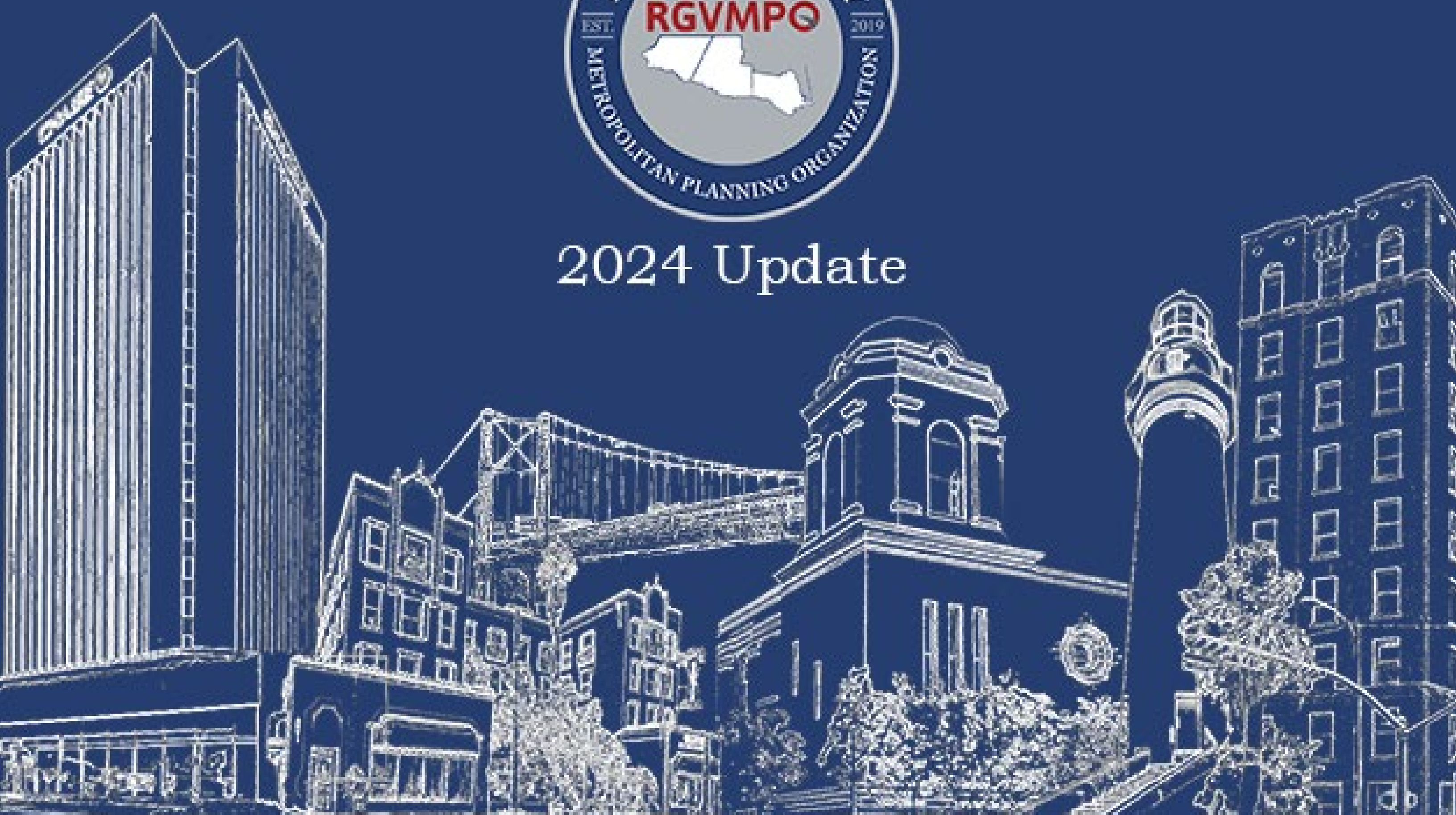
Rio Grande Valley Metropolitan Planning Organization

Congestion Management Process

2024 Update



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Introduction

What is a Congestion Management Process?

A Congestion Management Process (CMP) is a federally mandated set of procedures to be documented and sustained by Metropolitan Planning Organizations (MPO). The purpose of a CMP is to identify, analyze, and monitor traffic congestion in urban areas to provide data-driven implementation strategies and evaluate their effectiveness over time. This process is cyclic in nature and an ongoing effort meant to ease traffic congestion and improve the efficiency of a regional transportation network.

Rio Grande Valley Metropolitan Planning Organization (RGVMPO)

The RGVMPO, established in 2019, has a Metropolitan Area Boundary (MAB) spanning across three counties and 42 cities as designated by the Texas Governor. The combined population of Cameron County, Hidalgo County, and Starr County is approximately 1,375,708 people, positioning the Rio Grande Valley MPO as the fifth largest Metropolitan Planning Organizations in Texas (U.S. Census Bureau 2020). This demographic stature brings forth complex transportation challenges and the need for effective solutions. To address these challenges and inform decision-making, the RGVMPO employs a comprehensive Congestion Management Process (CMP) integrating data analysis with transportation planning and programming.

3-C Process

Successful congestion management emphasizes the 3-C process which stands for Cooperative, Comprehensive, and Continuing. This report is "Comprehensive" in that it is both *supportive of* and *supported by* RGVMPO adopted plans such as the Metropolitan Transportation Plan, the Transportation Improvement Program, the Unified Planning Work Program. It is "Continuous" in that a periodic assessment of implemented strategies is facilitated by use of qualitative objectives and performance measures. The process is "Cooperative" in that a diverse CMP subcommittee was formed and utilized to participate in data collection and analysis. A list of planning partners within the RGVMPO MAB include: TxDOT (Texas Department of Transportation) Pharr District, Cameron County Regional Mobility Authority, Hidalgo County Regional Mobility Authority, Local Governments, Transit Agencies (Valley Metro, BMetro, and Metro McAllen), and Residents. The 2024 CMP subcommittee is comprised of nine diverse members, including personnel from the municipal, county, and district.

Purpose of A Congestion Management Process

The Congestion Management Process is meant to address challenges that densely populated urban areas face from traffic resulting in wasted time, fuel, and economic costs. It should reflect visions in transportation planning documents established at the local, regional, and national level such as city ordinances, RGVMPO long- and short-range plans, Connecting Texas 2050, and the MAP-21 Act. With the main purpose being to identify, analyze, monitor, and evaluate traffic congestion with reliable data sources such as travel time reliability indices for both cars and trucks, the development of a CMP provides the opportunity for interagency collaboration amongst planning partners to analyze congestion issues ensuring a more effective allocation of limited transportation funding.

Code of Federal Regulations

Title 23 Part 450.322 specifies federal requirements and expected outcomes from a CMP. In short, the federal code states that all urban areas with a population greater than 200,000, called a Transportation Management Area (TMA), shall address traffic congestion using a developed, established, and implemented CMP. This report shall be provided to decision makers and the public to provide guidance on the selection of effective strategies for future implementation. The result of this process should be a safe and effective multimodal system. A CMP shall include the following:

- Definition of congestion management objectives and appropriate performance measures
- Methods to monitor and evaluate performance of the multimodal system periodically
- Identification of underlying causes of recurring and non-recurring congestion
- Support for congestion reduction and mobility enhancement for people and goods
- Cooperation between the State, MPO, Elected Officials, and public transportation providers
- Identification of an implementation schedule and possible funding sources
- Development of a regional goal that would improve transportation specifically for job access
- Identification and evaluation of the effectiveness of implemented and alternative strategies

8-Step Process

In order to ensure all the federal requirements are addressed in a CMP, the Federal Highways Administration (FHWA) has established an 8-step process model seen in Figure 1.1. Reflecting this structure, the subsequent eight chapters provide a detailed breakdown of each step, facilitating a step-by-step exploration of the congestion management process.

Action 1: Develop regional objectives
Action 2: Define CMP network
Action 3: Develop multimodal performance measures
Action 4: Collect data and monitor system performance
Action 5: Analyze congestion problems and needs
Action 6: Identify and assess strategies
Action 7: Program and implement strategies
Action 8: Evaluate strategy effectiveness

Figure 1.1 FHWA's 8 Step Process

Step 1: Develop Regional Goals, Objectives, & Principles

Crafting Goals that Address Traffic Congestion

This first step of the congestion management process is to develop fundamental principles, clearly defined goals, and measurable objectives that align with regional plans, and research findings. To execute this task appropriately, our team identified national, statewide, and regional goals pertaining to traffic congestion in plans endorsed by elected officials and experts. Extensive stakeholder engagement shaped both the long-term and short-term plans and programs of the RGVMPO. Consequently, aligning the goals of the CMP with those already established in adopted plans ensures regional coherence. Finalization of principles, goals, and objectives occurred in collaboration with current key regional stakeholders, including the Transportation Policy Board, Technical Advisory Committee, and the TxDOT Pharr district.

National Goals

The overarching national performance goals aimed at improving surface transportation is specified in the Moving Ahead for Progress in the 21st Century (MAP-21) Act. There are 7 fundamental categories of goals:

1) Safety
2) Infrastructure condition
3) Congestion reduction
4) System reliability
5) Freight movement and economic vitality
6) Environmental sustainability
7) Reduced project delivery days.

The Federal Highway Administration establishes methods to calculate and report on performance measures related to these goals for MPOs (Metropolitan Planning Organizations) and DOTs (Department of Transportation). This sets a uniform reporting system consistent among states. A few federal performance measures pertaining directly to traffic congestion are the percentage of person miles traveled on the interstate and non-interstate that are reliable, as well as Truck Travel Time Reliability Index (Chapter 4).

Long Range Planning Goals

The RGVMPO Long Range 25-year plan, otherwise known as the Metropolitan Transportation Plan (MTP), has similar preliminary visioning goals to reduce congestion and improve travel time reliability. Long range planning goals specified at the regional level in “RGVMPO 2045 MTP” also align with Statewide Long-Range Planning. One statewide long-range planning goal is to “Optimize System Performance” by mitigating congestion, enabling reliable travel times, and ensuring freight can move efficiently. Established statewide long-range targets for Urban Congestion Index is to be at

1.2 by 2030, and 1.15 by 2030. The Urban Congestion Index is calculated by dividing the actual time it takes to travel by the time it takes to travel during a period of "free flow" where commuters can travel up to the posted speed limit. This declining target shows that the state is committed to improving urban congestion. The adopted regional and statewide targets for reliability is that by 2025, 70% of the Person-Miles traveled on the interstate and non-interstate roads are reliable. Considering Freight Reliability, the regional and statewide target is that by 2025, the Truck Travel Time Reliability Index is at or above 1.55. A more detailed explanation of these targets, including performance measures can be found in Chapter 3.

CMP Principles, Goals, and Objectives

Table 1 is a chart that identifies three principles, six goals, and ten objectives. The framework of the Congestion Management Process for the Rio Grande Valley is guided by three core principles:

1. Reduce traffic congestion and increase travel time reliability index
2. Promote a sustainable multimodal network
3. Enhance transportation efficiency of commercial motor vehicle connectivity

To achieve these principles, six overarching goals establish specific activities that would effectively address the associated principle. Goals that directly address the First Principle, are to incorporate intelligent transportation systems and to identify and address corridors with the worst travel time reliability index. Each goal is further quantified with "SMART" objectives geared towards Specifying a Measurable, Agreed upon, Realistic, Timebound target. An example of a SMART objective in *Table 1* is to "reduce travel delay resulting from traffic signals by installing, maintaining, and monitoring light synchronization technology in 2025." Objectives will be detailed throughout the report in the appropriate step further specifying the proposed schedule, implementation responsibilities, and potential funding sources.

A safe and welcoming multimodal network is the core of the Second Principle. It aims to encourage walking, cycling, and public transit by improving infrastructure efficiency, equity, and safety. The underlying assumption is that by enhancing active transportation and public transit through improved reliability and widespread accessibility, a greater number of commuters will be incentivized to utilize these options, leading to a more sustainable transportation system. Objectives specify increasing active transportation usage and transit ridership by a certain percentage over a four-year period. To assess and potentially refine these objectives in future CMP updates, the RGVMPO will employ several monitoring methods such as utilizing bike/pedestrian counters to track active transportation usage and collaborating with transit providers to analyze their on-time performance reports obtained through Swiftly.

The Third Principle focuses on optimizing commercial vehicle movement within the Rio Grande Valley, a region known for having most ports of entry in Texas. This emphasis arises from the significant economic burden imposed by user delay costs associated with truck congestion. By streamlining cross-border trade through improved commercial vehicle mobility, this principle aims to alleviate this economic strain monitored using a Truck Travel Time Reliability Index.

Congestion Management Process Principles, Goals, and Objectives

Principle	Goal	Objective	
1st Principle: Reduce traffic congestion and increase travel time reliability	Goal #1: Incorporate intelligent transportation systems to reduce travel delay	Objective 1	Reduce travel delay resulting from traffic signals by installing and maintaining light synchronization technology
		Objective 2	Decrease Urban Congestion Index to 1.2 by 2030, and to 1.15 by 2050
	Goal #2: Identify and address corridors with the worst Travel Time Reliability index	Objective 3	Study and improve the travel time reliability index for corridors with an TTRI over 1.5
2nd Principle: Promote a sustainable multimodal network	Goal #3: Create a transportation system that encourages more single-occupancy road users to utilize public transit, cycling, and walking alternatives.	Objective 4	Increase active transportation usage by 5% over a 4 year time period
		Objective 5	Increase public transit ridership by 10% over a 5 year time period
	Goal #4: Determine apsects of congestion that support livability, equity, and economic vitality	Objective 6	Gather qualitative information through stakeholder engagement regarding transportation sustainability.
	Goal #5: Improve traffic safety	Objective 7	Develop a Safety Action Plan aimed at reducing traffic deaths and serious injuries by 2025.
		Objective 8	Utilitze access management strategies to reduce crash rates annually
3rd Principle: Enhance transportation efficiency of commercial motor vehicle connectivity	Goal #6: Minimize the disparity between peak-period travel conditions and free flow travel conditions for commercial motor vehicles near border crossings.	Objective 9	Improve truck connectivity from border crossings to the state highway system by reducing the (Truck Travel Time Reliability Index) TTTRI
		Objective 10	Improve truck travel safety by reducing the occurrences of freight crashes near border crossings

Table 1. Congestion Management Principles, Goals, and Objectives.

Step 2: Define the Congestion Management Process Network

Identifying the System

The purpose of defining the CMP network is to give attentive focus to the parts of the transportation system that are congested. The CMP network is defined by two factors, the geographic area of application and system components. The geographic area of application refers to planning boundaries where the RGVMPO is authorized to plan and program for. The Metropolitan Area Boundary (MAB) and Urbanized Area Boundary (UAB) seen in Figure 2.1 shows the geographic extent to which the RGVMPO can incorporate into the CMP network.

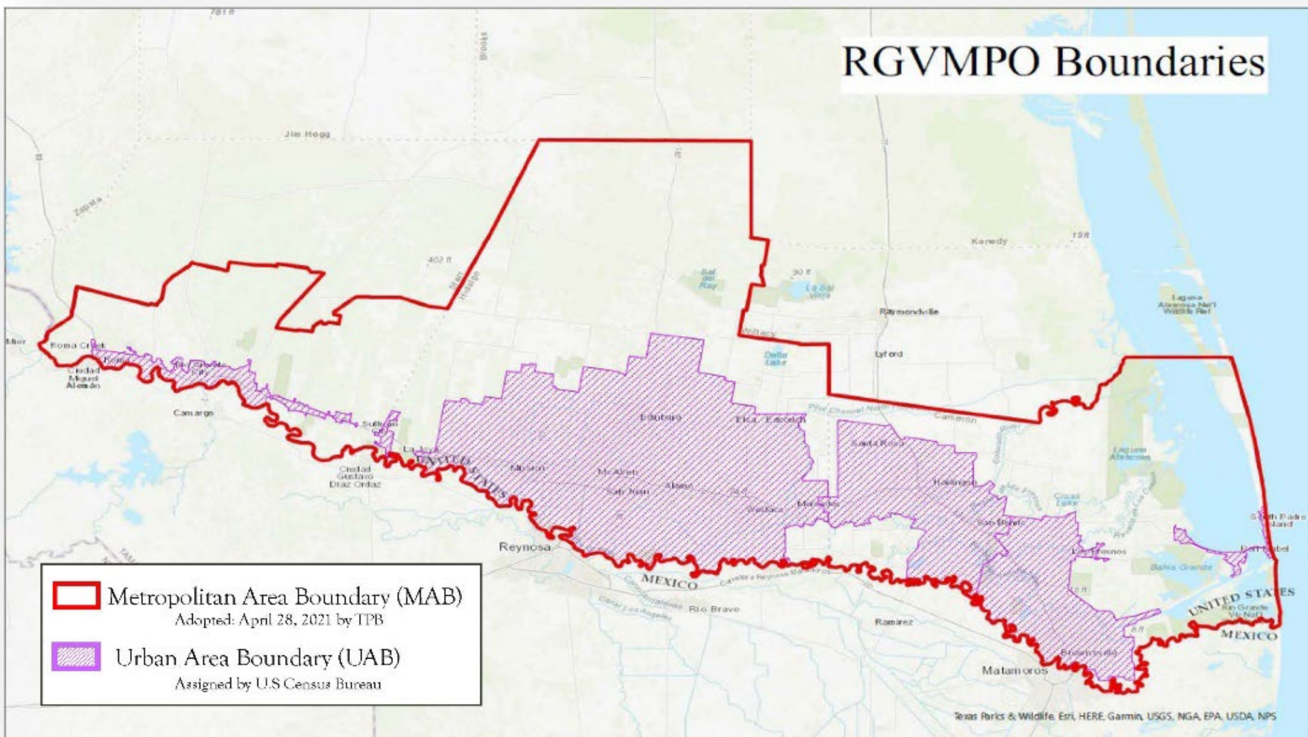

Figure 2.1 *RGVMPO Metropolitan Area Boundary Map*

CMP Network

The system components for the RGVMPO CMP network has been expanded to encompass any one of the multimodal transportation elements, including highways, roadways, sidewalks, bicycle routes, transit routes, and heavy weight corridors. Figure 2.2 shows the multimodal CMP Network within the Rio Grande Valley including on and off system roadways, transit routes, sidewalks, bike lanes and hike and bike trails. Figures 2.3, 2.4, and 2.5 illustrate the same CMP network zoomed into the county level to show the precise locations of transportation facilities.

