APPENDIX: REGIONAL MOBILITY STRATEGY - RMS 2019

FINAL REPORT

DECEMBER 2019

El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS

REGIONAL MOBILITY STRATEGY

Source: HNTB

El Paso Metropolitan Planning Organization

December 13, 2019

RMS was conceived as a mechanism to establish a greater transportation vision for the El Paso borderplex region. RMS shows the strength that builds when agencies, organizations and stakeholders come together to discuss the future of mobility and make smart transportation planning decisions that improve livability and economic vitality of this region. RMS rises to the challenge showing proof that the borderplex can be unified under integrated solutions that are reflective of statewide, regionally and locally shared goals. The efficient movement of goods and people, including across our international border through a seamless multimodal network, is a shared goal among stakeholders in the borderplex.

Without a doubt, there are many hurdles to overcome. The borderplex is a community comprised of multiple jurisdictions and governing bodies, as well as varying strategic plans and priorities. However, this diverse community has a collective passion to improve quality of life and quality of place and in advancing shared infrastructure for our highways, railways, ports of entry, bicycle and pedestrian ways. It takes the focused effort, harnessed by RMS, to strengthen the core of the region and the region will strengthen with a mutually agreed upon and supported transit network.

El Paso, like many communities within the state, must compete for limited funding from the Texas Transportation Commission in Austin. This is why it is incumbent upon us to tell our story – to collaborate, create sustainable partnerships, and be unified by a single voice. It is only through our partnerships and cooperation that El Paso can take its rightful place as an economic powerhouse where challenges can be addressed and opportunities can be realized. RMS displays the critical information for key decision makers to begin to prioritize projects – directing investments toward the opportunities that do more than address capacity and congestion.

The El Paso Metropolitan Planning Organization (MPO) and the TxDOT El Paso District invite you to embrace a true strategy to effect mobility decisions that support a regional vision. RMS comes at a pivotal time when the region's backbone highway – Interstate 10 – is aged beyond its useful life; when the number of vehicles traveling through the region, including those moving freight, are at an all-time high; when the economy and population growth is booming; and when our ports of entry are dealing with record wait times. The El Paso MPO is ready to be the catalyst for unifying the region, fostering collaboration, and getting things done. Will you join us?

Eduardo Calvo

El Paso MPO

Executive Director

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El Paso Chamber of Commerce – Mobility Coalition

David Michael Jerome, *President & CEO*

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Stephen Voglewede, *Director of Innovation & Performance*

Jack Chapman, *WestStar Bank Board of Governors and El Paso Chamber Board of Directors*

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The Borderplex Alliance

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Kassandra Huhn, *Director of Economic Research*

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City of El Paso

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Titles and/or organizations are accurate at the time listening sessions were conducted.

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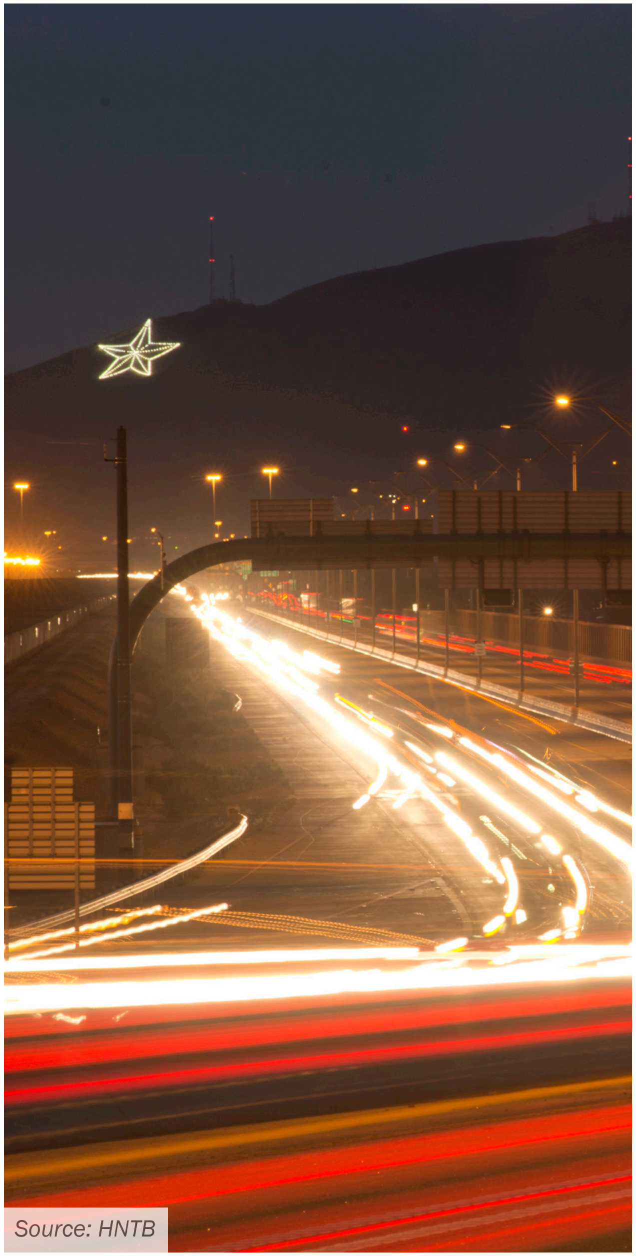


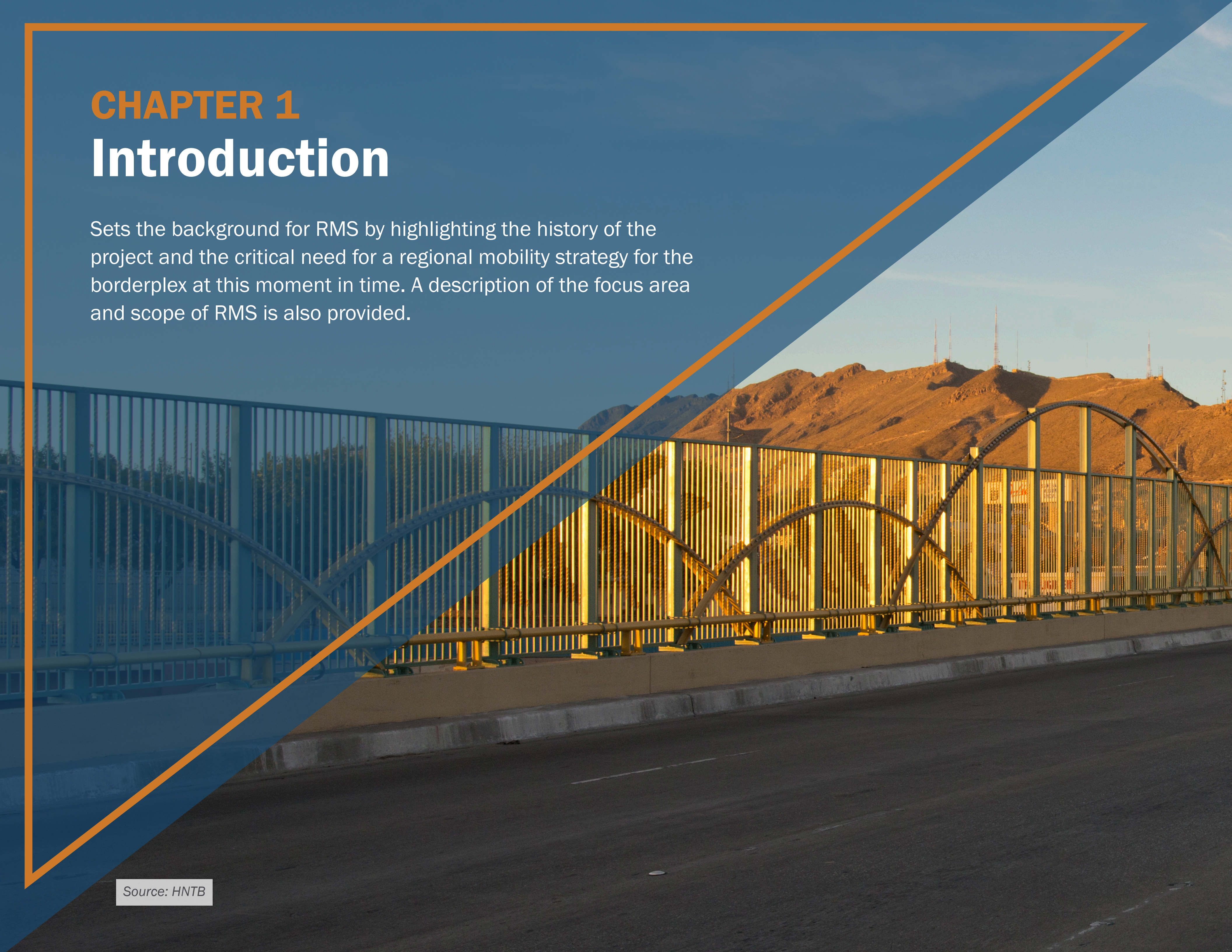
Source: HNTB

Titles and/or organizations are accurate at the time listening sessions were conducted.


Source: HNTB

CHAPTER 1
Introduction

Sets the background for RMS by highlighting the history of the project and the critical need for a regional mobility strategy for the borderplex at this moment in time. A description of the focus area and scope of RMS is also provided.



