Rio Grande Valley Multimodal Freight Network Designation

Rio Grande Valley Freight and Trade Transportation Plan

Final: October 2, 2020

Contents

Exhibits

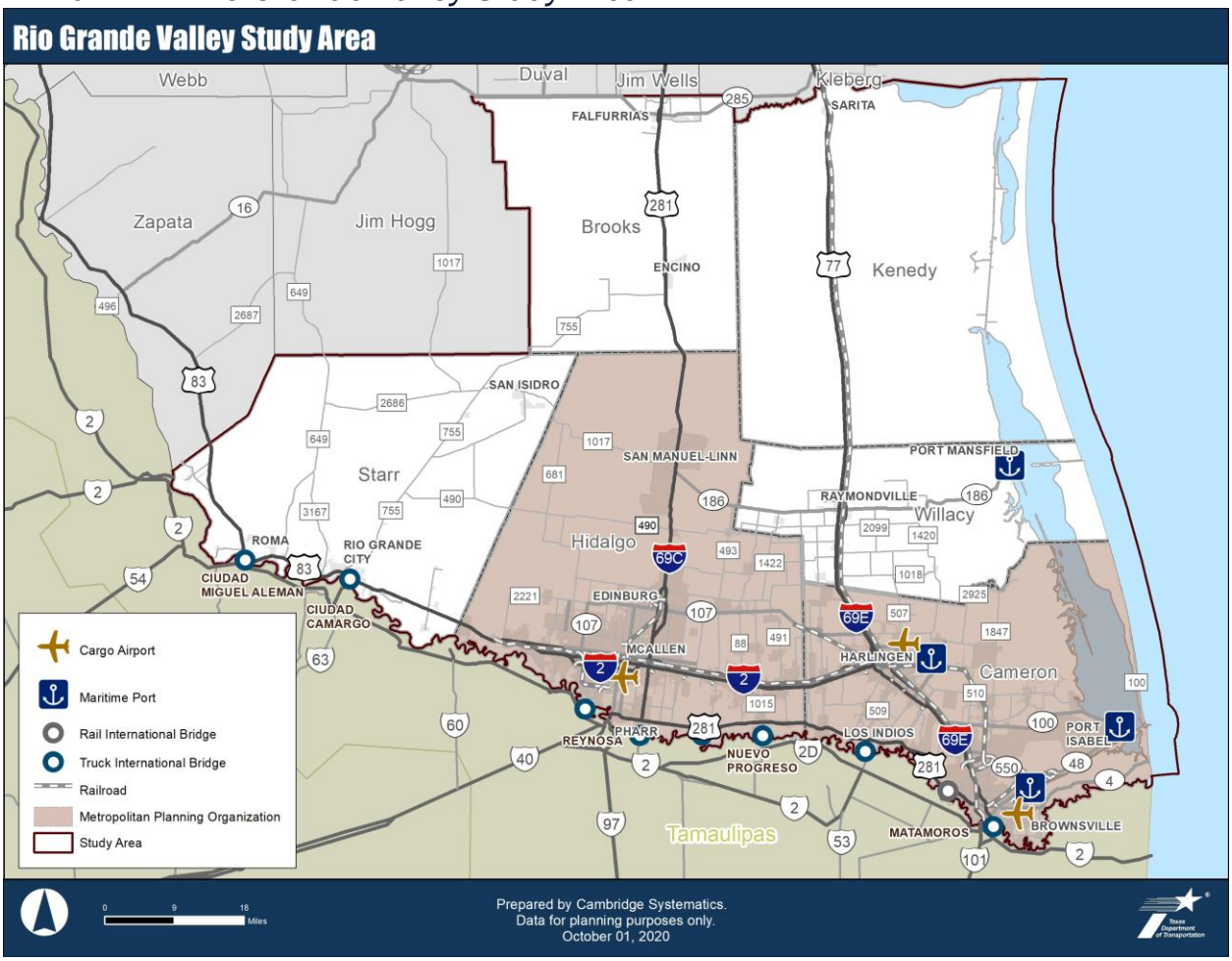
Acronyms

BPOE	Border Port of Entry
BTMP	Border Transportation Master Plan
BTS	Bureau of Transportation Statistics
CRFC	Critical Rural Freight Corridor
CUFC	Critical Urban Freight Corridor
FAST	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FTZ	Foreign Trade Zone
GIS	Geographic Information Systems
MPO	Metropolitan Planning Organization
NAICS	North American Industry Classification System
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
OS/OW	Oversize/Overweight
PHFS	Primary Highway Freight System
RGV	Rio Grande Valley
RGVHFN	RGV Highway Freight Network
RGVMFN	RGV Multimodal Freight Network
RGVSC	RGV Steering Committee
SAM	Statewide Analysis Model
TFMP	Texas Freight Mobility Plan
THFN	Texas Highway Freight Network
TMFN	Texas Multimodal Freight Network
TxDOT	Texas Department of Transportation
TxFAC	Texas Freight Advisory Committee
UP	Union Pacific
WA	Work Authorization

1.0 Introduction

During the development of the 2018 Texas Freight Mobility Plan (TFMP), stakeholder engagement workshops were held throughout the state, including four in the Rio Grande Valley (RGV), to discuss freight issues impacting the region and the state. During these workshops, as well as meetings of the Texas Freight Advisory Committee (TxFAC), freight movement and trade at the Texas-Mexico border were identified as significant contributors to regional, statewide, and national economic vitality. This project builds on the work started by the Texas Department of Transportation (TxDOT) with the TFMP by creating a regional freight plan covering the six counties of Brooks, Cameron, Hidalgo, Kenedy, Starr, and Willacy as shown in Exhibit 1. Additionally, the project complements the concurrent Border Transportation Master Plan (BTMP) which will identify transportation issues, needs, challenges, and opportunities and strategies of moving people and goods across the border, the border regions, and beyond.

Exhibit 1: Rio Grande Valley Study Area



1.1 Context of this Memorandum

TxDOT is developing a Rio Grande Valley Regional Freight and Trade Transportation Plan ("Regional Freight and Trade Plan"). This Regional Freight and Trade Plan is critical given the importance of the RGV to freight movement in Texas and nationally. The region is linked to many strategic Texas supply chains such as manufacturing, agriculture, and energy production, particularly through international trade activity. To complete this Regional Freight and Trade Plan, the following technical tasks will be completed:

- **Task 2.1: Develop Goals and Objectives.** Develop goals and objectives for the Regional Freight and Trade Plan in alignment with existing and ongoing planning efforts and stakeholder input.
- **Task 2.2: Regional Data Collection, Inventory and Analysis.** Collect, review, and analyze plans, studies, and data relevant to the RGV region. This task will culminate in a Geographic Information Systems (GIS) database that will be updated throughout plan development.
- **Task 2.3: Regional Trade and Freight Corridor and Network Identification.** Identify transportation assets to be included in the Regional Multimodal Freight and Trade Network through data analysis and stakeholder input. This task will culminate in the freight network used to prioritize recommendations and ultimately to update the TFMP. *This task is the subject of this memorandum.*
- **Task 2.4: Existing Regional Freight and Trade Needs Identification and Assessment.** Identify and assess the existing conditions, issues, and trends related to freight and trade movement in the region. This task will culminate in a needs assessment identifying the types and locations of high priority needs in the region and form the basis for implementation recommendations.
- **Task 2.5: Regional Trade and Freight Commodity Flow Profile.** Describe current freight and trade movements in the region using commodity flow and border crossing data. This task, in combination with Task 2.6, will culminate in a commodity flow and forecast summary.
- **Task 2.6: Regional Trade and Freight Forecasting.** Forecast commodity flows and freight movements for 2030, 2040, and 2050 and estimate the impact of freight growth on the transportation network. This task, in combination with Task 2.5, will culminate in a commodity flow and forecast summary.
- **Task 2.7: Regional Trade, Freight, and Economic Analysis.** Document the importance of the RGV's freight and trade movements to the regional, state, and national economy by quantifying jobs, income, gross regional product, and tax revenue related to freight and trade activities. This task will culminate in a summary of economic importance and fact sheets.

- **Task 2.8: Regional Land Use and Community Impacts.** Assess current and planned land use for industrial, commercial, and residential uses as it relates to the freight transportation network. This task will culminate in a summary of land uses, potential economic development opportunities, and environmental justice concerns.
- **Task 2.9: Regional Project Identification and Prioritization.** Identify transportation strategies to improve freight and trade movement in the region and prioritize projects based on the needs assessment completed in Task 2.4. This task will culminate in a prioritized list of strategies to include projects, programs, and policies.
- **Task 2.10: Regional Recommendations and Investment Plan.** Refine recommendations based on the strategy identification and prioritization conducted in Task 2.9. This task will culminate in a Freight Investment Plan for the RGV.
- **Task 2.11: Implementation and Action Plan.** Develop an implementation and action plan describing responsible parties, timeframes, and funding options for the recommendations identified in Task 2.10.
- **Task 2.12: Final Plan Documents.** Develop a final Regional Freight and Trade Plan and Executive Summary consolidating the technical and stakeholder engagement tasks completed throughout this project.

1.2 Organization of this Memorandum

This memorandum documents the process and outcome of designating the Rio Grande Valley Highway Freight Network (RGVHFN) and the Rio Grande Valley Multimodal Freight Network (RGVMFN). This network will be the basis for the needs assessment and project prioritization to be conducted in Tasks 2.4 and 2.9. The remainder of this memorandum is organized into the following sections:

- Section 2.0: Texas Highway Freight Network
- Section 3.0: Rio Grande Valley Highway Freight Network
- Section 4.0: Non-Highway Modes in the Rio Grande Valley
- Section 5.0: Rio Grande Valley Multimodal Freight Network

2.0 Texas Highway Freight Network

The foundation for the RGVMFN is the Texas Multimodal Freight Network (TMFN). The TMFN includes the Texas Highway Freight Network (THFN) and railroads, ports, waterways, airports, and border crossings that serve freight. The THFN is the portion of the state's highway network most critical to the state-wide movement of freight. Designation of the THFN was a key policy outcome of the adopted 2018 TFMP and includes the following:

- Texas' portion of the Federal Highway Administration (FHWA) designated National Highway Freight Network (NHFN).

- Texas Highway Trunk System (Trunk System) (codified in the Texas Administrative Code Title 43, Part 1, Chapter 16, Subchapter B); and
- Other corridors significant to moving freight in Texas, as identified in the THFN designation process.

The definition and designation of these components are summarized below.

2.1 National Highway Freight Network

National Highway Freight Network (NHFN) – The NHFN, consisting of 57,848 miles, designated by FHWA, is currently comprised of the following components:

- Primary Highway Freight System (PHFS) – The 41,514 miles of the PHFS was designated by the Federal Highway Administration (FHWA) based on eight factors:
  - Origins and destinations of freight movement in the United States;
  - Total freight tonnage and value of freight moved by highways;
  - Percentage of annual average daily truck traffic in the annual average daily traffic on principal arterials;
  - Annual average daily truck traffic on principal arterials;
  - Access to land and maritime ports of entry;
  - Access to energy exploration, development, installation, or production areas;
  - Access to population centers; and
  - Network connectivity.

Texas' portion of the PHFS totals 3,727.77 miles.

- Non-PHFS Interstates - The Fixing America's Surface Transportation (FAST) Act included the entirety of the Interstate System—including Interstate facilities not located on the PHFS—in the NHFN. The FHWA may update the maps and tables on a periodic basis, incorporating any Interstate System routes added to the Interstate System. The FAST Act restricts National Highway Freight Program (NHFP) funding from Non-PHFS Interstates in states deemed high mileage states, defined as having more than two percent of the National PHFS. Texas is classified as a high mileage state and thus cannot use NHFP funding on Non-PHFS Interstates.

In addition, as part of the FAST Act, FHWA allocated additional miles to each state, based on its PHFS mileage, to designate to the NHFN. These miles are eligible for NHFP funds and are referred to as:

- Critical Urban Freight Corridors (CUFC) – Key freight highway facilities in urbanized areas (defined by the U.S. Census Bureau); and

- **Critical Rural Freight Corridors (CRFC)** – Key freight highways located outside of urbanized areas.

Texas may designate as CUFCs a maximum of 10 percent of the PHFS mileage in the state (372.78 miles); and may designate as CRFCs a maximum of 20 percent of the PHFS mileage in the state (745.55 miles).