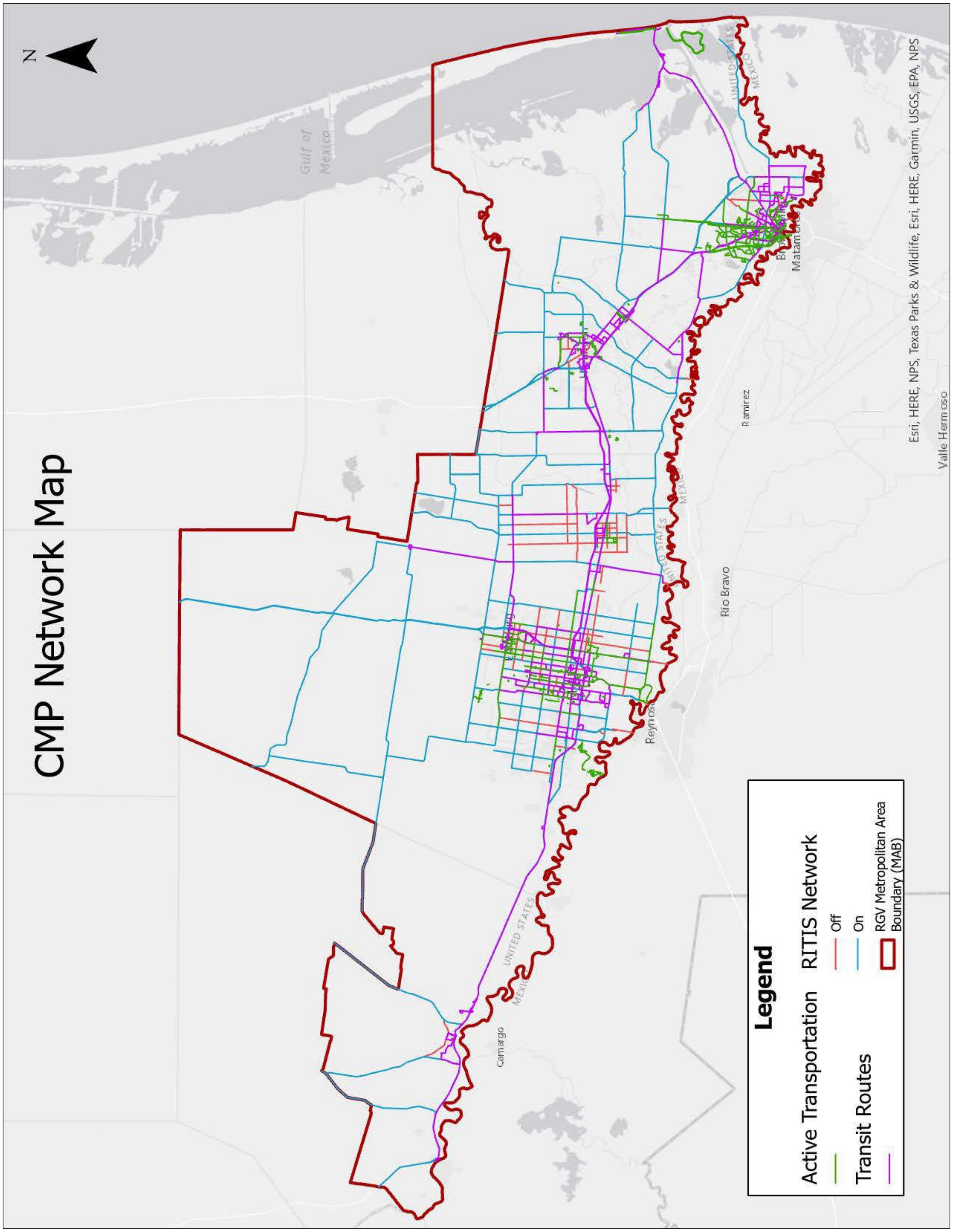

Figure 2.2 *CMP Network Map*

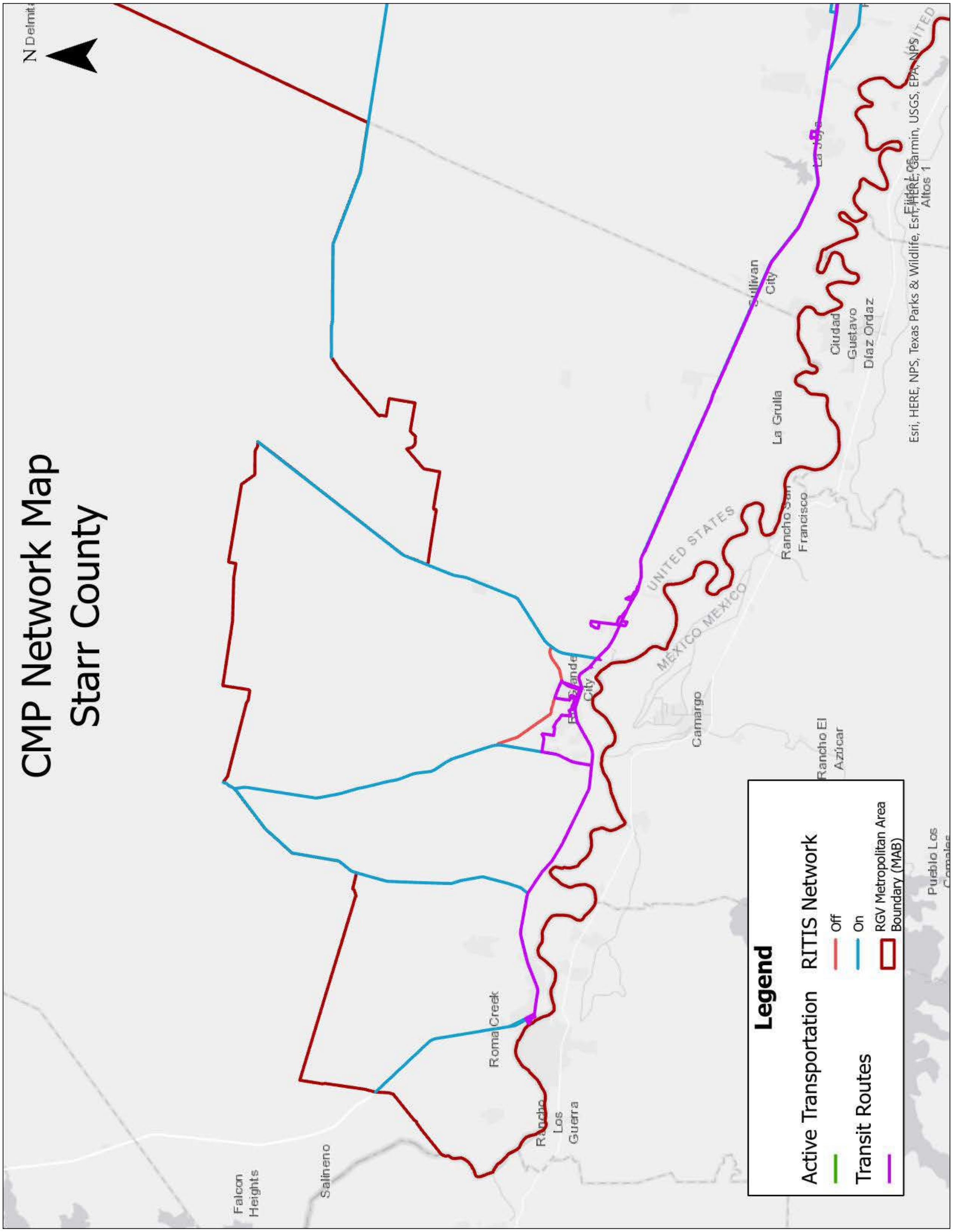

Figure 2.3 *CMP Network Map Starr County*

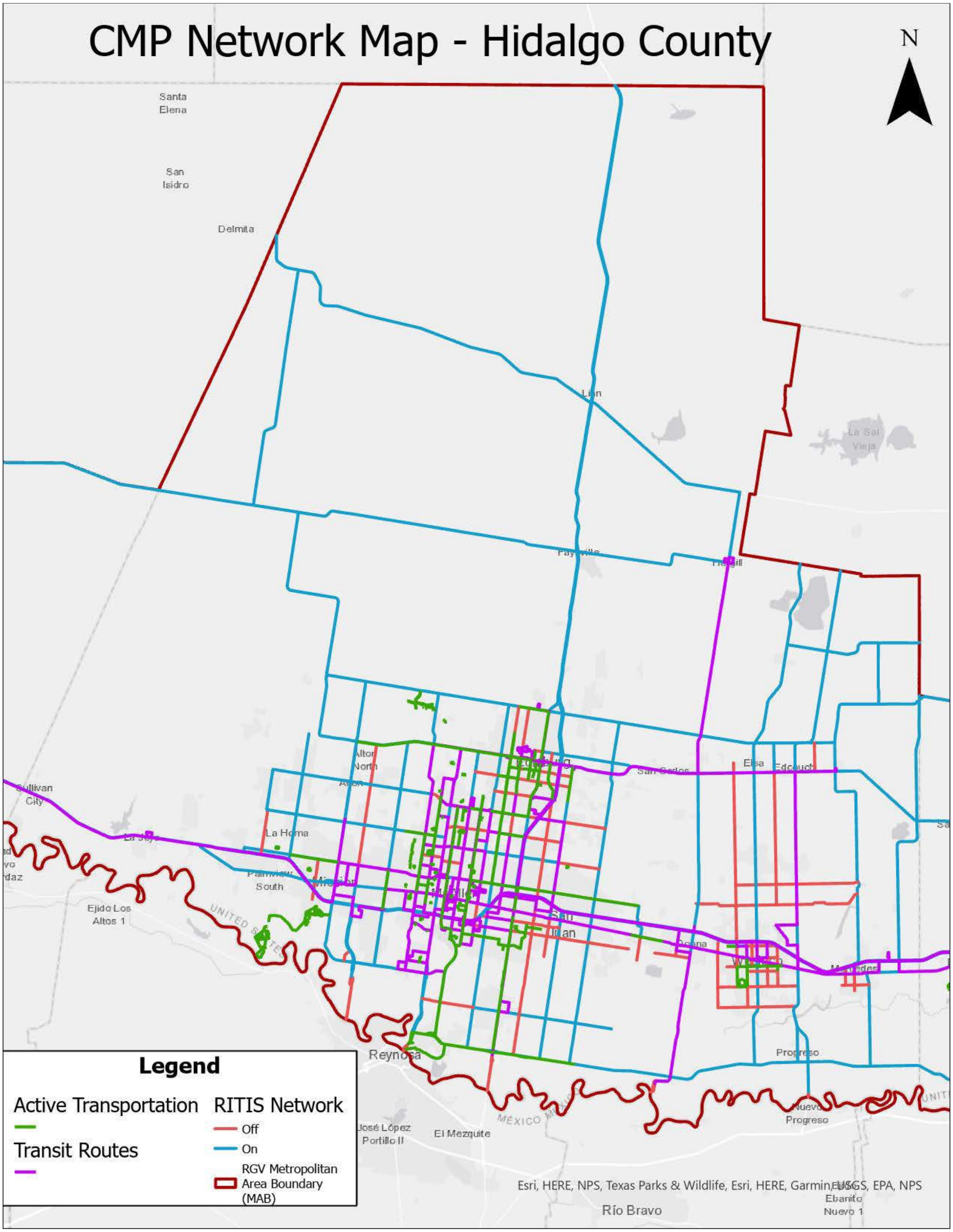

Figure 2.4 *CMP Network Map Hidalgo County*

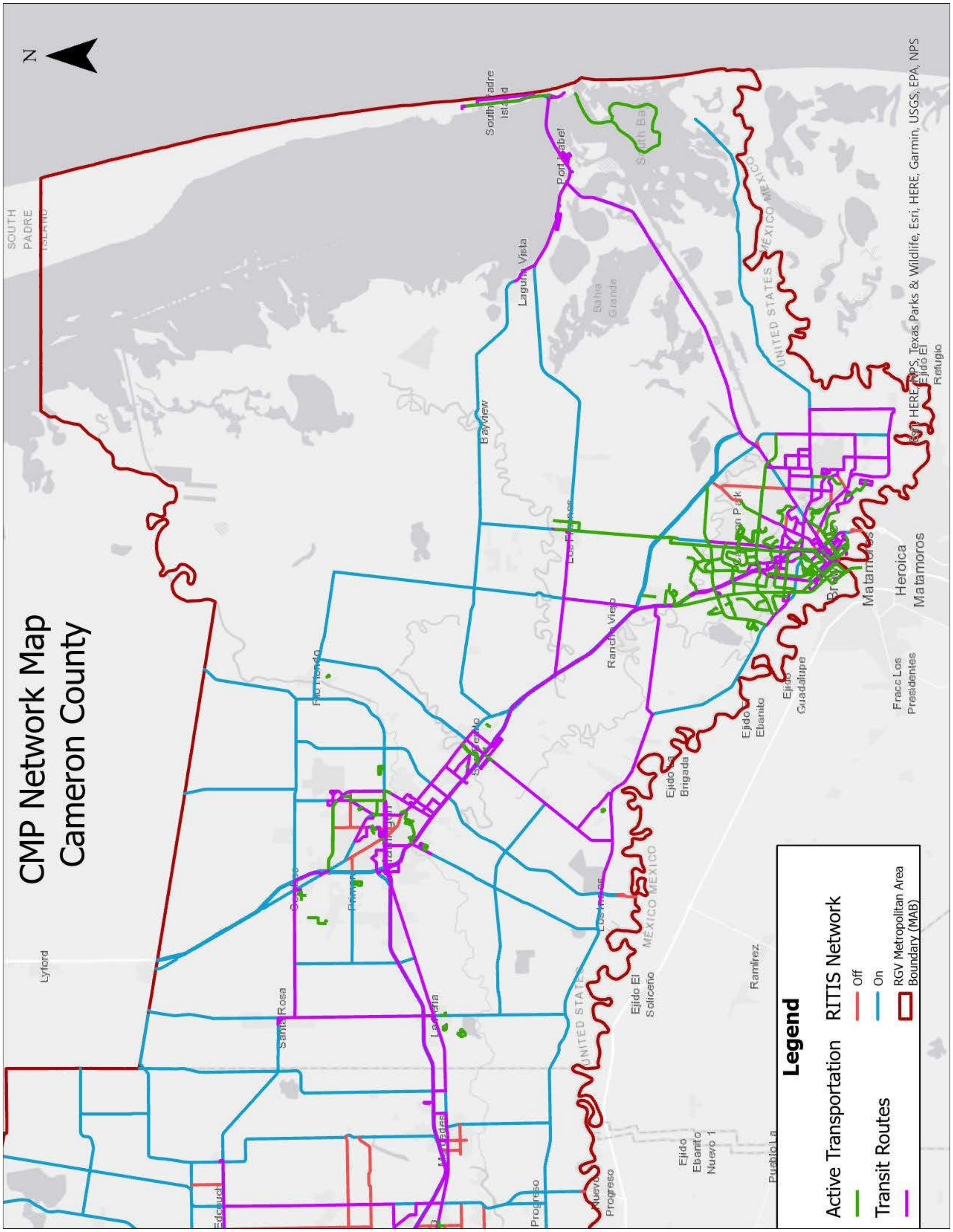

Figure 2.5 *CMP Network Map Cameron County*

Emergency Preparedness System Component

Recognizing that the Rio Grande Valley is a coastal community and is prone to life-threatening hurricanes, an invaluable system component of the CMP Network is the emergency evacuation route. A critical element of our coastal community's emergency preparedness strategy is contraflow planning. This strategy involves temporarily reversing the traffic flow on designated evacuation routes during hurricanes or other emergencies requiring mass evacuation. By converting inbound lanes to outbound lanes, contraflow maximizes the capacity of evacuation routes, allowing residents to leave the area more quickly and efficiently. This minimizes the impact of traffic congestion during an emergency evacuation by reducing the amount of time residents spend in evacuation zones, ultimately saving lives and minimizing property damage.

In preparation for the 2024 hurricane season, TxDOT Pharr District maintenance crews took a proactive approach by performing a contraflow exercise. The intent of this effort is to train staff on how to handle an emergency evacuation. The designated contraflow route in our region starts near the southernmost end of I-69E/US-83 in Brownsville, close to the Veterans International Bridge. From there, it heads inland towards Harlingen and then continues westward on I-2 until the Pharr Interchange. Finally, the route transitions north onto I-69C towards San Antonio. The terminus of the contraflow route is near the outskirts of Edinburg where traffic is directed onto an evacuation lane referred to as an evaculane in the legend. *Figure 2.6* below demonstrates the route and is publicly available at www.DriveTexas.org. The Drive Texas website provides the public with real-time information on road conditions. *Figure 2.7* shows precise locations of contraflow entrance and exit points on this route.