Source: HNTB


Help define the
future of our region.
Mobility.
Livability.
Economic Development.


Source: iStock

Regional Mobility Strategy Background

The Texas Department of Transportation (TxDOT) El Paso District in cooperation with the El Paso Metropolitan Planning Organization (MPO) initiated this Regional Mobility Strategy (RMS) and funded the opportunity to evaluate and reconsider the adjacent development pattern supported by the current highway system. TxDOT understands the need for a highway system to support vital intrastate travel and commerce, but they also recognize the need for the responsible stewardship of public funds and the necessity to ensure that stakeholders provide support for public infrastructure projects. Given that infrastructure needs are great, and resources are limited, the RMS process assists TxDOT to more effectively deliver on its mission to provide safe means of mobility to the traveling public by understanding how and where to direct resources. Publicly supported projects are delivered more efficiently with fewer delays; the RMS process helps TxDOT determine those projects that will be well supported by capturing what is most important to the people in the region containing El Paso - Juárez - Las Cruces.

It is fair to say that leadership among stakeholder groups perceived a lack of vision for the region. For that reason, RMS began in 2018 as an exercise among various stakeholders and partner agencies to craft a mutually agreed upon vision for mobility. Overarching questions posed to stakeholders were: where is the region going, what is the next big thing for the borderplex? Participants were tasked with identifying priorities and common themes, along with pinpointing what the focus of the region should be holistically. Recognizing the opportunity and responsibility to improve movement of goods and people within its region, the MPO and TxDOT formalized the RMS to understand and capture the views of participants and funnel those into a collective vision that recognizes the opportunities and implications associated with regional mobility, livability, and economic development.

RMS loosely defined the region as including Ciudad Juárez, Chihuahua, Mexico; Las Cruces, New Mexico; as well as municipalities inside El Paso County. The binational metropolitan area is referred by some as the borderplex and is home to more than two million people.

RMS is led by a technical team of planners, engineers and public affairs staff from the TxDOT El Paso District and its consultant team. Their role was to establish the framework for the need and purpose for the RMS, define the region and its limits, outline key components of the study, gather and evaluate existing planning studies, and identify an initial list of stakeholders.

Why A Regional Mobility Strategy?

With a robust manufacturing sector, a strong educational base and some of the nation's busiest inland ports, the borderplex continues to play a significant role in both the national and international economies. Growth in the region is expected to continue, highlighting the need for collaborative and innovative transportation solutions that respond to regional needs and preserve the quality of life that supports area residents while also attracting young professionals.

Together with other regional stakeholders and mobility agencies, TxDOT recognizes that all travelers benefit greatly when transportation agencies work together to address congestion using all the tools at their disposal. Key benefits of a region-wide multimodal evaluation study include:

- Better insight as majority funding partner of the transportation outcomes on TxDOT facilities;
- Increased agency participation in managing congestion levels through other modal solutions, providing greater benefits in lowered travel time and delays to roadway users;
- Increased cooperation with partner agencies and with the public, avoiding costly planning and design delays; and
- Continued development of positive working relationships with regional partners, which is particularly important when there are substantial changes in elected offices.

RMS promotes a safe, livable and sustainable multimodal infrastructure system by helping partner agencies understand and consider transportation and urban design challenges within the region. RMS supports regional mobility initiatives and provides priorities for future transportation development, economics and policies. It goes beyond the traditional planning model to include new partners with a stake in transportation planning and implementation, such as freight operators, customs and border protection, and the bordering states of New Mexico and Chihuahua, Mexico. It is a much-needed tool that decision-makers can use when making decisions for projects, and it is an aid in delivering key information that can be used in identifying opportunities for financing and funding a regional mobility vision.

The RMS process is helping create partnerships.

Dr. Teresa Quezada
Consultant, QDMS Consulting

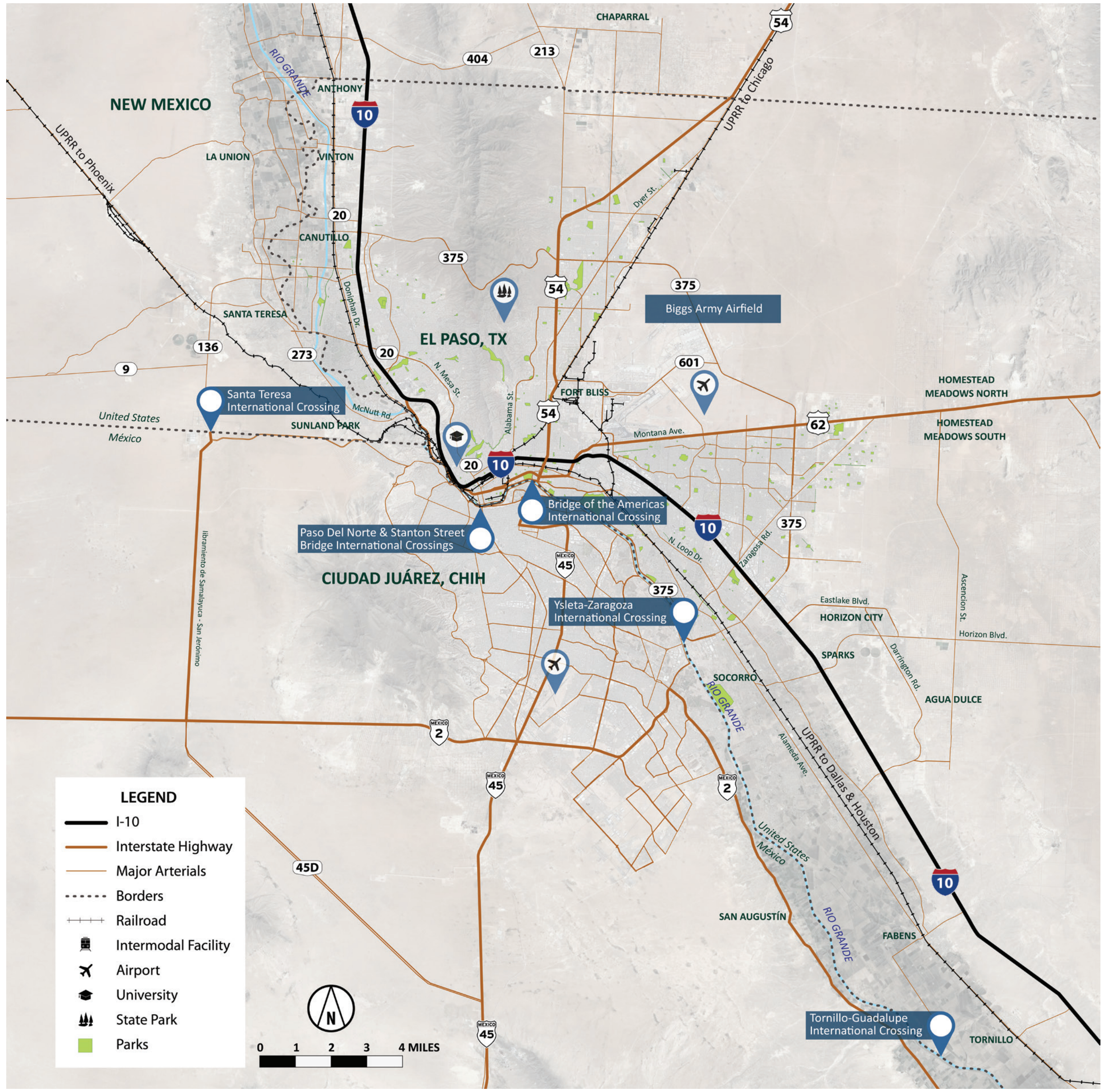
Focus Area

RMS seeks to understand current and future travel demand and patterns, as well as traffic volumes, and major activity centers to identify opportunities to improve mobility. The strategy considers the function that multimodal improvements can have in improving overall mobility in the region, such as increases in roadway capacity, improved transit service, and better bicycle and pedestrian facilities. Given the role the region has due to its location on the U.S.-Mexico border, the strategy also considers cross-border travel patterns by analyzing usage at area ports of entry (POE) and at international railroad crossings.

The RMS technical team gathered existing mobility studies *(Appendix A. Review of Existing Studies)* and evaluated them for commonalities and overlaps, and for differences and distinctions. Furthermore, the El Paso regional travel demand model (TDM), *Destino 2045*, was accessed to assess both the existing and future transportation network. The TDM helps to identify regional mobility challenges and opportunities.

A map of the focus area is shown in *Figure 1*.

Figure 1. RMS Focus Area Map



Source: HNTB

CHAPTER 2

The Centerpiece of RMS: Stakeholders

Highlights the stakeholder listening session effort, which is the centerpiece of RMS. Key themes from the listening sessions are summarized in this section.