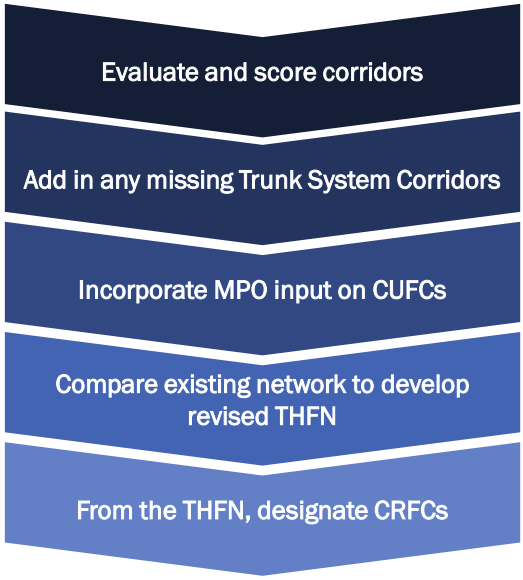
2.2 The Texas Highway Trunk System

The Texas Highway Trunk System is a network of rural divided highways that complements and includes elements of the Interstate Highway System. The Trunk System is limited to a maximum of 11,500 miles, of which 491 miles are in the RGV. The Trunk System is chosen by the Texas Transportation Commission as recommended by the TxDOT Executive Director. Routes on the Trunk System should meet at least one of the following criteria:

1. Maximizing the use of existing four-lane divided roadways;
2. Minimizing circuitous or indirect routing;
3. Connecting with principal roadways from adjacent states;
4. Connecting with principal deep-water ports with channel depths of 40 feet or more;
5. Connecting with principal Mexican ports of entry;
6. Serving significant military or other national security installations;
7. Serving tourism or recreational areas;
8. Comprising major truck routes;
9. Within 25 miles or less of cities of 10,000 population or greater;
10. Closing gaps in the existing state highway system; and
11. Providing system connectivity.

2.3 *Defining and Designating the Texas Highway Freight Network*

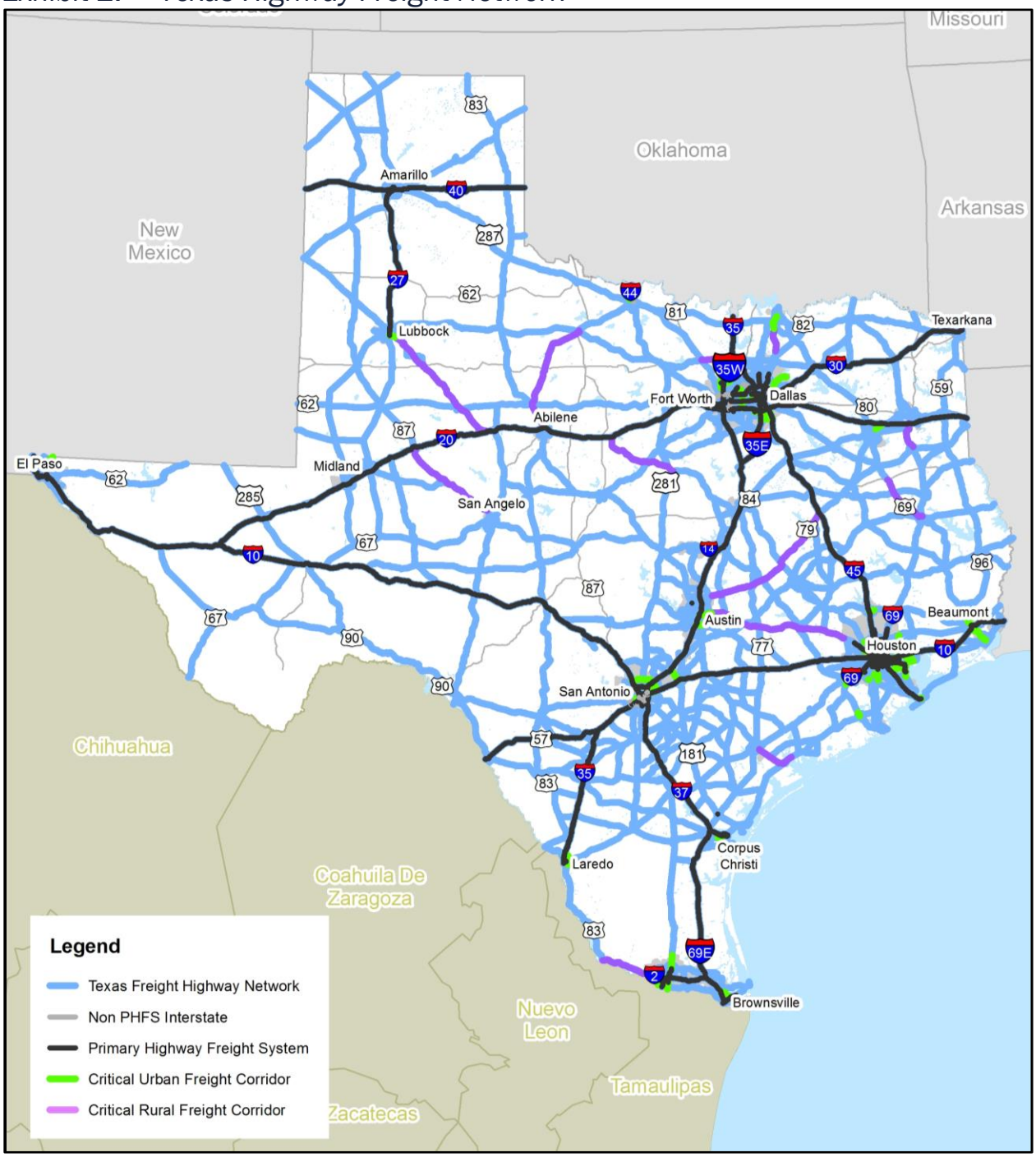
The THFN was designated through a systematic, data-driven and stakeholder-informed process, which is summarized to the right.



- **Step 1** – The evaluation of corridors was conducted using a customized designation tool that used a multicriteria analysis to score every segment on every corridor. Input from stakeholders across the state as well as the Texas Freight Advisory Committee (TxFAC) informed the development and weighting of the criteria.
- **Step 2** – Once the segments were scored, the results for the corridors in the top three and top four scores were compared against the previously adopted THFN, the Trunk System, and input from stakeholders, and adjusted accordingly.
- **Step 3 –** Under the FAST Act, metropolitan planning organizations (MPOs) with a population of more than 500,000 are responsible for identifying CUFCs in their urbanized areas, in consultation with TxDOT. TxDOT provided MPOs with a mileage limit based on population. MPOs selected and submitted their CUFC proposals to TxDOT, which were then incorporated into the THFN.
- **Step 4 –** The next step was to designate CRFCs from the scored THFN. The process started with identifying the universe of candidate facilities within Texas which included any facility meeting one or more of the criteria provided in the FAST Act. Next, each candidate facility was scored based on the number of criteria met and the top scoring facilities became the pool from which the final designation was made. The final designation was a result of input from stakeholders and TxFAC.

The final 2018 THFN with designated CUFCs and CRFCs is shown in Exhibit 2. It consists of 21,861 miles, of which 1,095 miles are in the RGV. CUFCs in the RGV include segments of FM 396, FM 511/SH 550, FM 1016 FM 2061, I-2, I-69, US 281, and US 83.

Exhibit 2: Texas Highway Freight Network



Source: 2018 Texas Freight Mobility Plan.

3.0 Rio Grande Valley Highway Freight Network

The designation of the RGVMFN follows the process used at the state level with modifications tailored to the critical industries and infrastructure supporting the region's

freight and trade activity. The highway portion of this network was designated using four guiding principles:

- A data-driven approach that used the latest available and vetted data;
- A stakeholder-informed process that incorporated input from numerous sources, including the Rio Grande Valley Steering Committee (RGVSC), stakeholder meetings held throughout the region and the state, and meetings with private sector and modal stakeholders;
- Transparency of criteria being used, data sources, and analytical processes; and
- Replicable process facilitated by a common framework that utilizes GIS-based tools and data.

3.1 Quantitative Scoring Process

The initial designation of the RGVHFN utilized four types of analysis, or factors: economic analysis, goods movement, supply chain for targeted industries, and market access and connectivity. The aspects examined within each of the factors are described below:

- **Economic Preparedness**: socioeconomic factors and economic activity generators along a roadway segment;
- **Goods Movement**: truck volumes, tonnage, and value of freight moving on a roadway segment;
- **Supply Chain**: number and size of businesses in the agriculture, energy, and transportation/warehousing sectors being served by a roadway segment; and
- **Market Access**: intermodal connectivity (connections to rail, pipeline, sand mine, airport, etc.), connectivity to key domestic and international trading partners, and connections to international ports of entry.

The relative importance of these four factors was determined by input from the RGVSC. Committee members rated each factor on a scale from 1 (not important/relevant) to 5 (very important/relevant). The goods movement category received the greatest consensus around its importance for designating the network (Exhibit 3). Economic preparedness and market access followed, and the supply chain factor had the lowest rating. Based on this input, the factors were given the maximum scores shown in Exhibit 4, for a maximum total score of 100.

Exhibit 3: RGVSC Ratings of Designation Factors

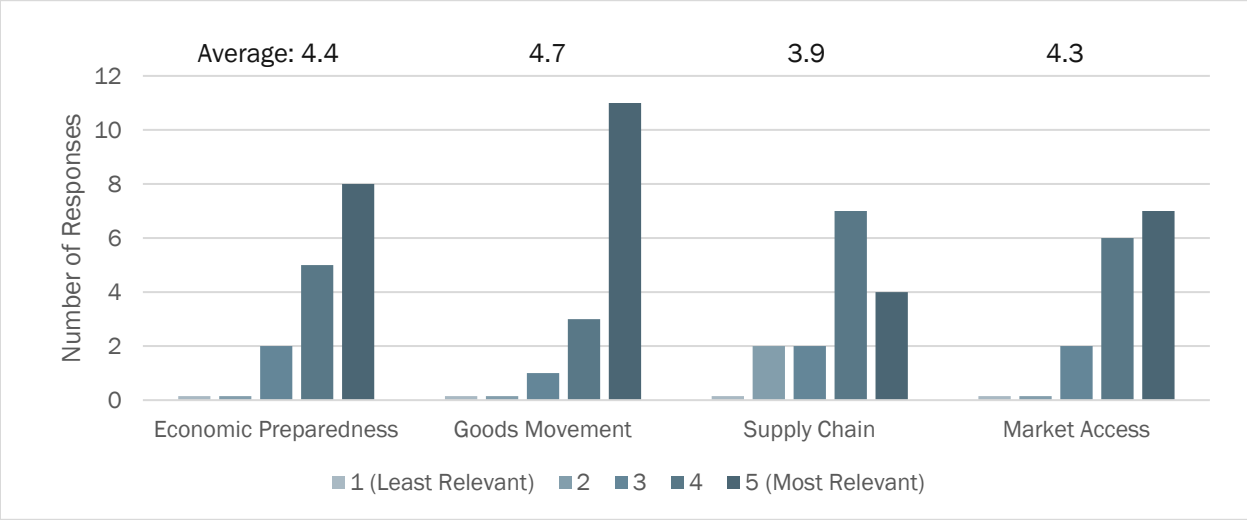


Exhibit 4: Resulting Weights of Designation Factors

Several criteria within each factor were identified and analyzed to derive a score for each. All criteria within a given factor were weighted equally and scaled to arrive at the maximum scores listed above.

3.2 Economic Preparedness Analysis

The economic preparedness factor measures the market activities that interact with freight transportation in the RGV. Four key industries were selected for analysis based on findings from stakeholder interviews: agriculture, mining/gas/oil, manufacturing, and transportation/warehousing. These industries were used throughout the designation process, adjusting their definition to the granularity of each data source. For example, some data sources group all agricultural-related employment or freight into a single agriculture commodity group. Others allow further division into specific crops or products.

