.

About INSIGHT Data

INSIGHT Data, Inc. pioneered the use of Big Data analytics to help transportation professionals solve their biggest problems. Applying proprietary machine-learning algorithms to over four trillion spatial data points over time, INSIGHT measures multimodal travel patterns and makes them available on-demand via the world’s first SaaS platform for mobility, INSIGHT InSight®. From identifying sources of congestion to optimizing new infrastructure to planning for autonomous vehicles, INSIGHT powers more than 6,000 global projects every month.

STREETLIGHT DATA

APPENDIX B
FHWA GUIDEANCE PERTAINING TO METRIC CALCULATION PROCEDURES OF CONGESTION, FREIGHT AND CMAQ PERFORMANCE MEASURES

National Performance Measures for Congestion, Reliability, and Freight, and CMAQ Traffic Congestion

General Guidance and Step-by-Step Metric Calculation Procedures

U.S. Department of Transportation
Federal Highway Administration

June 2018

National Performance Measures for Congestion, Reliability, and Freight, and CMAQ Traffic Congestion: General Guidance and Step-by-Step Metric Calculation Procedures presents recommended steps for calculating the National Highway System performance metrics (23 CFR 490.511), the Truck Travel Time Reliability metrics (23 CFR 490.611), and the Peak Hour Excessive Delay metric (23 CFR 490.711).

APPENDIX C
SURVEY OF CONGESTION MITIGATION STRATEGIES

The CMP uses a strategy toolbox with multiple strategies to support the congestion strategy or strategies for congested corridors. Following an approach used by other MPOs/TPOs and promoted by FHWA, the toolbox of congestion mitigation strategies is arranged so that the measures at the top take precedence over those at the bottom. The toolbox is presented below.

The "top-down" approach promotes the growing sentiment in today's transportation planning arena and follows FHWA's clear direction to consider all available solutions before recommending additional roadway capacity.

Transportation Demand Management Strategies

These strategies are used to reduce the use of single occupant motor vehicles, as the overall objective of TDM is to reduce the miles traveled by automobile. The following TDM strategies, not in any particular order, are available for consideration in the toolbox to potentially reduce travel in the peak hours. Strategies include:

Congestion Pricing: Congestion pricing can be implemented statically or dynamically. Static congestion pricing requires that tolls are higher during traditional peak periods. Dynamic congestion pricing allows toll rates to vary depending upon actual traffic conditions. The more congested the road, the higher the cost to travel on the road. Dynamic congestion pricing works best when coupled with real-time information on the availability of other routes.

Alternative Work Hours: There are three main variations: staggered hours, flextime, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to Spread out their arrival/departure times. Flextime allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.

Telecommuting: Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.

Guaranteed Ride Home Programs: These programs provide a safety net for those people who carpool or use transit to work so that they can get to their destination if unexpected work demands, or an emergency arises.

Alternative Mode Marketing and Education: Providing education on alternative modes of transportation can be an effective way of increasing demand for alternative modes. This strategy can include mapping Websites that compute directions and travel times for multiple modes of travel.

Safe Routes to Schools Program: This federally funded program provides 100 percent funding to communities to invest in pedestrian and bicycle infrastructure surrounding schools.

Preferential or Free Parking for HOVs: This program provides an incentive for employees to carpool with preferred of free-of-charge parking for HOVs.

Land Use/Growth Management Strategies

The strategies in this category include policies and regulations that would decrease the total number of auto trips and trip lengths while promoting transit and non-motorized transportation options. These strategies include the following:

Negotiated Demand Management Agreements: As a condition of development approval, local governments require the private sector to contribute to traffic mitigation agreements. The agreements typically set a traffic reduction goal (often expressed as a minimum level of ridesharing participation or a stipulated reduction in the number of automobile trips).

Trip Reduction Ordinance: These ordinances use a locality's regulatory authority to limit trip generation from a development. They spread the burden of reducing trip generation among existing and future developments better than Negotiated Demand Management Agreements.

Infill Developments: This strategy takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.

Transit Oriented Developments: This strategy clusters housing units and/or businesses near transit stations in walkable communities. By providing convenient access to alternative modes, auto dependence can be reduced.