Source: HNTB


MAXIMUM
CAPACITY FOR
THIS ROOM
45
NMDOT
District 1
Help define the future of our region.
Mobility.
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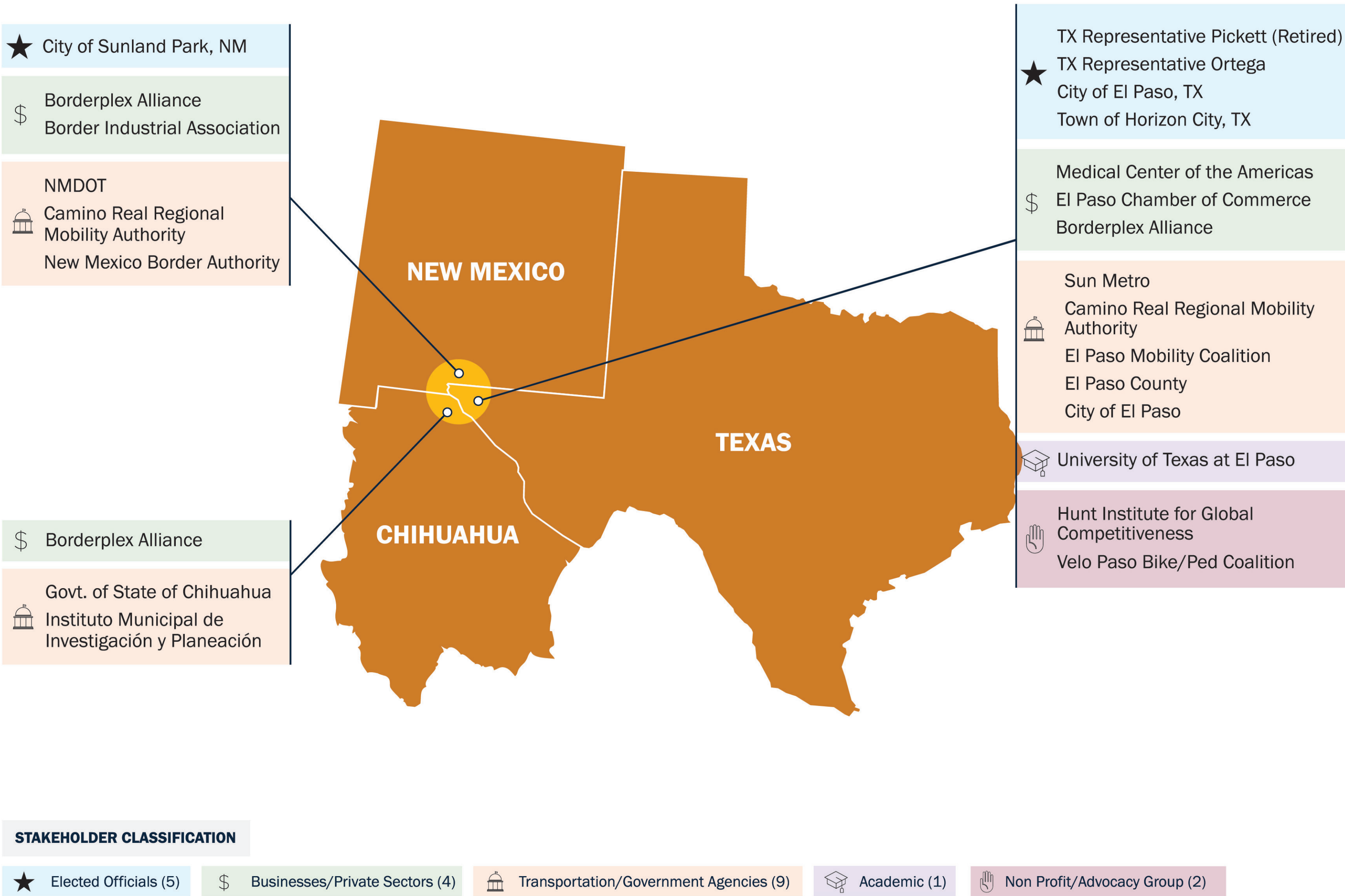
Source: goodfreephotos

The RMS is a binational, three-state collaborative effort to identify, prioritize, and facilitate projects and other initiatives at the regional, city, county or single corridor level. Central to the RMS process is the gathering of open and honest input from borderplex stakeholders through listening sessions. Stakeholders bring perspective to long-standing challenges, shed light on trends, and translate the abstract into tangible needs. The listening sessions that took place during this study were foundational to the relevancy of the RMS.

More than 20 stakeholder listening sessions were conducted between November 2018 and August 2019. The sessions focused on issues, opportunities, challenges, priorities, and ideas as identified by stakeholders themselves. Detailed information is in *Appendix B. Listening Session Materials and C. RMS Themes Matrix.*

Figure 2. Stakeholder Representation

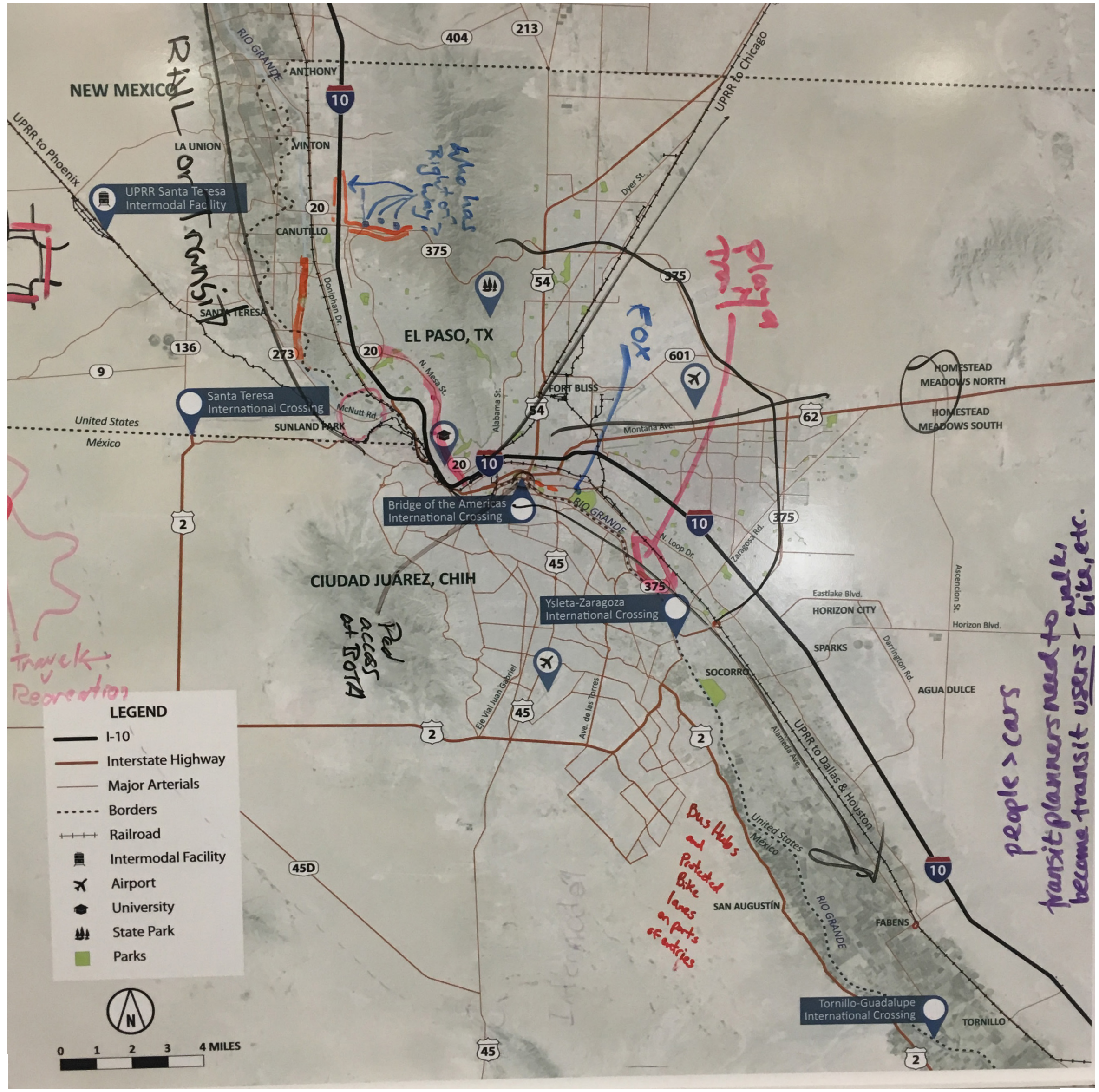


Stakeholders and Format of Listening Sessions

The RMS team, composed of TxDOT staff and its consultants, took a targeted approach to engaging its initial group of stakeholders. The primary goal was to capture a multimodal representative cross-section of stakeholders across the region. The region includes Texas, New Mexico, and the State of Chihuahua, Mexico. *Figure 2* captures the variety of interests, perspectives, and breadth of sectors and locations considered.

Invitations through U.S. mail, email, and by phone were provided to stakeholders who had been identified as distinct voices in the region. The outreach allowed the team to introduce the RMS process and to request the opportunity to meet with them in a listening session. In total, four TxDOT and 16 consultant project team members spent more than 700 hours with more than 70 stakeholders as part of 23 listening sessions.

The listening sessions were conducted in a freeform interview style to allow stakeholders the opportunity to communicate ideas and visions of importance to them. Stakeholders were provided with an RMS fact sheet that described the purpose, goals, and process. A questionnaire was also provided to help spur discussion. The questionnaire covered various aspects of transportation, such as mobility, land development, policies, environment, agency coordination, obstacles, opportunities, and priorities. Following each listening session, notes were formalized, and comments written on the map were documented.