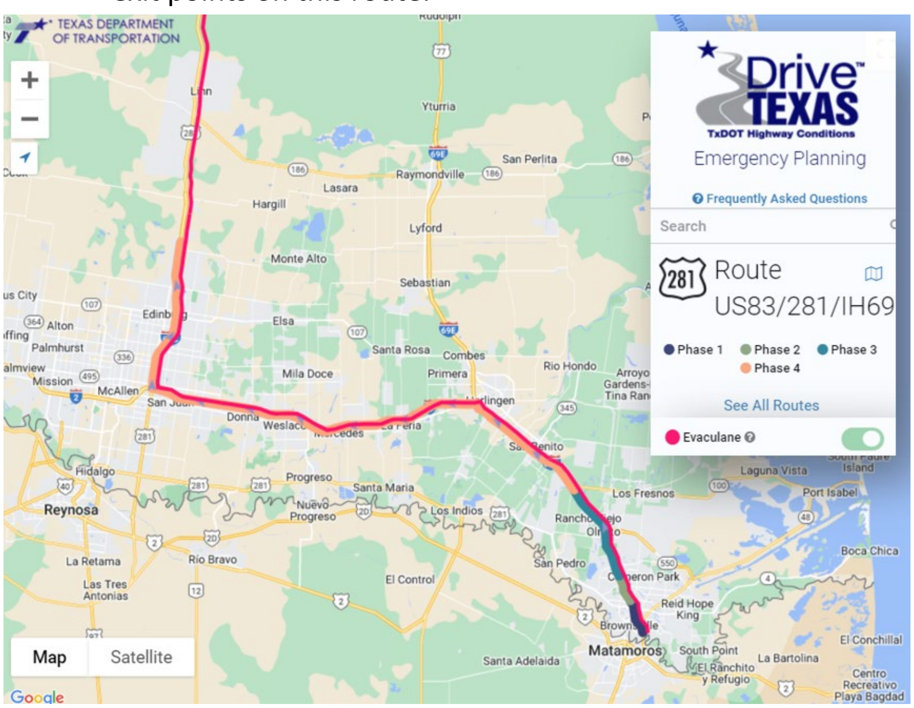

Figure 2.6 Contraflow Planning Map

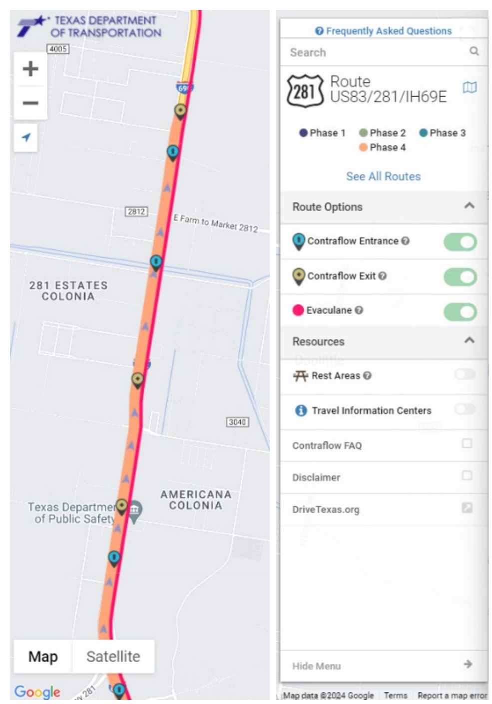

Figure 2.7 Contraflow Entrance and Exit Points

Step 3: Define Multimodal Performance Measures

Selecting quantitative metrics and setting reasonable targets

Well defined performance measures are crucial to the congestion management process as quantifiable set targets provide a clear need for specific datasets. Transportation Performance Management is a method to support and implement performance-based planning and programming (PBPP). Performance measures are used to track progress towards goals and objectives. Components of a performance measure are metrics, reliable data sources, and realistic targets. When setting targets, thresholds or "unacceptable conditions" should be defined to determine locations needing improvements.

Metrics

Referencing the objectives defined in Step One, measurable quantitative data monitoring travel delay is commonly known as the metric of Volume-to-Capacity (V/C). Volume refers to the number of cars on a roadway, and capacity refers to the maximum number cars that can pass through a roadway in a certain amount of time. Volume-to-capacity is a ratio with no unit being that both the numerator and denominator values are measured in number of cars. FHWA's CMP guidebook indicates that certain aspects of congestion like "duration" and "variability" are not captured by V/C ratios. Therefore, there are several other metrics incorporated into the objectives in *Table 1* on page 6.

Travel Time Reliability Index (TTRI) is a metric that is calculated using peak period flow travel times and free flow travel times. This measures the difference between the commute time it normally takes to travel versus the actual commute time it took to travel the same distance. Truck Travel Time Index is similar however the data only reflects commercial truck travel information.

The Person-Miles Traveled metric shows an estimated amount of is calculated by multiplying the number of people traveling by the distance they travel.

A "bottleneck" is defined as any road segment where the current speed has fallen below 60% of the reference speed for that segment for a period longer than 5 minutes. Once the speed returns to greater than 60% of the reference speed for more than 10 minutes, the bottleneck is considered cleared.

The transit ridership metric is measured by the number of riders using the transit system. To track progress towards increased transit ridership, this edition references data collected in 2023 and shared by transit providers at Policy Board meetings. The plan is to compare and contrast current transit ridership data to future transit ridership data in upcoming technical reports.

Step 4: Collect Data to Monitor System Performance

Accumulation of data sets for a data-driven approach

Traffic data is the foundation of the congestion management process. Statistical observations of how the transportation network is functioning in the real world provide concrete evidence for the necessity of improvements. Data collection quantifies both the need for and the effectiveness of implemented strategies. An important aspect of data collection is establishing data sources and coordinating with entities that have existing reliable consistent data sets and are updated periodically. The following three paragraphs detail the data sources used to

Data Collection from RITIS Probe Data Analytics Suite

Regional Integrated Transportation Information System (RITIS) is an extremely useful tool powered by INRIX that transportation planners across the nation use to collect data showing travel speeds using crowdsourced data. Crowdsourced traffic data goes beyond traditional methods by leveraging the collective intelligence of travelers on the road. This type of data comes from various sources, including navigation systems in vehicles, smartphone apps like Google Maps, and user reporting platforms like Waze. By pooling anonymized location information and user reports of incidents, crowdsourcing creates a dynamic and comprehensive picture of real-time traffic conditions. The Probe Data Analytics (PDA) suite provides real-time and historical traffic data that shows vehicle speed, congestion scans, and Travel Time Index

Data Collection from CoPlan

In years past, the RGVMPO obtained system performance data through a consultant to conduct travel time runs across Hidalgo and Cameron County using the floating car method. With this method, the average travel speed was determined with a test vehicle that "floats" with the flow of traffic. In this scenario, the driver of the test vehicle actively maintains a balance between the number of cars passing by and the number of cars passed. If no other cars were present, the driver of the test vehicle would drive the speed limit. The average speed was logged every 0.1 miles and translated into a Geographic Information System (GIS) format. Results from this analysis were useful in providing recommendations to improve specific intersections.

Congestion Management Process Assessment Tool

The Texas Transportation Institute developed the Congestion Management Process Assessment Tool (COMPAT) specifically for MPOs to analyze roadway performance based off metrics such as Truck Annual Average Daily Traffic, Truck Person-Hours of Delay, and Truck Travel Time Reliability. The tool is publicly available and has a user-friendly GIS interface where data for each segment can be accessed. Table 4.1 and Figures 4.1, 4.2, and 4.3 display data from this tool.

COMPAT User Guide Methodology Contact Us Change Log

Label	Truck Person-Hours of Delay	Truck AADT	Truck Vehicle Miles of Travel	Truck Congested Speed	Truck Travel Time Index
Interstate	179,427	5,385	203,827	62.37	1.06
Major Collector	430,610	189	86,140	40.64	1.19
Minor Arterial	288,685	433	49,476	40.12	1.22
Minor Collector	22,747	94	8,160	31.76	1.09
Other Freeway and Expressway	2,569	1,374	2,598	61.62	1.04
Other Principal Arterial	820,792	1,180	216,477	47.04	1.14

Table 4.1 Congestion Management Process Assessment Tool Table for RGVMPO

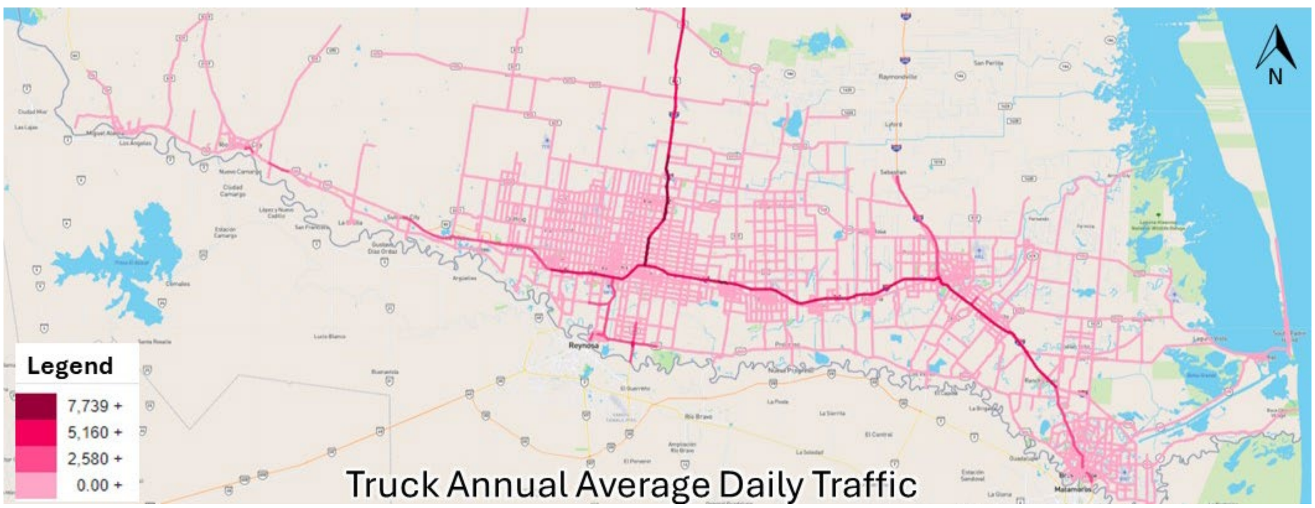

Figure 4.1 COMPAT Truck Average Annual Daily Traffic Map

Figure 4.2 COMPAT Truck Person Hours of Delay Map

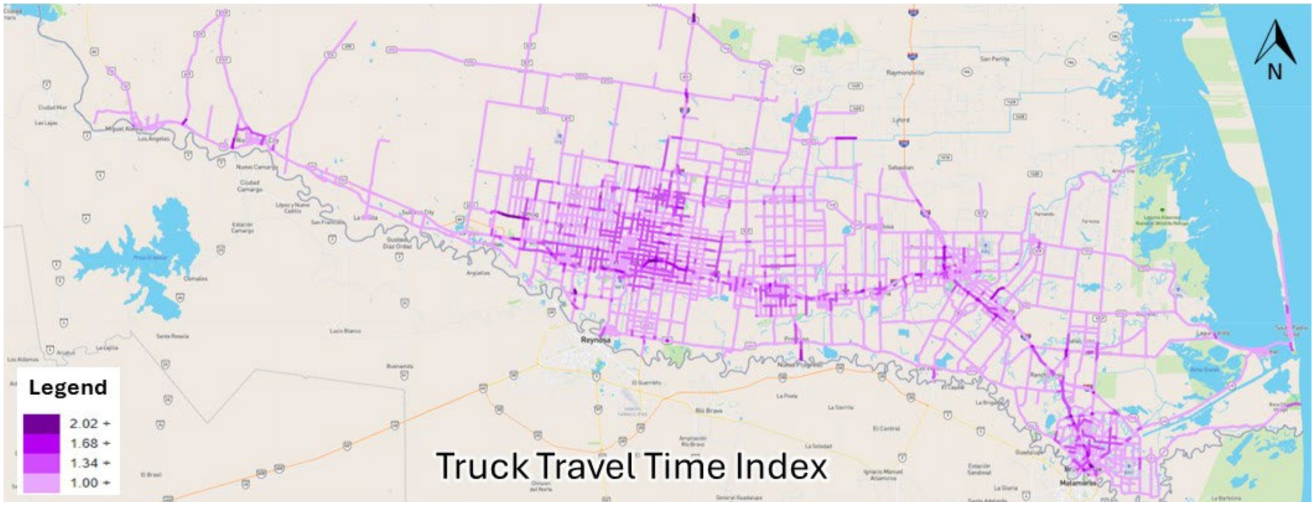

Figure 4.3 COMPAT Truck Travel Time Reliability Index Map

The Truck Average Annual Daily Traffic map proves that truck travel is heavily occurring on the major interstates in the valley. The Truck person hours of Delay Map shows where major slow downs occur. The Truck Travel Time Index Map shows the ratio where the AM and PM peak period travel time for trucks drops below the expected free flow travel time of trucks.

100 Most Congested Roadway Segments in Texas

According to a Technical Memorandum supported by TxDOT and prepared by Texas Transportation Institute (TTI) in November 2023 titled, "The 100 Most Congested Texas Road Segments", there are two segments on that list in the RGVMPO MAB. Data for this report was collected in 2022. The ranking in this list is measured by the number of extra hours of travel time experienced by travelers statewide.

Figure 4.4 shows the Mid-Valley major interstate, I-2, which provides east-west connectivity in Hidalgo County having two segments along the corridor ranked as the 59th and 95th most congested roadways in Texas. This is a high area of concern for our region as it is common for commuters to use this route for job access, as well as for freight trade. The primary reason these segments are reporting high levels of delay is because a major expansion project is currently under construction. 4 direct connectors are being widened from 1 lane to 2 lanes. The MPO and TxDOT will be monitoring the flow of traffic in this area when the Pharr Interchange construction is completed in 2024. For the most up to date information on the progress of construction at the interchange, we recommend visiting the TxDOT Pharr District Facebook page.

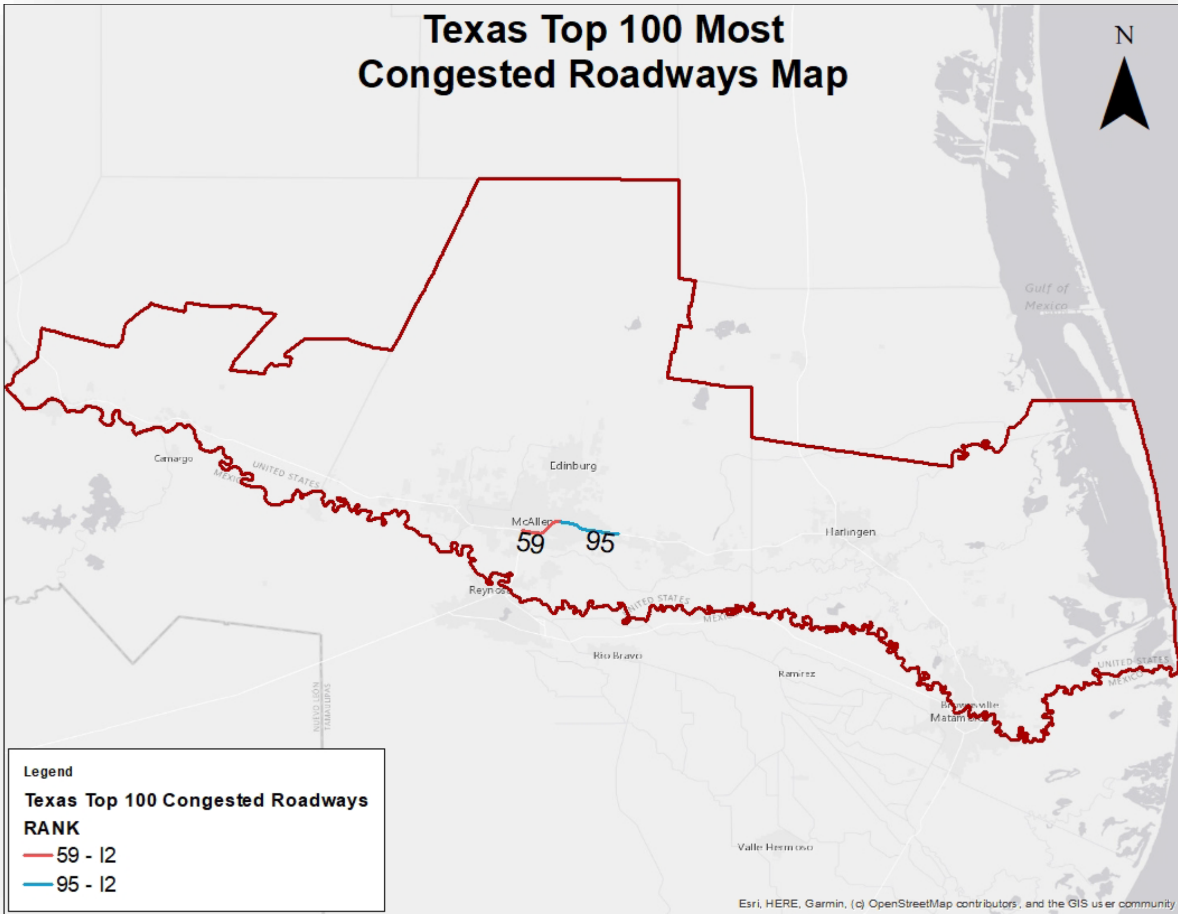

Figure 4.4. *Texas Top 100 Most Congested Roadways Map*

Table 4.1 shows the results from Figure 4.1 in a numerical format. The red segment on I-2 from US 281 to S 23rd St was reported to have an annual congestion cost of approximately $22.6 million dollars. The goal is to reduce the annual hours of delay per mile that is currently at 189,604 and 135,331 for each segment. The blue segment on I-2 from FM 1423 to US 281 was reported to have an annual congestion cost of approximately $22.2 million dollars. The Texas Congestion Index column, denoted with the acronym TCI, is a score that indicates the relationship between the peak-period average travel time and the free flow travel time. Having a 1.29 TCI means that a 30-minute trip in free flow traffic would take almost 39 minutes during peak period traffic.