Exhibit 5 displays the criteria incorporated into the economic preparedness factor. Each was weighted equally and then scaled to reach a total score of 25 according to the scoring process shown in Exhibit 4. All of the criteria in this category are based on demographic and employment data from the U.S. Census at the census tract level, and they were scored by

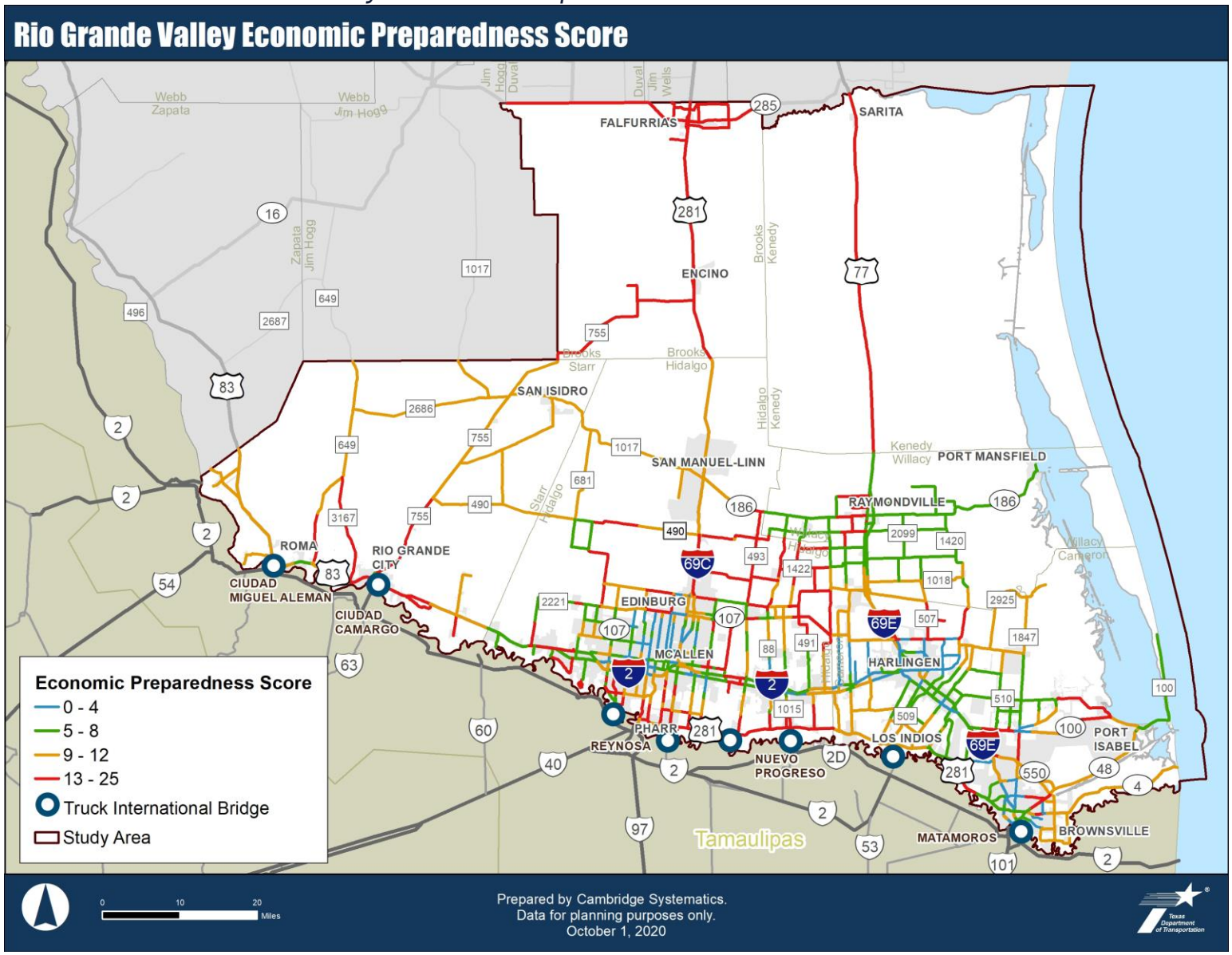
comparing local statistics to statewide averages. For example, the Texas population grew by about nine percent from 2010 to 2015. If the population of a census tract in the RGV grew by 18 percent over the same period, it grew twice as fast as the state (200 percent of statewide growth). Similarly, the employment intensity criteria measured the relative concentration of four industries in each census tract. For example, approximately five percent of Texas employment was in the transportation/warehousing sector in 2015. If ten percent of a census tract's employment was in that sector, its relative intensity is 200 percent. Census tract data were joined to the highway network based on the tract(s) each highway segment traverses. If the highway segment intersects multiple tracts, the tract containing the greatest length of the segment was used.

Exhibit 5: Economic Preparedness Metrics and Scoring Methodology

Metric	Data Source(s)	Value Range	Scoring Method	Description
Population Growth	U.S. Census 2010/2015	0 – 1,468%	< 100%: 0 100 – 149%: 1 150 – 199%: 2 200 – 249%: 3 250 – 299%: 4 300% or more: 5	Growth rate of tract compared to statewide growth rate. All negative growth rates scored as 0.
Employment Intensity: Agriculture	U.S. Census 2015	0 – 4,418%	<75%: 0 75 – 99%: 1 100 – 124%: 2 125 – 149%: 3 150% or more: 4	Employment in the agriculture industry compared to statewide average.
Employment Intensity: Mining/oil/gas	U.S. Census 2015	0 – 915%	<75%: 0 75 – 99%: 1 100 – 124%: 2 125 – 149%: 3 150% or more: 4	Employment in the mining/oil/gas industry compared to statewide average.
Employment Intensity: Manufacturing	U.S. Census 2015	0 – 148%	<75%: 0 75 – 99%: 1 100 – 124%: 2 125 – 149%: 3 150% or more: 4	Employment in the manufacturing industry compared to statewide average.
Employment Intensity: Transportation/ Warehousing	U.S. Census 2015	0 – 258%	<75%: 0 75 – 99%: 1 100 – 124%: 2 125 – 149%: 3 150% or more: 4	Employment in the transportation/warehousing industry compared to statewide average.

Exhibit 6 displays the results of this analysis, where red indicates the highest intensity and blue indicates the lowest intensity. This analysis is based on relative concentration of population growth and employment in key industries relative to statewide metrics. As a result, high density locations with significant population growth and freight activity scored highly. Industrial areas such as Pharr and near the Port of Brownsville have both a concentration of activity and a large magnitude of activity. Areas with lower population and employment density also scored well if the area has a concentration of freight employment or has been experiencing population growth. The densest residential areas, such as McAllen and parts of Harlingen, received low scores.

Exhibit 6: Rio Grande Valley Economic Preparedness Score



3.3 Goods Movement Analysis

The goods movement factor measures the amount of freight on each highway segment in several ways and assesses both current and future freight movement. The criteria under this category include the number of trucks, tonnage, and value moving on the highway segment in 2018. Tonnage and value measurements are based on 2015-2045 Transearch commodity flow data extrapolated to 2018 and 2050. The data were then enhanced using Enverus drilling data and border crossing statistics for 2018.[1] Commodity flows to, from, and through Texas were then applied to the Statewide Analysis Model (SAM) to assign trucks, tonnage, and value to the highway network.

The percent truck traffic criterium identifies locations where trucks are major users of the roadway, even if the total truck volumes are not as high as other locations. This criterium tends to identify non-interstate connectors. Growth in freight tonnage and value was also incorporated to account for anticipated growth in the regional freight economy. Finally, designated oversize/overweight (OS/OW) routes were given an additional point in the scoring. OS/OW traffic was identified as a critical component of the RGV's freight and trade activity during stakeholder interviews and forums. Exhibit 7 summarizes the criteria used to conduct the goods movement analysis. Each was weighted equally and then scaled to reach a total score of 30 according to the scoring process shown in Exhibit 4.

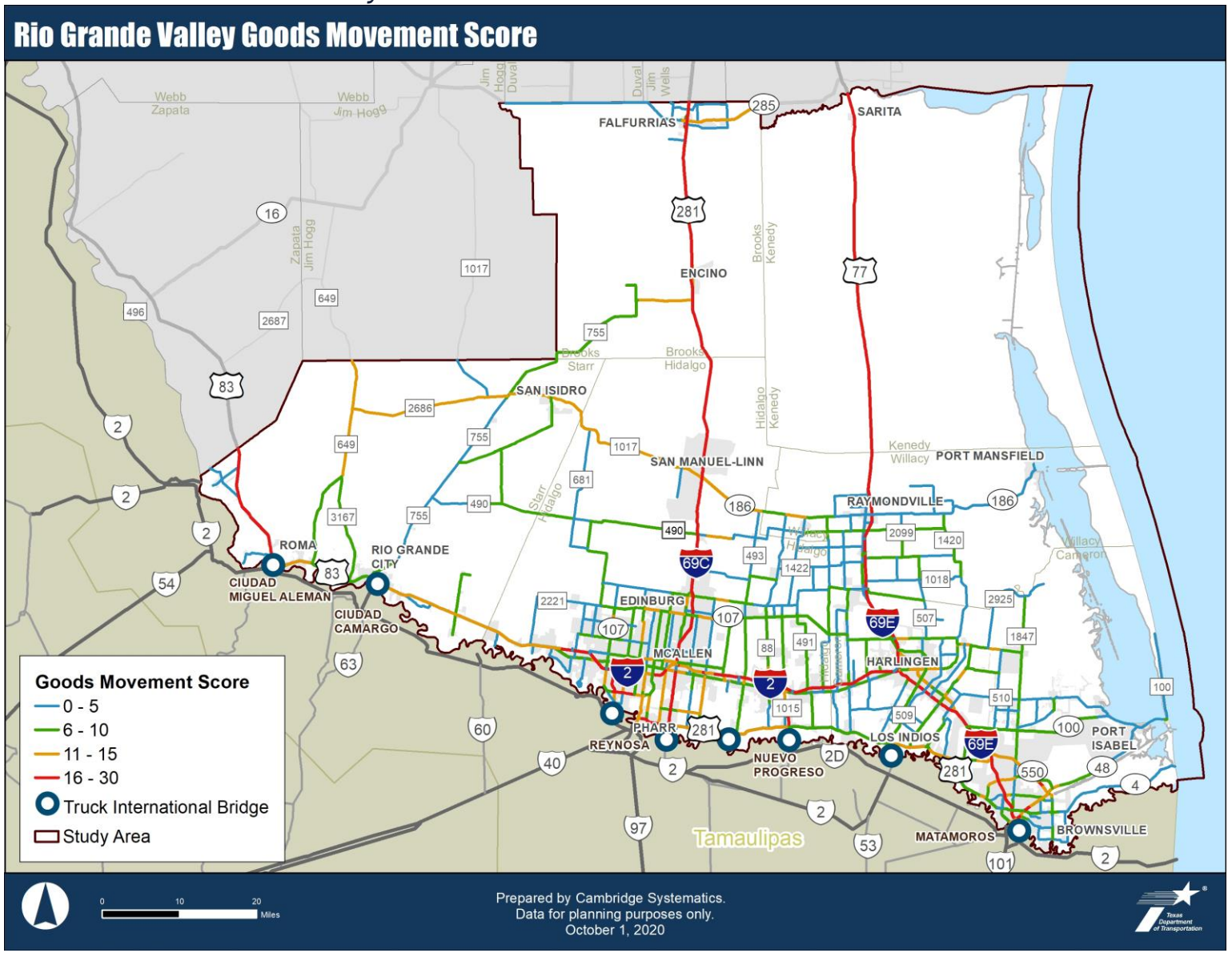
The results of the goods movement analysis are shown in Exhibit 8. I-69C, I-69E, I-2, and US 83 received the highest goods movement scores. Regional connectors such as SH 186 and FM 1017 also scored high. The greatest non-interstate concentrations of goods movement are located in Pharr/McAllen, Brownsville, and Harlingen. Findings from this analysis were supplemented with stakeholder input on goods movement, alternate routes, and expected growth during four transportation forums (described in Section 3.7).

[1] Drilling data used pertain to activity in the Permian Basin and likely do not have a large impact on the RGV commodity flows. However, these enhancements are included in the Transearch database used by TxDOT for freight planning.