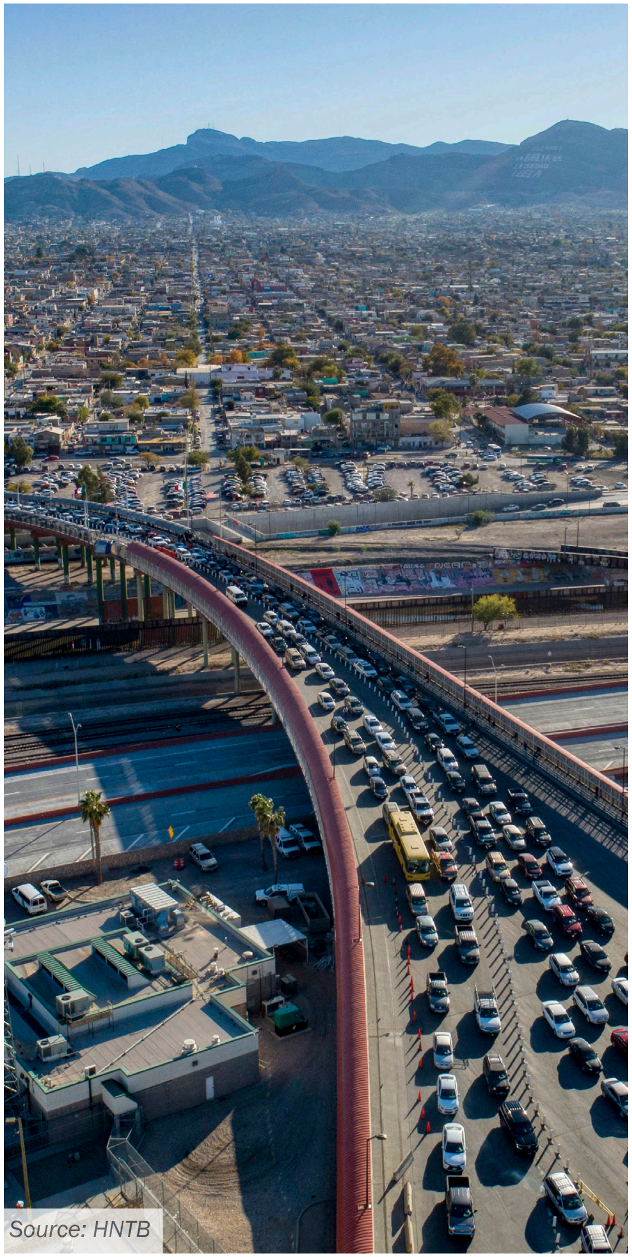


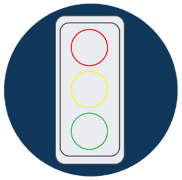
A dry-erase map of the RMS general area was on display during meetings. Stakeholders were encouraged to write on the map to facilitate pinpointed discussions and help capture comments.

What We Heard: Key Themes

The RMS team identified seven emerging themes of the listening sessions that were repeated by multiple stakeholders (*see Figure 3*). A matrix was developed to organize the top regional needs and identify synergies *(Appendix C. RMS Themes Matrix)*. Some themes were tangible issues, such as traffic flow, while other themes were more abstract, such as leadership. Feedback collected by the team was tabulated and categorized into the following themes:

Figure 3. Major Themes from Listening Sessions


Source: HNTB



Traffic Flow & Connectivity

The development of a seamless, multimodal transportation network was commonly cited as a top priority during listening sessions. Stakeholders discussed a need for improving I-10, completing connections between major highway corridors, eliminating choke points at POEs, additional international rail routes, and improved bicycle and pedestrian infrastructure. Air quality non-conformity related to traffic congestion has also been an issue in the region and was repeatedly mentioned by multiple stakeholders. Non-conformity has led to delayed or unrealized projects, and risks to transportation funding.

To improve connectivity, the needed reconstruction of I-10 (Reimagine I-10), improvements to alleviate congestion on Artcraft Road, construction of the Borderland Expressway in northeast El Paso, and the extension of NM 9 to NM 273 (McNutt Road) were noted as important projects. Additionally, stakeholders emphasized the importance of an outer loop, such as Borderland Expressway, (also known as Northeast Parkway) as an alternative to I-10, diverting traffic away from downtown where congestion and planned reconstruction are concerns.

Ports of entry are a significant economic component and a source of substantial travel time delays. Stakeholders agreed that improving cross border movement was imperative. This includes the movement of specialized materials, such as bio-sensitive materials and wind turbine blades. Dedicated lanes and additional ports of entry were discussed as options to address increasing congestion. Many stakeholders agreed Intelligent Transportation System (ITS) solutions should be implemented to decrease delays at border crossings.

Rail was a recurring topic, in particular, the Santa Teresa POE, which is at capacity and is in need of expansion to support existing and future commercial traffic. A Santa Teresa rail bypass or rail spur may be considered to address rail traffic congestion specifically in the downtown areas of El Paso and Juárez. Stakeholders repeatedly emphasized the importance of international trade to the regional economy and thought additional international rail crossings are needed, or at a minimum, rail-served industrial properties.

Finally, many stakeholders noted a multimodal transportation network is a vital component in improving connectivity and quality of life for residents.

Source: HNTB

Source: iStock

Regional Growth & Economic Development

Stakeholders agreed that international trade is central to the economic success of the region. As a result, delays at POEs were at the forefront of pressing issues discussed during the listening sessions. Stakeholders remarked that the focus should be on changing policies that have caused staffing shortages at POEs, where delays have affected the economy in terms of trade, investment, production, and quality of life. Additional rail crossings to support the growth of value-added manufacturing and activate industrial centers were also suggested.

Stakeholders recognized that economic development can be spurred by mobility projects that provide access to jobs with higher salaries and improve quality of life for residents. To help attract younger, up-and-coming entrepreneurs and professionals to the region, stakeholders urged the need for quality of life features such as better transit technology (e.g. designated lanes for autonomous vehicles), walkability between home and work, more companies in the area that are technology-focused, and more multimodal options for transportation (e.g. plug-in infrastructure for electric vehicles). They talked about the desire for better ways to move people, such as between El Paso, Las Cruces and Juárez. Aesthetics was also a point of discussion, such as the need to revamp eye-sores that are in plain sight from public right of ways and the need to build attractive destinations such as bike and pedestrian paths that leverage the region's landscape and landmarks. Many of the conversations centered on development of the downtown area and the Medical Center of the Americas campus which includes the Texas Tech University Health Sciences Center as priority areas that are ripe for investment and expansion. Developments like these have the potential to increase density in the urban core and provide jobs and opportunities to help nurture a high-skilled workforce. Targeted efforts should include transit-oriented development and bicycle/pedestrian friendly infrastructure, which were viewed by stakeholders as necessary to the success of a thriving downtown. Multiple stakeholders also identified the relocation of freight hubs away from the downtown area as a solution to alleviate congestion.

Northeast and far east El Paso were pinpointed as areas of new opportunity, citing high interest for rail-served properties by potential new businesses and industry. These areas are experiencing rapid growth due to readily available water and infrastructure, and are located near major community assets, such as Fort Bliss. Fort Bliss itself is regarded as a valuable partner in the region and the stakeholder discussion explored reframing the relationship with this major employer, which has put El Paso on the map on a national scale.

Policies

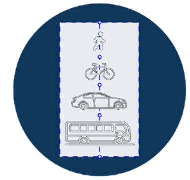
Policies and interlocal agreements play a critical role in the borderplex because the region is situated on both national and international borders. Listening sessions revealed that some stakeholders had different and, at times, conflicting policies and priorities. However, stakeholders expressed the need to come to an agreement on priorities at the regional level.

The following were discussed as common priorities that could be used to develop policies to benefit the region:

- Promote industry and manufacturing to incentivize investments and job growth;
- Reassess and balance the tax base;
- Catalyze opportunities and reframe partnership with Fort Bliss;
- Develop bi-national agreements and incentivize Mexico to build complementary infrastructure;
- Push back against policies that hamper the movement of people and goods at border crossings;
- Expedite and streamline the environmental review process for projects;
- Include bicycle and pedestrian-friendly infrastructure as a required component of design on projects;
- Strategize growth, disincentivize sprawl, employ infill incentives; and
- Target projects that improve quality of life.
- Understand the needs or demands of the new workforce and millenials

Horizon City Listening Session, Source: HNTB

Source: Sun Metro



Multimodal

Stakeholders largely agreed that increased mass transit capacity in conjunction with transit-oriented development would greatly improve quality of life. Stakeholders recognized that multimodal solutions will also play a key role in alleviating congestion downtown. Brio Rapid Transit System (RTS) is a first step to achieving fast, automated mass transit between the airport and downtown, and to provide connections to major destinations, such as the University of Texas at El Paso (UTEP), from surrounding communities. The opinions and ideas given by stakeholders to improve mass transit could be used to formulate a much-needed and overdue strategic plan by the City of El Paso's mass transit department (Sun Metro). A need for investment in rural transit improvements was consistently expressed by stakeholders throughout the listening sessions.