Rank	Road	From	To	Delay/Mile	TCI	PTI (95%)	Annual Congestion Cost
59	IH 2	US 281	S 23rd St	189,604	1.40	1.99	$22,630,007
95	IH 2	FM 1423	US 281	135,331	1.29	1.47	$22,286,789

Table 2 *Texas Top 100 Most Congested Roadways Table*

Top 20 Bottlenecks

Figures 4.5 and 4.6 on pages 19 and 20 illustrate the Top 20 bottlenecks in our region, identified using RITIS Probe Data Analytics. Each circle marks the head of a bottleneck, while the accompanying line delineates the extent of congestion and the corresponding reduction in travel speed. Among these top 20 bottlenecks, 6 are located in Cameron County, with the remaining in Hidalgo County. Notably, the bottlenecks in Hidalgo County contribute to the most significant delays, as detailed in the Total Delay in Table 3.2. Specifically, the intersection of I-69 and N Cage Blvd ranks among the top 5 bottlenecks, potentially due to ongoing construction in the area. After construction is complete and data normalizes, the RGVMPO intends to compare data reflecting congestion from before, during, and after the major interchange improvement.

Out of the 12 ports of entry in the Rio Grande Valley, two have also contributed to the bottlenecks: Tx-600-SPUR N (#10, Pharr International Bridge) and Tx-4 W (#16, Gateway International Bridge). The Pharr International Bridge serves as one of the most important ports of entry, handling both commercial and passenger vehicles. It connects U.S. Route 281 with the Mexican city of Reynosa, a significant industrial hub. The Gateway International Bridge, located in Brownsville, TX, connects to the Mexican city of Matamoros. Situated in Downtown Brownsville, this bridge's bottleneck status is understandable due to its proximity to the University of Texas at Brownsville and its role as the main port of entry for pedestrian crossings on both sides of the border, serving individuals commuting to work or school.

Additionally, the Tx-100 W at Brownsville Port Isabel Highway serves as another critical bottleneck. This area experiences heavy traffic, especially on weekends, as it is the sole route to South Padre Island via the Queen Isabella Bridge, resulting in substantial congestion.

Looking ahead, it's important to note that these are currently the top 20 bottlenecks identified in the region. Future updates aim to broaden the scope to include up to 50 bottleneck analyses, potentially highlighting more areas in Cameron County. Currently, most of the bottlenecks are in Hidalgo County, with none identified in Starr County. However, this distribution could shift based on ongoing transportation projects and evolving traffic patterns.

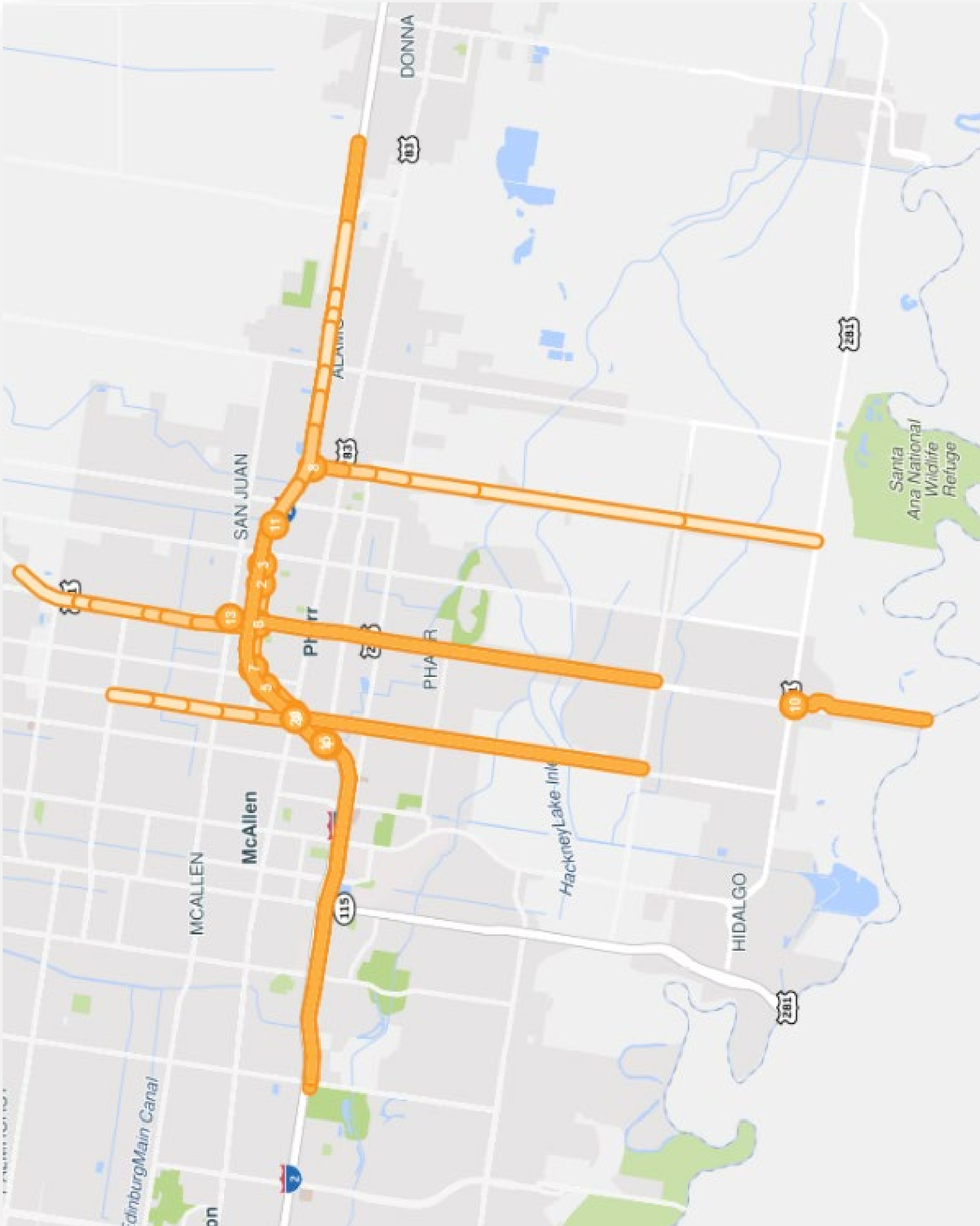

Figure 4.5 *Top 20 bottlenecks Map Zoomed into Hidalgo County*

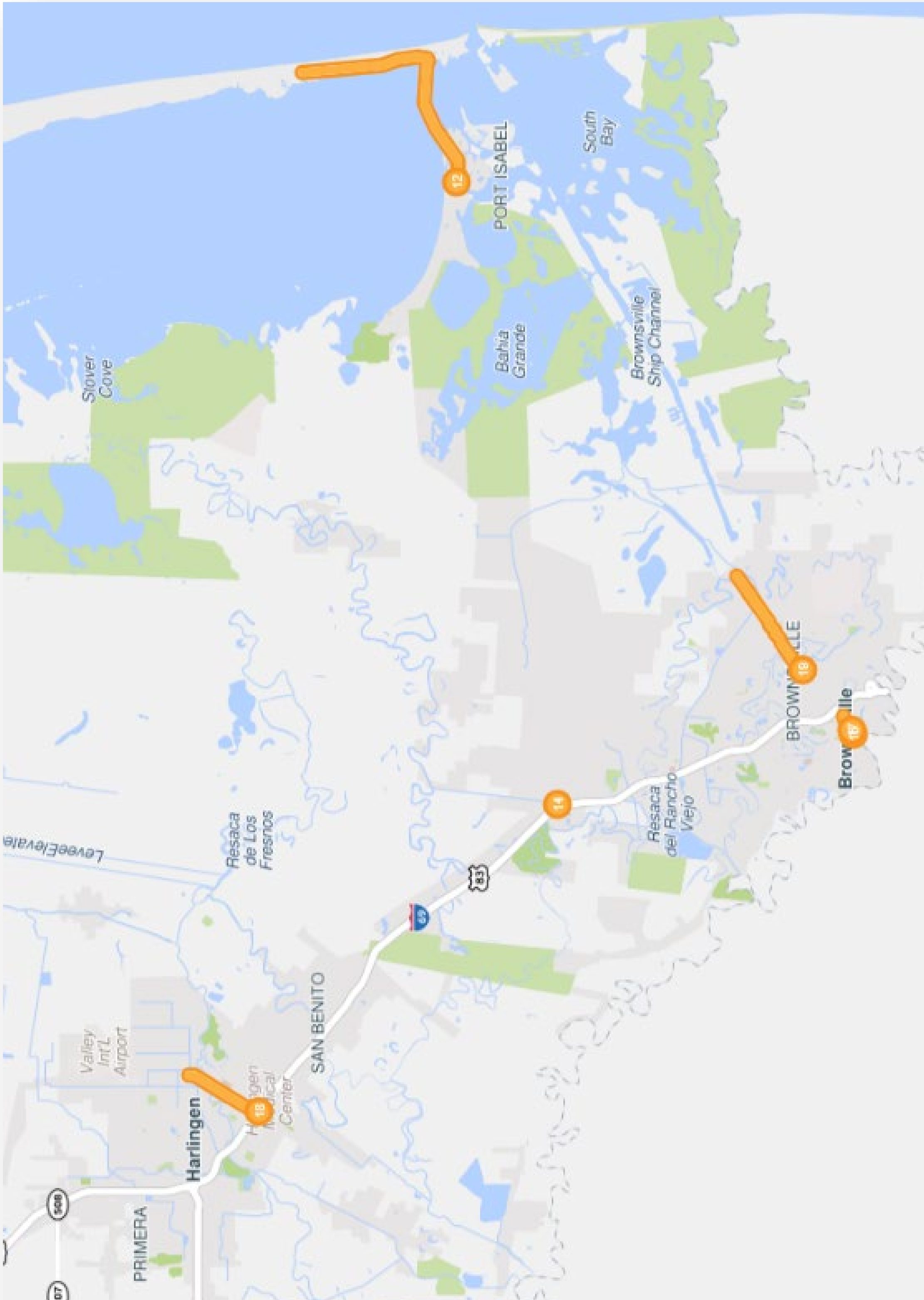

Figure 4.6 *Top 20 bottlenecks Map Zoomed into Cameron County*

Top 20 Bottlenecks in 2023		Bottleneck Profile		
Rank	Head Location	Average Max Length	Average Daily Duration	Total Duration
1	US-83 N @ US-83 BUS/TX-374	1.42	2 h 57 m	45 d 1 h 5 m
2	US-83 S @ I-69C/US-281/N CAGE BLVD	2.09	1 h 24 m	21 d 7 h 42 m
3	US-83 N @ I RD	1.95	1 h 10 m	17 d 20 h 18 m
4	US-83 S @ E JACKSON AVE/W SAM HOUSTON BLVD	1.37	1 h 36 m	24 d 11 h 2 m
5	US-83 S @ US-83 BUS/TX-374	2.08	32 m	8 d 8 h 8 m
6	US-281 S @ I-2/US-83	0.64	3 h 25 m	51 d 23 h 46 m
7	US-83 N @ I-69C/US-281/N CAGE BLVD	2.35	18 m	4 d 19 h
8	FM-2557 N @ US-83/FRONTAGE RD	0.14	11 h 32 m	175 d 10 h 39 m
9	FM-2061 N @ I-2	0.43	5 h 3 m	76 d 21 h 26 m
10	TX-600-SPUR N @ US-281/US-281 SPUR	1.93	2 h 28 m	37 d 15 h 7 m
11	US-83 N @ NEBRASKA AVE	1.49	23 m	5 d 22 h 43 m
12	TX-100 W @ BROWNSVILLE PORT ISABEL HWY	4.66	38 m	9 d 17 h 26 m
13	US-281 N @ FERGUSON AVE	0.48	1 h 16 m	19 d 7 h 54 m
14	FM-511 S @ I-69E/US-77/US-83/OLMITO NORTH RD	0.13	19 h 13 m	292 d 6 h 10 m
15	US-83 N @ FM-2061/S JACKSON RD	2.25	5 m	1 d 12 h 2 m
16	TX-4 W @ MEXICO/UNITED STATES	0.15	12 h 29 m	189 d 23 h 8 m
17	TX-4 E @ US-77-BR/E WASHINGTON ST/E ELIZABE...	0.16	8 h 51 m	134 d 19 h 11 m
18	TX-499-LOOP S @ I-69E/US-77/US-83	0.08	11 h 29 m	174 d 18 h 57 m
19	TX-48 S @ TX-4/E 14TH ST	0.8	1 h 22 m	20 d 20 h 54 m
20	FM-3362 S @ I-2	0.69	1 h 31 m	23 d 3 h 6 m

Table 4.2 Top 20 Bottlenecks in 2023

Top 20 Bottlenecks in 2023		Base Impact Weighted By		
Rank	Head Location	Speed Differential	Congestion	Total Delay ▼
1	US-83 N @ US-83 BUS/TX-374	3,575,243	200,583	213,693,231
2	US-83 S @ I-69C/US-281/N CAGE BLVD	2,241,379	128,632	138,332,644
3	US-83 N @ I RD	1,874,125	94,608	90,653,189
4	US-83 S @ E JACKSON AVE/W SAM HOUSTON BLVD	1,546,070	79,909	81,617,807
5	US-83 S @ US-83 BUS/TX-374	954,508	62,810	72,640,114
6	US-281 S @ I-2/US-83	722,219	57,363	62,850,008
7	US-83 N @ I-69C/US-281/N CAGE BLVD	629,056	41,507	46,443,615
8	FM-2557 N @ US-83/FRONTAGE RD	224,519	22,982	39,839,614
9	FM-2061 N @ I-2	705,842	70,280	37,337,285
10	TX-600-SPUR N @ US-281/US-281 SPUR	1,228,995	152,115	26,558,153
11	US-83 N @ NEBRASKA AVE	523,719	28,171	26,152,865
12	TX-100 W @ BROWNSVILLE PORT ISABEL HWY	1,396,834	94,696	23,097,480
13	US-281 N @ FERGUSON AVE	123,577	12,866	21,337,824
14	FM-511 S @ I-69E/US-77/US-83/OLMITO NORTH RD	828,940	69,568	17,888,562
15	US-83 N @ FM-2061/S JACKSON RD	196,051	13,306	14,818,228
16	TX-4 W @ MEXICO/UNITED STATES	251,753	41,561	12,667,848
17	TX-4 E @ US-77-BR/E WASHINGTON ST/E ELIZABE...	245,701	41,564	12,211,154
18	TX-499-LOOP S @ I-69E/US-77/US-83	224,920	16,096	12,044,013
19	TX-48 S @ TX-4/E 14TH ST	278,069	25,164	11,902,840
20	FM-3362 S @ I-2	239,706	26,752	11,237,526

Table 4.4 Top 20 Bottlenecks in 2023 (cont)

Public Transportation System

With the second principle in the CMP being to promote sustainable multimodal network, and a specified objective listed under that principle being to increase transit ridership by 10% over a 5-year period, the RGVMPO documents ridership data presented by transit providers quarterly at Policy Board meetings to monitor progress towards this goal to be able to evaluate the effectiveness of public transportation investments. Figure 4.7 shows that transit ridership data collected in 2023 from BMetro, Island Metro, Metro McAllen, and Valley Metro. The green column represents the total amount of ridership for all transit providers combined. As future data is collected and analyzed, it will be compared to 2023 values as the baseline year.