Exhibit 7: Goods Movement Analysis Metrics and Scoring Methodology

Metric	Data Source(s)	Value Range	Scoring Method	Description
Designation as an Oversize/ Overweight Route	Hidalgo County Regional Mobility Authority; Port of Brownsville	Yes or No	No: 0 Yes: 1	Identify OS/OW routes.
Annual Average Daily Truck Traffic	TxDOT Roadway Inventory	0 – 13,100	<250: 0 250 – 499: 1 500 – 999: 2 1,000 -2,999: 3 3,000 – 4,999: 4 5,000 or more: 5	Identify roadways carrying the highest number of trucks.
Percent Truck Traffic	TxDOT Roadway Inventory	0-100%	<10%: 0 10 – 19%: 1 20 – 29%: 2 30 – 39%: 3 40 – 49%: 4 50% or more: 5	Identify roadways carrying predominantly trucks.
Total Tonnage	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data.	0 – 140k+ tons	< 2,500: 0 2,500 – 4,999: 1 5,000 – 9,999: 2 10,000 – 19,999: 3 20,000 or more: 4	2018 daily truck tonnage assigned to the highway network.
Total Value	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data.	$0 – $300M+	<$2.5M: 0 $2.5M – $4.9M: 1 $5M – $9.9M: 2 $10M – 19.9M: 3 $20M or more: 4	2018 daily truck value assigned to the highway network.
Tonnage Growth	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data.	0 – 3,841%	< 25%: 0 25 - 49%: 1 50 - 74%: 2 75 - 99%: 3 100% or more: 4	Percent change in daily highway tonnage between 2018 and 2050.
Value Growth	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data.	0 – 4,875%	< 25%: 0 25 - 49%: 1 50 - 74%: 2 75 - 99%: 3 100% or more: 4	Percent change in highway daily value between 2018 and 2050.

Exhibit 8: Rio Grande Valley Goods Movement Score



3.4 Supply Chain Analysis

The supply chain factor measures support for strategic industries in the region by incorporating business locations, tonnage, and value for the RGV's primary freight industries. The industry definitions in this factor vary slightly from those used in the economic preparedness category due to different categorization of data.

Infogroup establishment data from 2018 was used to locate freight-generating businesses and associate them with the highway network. Establishments are categorized into 6-digit North American Industry Classification System (NAICS) codes. NAICS codes associated with produce, oil and gas, transportation equipment and component manufacturing, and warehousing were selected based on interviews with maritime ports, ports-of-entry, and industry associations at the beginning of this project. Exhibit 9 lists representative NAICS codes in each of the four selected areas.

Exhibit 9: Sample NAICS Codes from Strategic Industries

Strategic Industry Category	Sample NAICS Codes
Produce	111211: Potato Farming 111310: Orange Groves 111331: Apple Orchards 111333: Strawberry Farming 111335: Tree Nut Farming 111411: Mushroom Production 111930: Sugarcane Farming 111991: Sugar Beet Farming
Oil and Gas	211111: Crude Petroleum and Natural Gas Extraction 211112: Natural Gas Liquid Extraction 213111: Drilling Oil and Gas Wells 213112: Support Activities for Oil and Gas Operations 237120: Oil and Gas Pipeline and Related Structures Construction
Transportation Manufacturing	336111: Automobile Manufacturing 336120: Heavy Duty Truck Manufacturing 336320: Motor Vehicle Electrical and Electronic Equipment Manufacturing 336360: Motor Vehicle Seating and Interior Trim Manufacturing 336411: Aircraft Manufacturing 336414: Guided Missile and Space Vehicle Manufacturing 336510: Railroad Rolling Stock Manufacturing 336611: Ship Building and Repairing
Warehousing	493110: General Warehousing and Storage 493120: Refrigerated Warehousing and Storage 493130: Farm Product Warehousing and Storage 493190: Other Warehousing and Storage

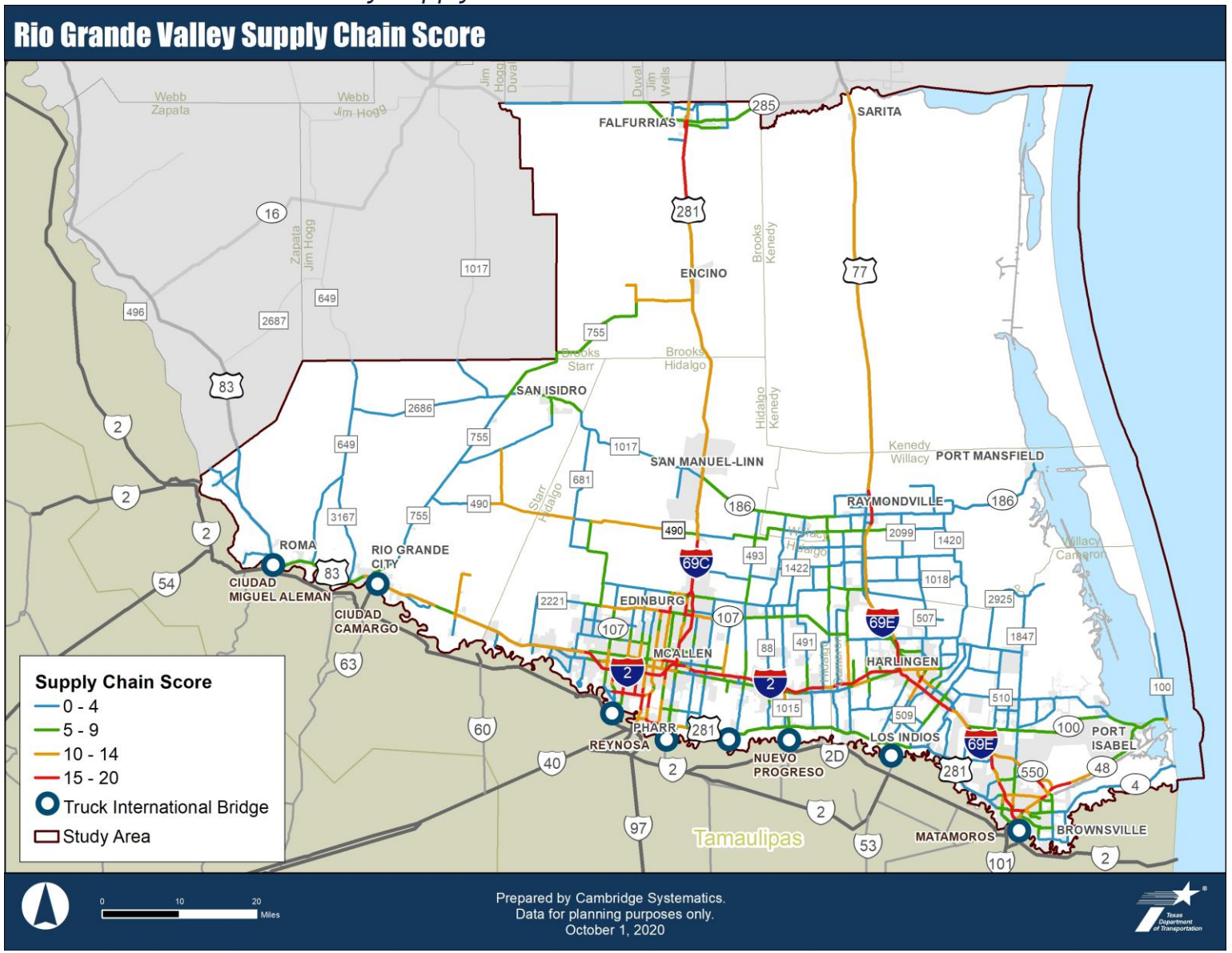
The SAM model classifies freight movement into 15 commodity groups, so broad categories were used to identify freight movement in strategic supply chains. Agriculture, petroleum products, and secondary freight were the three commodity groups selected to capture activity in strategic industries in the region without broadening the definition beyond meaningful interpretation. Exhibit 10 summarizes the criteria used to conduct the supply chain analysis. Each was weighted equally and then scaled to reach a total score of 20 according to the scoring process shown in Exhibit 4.

Exhibit 10: Supply Chain Analysis Metrics and Scoring Methodology

Metric	Data Source(s)	Value Range	Scoring Method	Description
Establishments in Strategic Industries	Infogroup 2018	0 – 17	0: 0 1 – 2: 1 3 – 5: 2 6 or more: 3	Establishments in strategic industries within 2 miles of roadway.
Tonnage in Strategic Industries	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data	0 - 80k+	< 2,500: 0 2,500 – 4,999: 1 5,000 – 9,999: 2 10,000 – 19,999: 3 20,000 or more: 4	2018 daily tonnage in strategic industries carried by roadway.
Value in Strategic Industries	TxDOT; SAM; supplemented using Enverus driven estimates of sand and water trucks and TTI border crossing data	$0 - $90M+	<$2.5M: 0 $2.5M – $4.9M: 1 $5M – $9.9M: 2 $10M – 19.9M: 3 $20M or more: 4	2018 daily value in strategic industries carried by roadway.

The results of the supply chain analysis are shown in Exhibit 11. Roadways around Pharr International Bridge, which handles most of the state's produce imports, rated highly. Regional connectors between the Ports of Brownsville and Harlingen and the interstate system also rose to the top. The I-69 corridors, including US 281 and US 77, were identified due to the large volume of freight tonnage and value moving through the region. Notably, activity in strategic supply chains is concentrated near the U.S.-Mexico border and on the two I-69 corridors.

Exhibit 11: Rio Grande Valley Supply Chain Score



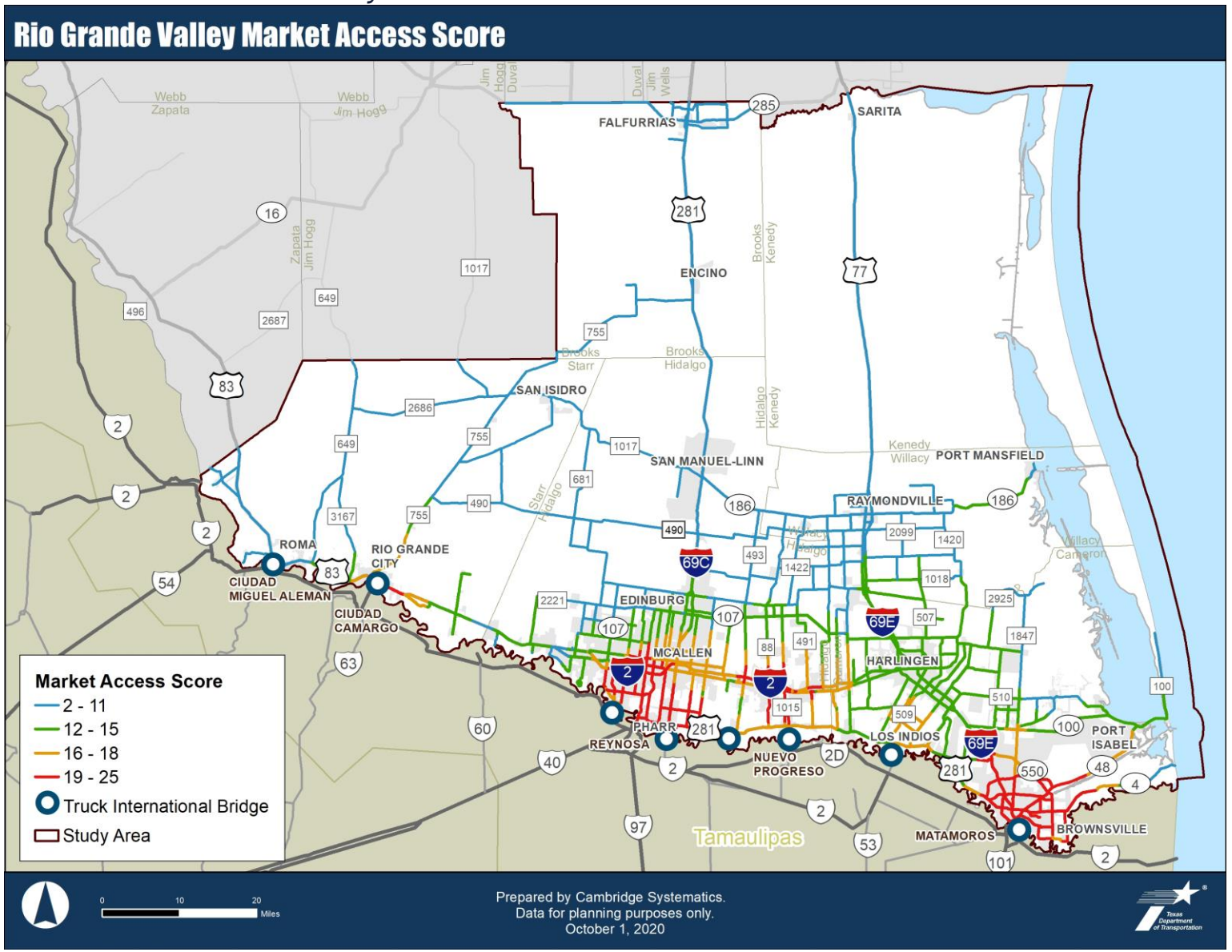
3.5 Market Access Analysis

The market access factor measures the role of highway segments in transporting goods to markets within and beyond the RGV. Foreign Trade Zones (FTZs) in the region are catalysts for freight activity related to multinational supply chains, and feedback from the RGVSC indicated that warehousing and other supporting activities may extend for miles beyond the FTZ. Travel times to intermodal facilities (maritime ports, rail intermodal, and cargo airports) and commercial vehicle border crossings were also used to measure the relevance of each segment to accessing these critical facilities. Exhibit 12 lists each of the scoring criteria in the market access category. Each was weighted equally and then scaled to reach a total score of 25 according to the scoring process shown in Exhibit 4. The resulting scoring for this factor is shown in Exhibit 13.