Stakeholders noted that the existing sidewalk and bicycle network is not sufficient to encourage commuters to travel without a motorized vehicle. Bicycle and pedestrian networks that provide access to schools, recreational areas, and jobs should be prioritized – with opportunities being taken when possible to grade separate roads from bike/pedestrian paths. It was also noted that the bicycle network currently does not connect to many major roadways or intersections, leaving gaps in network connectivity. Participants agreed catalysts for change include mixed-use developments to promote more walkable communities to encourage a paradigm shift in the way people travel.

Technology

Stakeholders unanimously agreed that an upgrade to the ITS infrastructure is needed at the POEs to improve border wait times. Low tech POEs could potentially be made more efficient with automated crossing inspections. Participants agreed that ITS infrastructure is needed where traffic signal failures and congestion occur most frequently. Additionally, ITS could make it possible to implement toll operations in order to generate much-needed revenue.

As planning for ITS takes place, innovative travel options and infrastructure improvements rapidly being adopted by smart cities should be considered. This includes accommodating infrastructure for autonomous and connected vehicles, Wi-Fi equipped vehicles, ridesharing, and rezoning to accommodate installation of fiber networks.

Stakeholders also discussed the need to build a transportation foundation to help cultivate a high-skilled workforce in the tech sector. Participants encouraged the development of training centers and programs for jobs in fields such as automation.

Source: HNTB


Source: goodfreephotos

Funding

Stakeholders agreed that there is a funding disparity and a lack of understanding of funding. One reason for the perceived disparity when comparing El Paso to other Texas metros such as Houston, Dallas, Austin or San Antonio may be that the TxDOT application process does not account for the needs and trips generated by the adjacent communities in New Mexico and the State of Chihuahua, Mexico. Most importantly, priorities for the region must be identified before funding can be addressed because they will also shape the projects that proceed into implementation. There was an understanding from stakeholders that TxDOT and the New Mexico Department of Transportation (NMDOT) set funding limitations and that different types of funding sources should be targeted or considered. These can include tolling, federal funds, and public-private partnerships. Other commonly discussed topics included obtaining a TxDOT metro designation for El Paso and securing more funding for bicycle and pedestrian improvements.

Leadership

In general, stakeholders voiced concerns over the appearance of a lack of cooperation, or fragmented coordination amongst leaders in the region. The general thought was that local transportation decision-makers and leaders often appear unfocused on broader goals and are instead focused on the local level; they appear disengaged and inconsistent when advocating at the state level. The disjointed initiatives and interests may be due to the region's makeup of different governments, different languages, different bureaucracies, and different needs.

Stakeholders voiced a desire for increased collaboration between local, state, foreign, and military leadership to focus on policies and prioritize projects that help advance the region as a whole. Stakeholders agreed that bringing key decision-makers who represent a variety of interests to the table, would be necessary to develop a cohesive strategy to help the region speak with a single voice. During the listening sessions, many regarded the El Paso MPO as fragmented when it comes to developing a vision and strategy, but also noted their role as a leader would be critical in the development of a regional mobility strategy.

Participants thought El Paso should harness its potential as an international destination. To that end, many suggested local leaders need to exert pressure at the national level to dismantle policies currently affecting border crossing times, which many feel have caused a host of issues and affected economic vitality in the region.

There is a need for stronger transportation leadership in El Paso. We need one voice. We need to work together.

State Representative
Evelina "Lina" Ortega

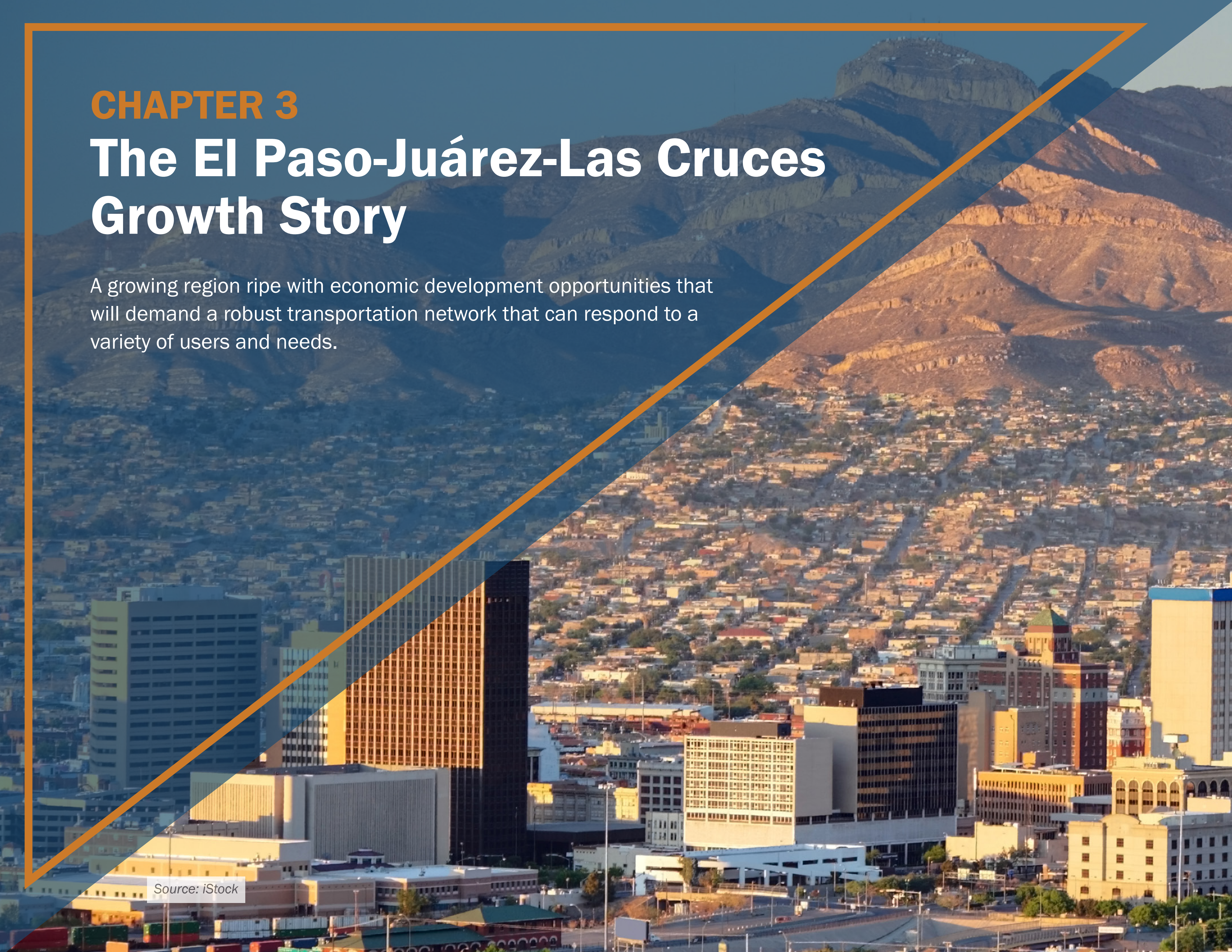
Next Steps: Engage

RMS acts to fairly record the opinions of the people and deliver technical information to support the major themes of stakeholder feedback, but this is not the final outcome, only the beginning. RMS attempts to capture enough information to allow for early decision-making. The feedback contained herein and in the following sections, validates the next steps for stakeholders to engage and begin to identify common goals, prioritize projects, realize a unified voice for the region, and secure funding opportunities for big ideas that truly support the regional vision.

CHAPTER 3

The El Paso-Juárez-Las Cruces Growth Story

A growing region ripe with economic development opportunities that will demand a robust transportation network that can respond to a variety of users and needs.



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Source: iStock

Regional Setting

Located on the Rio Grande, El Paso is just across the border from Ciudad Juárez, Chihuahua, Mexico. The two cities, along with Las Cruces, which is in the neighboring state of New Mexico, form a binational metropolitan area, sometimes referred as the borderplex, with a regional population of over two million people making it the largest bilingual-binational workforce in the Western Hemisphere[1].

The region including El Paso, Juárez and Las Cruces is the second largest per capita manufacturing area in the United States. Maquilas are the main contributor to this as they transport supplies across the border to support corporate industries demanding a range of electronics, automotive parts, plastics and metals. There are $48.1 billion in annual exports into the U.S. from Ciudad Juárez, surpassing Tijuana in foreign purchases from maquilas[2]. In addition to the large manufacturing presence, there are three major United States military installations – Fort Bliss, Holloman Air Force Base, and White Sands Missile Range -- which collectively cover more than two million acres of land dedicated to research, development, testing, and evaluation for our nation's defense. The location of these facilities is attractive to industries tied to aerospace, aviation and defense contracting, creating new opportunities for the regional economy and a positive impact on the business environment[3].