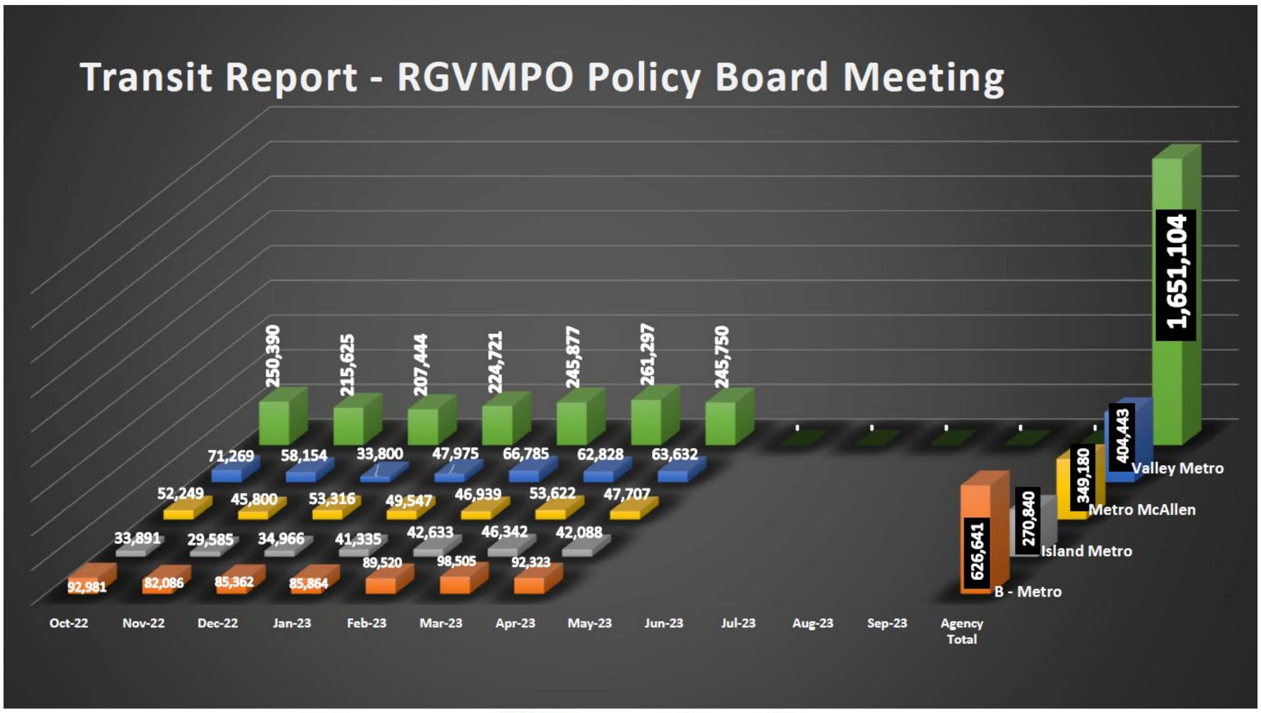

Figure 4.7 2023 Transit Ridership Data

Public transportation contributes to the congestion management process by relieving highly trafficked, congested roadways with services provided by buses and micro-transit vans. Scheduling transit routes along major thoroughfares, state highways, and interstates provides alternative transportation options, especially during peak travel times. Bus rapid transit and passenger rail are future endeavors for our metropolitan planning area, but rehabilitating and expanding our current system is paramount. Figure 4.8 shows Transit ridership data on specific BMetro routes

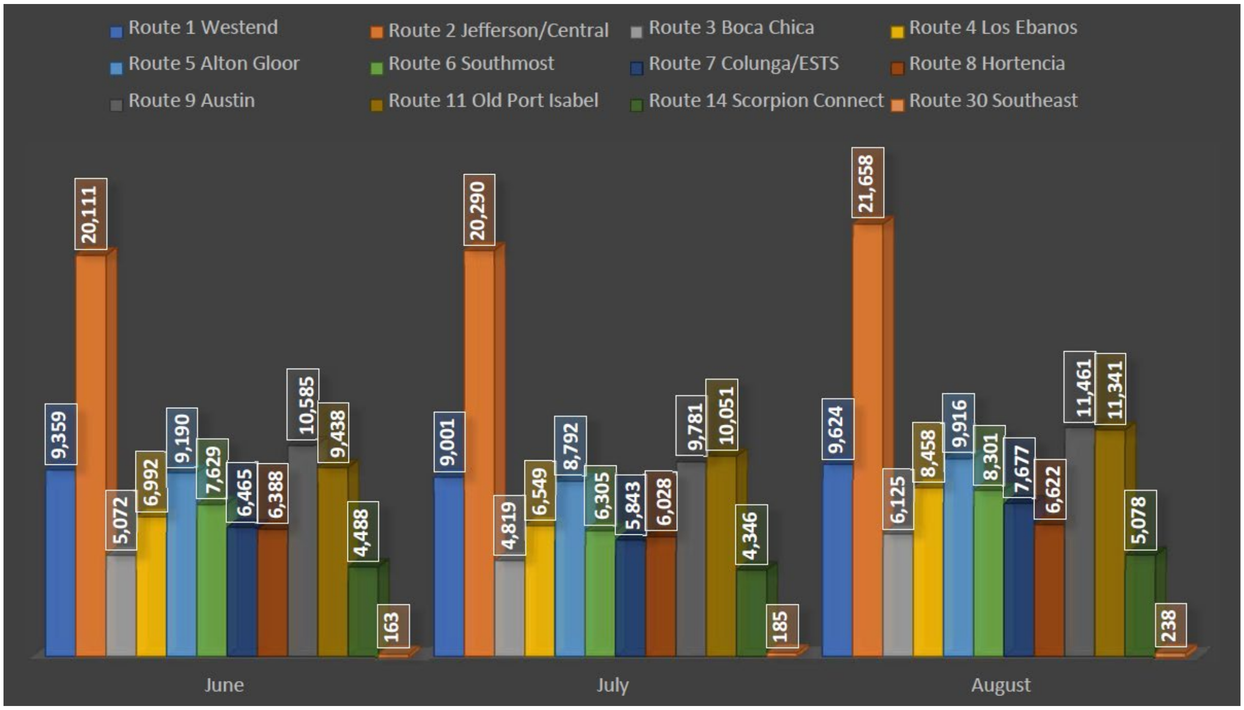

Figure 4.8 2023 Summer Transit Ridership Data for BMetro

Other highly trafficked roadways serviced by transit providers within the RGVMAB include:

- Interstate 69C & 69E are serviced by both Valley Metro and B-Metro providing connectivity to Medical Centers, the University of Texas Rio Grande Valley, various retail outlets, City Halls, and County Courthouses.
- Interstate 2 is serviced by Valley Metro from Starr County to Cameron County. Red Line 1&2 run from McAllen's Central Station to Harlingen's Bus Station, to La Plaza Station in Brownsville. Green Line 1 transports from Rio Grande City to McAllen.
- State Highway 48 is serviced by Valley Metro. Valley Metro's Blue Line and Route 50 operate from La Plaza Bus Terminal to Brownsville-SPI International Airport, to Port Isabel.
- State Highway 107 is serviced by Valley Metro from La Villa to Edinburg and Metro McAllen provides transportation from Central Station to UTRGV in Edinburg.
- US Highway Business 83 is serviced by Valley Metro via Route 31, which travels from the Harlingen Terminal to McAllen Central Station. Metro McAllen's Central Station is located on US Business 83 with various routes traveling through major corridors, connecting riders with schools, hospitals, restaurants, and much more.
- Nolana Loop is serviced by Metro McAllen. Routes 6 & 8 connect transit users with Central Station, Hospitals located along McColl Rd., the Public Library, Museum, and the Northside Transfer Station.
- Boca Chica Boulevard is served by B-Metro – Route 3 travels from La Plaza Terminal to Price Rd & Paredes Line, returning to La Plaza Terminal.

Step 5: Analyze Congestion Problems & Needs

Processing of data for meaningful insight

The Fifth Step in the Congestion Management Process involves a comprehensive analysis of congestion issues and associated needs. This analysis leverages raw data to generate meaningful insights and impactful recommendations in providing a data-driven narrative supported by compelling evidence. Specifically, in this chapter, the analysis will use data visualization pie charts, maps, and space-time diagrams

Causes of Congestion

The RITIS Data Archive was used to identify the causes of congestion on the National Highway System (NHS) recorded in 2019. The following pie charts illustrate the sources of disruption at three geographical scales: nationwide, statewide, and for the counties of Cameron, Hidalgo, and Starr. Accompanying data shows the "User Delay Costs" in dollars and "Vehicle Hours of Delay" in hours for those boundaries. *Figure 5.1* is a legend that defines the specific type of distribution represented in the charts.

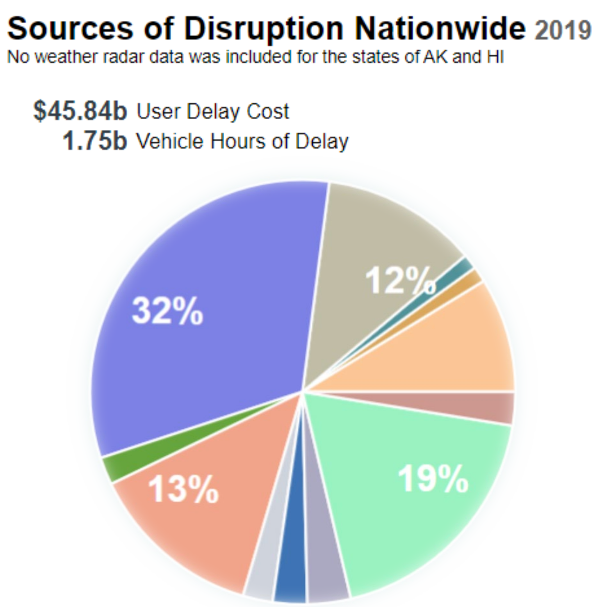

Figure 5.2 Causes of Congestion Nationwide

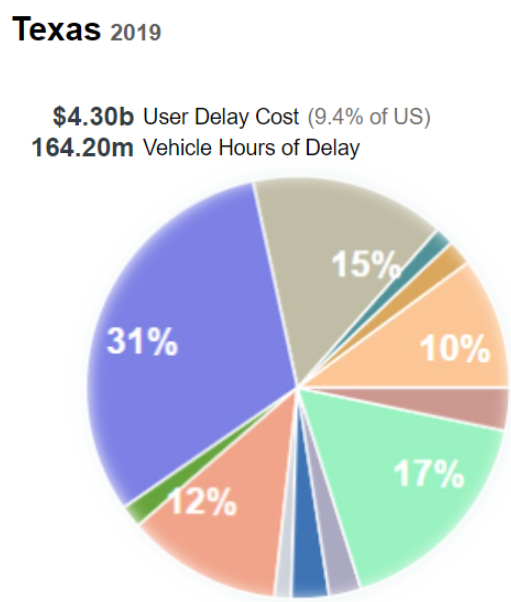

Figure 5.3 Causes of Congestion Statewide

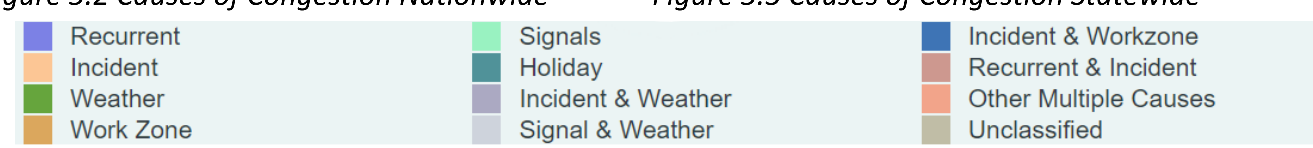

Figure 5.1 Legend for Causes of Congestion

Cameron, TX 2019

$16.40m User Delay Cost (0.4% of TX)
626.62k Vehicle Hours of Delay

In Cameron County the lead cause of congestion is traffic signals. The second and third leading causes of congestion are unclassified where there was an interruption in flow traffic with no discernable cause, and multiple causes where more than one factor caused a congested event. Given the significant user delay cost of $16.4M in 2019 alone, investing nearly$1M for light synchronization equipment seems well-justified.

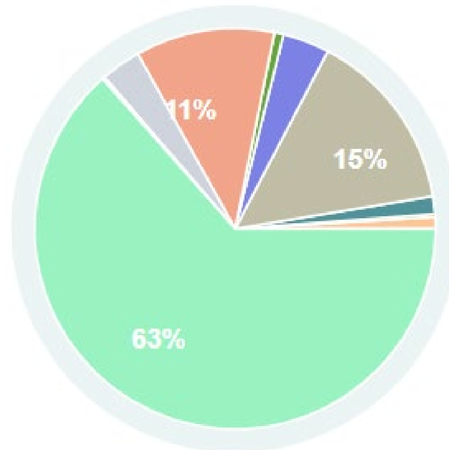

Figure 5.4 Causes of Congestion for Cameron County

Hidalgo, TX 2019

$50.92m User Delay Cost (1.2% of TX)
1.95m Vehicle Hours of Delay

In Hidalgo County the lead cause of congestion is also traffic signals. The second and third leading causes are similar to Cameron County and Starr County. A notable difference is that the percentage of congestion occurring from recurring traffic for Hidalgo County is significantly less than the Nation and State.

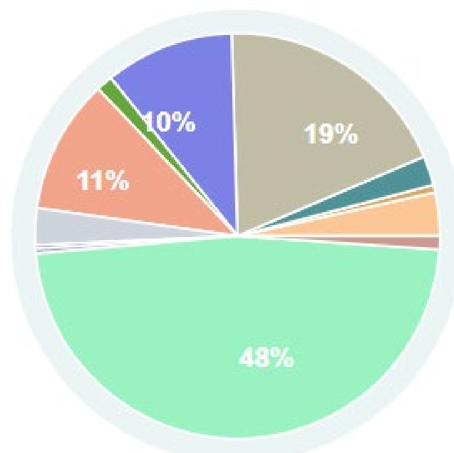

Figure 5.5 Causes of Congestion for Hidalgo County

Starr, TX 2019

$1.05m User Delay Cost (0.0% of TX)
40.27k Vehicle Hours of Delay

In Starr County the lead cause of congestion is also traffic signals. It's important to note that the percentage of congestion attributable to signals for this region is significantly higher than both national and state averages, likely resulting in a different set of recommendation strategies.

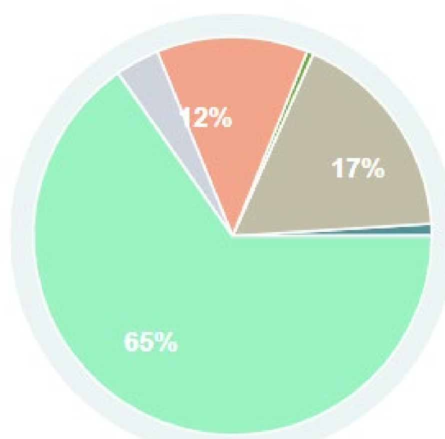

Figure 5.6 Causes of Congestion for Starr County

Trip Analytics

Figure 5.7 shows data gathered from the trip analytics tool from INRIX in 2023 for passenger vehicle trips entering and exiting each county. This data reveals patterns of origin and destination for people. Complementing this, Figure 5.8 shows the number of commercial trucks that travel between Hidalgo County and Cameron County. Starr County Starr County does not have individual recorded history similar to Hidalgo and Cameron because the county is grouped with another larger zone.

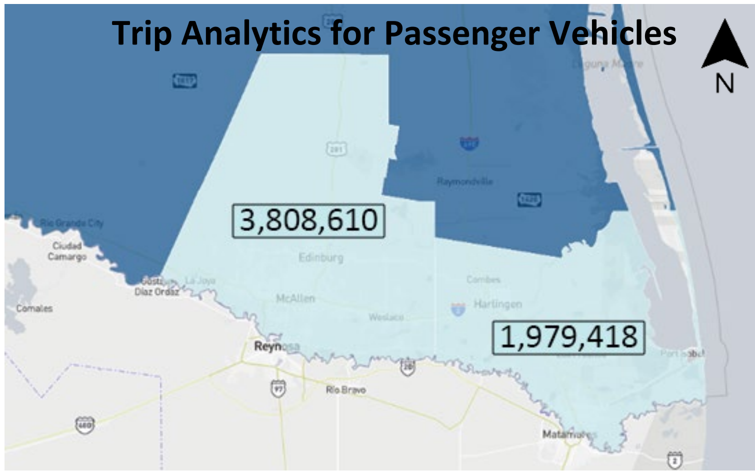

Figure 5.7 *Trip Analytics showing Transportation Demand for Passenger Vehicles*

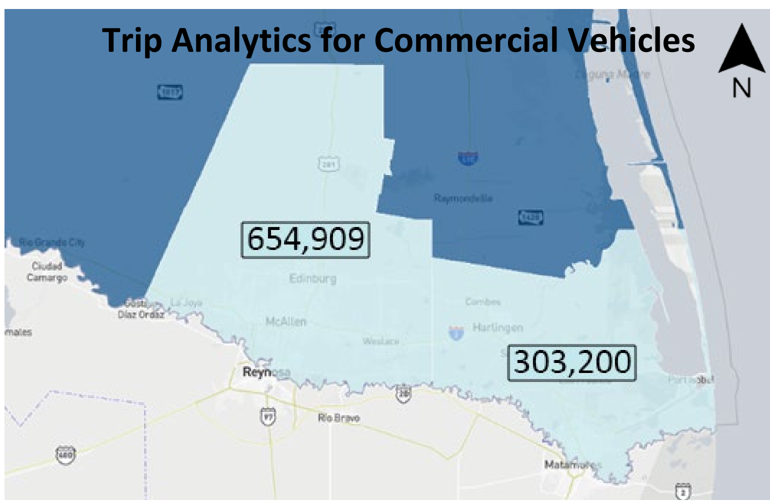

Figure 5.8 *Trip Analytics showing Transportation Demand for Commercial Vehicles*

Corridor Analyses

To formulate effective congestion mitigation strategies, understanding the specific reasons behind travel delays on various corridors is crucial for developing targeted solutions. This section presents a comprehensive analysis of 8 congested corridors, exploring the factors that contribute to congestion along key transportation routes. Data being analyzed is according to the Travel Time Index.