Exhibit 12: Market Access Metrics and Scoring Methodology

Metric	Data Source(s)	Value Range	Scoring Method	Description
Proximity to Foreign Trade Zones	Department of Commerce	0 – 1	Within 2 miles: 3 Within 2-5 miles: 2 Within 5-10 miles: 1 More than 10 miles: 0	Distance of roadway to an FTZ.
Truck Travel Time to Commercial Vehicle Border Crossing	ESRI, HERE, TxDOT	0 – 90+	0 – 15 minutes: 4 15 – 30 minutes: 3 30 – 60 minutes: 2 60 – 90 minutes: 1 More than 90 minutes: 0	Typical truck travel time from roadway segment to commercial vehicle border crossing.
Truck Travel Time to Intermodal Facility	ESRI, HERE, BTS	0 – 90+	0 – 15 minutes: 4 15 – 30 minutes: 3 30 – 60 minutes: 2 60 – 90 minutes: 1 More than 90 minutes: 0	Typical truck travel time from roadway segment to intermodal facility.

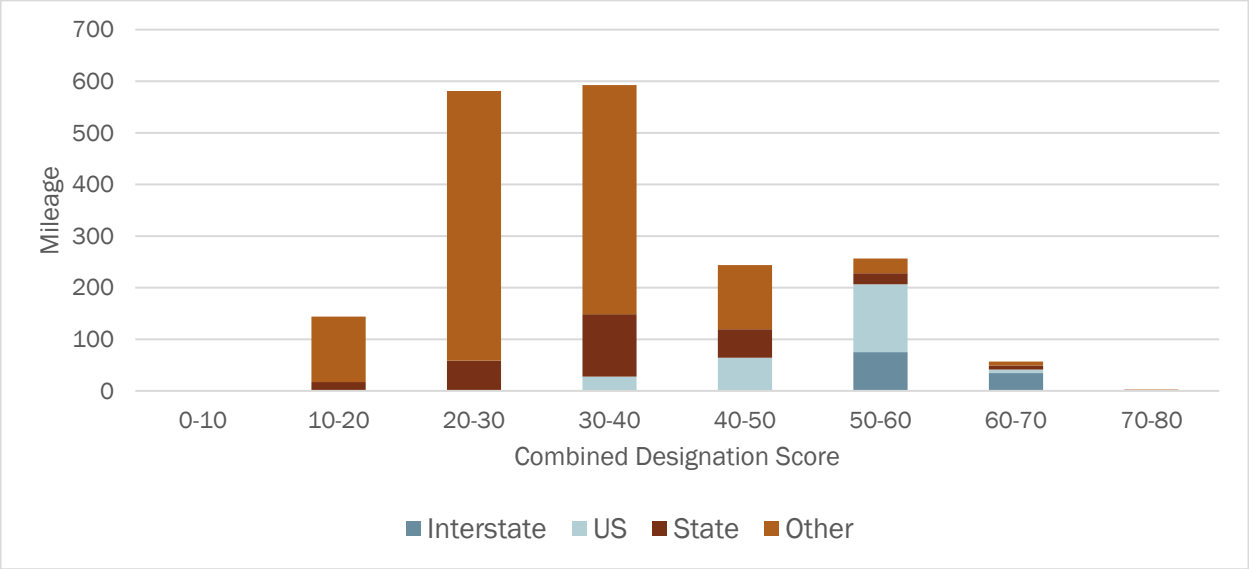
Exhibit 13: Rio Grande Valley Market Access Score



3.6 *Initial Rio Grande Valley Highway Freight Network*

The four designation factors were summed to a combined designation score with a maximum possible score of 100. The highest score received was 72 and the average score was 37. The distribution of scores by highway system is shown in Exhibit 14. Interstates and U.S. highways tended to receive higher scores than state or local roadways, though several state and local roadways were identified as important freight corridors, especially in Pharr and Brownsville. Exhibit 15 displays the combined designation scores in the study area.

Exhibit 14: Combined Designation Scores by Highway System



Based on these scores, segments were assigned an initial tier in the RGVHFN, shown in Exhibit 16:

- Tier 1: Roadways carrying significant freight volumes and traversing locations with intensive freight activity. In initial analysis, scores were higher than 50.
- Tier 2: Roadways that are critical to supporting freight movement due to volume or connectivity to businesses or markets. In initial analysis, scores were between 37 (the average score) and 50.
- Tier 3: Roadways providing important supporting connections between businesses, freight facilities, or roadways. In initial analysis, scores were between 25 and 37. Scores under 25 were not included in the initial RGVHFN.

Exhibit 15: Combined Rio Grande Valley Freight Network Designation Score

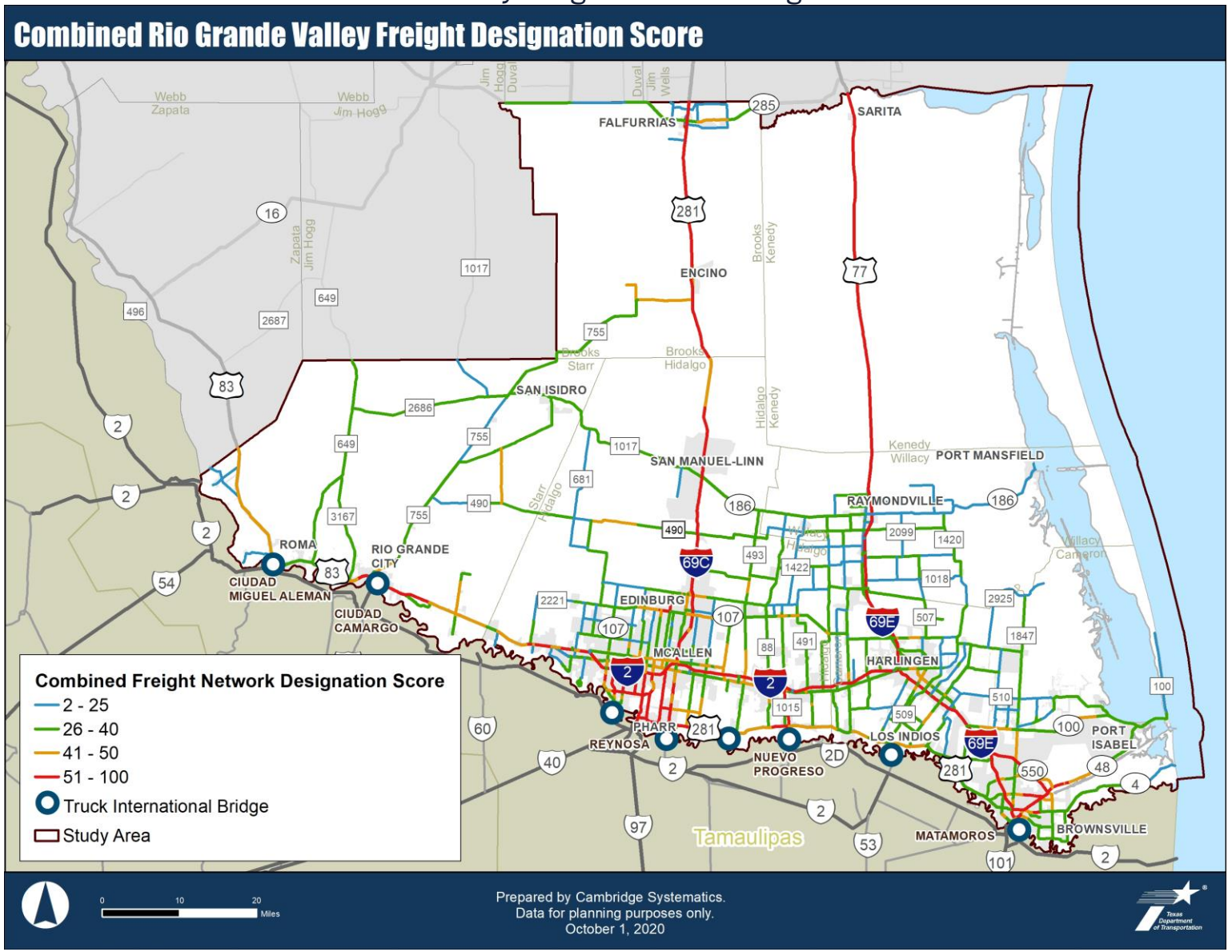
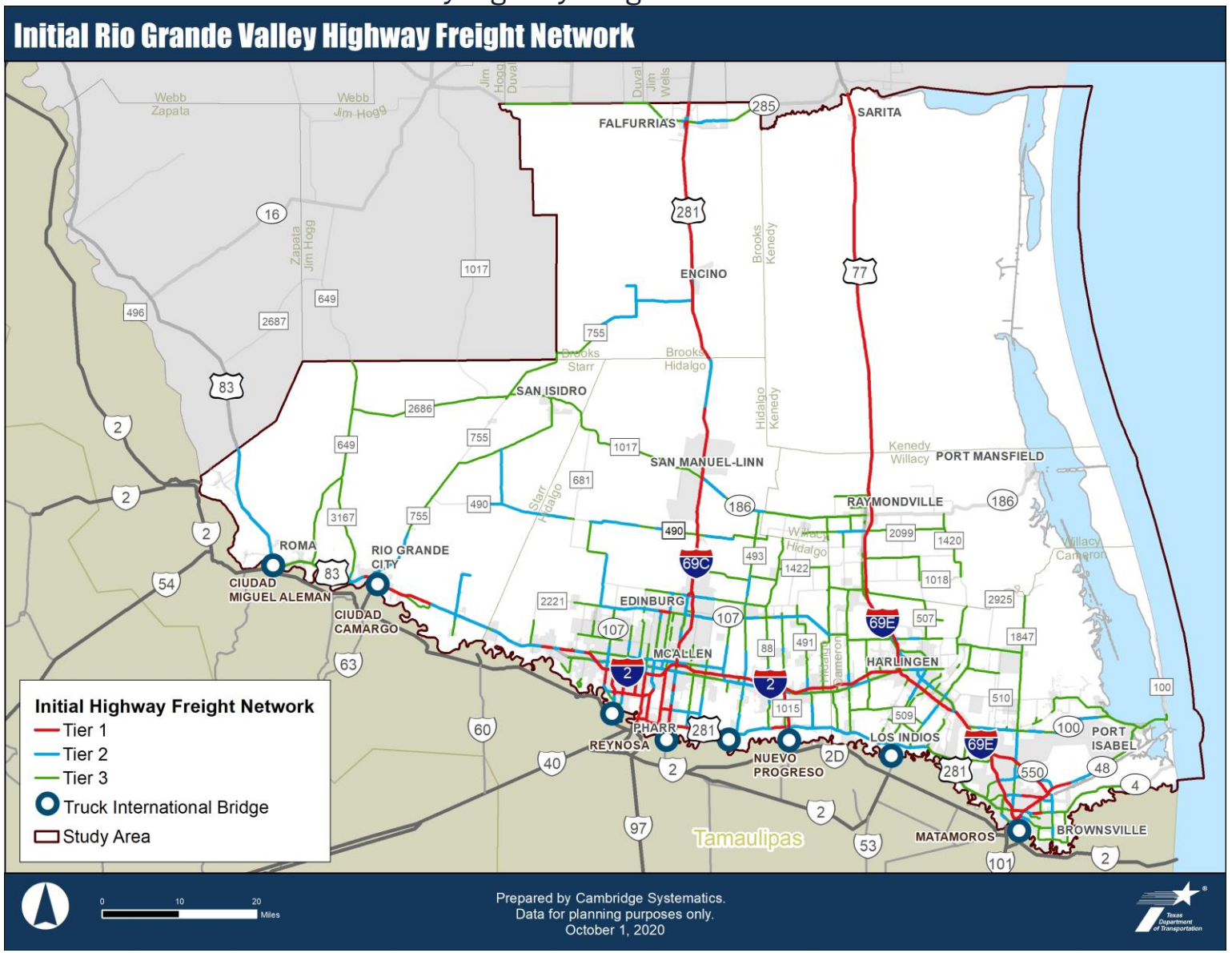


Exhibit 16: Initial Rio Grande Valley Highway Freight Network



3.7 Stakeholder Input

Stakeholder input on important freight corridors to include in the RGVHFN was collected during four transportation forums held in Rio Grande City, McAllen, Harlingen, and Brownsville during February 2020. Attendees split into small groups to discuss the RGV's freight network, including important routes, needs, opportunities, and anticipated development. Stakeholders could add comments to an online map or share their perspective with two facilitators in each group.