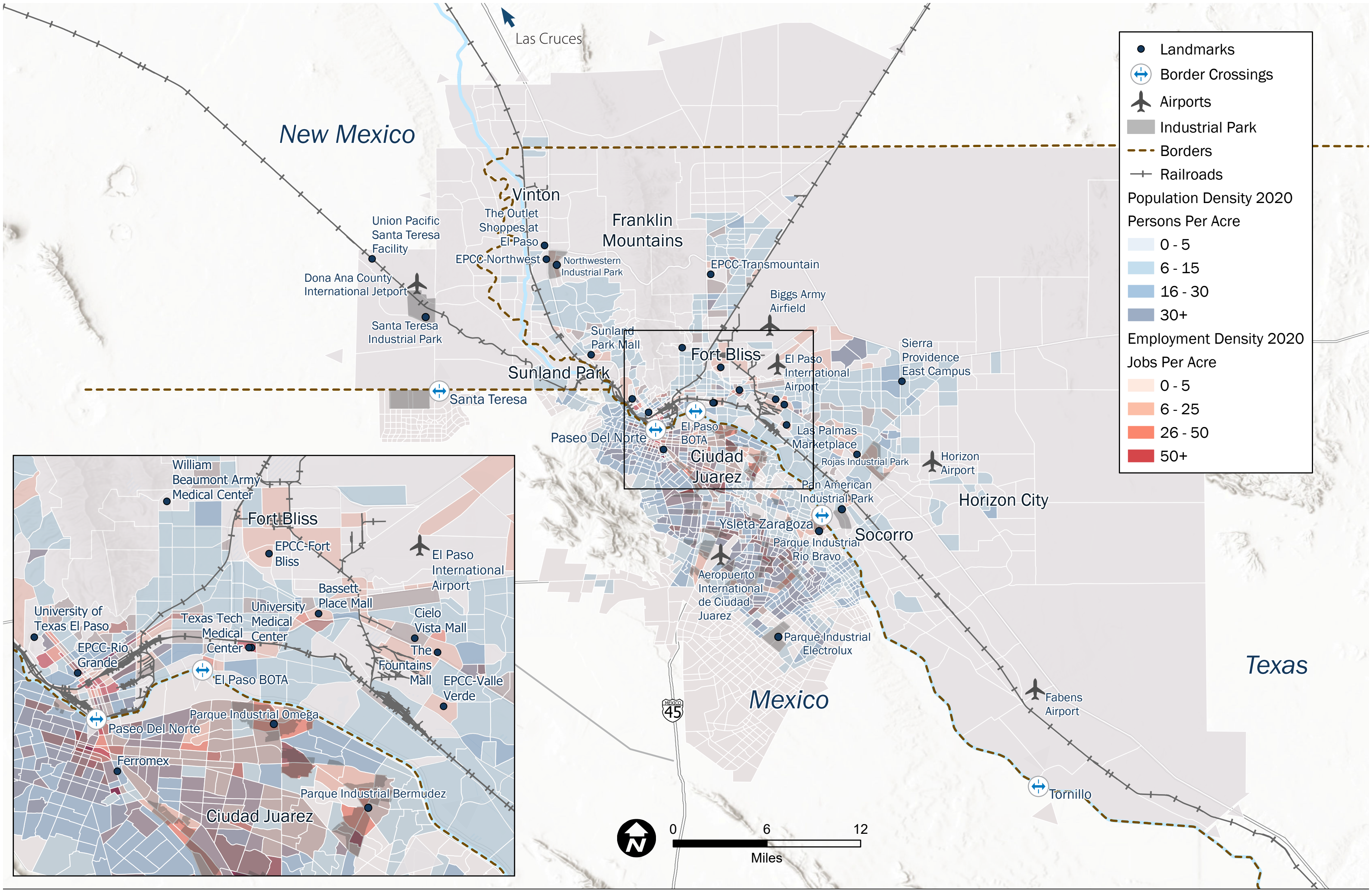
Regional Population and Employment Growth

Population Forecasts

While the region's population exceeds two million people today, forecasts suggest it will increase another 50 percent or more by 2045[4]. Much of this population growth is expected to occur in east and northeast El Paso, Horizon City, Fort Bliss, as well as areas near Sunland Park and Santa Teresa in New Mexico *(see Figures 4 and 5)*. A closer look at the data reveals other areas that are expected to experience high population growth including, the I-10 corridor in southern El Paso County and the Eastlake Boulevard corridor approaching Horizon City. Areas near Socorro, Vinton, and along Dyer Street in north El Paso County will continue to see population increases as well[5]. This growth in new residents will increase demand on the region's infrastructure. Finding innovative solutions to moving people and goods within these corridors will become paramount.

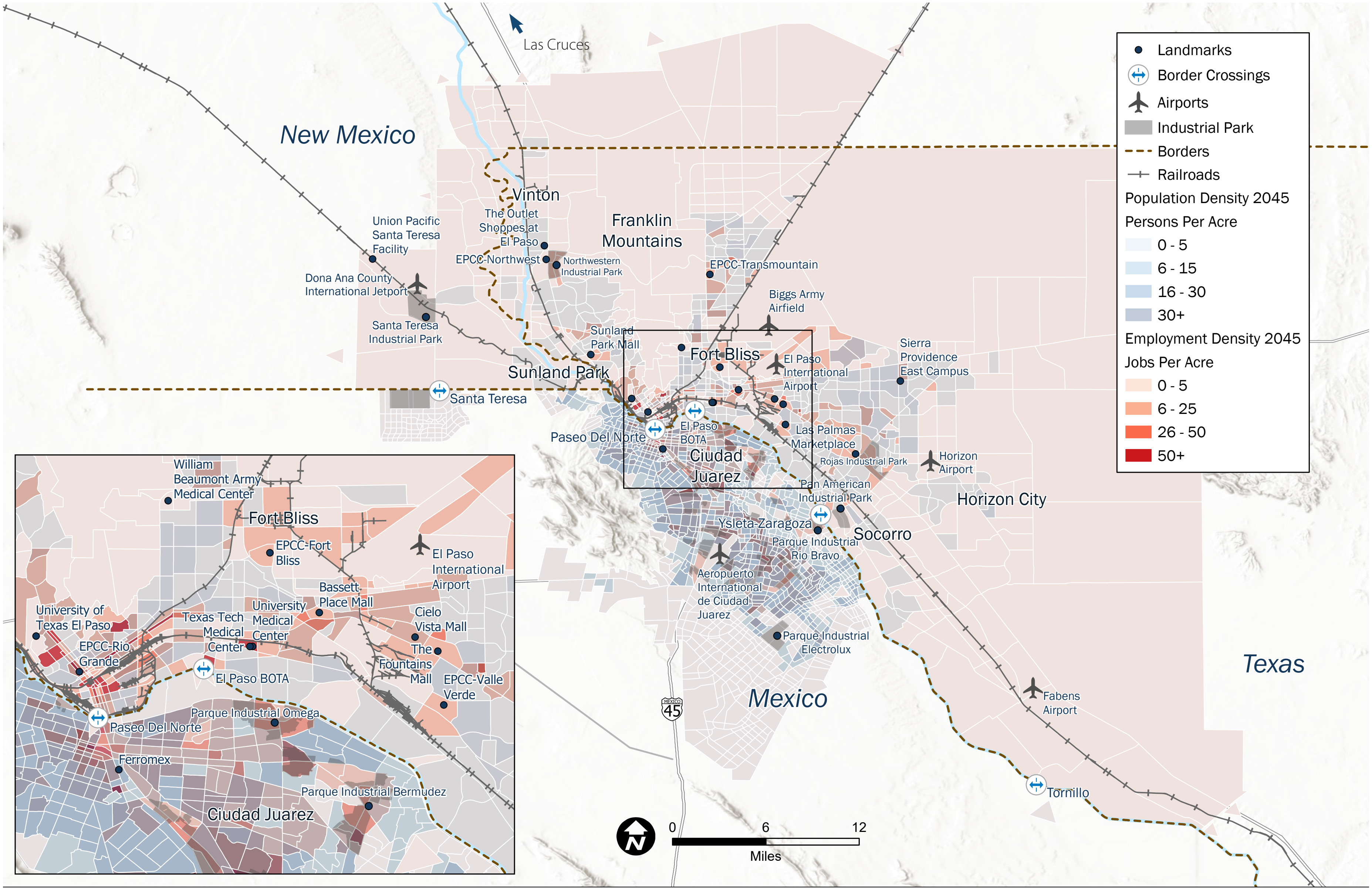
[1]Source: US Census Bureau, 2017 American Community Survey; INEGI, 2010
[2]Source: Borderplex Alliance 2020 Strategic Plan
[3]Source: Borderplex Economic Outlook to 2018
[4]This number is based on current population estimates for and forecasts for El Paso, and Las Cruces INEGI, 2010; Destino 2045
[5]El Paso Metropolitan Planning Organization. Destino 2045:2045 Demographic and Employment Growth, page 1

Figure 4. Existing Population & Employment



Source: El Paso MPO: 2045 Destino Regional Travel Demand Model, IMIP (Juárez): Traffic Analysis Zone Layer

Figure 5. Future Population & Employment



Source: El Paso MPO: 2045 Destino Regional Travel Demand Model, IMIP (Juárez): Traffic Analysis Zone Layer

Jobs in the Region

The El Paso–Juárez–Las Cruces labor market consisted of more than 760,000[6] jobs in 2017 and has nearly 30 companies that each employ at least 500 persons in the area[7]. As reported by the North American Industry Classification System (NAICS), health care and social assistance, retail trade, educational services, accommodation and food services, administration and support services represent the top five industries for the portion located in the U.S. In Juárez, manufacturing continues at a strong pace resulting in a noticeable increase in transportation and logistics operations across the border[8].