Design Guidelines for Pedestrian-Oriented Development: Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.

Mixed-Use Development: This strategy allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles.

Public Transit Strategies

Two types of strategies, capital improvements and operating improvements, are used to enhance the attractiveness of public transit services to shift auto trips to transit. Transit capital improvements generally modernize the transit systems and improve their efficiency; operating improvements make transit more accessible and attractive. The following strategies are included in the toolbox for consideration:

Transit Capacity Expansion: This strategy adds new vehicles to expand transit services.

Increasing Bus Route Coverage or Frequencies: This strategy provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use. Implementing Regional Premium Transit: Premium transit such as Bus Rapid Transit (BRT) best serves dense urban centers where travelers can walk to their destinations. Premium regional transit from suburban areas can sometimes be enhanced by providing park-and-ride lots.

Providing Real-Time Information on Transit Routes: Providing real-time information on bus progress either at bus stops, terminals, and/or personal wireless devices makes bus travel more attractive.

Reducing Transit Fares: This relatively easy-to-implement strategy encourages additional transit use, to the extent that high fares are a real barrier to transit. However, due to the direct financial impact on the transit system operating budgets, reductions in selected fare categories may be a more feasible strategy to implement.

Provide Exclusive Bus Right-Of-Way: Exclusive right-of-way includes bus ways, bus-only lanes, and bus bypass ramps. This strategy is applied to freeways and major highways that have routes with high ridership.

Non-Motorized Transportation Strategies

Non-motorized strategies include bicycle, pedestrian, and trail facility improvements that encourage non-motorized modes of transportation instead of single-occupant vehicle trips. The following strategies are included:

New Sidewalk Connections: Increasing sidewalk connectivity encourages pedestrian traffic for short trips.

Designated Bicycle Facilities on Local Streets: Enhancing the visibility of bicycle facilities increases the perception of safety. In many cases, bicycle lanes can be added to existing roadways through restriping.

Improved Bicycle Facilities at Transit Stations and Other Trip Destinations: Bicycle racks and bicycle lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.

Improved Safety of Existing Bicycle and Pedestrian Facilities: Maintaining lighting, signage, striping, traffic control devices, and pavement quality and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.

Exclusive Non-Motorized ROW: Abandoned rail rights-of-way and existing parkland can be used for medium- to long-distance bicycle trails, improving safety and reducing travel times.

Complete Streets: Routinely designing and operating the entire right-of-way can enable safe access for all users including pedestrians, bicyclists, motorists, and transit. Elements that may be found on a complete street include sidewalks, bike facilities, special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, support for changing mobility technologies, and more.

Transportation Demand Management Strategies

The following TDM strategies are recommended to encourage HOV use:

Ridesharing (Carpools & Vanpools): In ridesharing programs, participants are matched with potential candidates for sharing rides. This typically is arranged/encouraged through employers or transportation management agencies that provide ride-matching services. These programs are more effective if combined with HOV lanes, parking management, guaranteed ride home policies, and employer-based incentive programs.

High Occupancy Vehicle Lanes: This increases corridor capacity while, at the same time, providing an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, rideshare matching services, and employer incentives.

Park-and-Ride Lots: These lots can be used in conjunction with HOV lanes and/or express bus services. They are particularly helpful when coupled with other commute alternatives such as carpool/vanpool programs, transit, and/or HOV lanes.

Employer-Landlord Parking Agreements: Employers can negotiate leases so that they pay for parking spaces used only by employees. In turn, employers can pass along parking savings by purchasing transit passes or reimbursing non-driving employees with the cash equivalent of a parking space.

Parking Management: This strategy reduces the instance of free parking to encourage other modes of transportation. Options include reducing the minimum number of parking spaces required per development, increasing the share of parking spaces for HOVs, introducing or raising parking fees, providing cash-out options for employees not using subsidized parking spaces, and expanding parking at transit stations or park-and-ride lots.

Managed Lanes: FHWA defines managed lanes as highway facilities or a set of lanes in which operational strategies are implemented and managed (in real time) in response to changing conditions. Examples of managed lanes may include High-Occupancy Toll (HOT) lanes with tolls that vary based on demand, exclusive bus-only lanes, HOV and clean air and/or energy-efficient vehicle lanes, and HOV lanes that could be changed into HOT lanes in response to changing levels of traffic and roadway conditions.