US 83 from Loma Blanca Road to FM 755

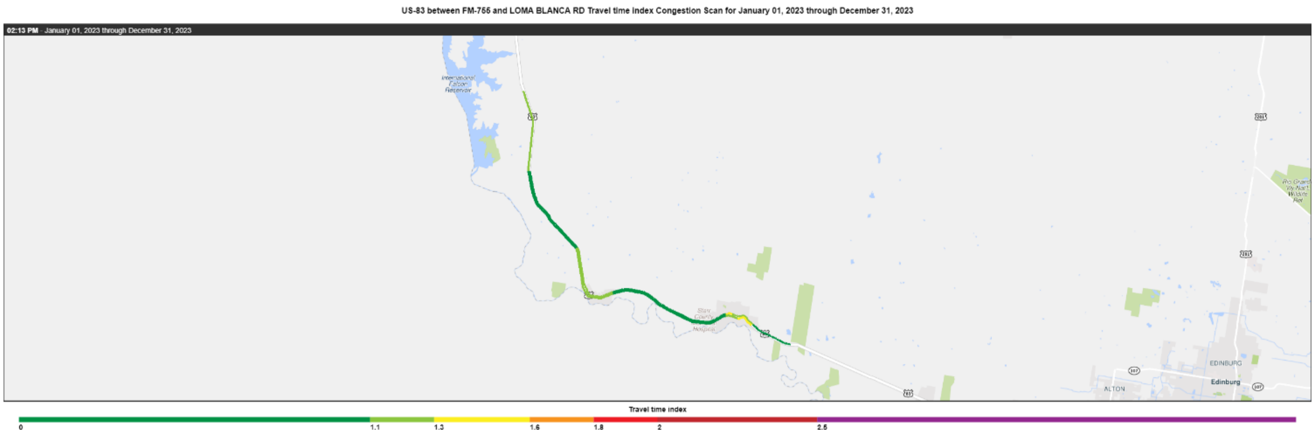

Figure 5.9. *Travel Time Index Trend Map for US 83 from Loma Blanca Road to FM 755.*

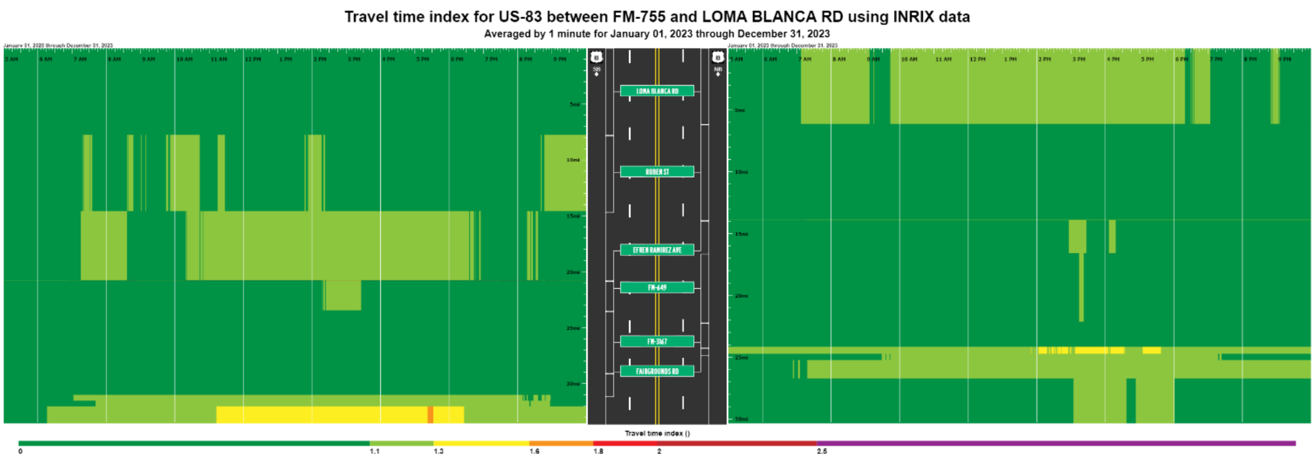

Figure 5.10. *Travel Time Index Congestion Scan for US 38 from Loma Blanca Road to FM 755*

Description

US 83 is the primary East-West corridor connecting Zapata, Rio Grande City, Sullivan City and La Joya, TX. The section of Loma Blanca Rd to FM 755 is mostly a four-lane divided highway with some sections being a 4-lane undivided with center turning lane. There are also bi-directional median turns throughout the corridor section

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Southbound	5PM-6PM	A. FM 755 to Fairgrounds Rd	1.3-1.6

Table 5.1. *Typical Commuting Conditions for US 38 from Loma Blanca Road to FM 755*

Nolana from Ware Rd to McColl Rd

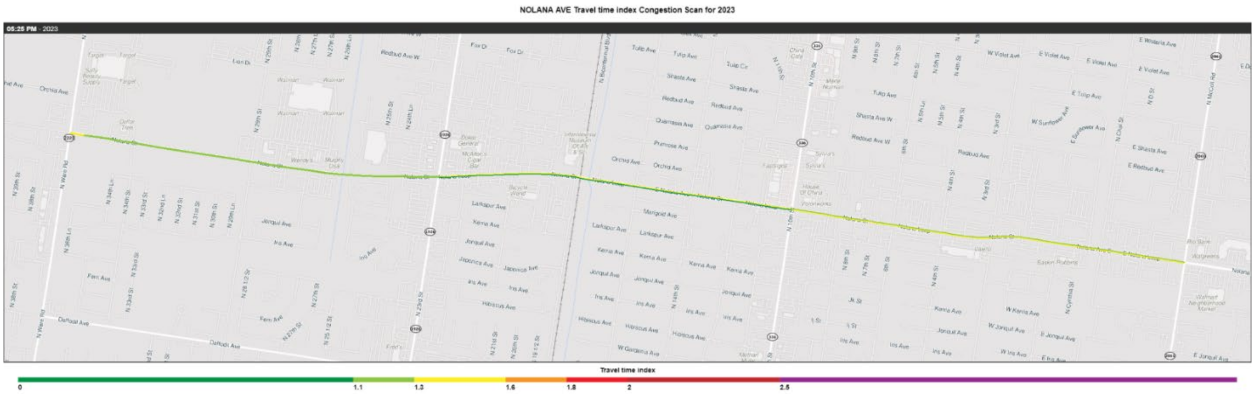

Figure 5.11. *Travel Time Index Trend Map for Nolana from Ware Rd to McColl Rd*

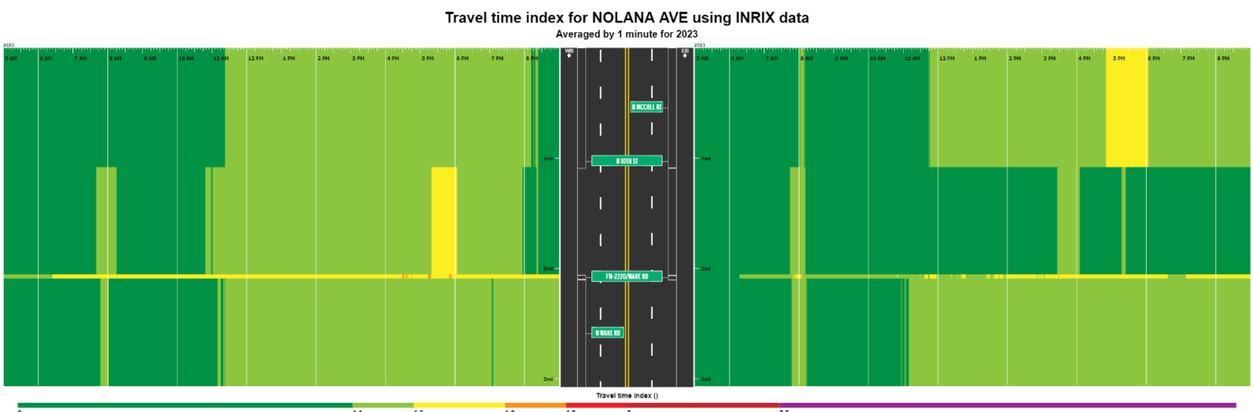

Figure 5.12. *Travel Time Index Graphic for Nolana from Ware Rd to McColl Rd*

Description

Nolana is one of the main East-West corridors that connects McAllen to Pharr. The section of Nolana from Ware to McColl is mostly 6-lane undivided with center turning lanes and 4-lane undivided with center turning lanes with some right-turn lanes within this section.

Locations of Typical Slow Downs:

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Westbound	4PM-6PM	FM 2220/Ware Rd Intersection	1.1 - 1.3
Southbound	5PM-6PM	FM 755 to Fairgrounds Rd	1.3-1.6

Table 5.2. *Typical Commuting Conditions for Nolana from Ware Rd to McColl Rd*

Jackson from Ferguson Ave to Hall Acres Rd

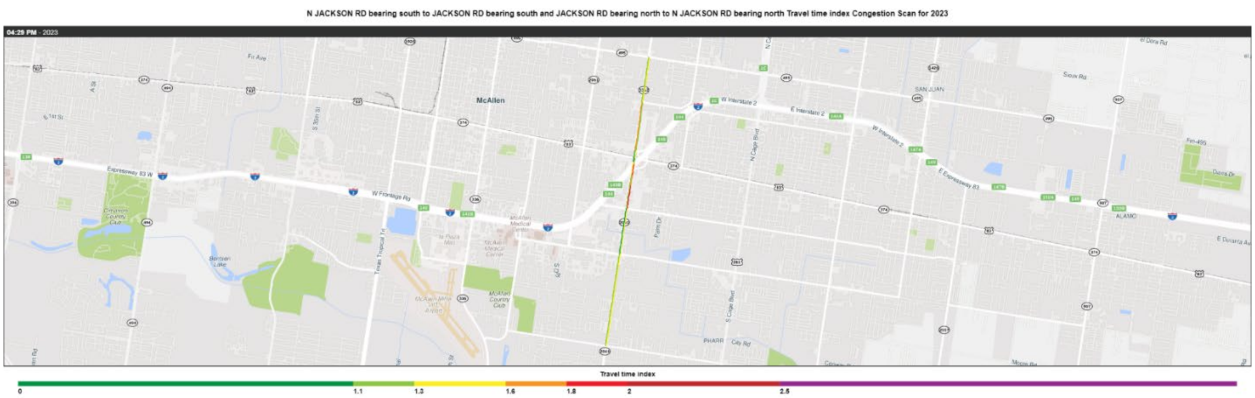

Figure 5.13. *[Travel Time Index Trend Map for Jackson from Ferguson Ave to Hall Acres Rd]*

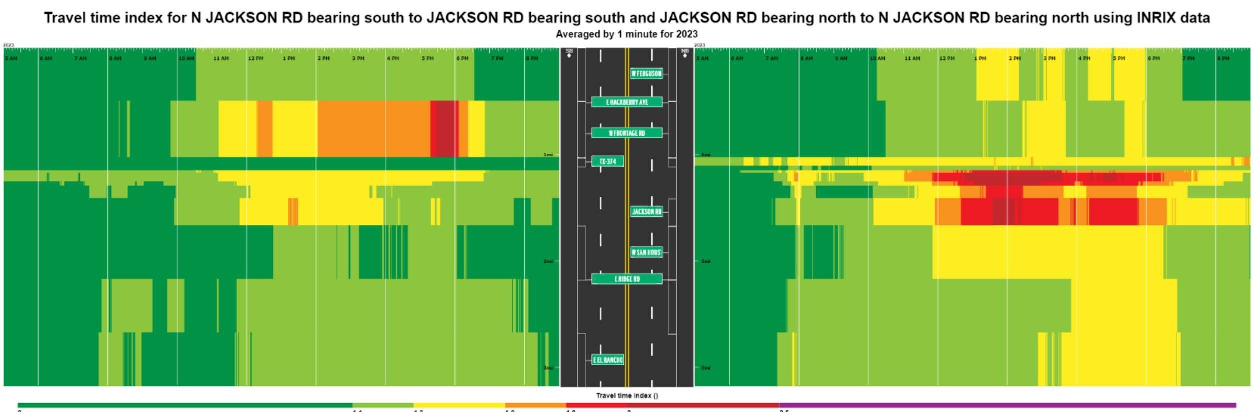

Figure 5.14. *Travel Time Index Graphic for Jackson from Ferguson Ave to Hall Acres Rd*

Description

This Section of Jackson Rd runs north-south connecting the northern portion of Pharr and surrounding communities to the South portion of Pharr. The section of Jackson from Furgeson Ave to Hall Acres Rd is a 4-lane roadway with a continuous center turning lane.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Southbound	12PM-1PM	Between Hackberry and TX-374	1.3-1.6
Southbound	2PM-6:30PM	Between Hackberry and TX-374	1.3-2.0
Southbound	1PM-2PM	Between Jackson and TX-374	1.6-1.8
Northbound	1PM- 2:30	TX-374 Intersection	1.3-1.6
Northbound	8PM-9PM	TX-374 Intersection	1.6-1.8
Northbound	7AM-8AM	Between Jackson and TX-374	1.6-2.0
Northbound	1030AM-8PM	Between Jackson and TX-374	1.6-2.0

Table 5.3. *Typical Commuting Conditions for Jackson from Ferguson Ave to Hall Acres Rd*

SH4 from I-69 to Oklahoma Ave

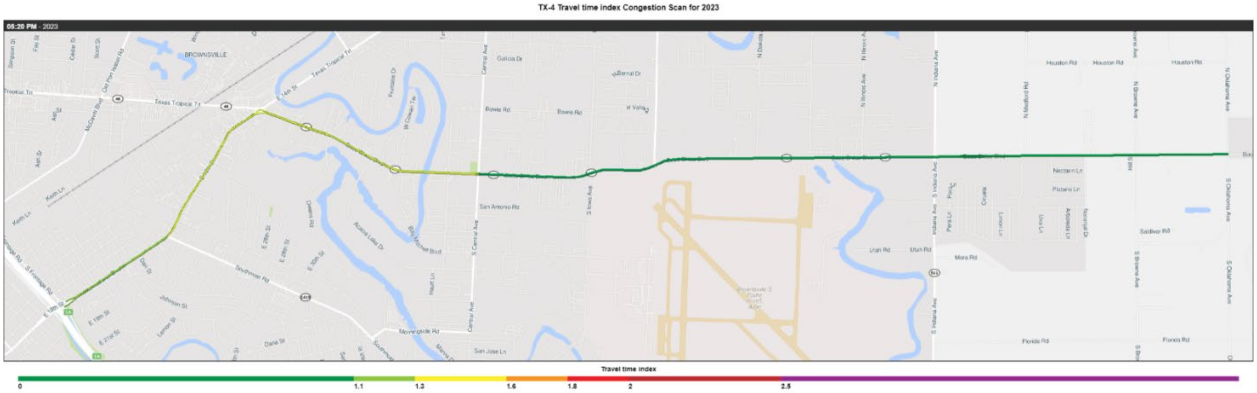

Figure 5.15. *Travel Time Index Trend Map for SH4 from I-69 to Oklahoma Ave*

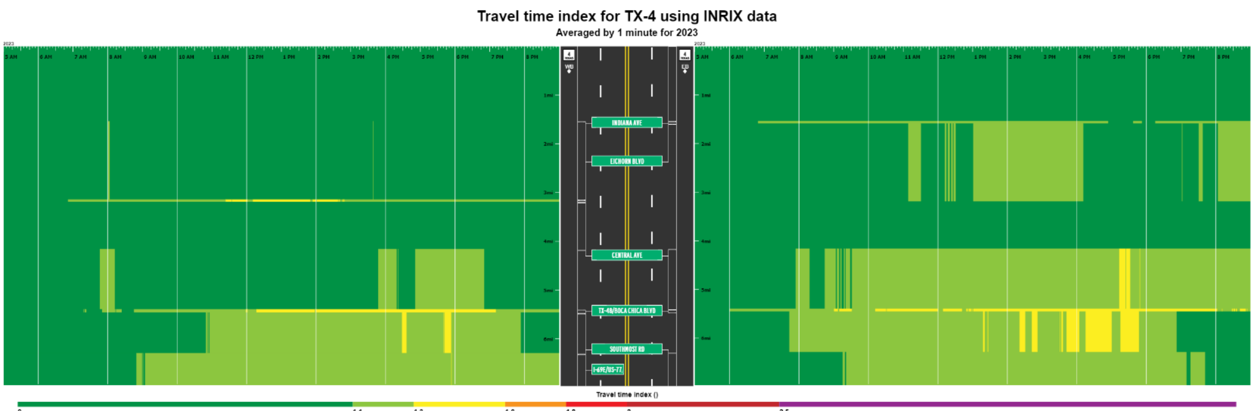

Figure 5.16. *Travel Time Index Graphic for SH4 from I-69 to Oklahoma Ave*

Description

SH4 connects I69E with east Brownsville and serves as a main corridor for travel between the Brownsville-South Padre Island Airport, SpaceX facilities, Central Brownsville and surrounding communities. This section of the roadway is mainly a 4 lane with shoulders and 4-lane with a continuous center turning lane.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Westbound	11AM-3PM	Between Eichorn Blvd and Central Ave	1.3-1.6
Westbound	12PM- 7PM	Between TX-48/Boca Chica Ave and Southmost Rd	1.3-1.6
Eastbound	5PM-6PM	Between Central Ave. TX-48/Boca Chica Ave	1.3-1.6
Eastbound	9AM-9PM	At TX-48/Boca Chica Ave	1.3-1.6
Eastbound	1PM- 6PM	Between Tx-48/Boca Chica Ave and Southmost Rd	1.3-1.6