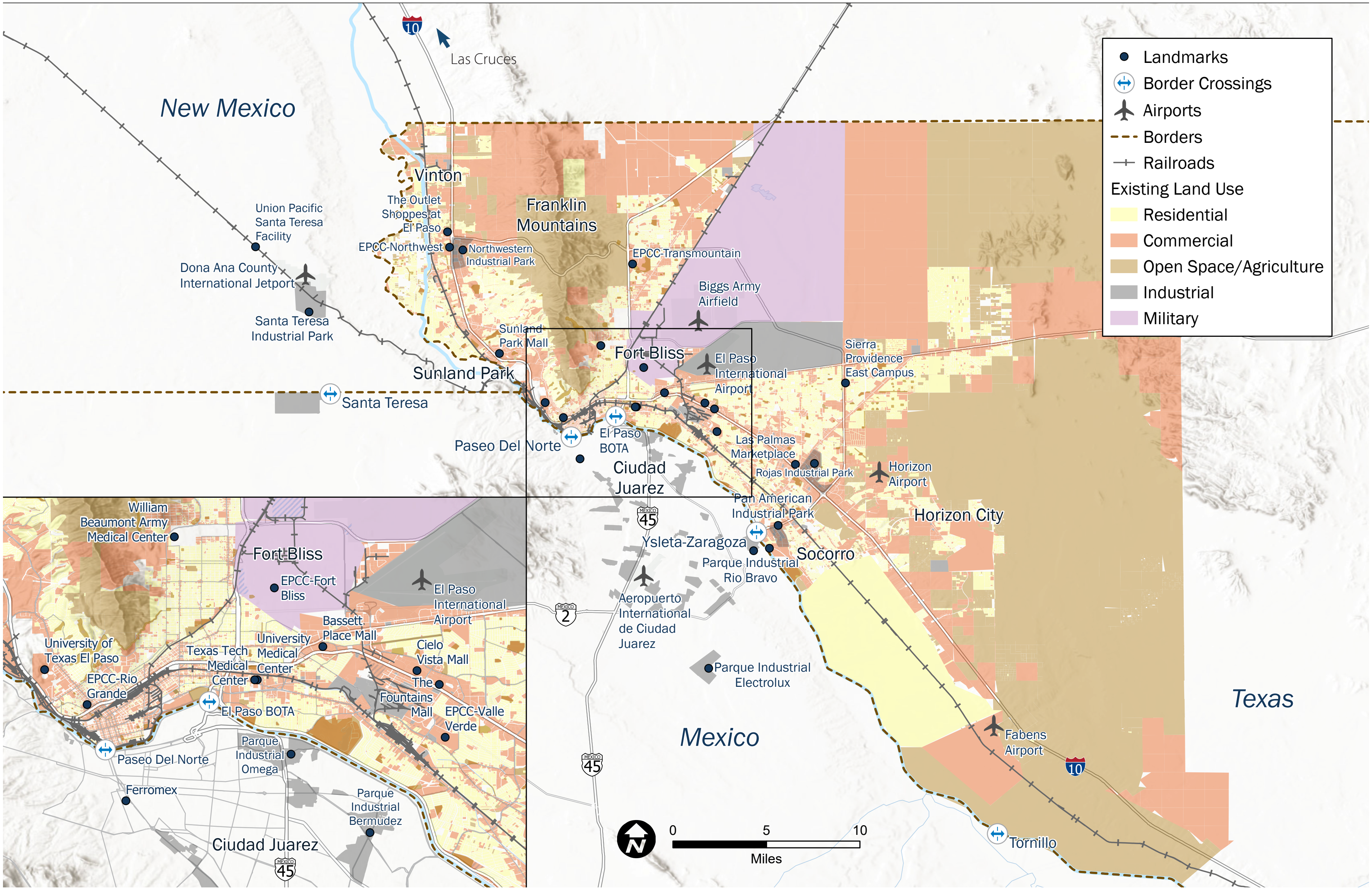
Employment centers play a critical role in regional mobility since they become key destinations for users. Nearly 80 percent of these centers, representing about 33,000 jobs, are located within El Paso city limits[9]. A large concentration of healthcare providers is located around the Medical Center of Americas east of downtown El Paso, and the hospital district near Mesa Street and Schuster Avenue, adjacent to the UTEP campus. Two new hospitals were recently constructed, one in the northwest near Loop 375/Transmountain Drive and Resler Drive and one in the far east near US 62/180 (Montana Avenue) and Loop 375/Joe Battle Boulevard Apart from Fort Bliss, government complexes are generally concentrated in downtown El Paso, with several large complexes located along the I-10 and US 54 corridors. In addition, there are 10 college campuses including UTEP, New Mexico State University, and several El Paso Community College campuses located in the region with a combined enrollment of over 54,000 students. *(see Figure 6)*.

Retail trade comprises almost 14 percent of the labor force, providing another 40,000 jobs. While these shops are generally dispersed throughout the region, many of the larger developments are situated along the I-10 corridor for greater access, including the Fountains at Farah, Cielo Vista Mall, Bassett Place, The Outlet Shoppes at El Paso, and Sunland Park Mall. These tend to be major destinations for cross border passenger vehicles coming from Mexico *(see Figure 6)*.

Source: theelpasoclub.com

[6]*Source: US Census Bureau. American Community Survey 2013-2017 5-Year Estimates; INEGI, 2010 Census*
[7]*Texas A&M Real Estate Center. Accessed at: https://assets.recenter.tamu.edu/documents/mktresearch/El%20Paso_Top_Employers.pdf*
[8]*Source: Industry Today. El Paso Regional Economic Development Corporation- The Ciudad Juárez – El Paso Borderplex. Accessed at: https://industrytoday.com/article/the-ciudad-juarez-el-paso-borderplex/*
[9]*Source: U.S. Census Bureau, Center for Economic Studies, 2017*

Figure 6. Existing Land Uses and Major Activity Centers



Source: City of El Paso General Land Use Layer 2019

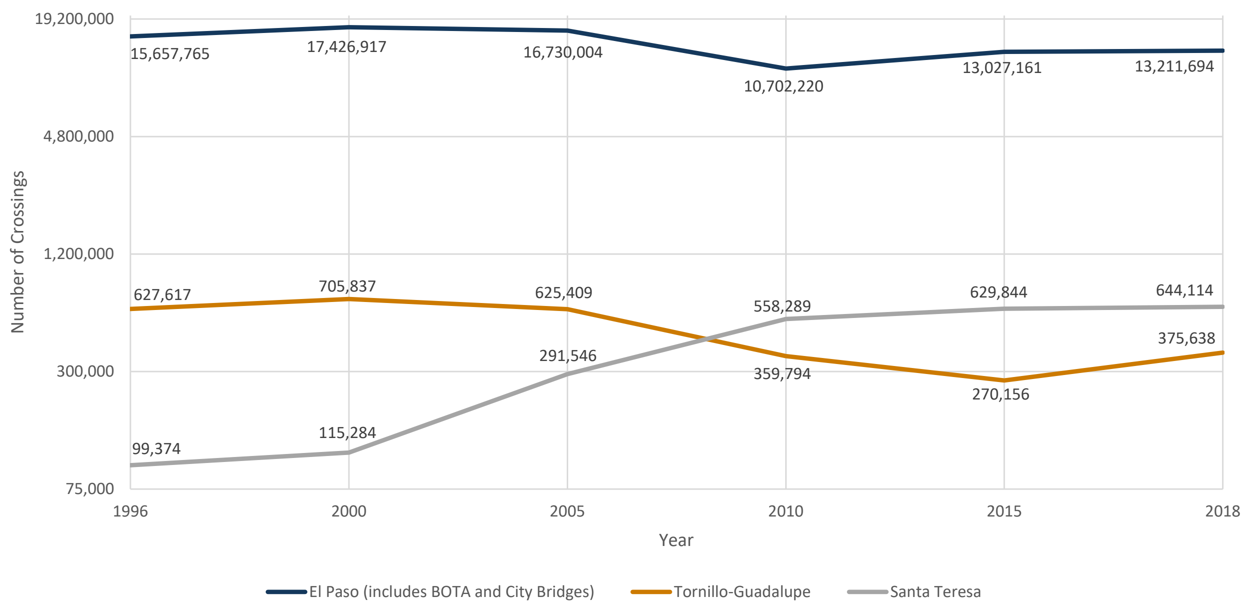
Activity at Area Ports of Entry

The economies on both sides of the international border are closely linked. To better understand cross-border traffic patterns of people and vehicles within this region, a review of the El Paso, Santa Teresa, and Tornillo-Fabens POEs was conducted. The RMS team also participated in discussions with the City of El Paso International Bridges Steering Committee which meets each month. As shown in *Table 1*, over 13 million inbound trips into the U.S. were made at these locations in 2018. In the same year, the POE contributed over $81 billion to the national economy, which is a strong indicator that U.S. residents across the country benefit from this tremendous cross-border trade with Mexico and numerous other countries that ship their products through this location[10].