In general, attendees felt that roadways leading to border ports-of-entry (BPOE) were critical connectors in the system, even for crossings that currently serve little or limited truck traffic. For example, Donna International Bridge and Anzalduas International Bridge currently only serve southbound, empty trucks, but improvements are planned at these locations to accommodate northbound and loaded trucks. Stakeholders also felt that truck traffic to or from international bridges in the RGV would increase significantly over current levels in the long term. Stakeholders also commented on the importance of roadways accessing maritime ports and identified common routes (e.g., FM 509 and FM 106 accessing the Port of Harlingen). Finally, longer routes to other markets were also identified. For example, stakeholders identified FM 755 as an important route for trucks traveling from Mexico, through the Rio Grande City/Roma area in the western part of the RGV, and on to Houston. Exhibit 17 displays the locations identified by stakeholders on the online map.

3.8 Draft Final Rio Grande Valley Highway Freight Network

The initial designation result described in Section 3.6 was updated based on stakeholder input and refined to create cohesive corridors. For example, segments of Military Highway were initially categorized as either Tier 1 or Tier 2 depending on the level of freight activity in the surrounding area and subsequent traffic on the highway. With stakeholder input, this entire corridor was upgraded to Tier 1 in recognition of its role connecting the RGV's BPOE and connecting it to markets to the northwest, such as Laredo. The draft final RGVHFN is shown in Exhibit 18.

Exhibit 17: Stakeholder Comments on Freight Network Designation

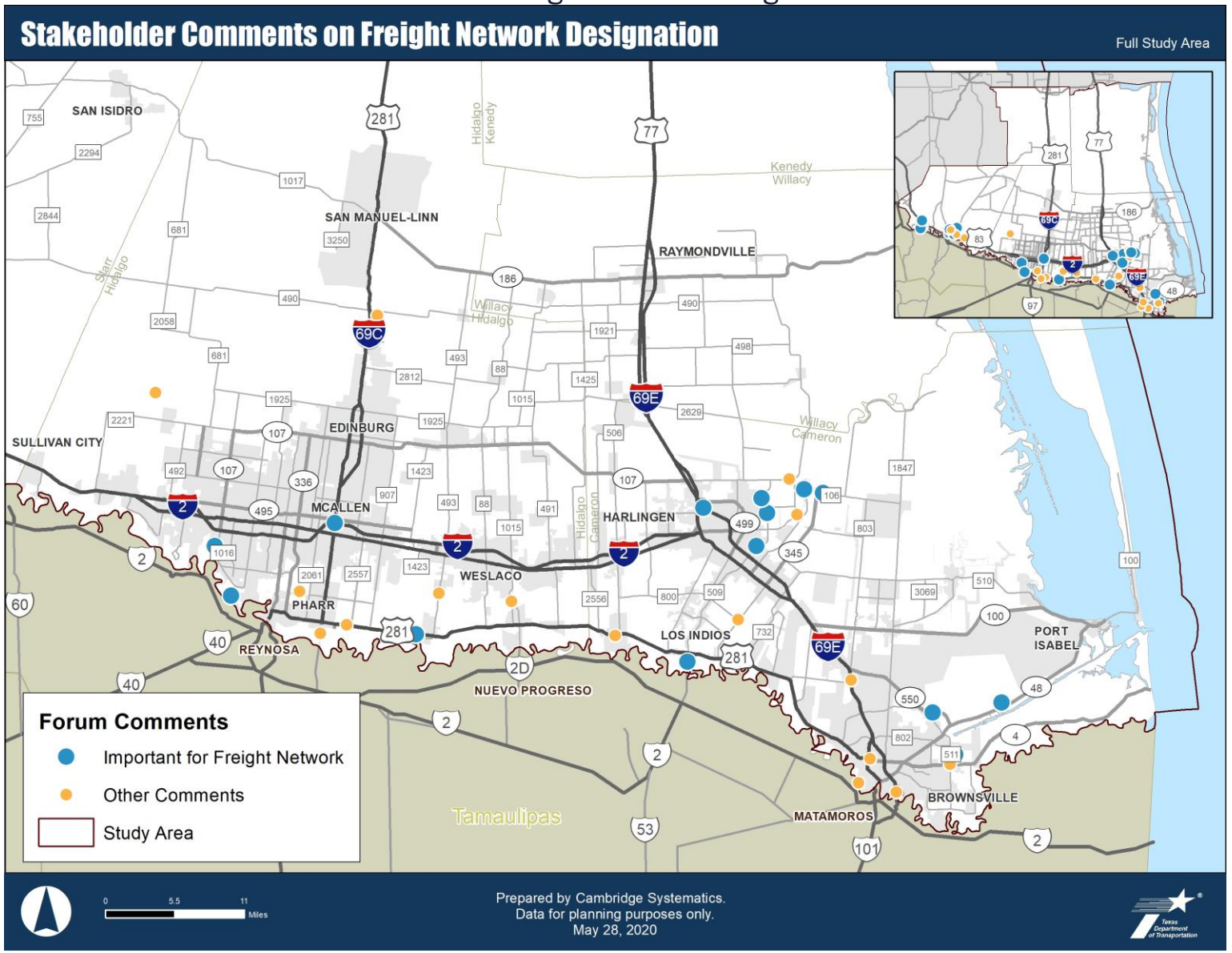
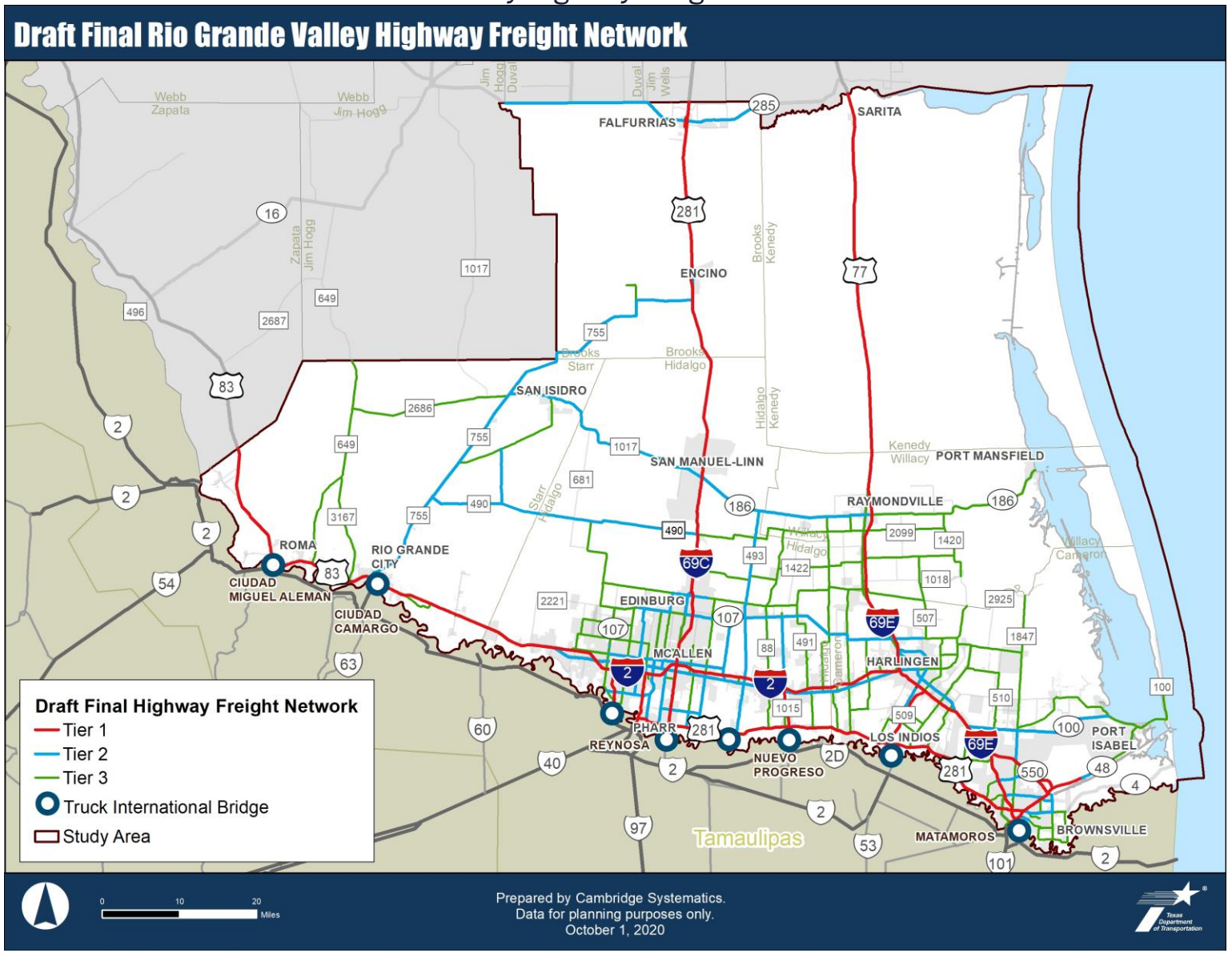


Exhibit 18: Draft Final Rio Grande Valley Highway Freight Network



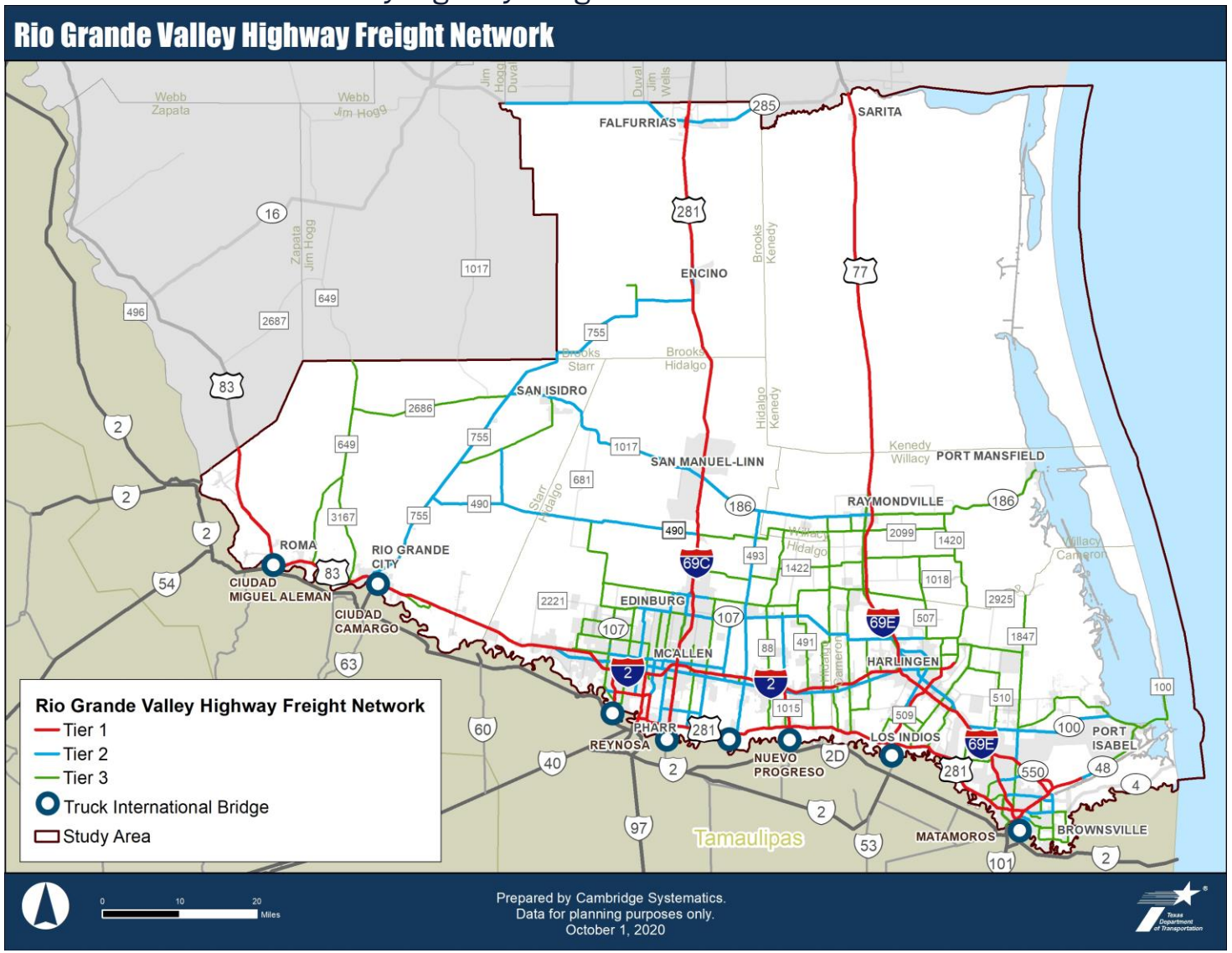
3.9 Final Rio Grande Valley Highway Freight Network