Table 5.4. *Typical Commuting Conditions for SH4 from I-69 to Oklahoma Ave*

BUS 83 from I-2 to I-69

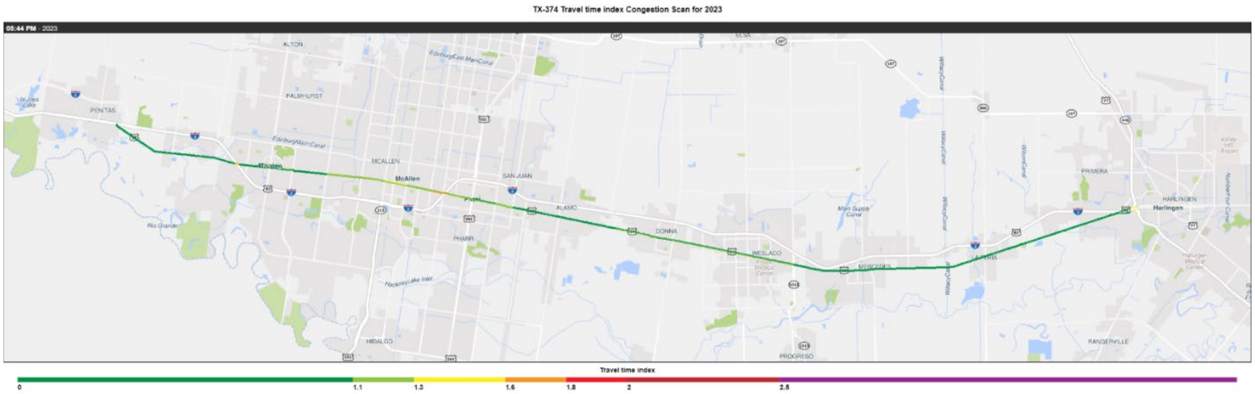

Figure 5.17. *Travel Time Index Trend Map for BUS 83 from I-2 to I-69*

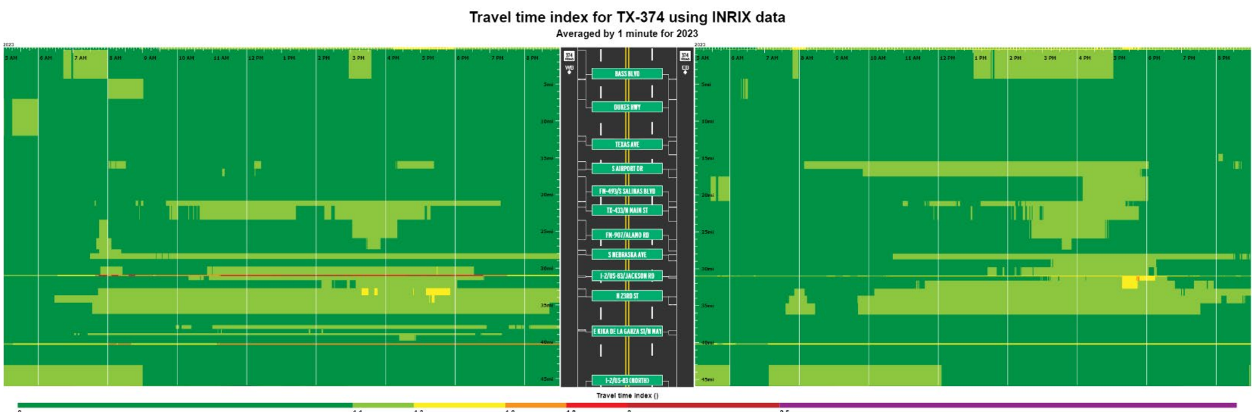

Figure 5.18 *Travel Time Index Graphic for BUS 83 from I-2 to I-69*

Description

Business 83 serves as the main business corridor that runs East/West corridor parallel to Interstate IH-2. It connects multiple cities and surrounding communities. This section BUS 83 is a 4-lane roadway with a continuous left turn lane.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Westbound	730AM-8PM	Intersection of I-2/US-83/Jackson Rd	1.6-2.0
Westbound	8AM-9PM	Intersection of E. Kika de la Garza St.	1.6-2.0
Eastbound	5PM-6PM	Intersection of I-2/US-83/Jackson Rd	1.3-1.6
Northbound	1030AM-8PM	Between Jackson and TX-374	1.6-2.0

Table 5.5. *Typical Commuting Conditions for BUS 83 from I-2 to I-69*

Queen Isabella Causeway from I69E/US-77/US-83 to Orca Circle

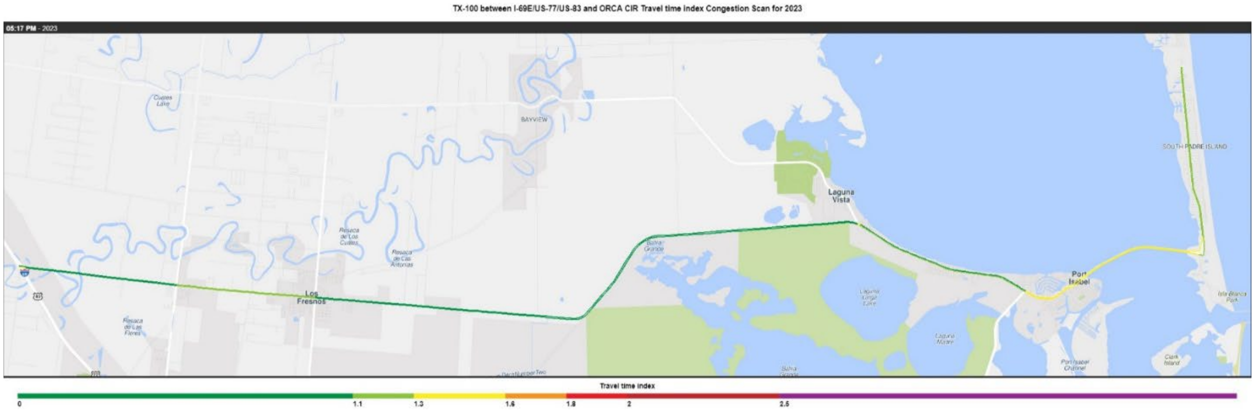

Figure 5.19. *Travel Time Index Trend Map for Queen Isabella Causeway from I69E/US-77/US-83 to Orca Circle*

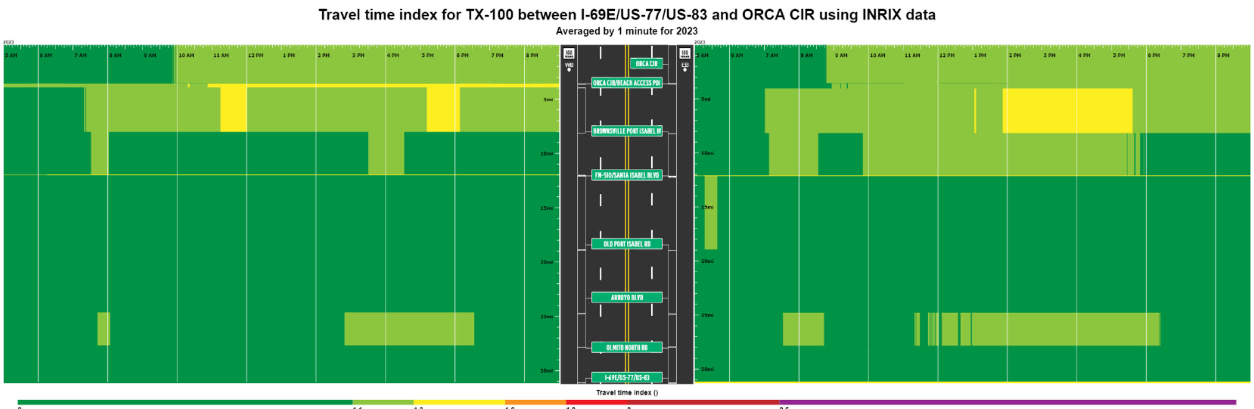

Figure 5.20. *Travel Time Index Graphic for Queen Isabella Causeway from I69E/US-77/US-83 to Orca Circle*

Description

The Queen Isabella Causeway is a concrete pier and beam bridge that connects Port Isabel to South Padre Island. Given the influx of tourism during the summer months and congestion experienced on the only inlet and outlet to the island, several signalizations along the corridor in The City of Port Isabel have been changed to flash yellow. This improvement has successfully allowed for a steadier flow of traffic during peak hour travel periods. Local police departments are also playing their role by implementing stringent policing practices aimed at reducing severe collisions caused by distracted and drunk drivers, resulting in less non-recurring traffic delays.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Westbound	10AM-9PM	At Orca Cir.	1.3-1.6
Westbound	10:30AM - 12PM	Between Orca Cir and Brownsville-Port Isabel Hwy	1.3-1.6
Westbound	5PM -6:15PM	Between Orca Cir and Brownsville-Port Isabel Hwy	1.3-1.6
Eastbound	1PM- 1:15PM	Between Orca Cir and Brownsville-Port Isabel Hwy	1.3-1.6
Eastbound	1:45PM-5:45PM	Between Orca Cir and Brownsville-Port Isabel Hwy	1.3-1.6

Table 5.6. *Typical Commuting Conditions for Queen Isabella Causeway from I69E/US-77/US-83 to Orca Circle*

Stewart from I69E to US281

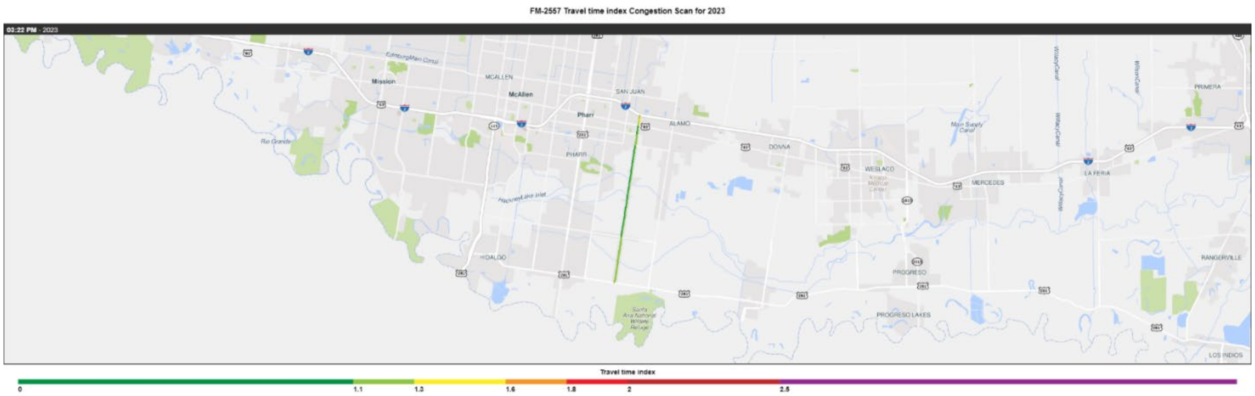

Figure 5.21. *Travel Time Index Map for Stewart from I69E to US281*

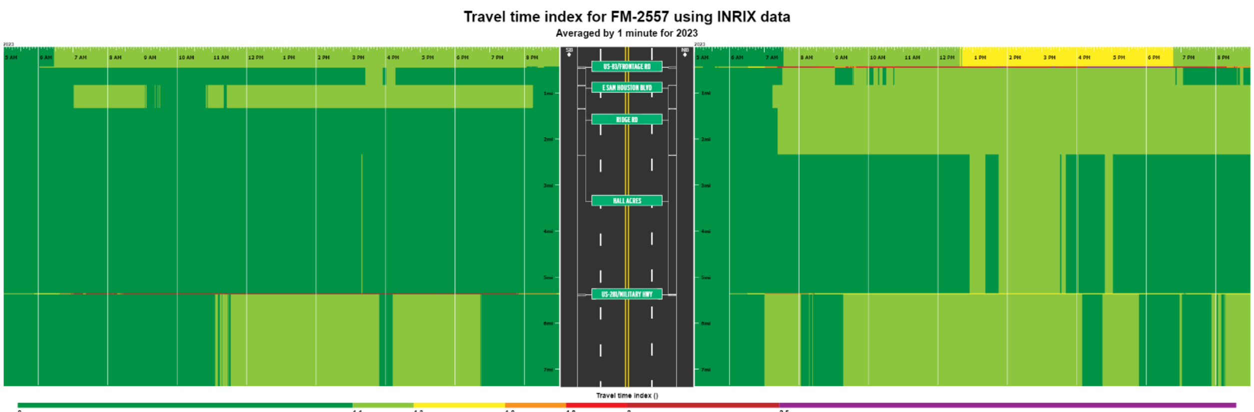

Figure 5.22. *Travel Time Index Graphic for Stewart from I69E to US281*

Description

Stewart Rd connects the North and South areas of Mission and surrounding communities. It is mainly a 2-lane roadway.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Southbound	6AM-9PM	6AM-9PM at US 281/Military Hwy	1.3-2.0
Northbound	6:30AM-9PM	6:30AM-9PM at US-83/Frontage Rd	1.3-2.0

Table 5.7. *Typical Commuting Conditions for Stewart from I69E to US281*

Cage (Tx-600 SPUR) from US 281 to US/Mexico Border

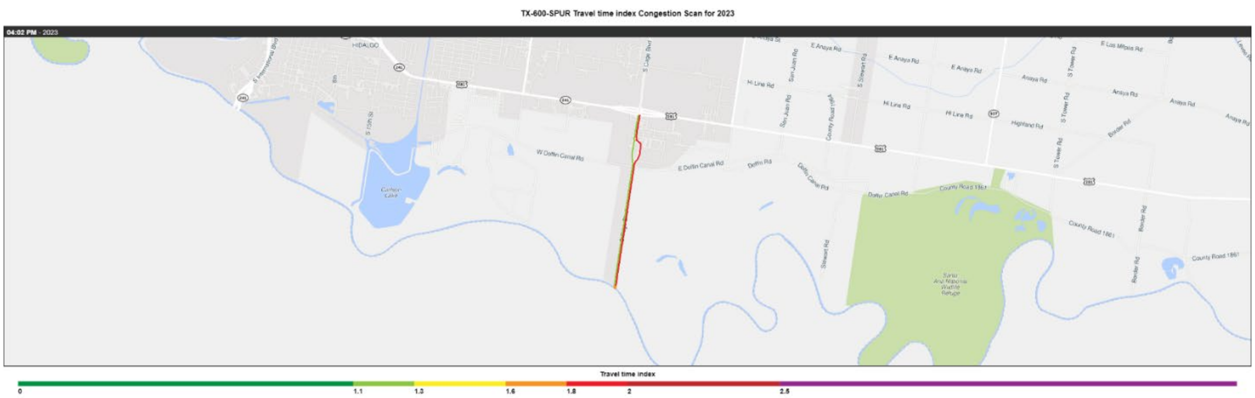

Figure 5.23. *Travel Time Index Map for Cage (Tx-600 SPUR) from US 281 to US/Mexico Border*

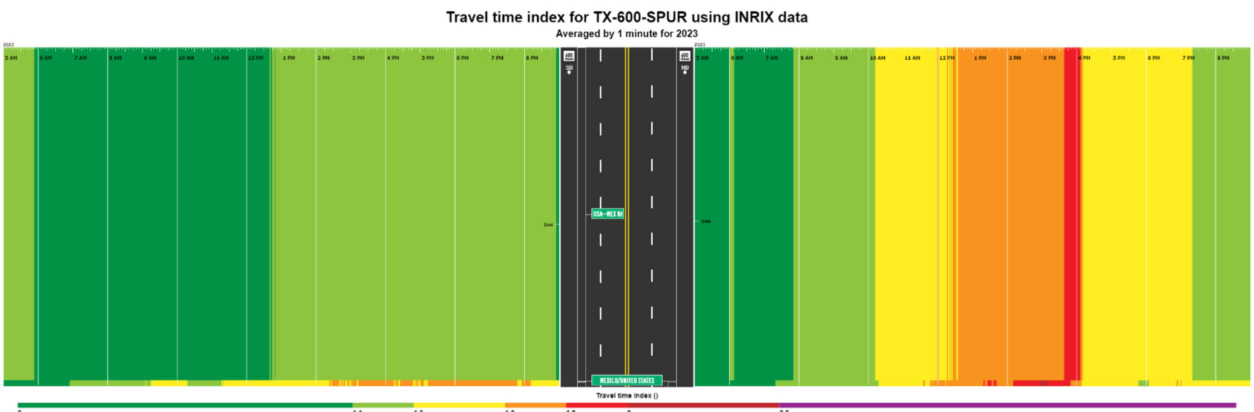

Figure 5.24. *Travel Time Index Graphic for Cage (TX-600 SPUR) from US 281 to US/Mexico Border*

Description

Cage Blvd is the primary north-south corridor connecting North and South Pharr and surrounding communities. This section of Cage is composed of sections that are 4-lane with raised median and 4-lane with continuous center-turning lane. The Twin Span Bridge expansion project will improve truck travel delay costs and improve the connectivity between the port of entry and the interstate. Post construction, the Truck Travel Time Reliability index along this corridor will be closely monitored in future updates and technical reports of the CMP in the following years.

Typical Commuting Conditions in 2023			
Direction	Time	Location	TTI Range
Southbound	2PM-10PM	Mexico/United States Border	1.00 - 1.6
Northbound	10AM-10PM	Mexico/United States Border	1.3 - 2

Table 5.8 *Typical Commuting Conditions for Cage (TX-600 SPUR) from US 281 to US/Mexico Border*

Step 6: Identify & Assess Congestion Strategies

Creating solutions supported by data analysis

Viable solutions to combat traffic congestion include an array of strategies that can be categorized into 4 main categories. A combination of Demand Management, Traffic Operations, Public Transportation, and Roadway Improvements is the recommended solution to effectively manage congestion. The most appropriate strategy for a corridor depends heavily on the local context. For example, promoting alternative modes like bike lanes or sidewalks near border crossings with high truck traffic delays wouldn't be practical. This is due to two key factors: first, safety concerns for cyclists sharing lanes with large trucks, and secondly the function of the corridor is to swiftly and efficiently move commercial trucks to and from the port of entry to the interstate.

Demand Management

Demand management strategies aim to reduce the amount of single occupancy vehicles using transportation infrastructure during the AM and PM peak hours. This type of strategy primarily relies on policy changes to encourage behavior modifications among commuters, minimizing the need for additional infrastructure construction. Demand management is a relatively low-cost options that alters the commuter behavior instead of changing the built environment which can be costly, labor intensive, and require more materials. It is recognized as a more sustainable transportation solution which addresses the Second Principle of promoting a sustainable network and more specifically, Objective 6, which is to gather qualitative information regarding sustainable transportation (see page 5). By maximizing existing infrastructure, it reduces the need for construction activities and their environmental impact. A limitation is that it is not easily implementable by the RGVMPO or Local Governments, as options such as telecommuting and flexible work hours are at the employer's discretion. TxDOT's commitment to flexible work schedules serves as a model for other organizations. By reducing the number of vehicles on the road during peak hours, this program demonstrates a proactive approach to congestion management.

- Promoting alternatives
- Congestion pricing
- Flexible Work Hours Programs (TxDOT)
- Telecommuting
- Support/encourage mixed use development
- Development of policies that support TOD
- Carpooling incentives

Traffic Operations

These set of strategies focus on the maintenance and operations within a transportation network. A key focus for the RGVMPO in the coming years is optimizing traffic signal timing. Additionally integrating accessible traveler information systems to keep commuters informed about real-time traffic conditions is a low cost and effective option. Our organization, alongside our planning partners, has been actively involved in the development of a statewide 511 system for Texas, similar to the existing DriveTexas.org website, which will offer real-time traffic alerts and advisories. This would allow drivers to make informed decisions about their journeys, ultimately contributing to a safer and more efficient network.