Intelligent Transportation Systems Strategies

The strategies in Intelligent Transportation Systems (ITS) use new and emerging technologies to mitigate congestion while improving safety and environmental impacts. Typically, these systems are made up of many components, including sensors, electronic signs, cameras, controls, and communication technologies. ITS strategies are sets of components working together to provide information and allow greater control of the operation of the transportation system. The following strategies are included in the toolbox.

Dynamic Messaging: Dynamic messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.

Advanced Traveler Information Systems (ATIS): ATIS provides an extensive amount of data to travelers, such as real-time speed estimates on the Web or over wireless devices and transit vehicle schedule progress. It also provides information on alternative route options.

Integrated Corridor Management (ICM): This strategy, built on an ITS platform, provides for the coordination of the individual network operations between parallel facilities, creating an interconnected system. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion.

Transit Signal Priority (TSP): This strategy uses technology located onboard transit vehicles or at signalized intersections to temporarily extend green time, allowing the transit vehicle to proceed without stopping at a red light.

Transportation Systems Management Strategies

Transportation Systems Management (TSM) strategies identify operational improvements to enhance the capacity of the existing system. These strategies typically are used together with ITS technologies to better manage and operate existing transportation facilities. The following strategies are included in the toolbox.

Traffic Signal Coordination: Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events (such as the arrival of a vehicle, pedestrian, bus or emergency vehicle), set to adopt one of several predefined phasing plans based on current traffic conditions, or set to calculate an optimal phasing plan based on current conditions.

Channelization: This strategy is used to optimize the flow of traffic for making left or right turns usually using concrete islands or pavement markings.

Intersection Improvements: Intersections can be widened, and lanes restriped to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders.

Bottleneck Removal: This strategy removes or corrects short, isolated, and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint that results in a traffic bottleneck.

Vehicle Use Limitations and Restrictions: This strategy includes all-day or selected time-of-day restrictions of vehicles, typically trucks, to increase roadway capacity.

Improved Signage: Improving or removing signage to clearly communicate location and direction information can improve traffic flow.

Geometric Improvements for Transit: This strategy includes providing for transit stop locations that do not affect the flow of traffic, improve sight lines, and improve merging and diverging of buses and cars.

Intermodal Enhancements: Coordinating modes makes movement from one mode to the other easier. These enhancements typically include schedule modification to reduce layover time or increase the opportunity for transfers, creation of multimodal facilities, informational kiosks, and improved amenities at transfer locations.

Goods Movement Management: This strategy restricts delivery or pickup of goods in certain areas to reduce congestion.

Incident Management Strategies

Freeway Incident Detection and Management Systems: This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.

Access Management Strategies

Access Management Policies: This strategy includes adoption of policies to regulate driveways and limit curb cuts and/or policies that require continuity of pedestrian, bicycle, and trail facilities.

Corridor Preservation/Management Strategies

Corridor Preservation: This strategy includes implementing, where applicable, land acquisition techniques such as full title purchases of future rights-of-way and purchase of easements to plan proactively in anticipation of future roadway capacity demands.

Corridor Management: This strategy is applicable primarily in moderate- to high-density areas and includes strategies to manage corridor rights-of-way. The strategies range from land-use regulations to landowner agreements such as subdivision reservations, which are mandatory dedications of portions of subdivided lots that lie in the future right-of-way.

Adding roadway capacity

Strategies to add capacity are costly and the least desirable strategies and should be considered last resort method for reducing congestion. Capacity-adding strategies should be applied after determining the demand and operational management strategies identified earlier are not feasible solutions. The key strategy is to increase the capacity of congested roadways through additional general purpose travel lanes (or passing lanes on rural two-lane facilities).

Increase the capacity of congested roadways through additional general purpose travel lanes (or passing lanes on rural two-lane facilities).

APPENDIX D
STUDY NETWORK HIGHEST CONGESTION (SRF)
(PM PEAK: 4:00 PM – 6:00 PM; RED = "SEVERE")