The draft final RGVHFN was presented to the RGVSC in June 2020. The RGVSC members were able to submit additional comments on an online map to add, remove, promote, or demote segments on the RGVHFN. Most comments called for the promotion of corridors to a higher tier, including:

- FM 106,
- FM 509,
- FM 755,
- SH 107, and
- SH 100.

Additionally, members of the RGVSC commented that new highways such as the East Loop Connector near the Port of Brownsville should be added to the RGVHFN as they are completed. As recommendations and strategies identified in the Regional Freight and Trade Plan are implemented, new or improved freight facilities should be considered in addition to the corridors and facilities identified in this memorandum. Exhibit 19 displays the final RGVHFN.

Exhibit 19: Rio Grande Valley Highway Freight Network



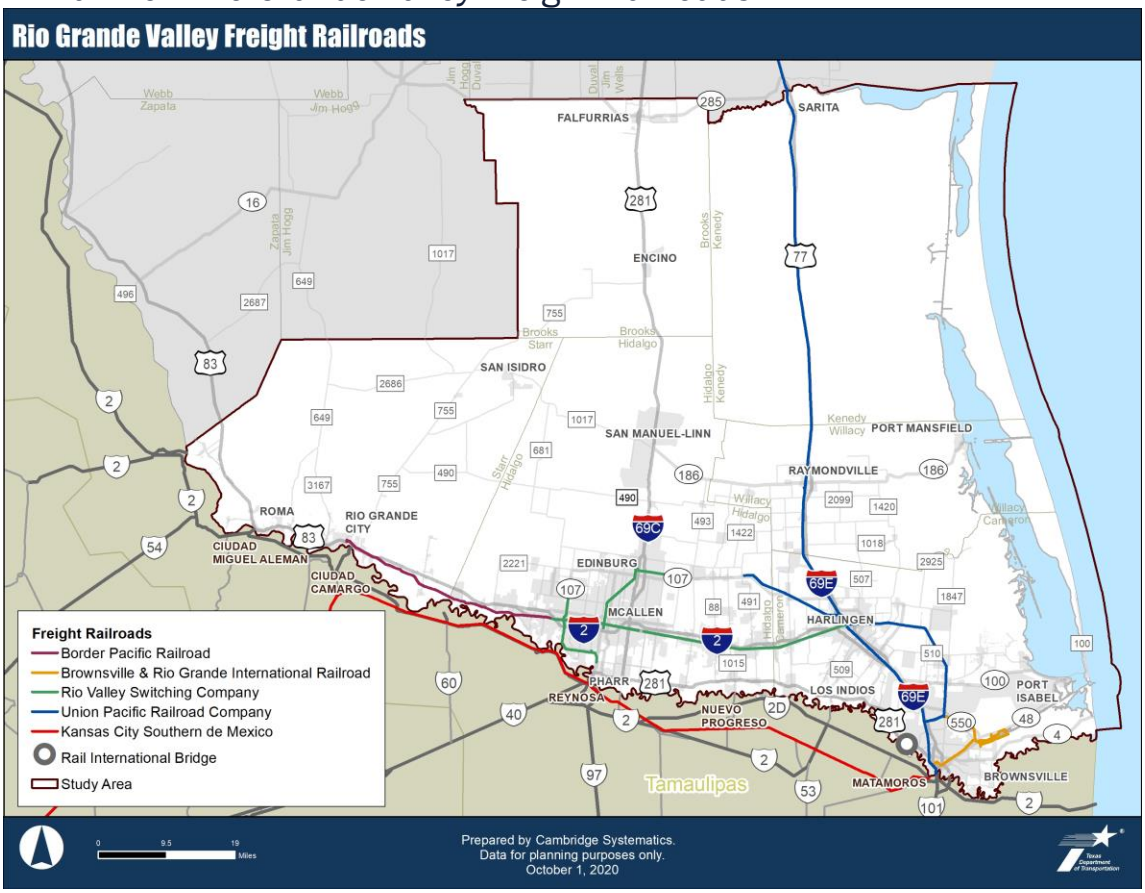
4.0 Non-Highway Modes in the Rio Grande Valley Multimodal Freight Network

The RGV includes freight infrastructure from all major non-highway modes, including railroads, deep and shallow draft ports, waterways, airports, international bridges, and pipelines. Additional detail about the region's multimodal freight infrastructure will be documented in the RGV Modal Profile Memorandum as part of this project. The assets selected for inclusion in the RGVMFN are summarized in this memorandum as well.

4.1 Railroads

The RGV contains freight rail infrastructure operated by one Class I and three short line railroads, shown in Exhibit 20. Union Pacific (UP) owns track running along the I-69E corridor and connecting to the region's only rail international bridge (the West Rail Bridge at Brownsville-Matamoros). The Border Pacific Railroad connects Rio Grande City to McAllen, and the Rio Valley Switching Company continues along the same corridor to Harlingen with spurs to Edinburg and Pharr. The Brownsville & Rio Grande International Railroad connects the Port of Brownsville to the UP line and the West Rail Bridge. All of these freight railroads are included in the RGVMFN.

Exhibit 20: Rio Grande Valley Freight Railroads

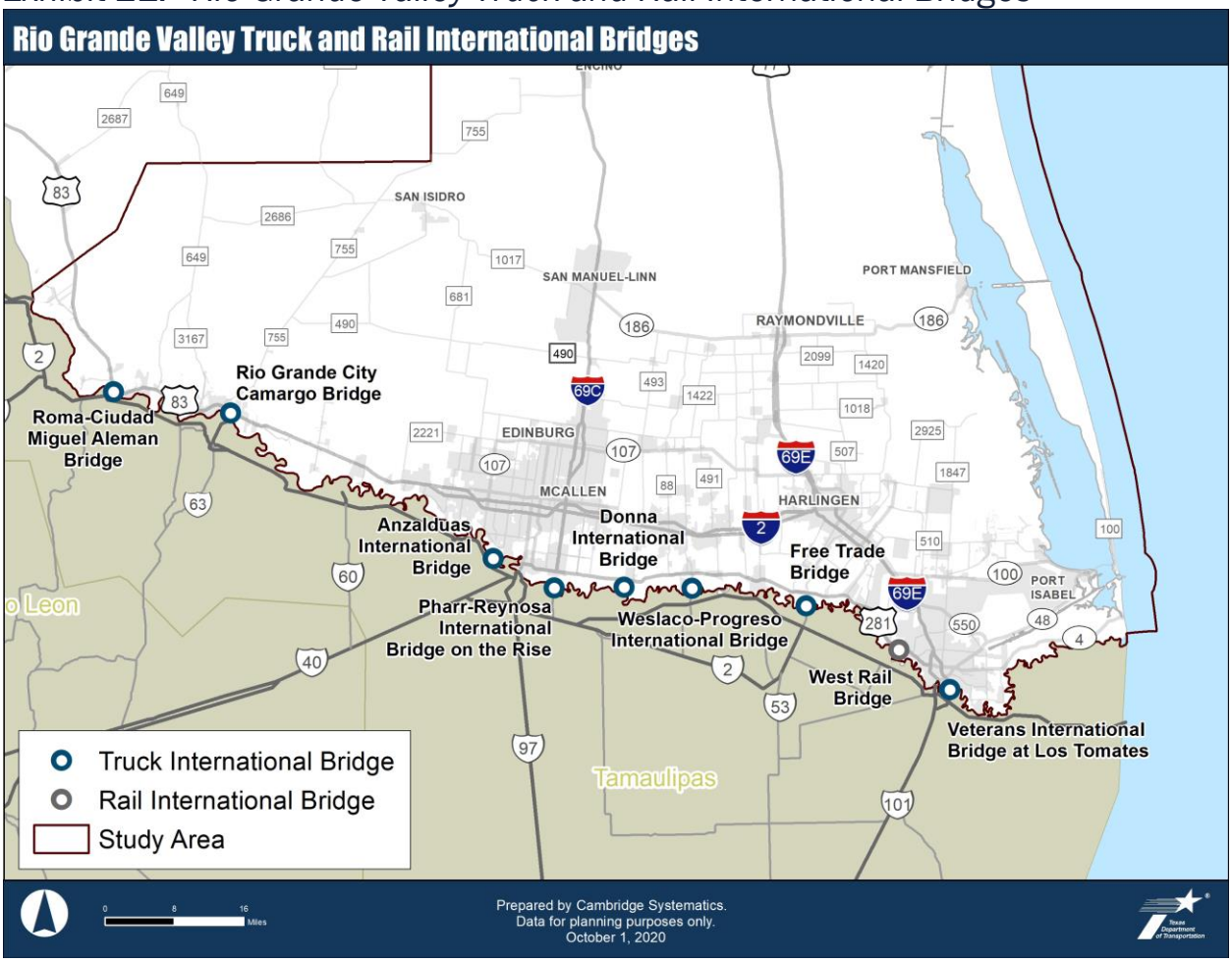


4.2 Border Ports of Entry/International Bridges

There are eight international bridges serving commercial vehicle traffic in the RGV. Two of these bridges, Donna International Bridge and Anzalduas International Bridge, only serve southbound, empty trucks at this time. The West Rail Bridge in Brownsville is the only international rail bridge in the RGV. The truck and rail bridges in the RGV are shown in Exhibit 21, and all of these international bridges are included in the RGVMFN:

- Roma-Ciudad Miguel Aleman Bridge,
- Rio Grande City Camargo Bridge,
- Anzalduas International Bridge,
- Pharr-Reynosa International Bridge on the Rise,
- Donna International Bridge,
- Weslaco-Progreso International Bridge,
- Free Trade Bridge at Los Indios,
- West Rail Bridge, and
- Veterans International Bridge at Los Tomates.