- Promoting alternatives
- Access management
- Traffic Signal Timing Optimization
- Transit Signal Priority
- Traffic Calming
- Traveler Info. Systems (511)
- HERO Program
- Law Enforcement

Public Transportation

Providing a safe, reliable, and convenient public transportation option is a highly equitable and sustainable solution. A comprehensive RGVMPO Resilience and Sustainability Analysis (linked here) produced in 2023 indicates that "Investing in service improvements for both transit-dependent and choice riders removes cars from the road and leading to a significant reduction in greenhouse gases, localized air pollution, and congestion." Regional connectivity is a high priority for RGVMPO transportation planning. With four public transportation providers across all three counties in our Metropolitan Area Boundary (MAB), most of our highly congested corridors are covered by transit routes. Valley Metro services are offered region-wide, with routes from Rio Grande City (Starr County) to Brownsville and Port Isabel (Cameron County). Valley Metro also provides demand response services to Willacy and Zapata Counties. Brownsville, McAllen, and Island Metro service their respected municipalities with connection to Valley Metro transit routes.

The Rio Grande Valley's (RGV) transit providers are dedicated to increasing efficiency and convenience. By maintaining a reliable transit system, Valley Metro, Brownsville Metro, Metro McAllen, and Island Metro retain existing passengers and attract new riders as well. Whether traveling by personal vehicle or utilizing public transportation, heavily congested areas delay travel times. During peak traffic congestion, one bus carrying 10-15 passengers is highly preferred over 10-15 single-occupancy vehicles. Enhancing transit route frequency, extending operating hours, and adjusting the distance between bus stops/shelters improve overall travel time. Continued efforts by our region's transit providers help alleviate congestion by scheduling accurate levels of service, adjusting route alignments, strategically placing stops, shelters, and stations along transit corridors. The RGVMPO Transit TIP provides an opportunity for both planning and funding transit projects for up to four years. Selecting projects that cater to system reliability, safety, and efficiency helps address federal performance measures and mitigate congestion throughout the region.

Operating assistance projects assist with achieving higher levels of service and enhancing bus/van drivers' on-time performance. Bus station(s), bus stops, and transit terminal projects improve existing infrastructure and new facilities. Scheduling software such as Swiftly provides transit planners and dispatchers with support needed for maintaining existing routes and expanding coverage as needed. Preventive maintenance is vital to transit providers in avoiding vehicle breakdowns therefore increasing the reliability of a fully functioning route. Maintenance facilities are necessary for rehabilitation of existing fleet vehicles and when new vehicles and equipment are purchased, providers benefit from modern advancements in performance and technology.

Revenue, Equipment, & Facility assets (vehicles/equipment) that have met or exceeded their useful life benchmark should be repaired or replaced and facilities with a condition rating below 3.0 should be repaired or replaced. Initiatives and investments incorporated into programming of Transit TIP projects will address concerns related to asset management. Safety Initiatives and investments for reducing fatalities, injuries, reportable events, and mechanical failures are incorporated into programming of Transit TIP projects. RGV transit providers address congestion by increasing ridership, adjusting fixed routes, adding on-demand services, enhancing facilities (such as stations, stops, and shelters), and improving the quality & efficiency of overall service. Subscriptions to scheduling and dispatching software are renewed annually, assisting planners and dispatchers with route designations. Preventive maintenance is necessary for the prevention of vehicle breakdowns and addressing safety concerns with fleet operations. If public transit vehicles are regularly maintained and/or replaced, the chances of service interruptions are significantly reduced. Transit planners adjust route alignments based on ridership and strive to serve the areas with higher demands. To encourage ridership and directly address congestion caused by single-occupancy vehicles, the RGVMPO consulted with local transit providers and identified the following strategies:

- Realigned transit service
- Bus Rapid Transit (BRT)
- Vanpooling
- Enhanced transit amenities and safety
- Bike/Ped connectivity with transit
- Bike racks

Roadway Improvements

These set of strategies represent the most capital-intensive solutions to address congestion management. While added capacity projects may be necessary, it is recommended to consider the solutions above before resorting to these types of roadway improvements.

- Center turn lanes
- Intersection improvements
- Overpasses or underpasses

Congestion and Delay Study: Traffic Signal Optimization

The majority of the segments found to be congested would improve by optimizing and coordinating the signals along the corridors. In general, much of the study network would see substantially improved operations before requiring larger capital expenditures. Of the roadway segments that were congested, 59% would improve to acceptable levels with optimized and coordinated signal timing. The signals shown are primarily those that are maintained by cities with populations greater than 50,000. This threshold is the point where TxDOT turns over maintenance of on-system signals to the respective city. These signals are coupled with those that were recently optimized and coordinated through a City of McAllen funded effort. Leveraging that recent effort by continuing the coordination across city limit lines would allow the region to benefit from the combined effort.

FHWA provides guidance for appropriate funding for staffing and maintenance of traffic signals. The local funding for those areas has been less than ideal. That has now led to signal systems around the region not operating well and therefore contributing to the delays observed. Traffic signals include computers that have the functionality to move traffic with less delays than those experienced in the Valley.

Signal timing continues to be an area that deserves attention within the region to allow maximum efficiency of the existing system before costly widening to add capacity. Signal timing optimization and coordination facilitate smoother operations, less stops, less delay, improved fuel economy, lower vehicle emissions, and less headaches for drivers. The cost / benefit of signal timing projects far exceeds projects 100 times as expensive and can be accomplished in far less time and much less impact to drivers and property owners to endure roadway construction.

Signal timing improvements are a relatively inexpensive way to make significant improvements on a transportation network. Improved signal timing can decrease delay by appropriately allocating green time among competing phases. This allows more traffic to pass through the signal with less delay. By adjusting cycle lengths and offsets, drivers can travel longer distances along a corridor before having to stop for a red light. This decreases travel time and improves air quality. Both signal timing optimization and traffic signal progression are low-cost improvements to make the best use of existing capacity and optimize allocation of funding. The cost for a signal timing improvement project varies depending on the number of traffic signals, the controller capabilities, vehicle detection condition, the location of the traffic signals and adjacent signals, the number of timing plans required, and implementation and fine-tuning needs. The results will be very evident as has been demonstrated previously with localized projects. A regional perspective would produce consistent travel time runs even when crossing from one city / agency to another.

Also, research has shown that coordinated signal timing will not only reduce delay and gas consumption but will also improve safety by reducing stop and go traffic. This will in turn reduce rear end crashes.

Step 7: Implement Data Driven Strategies & Procedures

Plan for the execution of congestion management strategies

To implement the strategies evaluated in Step 6 effectively, the RGVMPO intends to restructure the current project prioritization process to better address congestion for projects programmed in our short- and long-range plans. This approach will ensure that resources are allocated efficiently, targeting the areas with the most significant impact on traffic flow. By refining the prioritization process for the future programming of funds, we aim to enhance overall transportation efficiency, improve the quality of life for our community, and achieve the three key principles identified in the first step which are to reduce traffic congestion and Increasing travel time reliability, promote a sustainable network, and enhance commercial vehicle connectivity.

The following sections describe several funding sources programmed in the 4-year RGVMPO Transportation Improvement Program (TIP) for both Highway and Transit projects. To an extent, the organization is authorized to establish scoring criteria for several funding categories listed below to essentially determine project prioritization and ensure that congestion issues are being addressed and solved. The tables accompanying the categories described below include a overview of project details, including the project name, planned year of implementation, and estimated funding allocation.

Category 7 – Metropolitan Mobility and Rehabilitation (Highway)

The Rio Grande Valley Metropolitan Planning Organization (RGVMPO) has been actively restructuring its project scoring system for the Category 7 – Metropolitan Mobility and Rehabilitation program to prioritize congestion relief. This continuous restructuring process aims to ensure that congestion is a key component in evaluating and selecting projects for funding. By incorporating congestion metrics, the RGVMPO seeks to identify and support projects that will significantly improve traffic flow, reduce travel time, and enhance overall mobility within the region. This strategic focus is intended to address the growing transportation demands of the Rio Grande Valley, thereby improving the efficiency and safety of the transportation network. While this list of projects is not exhaustive, the organization plans to expand upon this section in future technical reports and updates to the Congestion Management Process as additional data becomes available through the data collection software mentioned in Chapter 4.

Category 7 Projects Programmed to Alleviate Congestion		
Project Name	**Year**	**Estimated Funding**
Nolana Loop	2024, 2027, 2028	$28,390,000
Twin Span Bridge	2024	$2,000,000
East Loop	2027	$880,000

Category 9 – Transportation Alternatives Set-Aside Program (TASA)

The Rio Grande Valley Metropolitan Planning Organization (RGVMPO) utilizes Category 9 – Transportation Alternatives Set-Aside Program funding to address congestion by promoting alternative transportation options. By investing in projects like trails, sidewalks, and bike paths, the RGVMPO aims to reduce the reliance on vehicular travel, thereby alleviating congestion on roads. These alternative transportation projects not only provide safe and convenient routes for non-motorized travel but also encourage a shift towards more sustainable and healthier transportation modes. This approach is part of the broader strategy to create a more balanced and efficient transportation system in the Rio Grande Valley, enhancing overall mobility and accessibility while mitigating traffic congestion.

Programmed Category 9 Projects Alleviating Congestion		
Project Name	**Year**	**Estimated Funding**
McAllen Vision Zero Planning Study	2022	$150,000
Hidalgo County Active Mobility Plan	2023	$330,000
B-M-G Trail Extension	2025	$544,000
Freddy Gonzalez Intersection Improvements	2025	$579,000
Underground Trail Passing	2027	$2,797,000

Category 10 – Carbon Reduction Program (Transit & Highway)

The Rio Grande Valley Metropolitan Planning Organization (RGVMPO) leverages Category 10 – Carbon Reduction Program funding to mitigate congestion through projects that also contribute to lowering carbon emissions. By focusing on sustainable transportation solutions such as public transit enhancements, electric vehicle (EV) infrastructure, and intelligent transportation systems (ITS), the RGVMPO aims to create a more efficient and environmentally friendly transportation network. These initiatives not only help reduce greenhouse gas emissions but also improve traffic flow and decrease congestion by promoting alternative modes of transport and optimizing existing infrastructure. This dual approach aligns with broader goals of enhancing air quality and achieving long-term congestion relief in the region.

Programmed Category 10 Projects Alleviating Congestion		
Project Name	**Year**	**Estimated Funding**
Pharr Bridge Commercial Vehicle Parking Site	2024	$11,440,000
Bus Passenger Loading Areas and Facility Improvements	2026	$920,000
Countywide Light Synchronization Projects	2025	$1,890,000
Southmost Nature Trail Phases	2026 & 2027	$7,500,000

Section 5307 – Urbanized Area Formula Funding program (Transit)

The Urbanized Area Formula program (49 U.S.C. 5307) makes federal funding available to urbanized areas for transit capital and operating assistance and for transit-related planning activities. Funding for the formula program is determined based on the level of transit service provision, population, and other factors.

The RGVMPO has $69,060,479 programmed in FY 2025-2028 TIP. Project descriptions include but are not limited to Preventive Maintenance, Dispatching and Scheduling Software, Operations, and Facility Improvements. A key project example HCVM-123 & 129 - The Valley Metro Transit Terminal and Maintenance Facility Construction will greatly contribute to the CMP by providing a new station for departures, transfers, and arrivals. The maintenance facility will assist in asset management and addressing safety measures. This project will not just contribute to the frequency and efficiency of transit routes, but it will help keep riders and operators safe.

Section 5310 – Enhanced Mobility of Seniors and Individuals with Disabilities (Transit)

The Enhanced Mobility program provides formula funding to assist in meeting the transportation needs of the elderly and persons with disabilities when the primary transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. The purpose of this program is to enhance mobility for seniors and persons with disabilities by providing funds for programs to serve the special needs of transit-dependent populations beyond traditional public transportation services and paratransit services. Funds from the 5310 program can be used for both capital improvements and operating expenses.

The RGVMPO has $4,610,205 programmed in the FY 2025-2028 TIP. Project descriptions include but are not limited to ADA Coordinator, Paratransit, Mobility Management, Administration and Capital. A key project example is HCMM-084 & 085 – Paratransit ADA Accessible Vehicle Purchases are accommodations for our region’s elderly and individuals who struggle with disabilities. Individuals who require assistance will be able to travel safely and efficiently to medical facilities and pharmacies while visiting retail outlets, dining, public buildings, and educational institutions. Riders may utilize both the McAllen Central Station and Northside Transfer Station for arrival and departure.

Section 5339 – Bus and Facilites (Transit)

The FAST Act updated this previously formula-based program (49 U.S.C. 5339) authorizes FTA to award Bus Program grants through a competitive process. This provides capital funding to states and designated recipients to replace, rehabilitate, and purchase buses, vans, and related equipment, and to construct bus related facilities and is intended to improve the condition of the nation's public transportation bus fleets, expand transportation access to employment, educational, and healthcare facilities, and to improve mobility options in rural and urban areas throughout the country. This is tied to Transit Asset management and Safety directives and includes prioritization for projects that demonstrate connectivity and implementation of advanced technologies.

The RGVMPO has $3,082,672 programmed in FY 2025-2028 TIP. Project descriptions include but are not limited to Rehab/Renovate Stations/Stops/Terminals, Capital Improvement, Fleet Overhauls, and Support Equipment. A key project example is PHRBMPO158 – Rehab/Renovate: Administration/Maintenance Facility with improvements to Stations/Stops/Terminals – This project will fund rehabilitation and renovation to Brownsville Metro's administration and maintenance facilities with additional improvements to bus stations and stops. Enhancing the effectiveness of existing facilities and bolstering confidence in the overall transit system promotes ridership. Transit can remove a significant number of single-occupancy vehicles from the most congested roadways and utilize road space systematically.

Step 8: Monitor Effectiveness of Implemented Strategies

Evaluating the efficacy of congestion management strategies

Evaluating the efficacy of congestion management strategies within the Rio Grande Valley involves a comprehensive analysis of various performance measures across all programmed projects aimed at alleviating congestion. The RGVMPO utilizes a range of metrics to assess the impact of these projects, including traffic volume reductions, travel time savings, and improvements in vehicle speed and flow. Additionally, metrics such as reduced emissions, increased public transit ridership, and enhanced pedestrian and cyclist safety are considered to provide a holistic view of the strategies' effectiveness. Surveys and feedback from residents provide insight into the user experience and satisfaction with new infrastructure, while data collection and analysis enable the RGVMPO to monitor progress and make data-driven adjustments to optimize outcomes. By comparing pre- and post-implementation data, the RGVMPO ensures that the projects are meeting their intended goals of reducing congestion and improving overall transportation efficiency in the region, and by rigorously monitoring performance indicators, the RGVMPO plans to continually refine strategies to effectively alleviate congestion and guide future investments towards a sustainable and efficient transportation system for the Rio Grande Valley.

To maintain data accuracy in the congestion management process, a technical report evaluating the CMP network can be generated biennially to coincide with the adoption schedule of RGVMPO Transportation Improvement Programs. A comprehensive update to the CMP is planned to be conducted every four to five years to align with the adoption cycle of Metropolitan Transportation Plan updates. This cyclical approach ensures that congestion management remains current and relevant to evolving transportation needs. Consistent with this timeline, a technical report is scheduled for completion in 2026 for inclusion in the future 2027-2030 TIP, and a comprehensive update is slated in 2030 for inclusion in the 2055 MTP.

Conclusion

Results & Future Processes

The established Congestion Management Process (CMP) to addresses traffic congestion challenges in the region by detailing FHWA's eight steps, highlighting congested areas, strategies, and funding sources utilized to tackle congestion and improve mobility.

The CMP identified bottlenecks, peak hour travel patterns, and infrastructure limitations as key contributors to congestion. The RGVMPO utilizes various data sources, including TTI, TTRI, and bottleneck analysis, to identify congested areas and measure the effectiveness of implemented strategies. A combination of strategies address congestion, including demand management, traffic operations improvements, public transportation enhancements, and targeted roadway improvements. Our organization will continue to explore the integration of intelligent transportation systems (ITS) and other emerging technologies to optimize traffic flow and improve network efficiency. The RGVMPO monitors the effectiveness of implemented strategies through metrics like traffic volume reduction, travel time savings, and public transit ridership to ensure projects meet their congestion reduction goals. Most importantly, the RGVMPO is committed to continuously refining the CMP by incorporating new data sources, technologies, and best practices.

Improving public transport can significantly reduce congestion by planning and programming projects that promote effective strategies. Increase frequency and reliability by ensuring that buses, vans, trollies, and or commuter rail run frequently and timely, making public transport more appealing to commuters. Lower fares create affordable options that encourage more people to participate in the use of transit services. Improvements to comfort, cleanliness, and safety enhance the quality of service while expanding coverage extends the network to underserved areas. Integrating various modes of transport, such as buses, railcars, scooters and bicycles minimizes reliance on motor vehicles. Park and ride facilities encourage people to park their vehicles and use public transportation for the remainder of their commute. Bus rapid transit with priority lanes are plans for the near future but commuter rail will eventually be a viable option. Ultimately, the CMP aims to encourage an integrated multimodal transportation network by promoting both public transit and active transportation, guiding the allocation of capital and operational improvements within the Transit Improvement Program (TIP). The RGVMPO Congestion Management Process (CMP) identifies Public Transportation as an effective solution to improve traffic congestion by reducing the number of single occupancy vehicles on the road.

The RGVMPO recommends leveraging various funding sources, such as Category 7, Category 9, and Category 10 programs, to prioritize congestion relief projects and promote alternative transportation options. We continue to work collaboratively with TxDOT and other planning partners to secure adequate funding for congestion relief projects. By implementing these future processes, the RGVMPO strives to ensure the continued effectiveness of the CMP and achieve long-term sustainable mobility solutions for the Rio Grande Valley.

Appendix

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