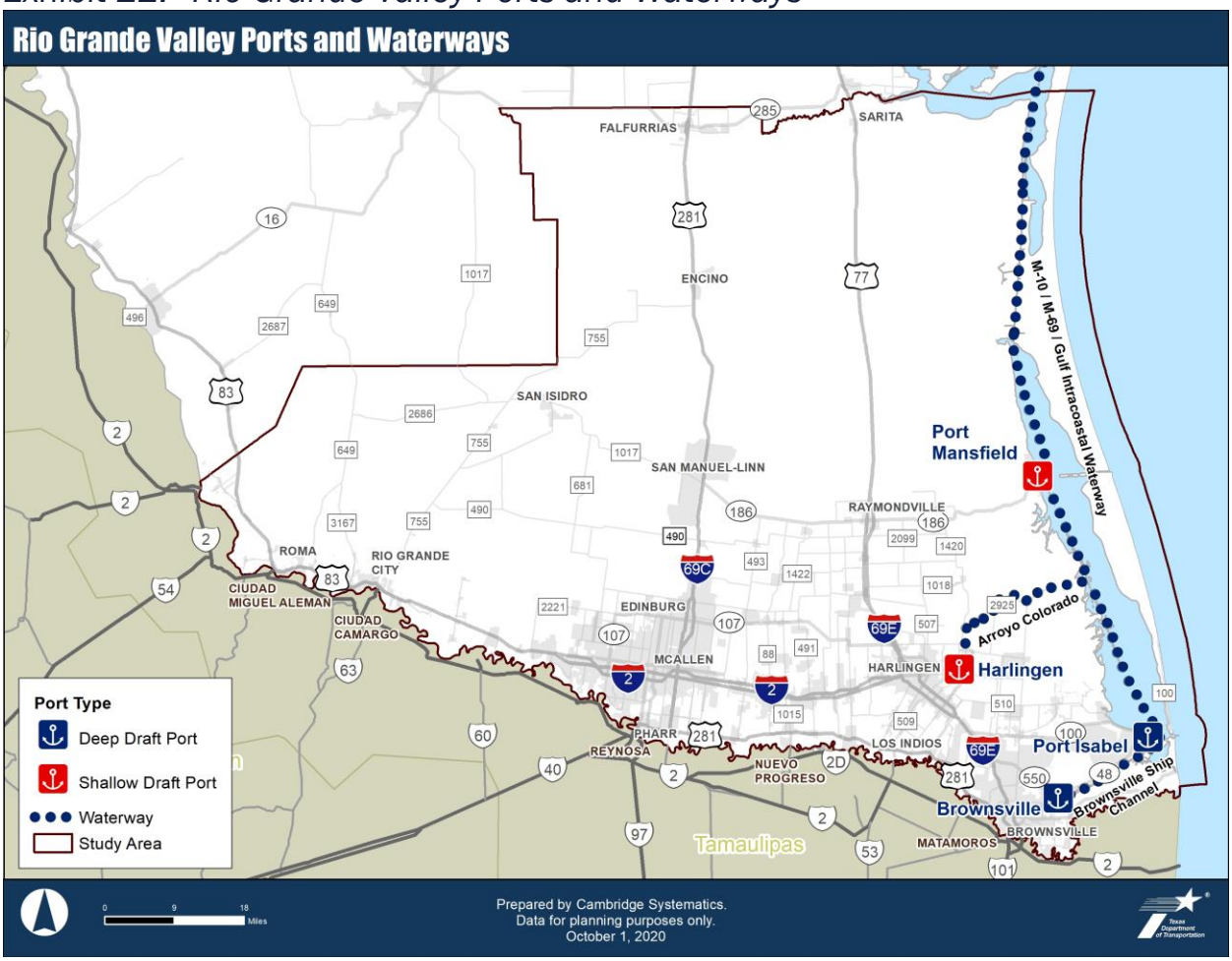
Exhibit 21: Rio Grande Valley Truck and Rail International Bridges



4.3 Ports and Waterways

There are two deep draft and two shallow draft ports in the RGV, and all are included in the RGVMFN. The Ports of Brownsville and Port Isabel are deep draft ports, and the Ports of Harlingen and Port Mansfield are shallow draft ports. Marine Highway 69 (M-69), also known as the Gulf Intracoastal Waterway, is an important connection to domestic markets along the Gulf Coast and is also included in the RGVMFN. Exhibit 22 displays the ports and waterways in the RGV.

Exhibit 22: Rio Grande Valley Ports and Waterways

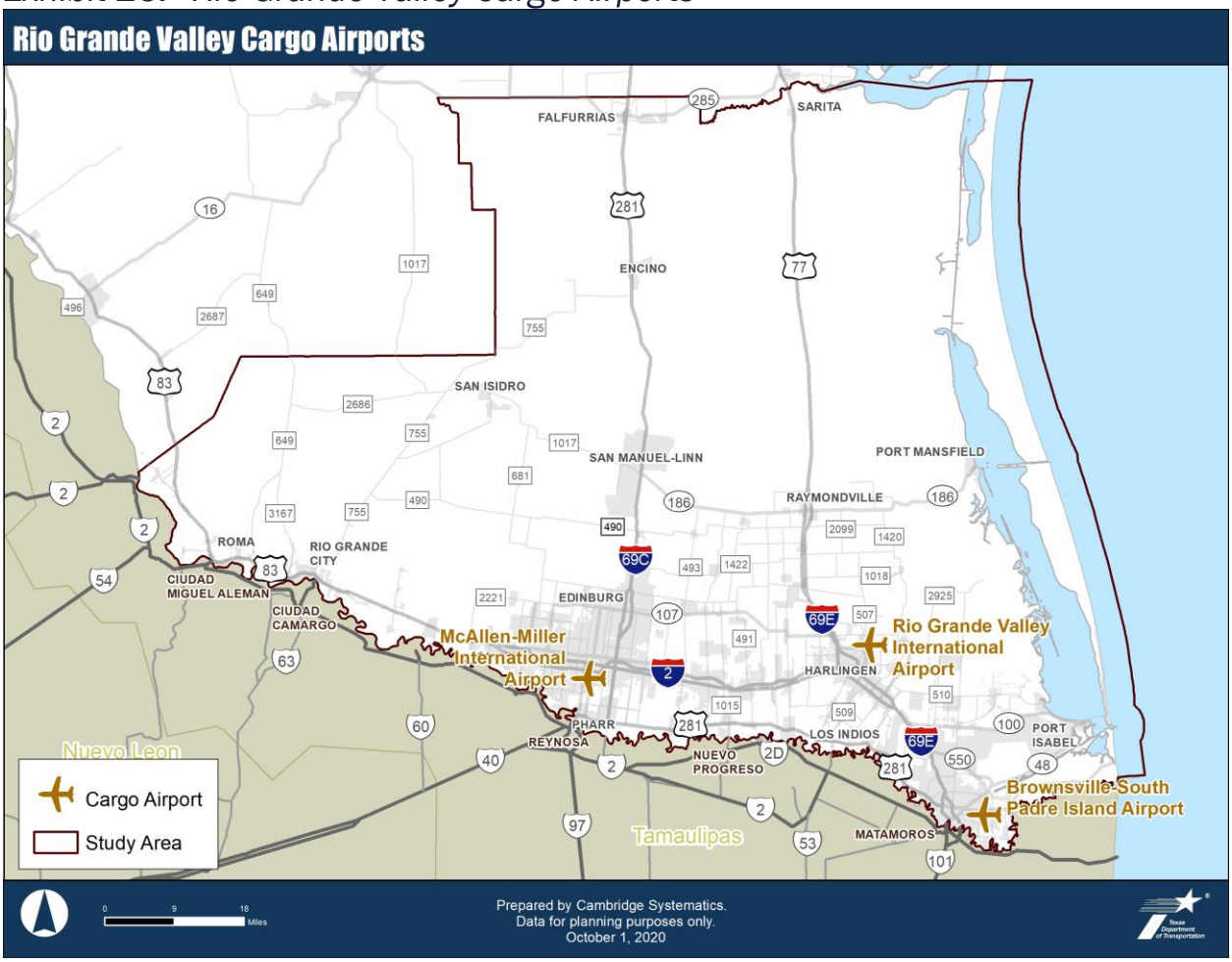


4.4 Airports

Only three airports in the RGV reported cargo traffic in the Federal Aviation Administration's (FAA) Air Carrier Statistics Database (also known as the T-100 data bank). These three airports handle the majority of the RGV's air cargo and are included in the RGVMFN, as shown in Exhibit 23:

- Rio Grande Valley International Airport (50,893 tons in 2019),
- McAllen-Miller International Airport (10,309 tons in 2019), and
- Brownsville-South Padre Island Airport (1,044 tons in 2019).

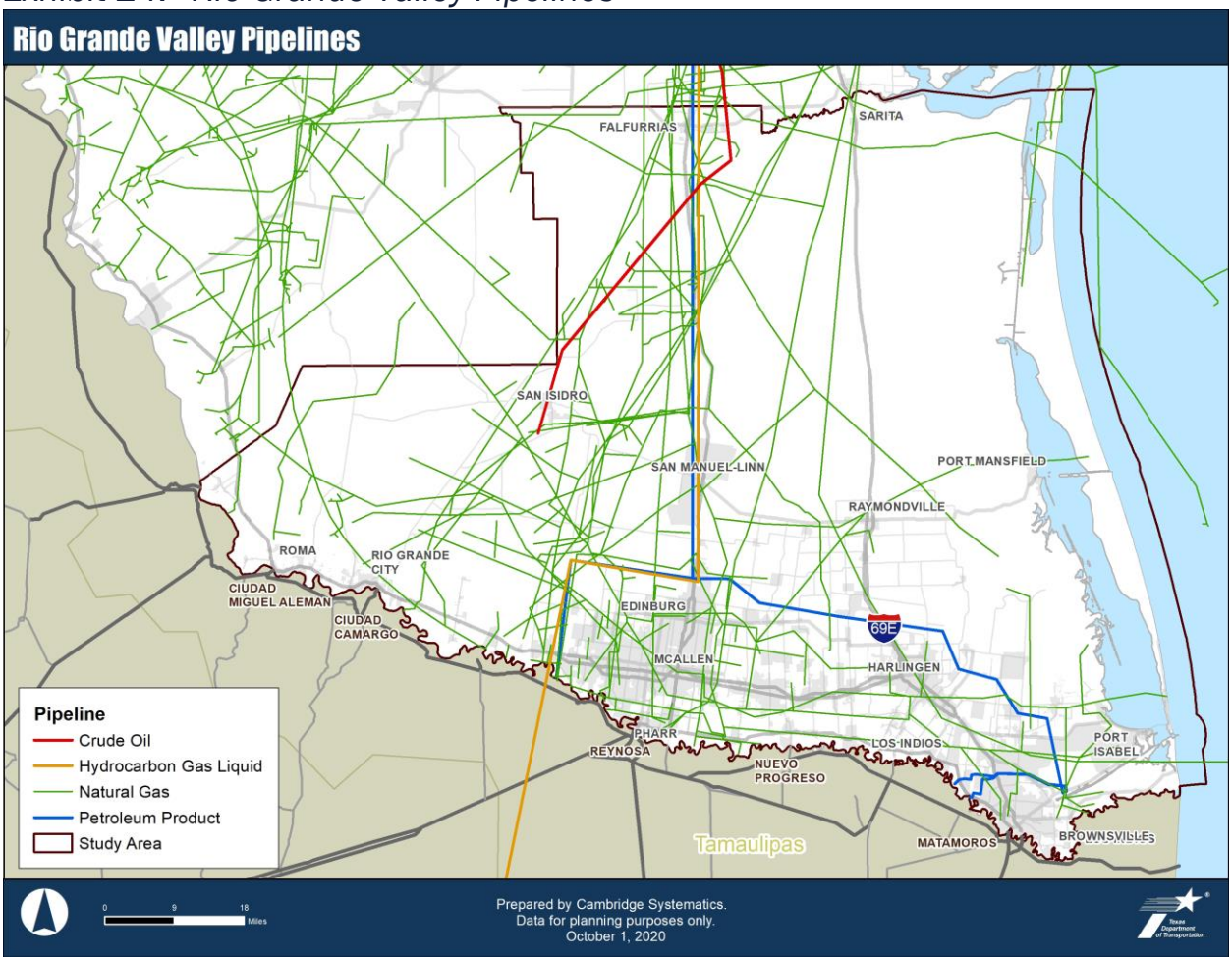
Exhibit 23: Rio Grande Valley Cargo Airports



4.5 Pipelines

Pipelines play a critical role in the movement of liquid cargo off of the surface transportation system. All pipelines in the region are included in the RGVMFN. The role of pipelines in the RGV has been temporarily changed due to pipeline shutdowns in Mexico. However, domestic transportation continues. Exhibit 24 displays crude petroleum, hydrocarbon gas liquid, natural gas, and petroleum product lines in the region.

Exhibit 24: Rio Grande Valley Pipelines



Source: U.S. Energy Information Administration, 2020.

5.0 Rio Grande Valley Multimodal Freight Network

The RGVMFN contains the RGVHFN, railroads, border crossings, ports and waterways, airports, and pipelines described in this memorandum. The RGVMFN containing each of these components is shown in Exhibit 25, excluding pipelines for clarity.

Exhibit 25: Rio Grande Valley Multimodal Freight Network