Using available data and local knowledge from the Steering Committee, the RMS team identified and mapped common origins and destinations in the region and identified key corridors along the U.S.-Mexico border that provide access to area POEs. Key origins identified for freight entering the U.S. were Aeropuerto Cd. Mexico, Parque Industrial Bermudez and Parque Industrial Juárez. Key destinations for freight entering the U.S., include: Airport Industrial Park, Pan American Industrial Park, Rojas Industrial Park, Santa Teresa Industrial Park and Northwestern Industrial Park. While key origins for personal vehicles were not identified from these efforts, stakeholders were able to pinpoint several key destinations for these trips, including:

- The Outlet Shoppes at El Paso
- Cielo Vista Mall/Fountains at Farah
- El Paso International Airport
- UTEP
- Bassett Place; and
- Las Palmas Marketplace

Table 1. Total International Vehicle & Pedestrians Crossings



[10]USTradeNumbers-World City, Inc. (2019). El Paso Border Crossing, Texas. Retrieved from https://www.ustradenumbers.com/port/el-paso-border-crossing-texas

Borderplex Alliance Listening Session, Source: HNTB

While the RMS team was unable to obtain specific feedback as to the movement of freight within the U.S., some insight was gleaned from two of the major operators in the area. The operators explained that while all loads are destined for transfers in El Paso, the majority of freight goes on to destinations in the U.S. including major transportation hubs in Memphis, Los Angeles, Chicago, and Miami. This system of transfers is necessary since current federal regulations do not permit Mexican truckers to transport loads directly from Mexico to points outside the 15-mile commercial zone beyond El Paso's corporate limits[11]. Instead, once the loads are brought to the U.S. by drayage companies, these loads are then transferred to U.S. destinations by "over the road" or long-haul companies.

Findings from this analysis support that TxDOT El Paso District should continue to work with the Federal Highway Administration (FHWA) and local agency partners to identify ways to efficiently collect and maintain data for short-range and long-range planning efforts that ensure infrastructure near and at the border crossings is adequate to meet future demand. It is also recommended that the TxDOT El Paso District, in partnership with other regional stakeholders, work with the Texas-Mexico Border Transportation Master Plan[12] effort that is currently underway to identify cross-border challenges, analyze existing transportation systems, and will include a prioritized list of transportation investment strategies that support economic competitiveness and improve cross-border trade and transportation impacts.

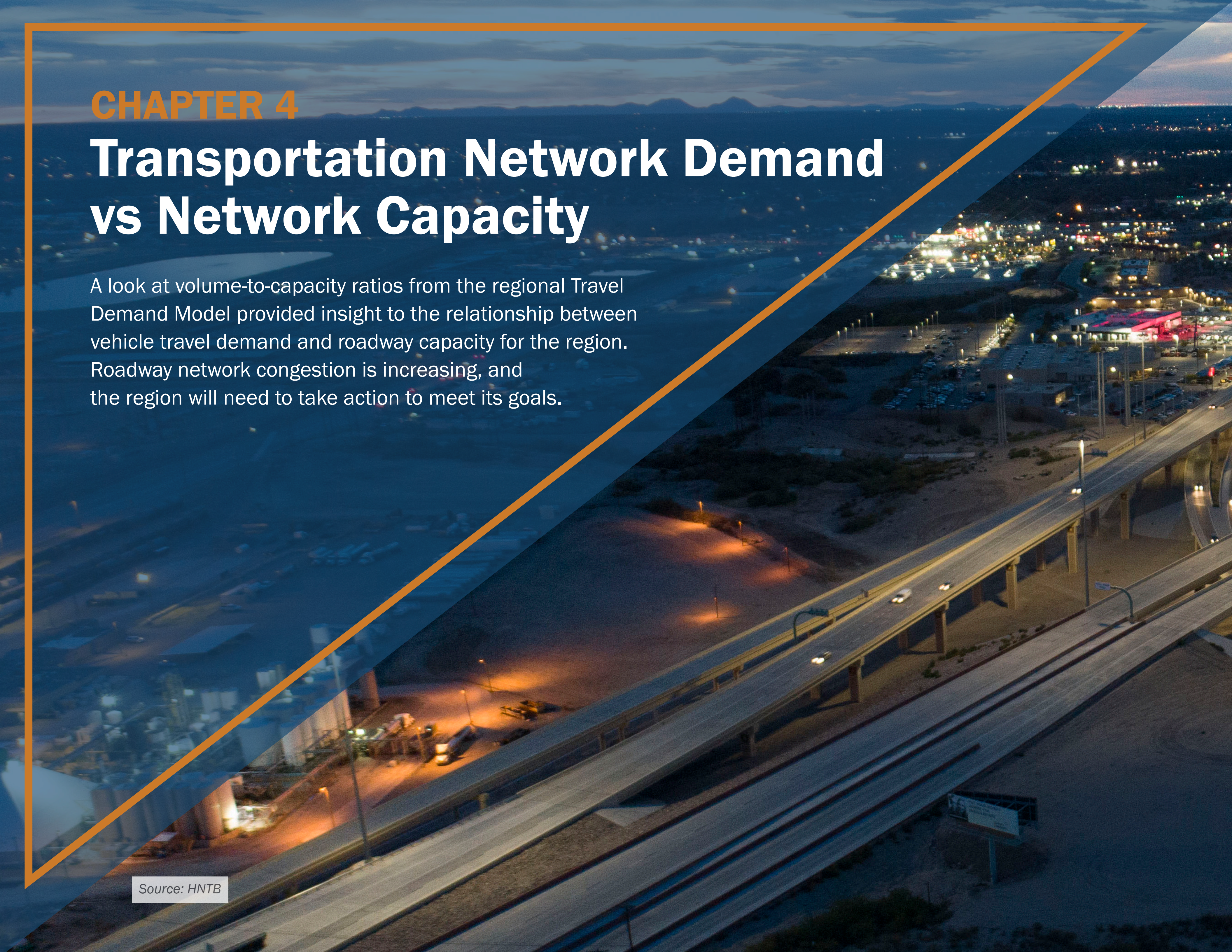
[11] *El Paso's commercial zone defined at: https://www.govinfo.gov/content/pkg/CFR-2018-title49-vol5/xml/CFR-2018-title49-vol5-sec372-247.xml*
[12] *TxDOT, Texas-Mexico Border Transportation Master Plan, Statewide Study, https://www.txdot.gov/inside-txdot/projects/studies/statewide/040219.html*

Source: HNTB

CHAPTER 4

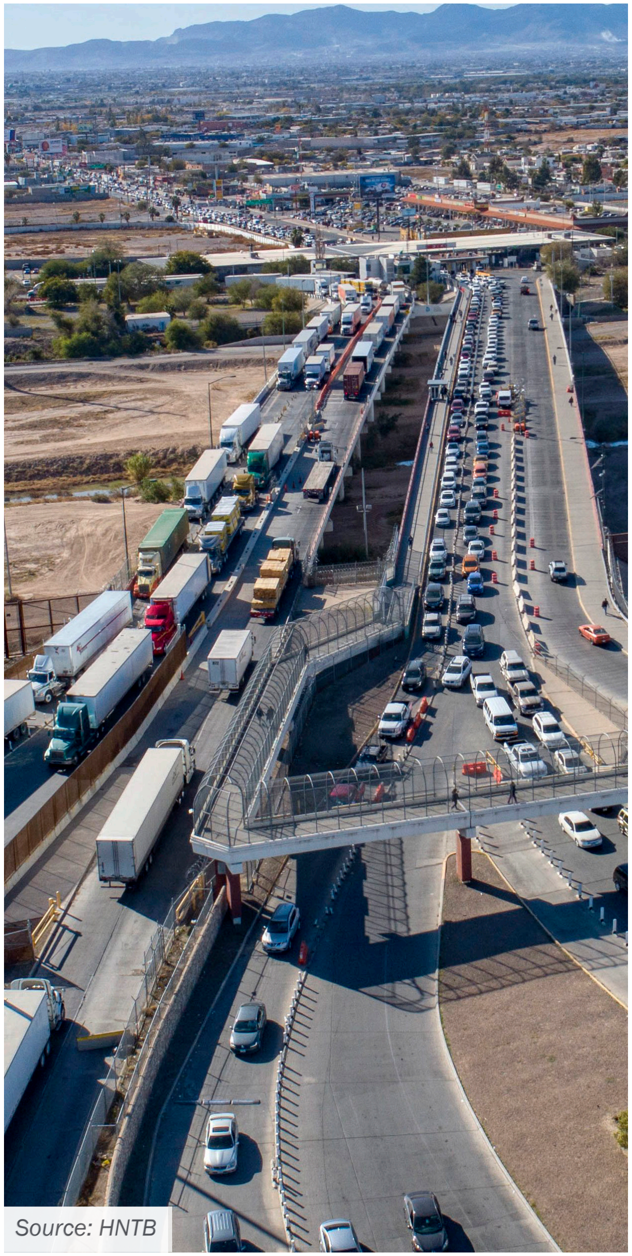
Transportation Network Demand vs Network Capacity

A look at volume-to-capacity ratios from the regional Travel Demand Model provided insight to the relationship between vehicle travel demand and roadway capacity for the region. Roadway network congestion is increasing, and the region will need to take action to meet its goals.



Source: HNTB


Help define the future of our region.
Mobility.
Livability.
Economic Development.


Source: HNTB

Roadway Network Congestion

Most recent estimates released by the U.S. Census Bureau indicated that in 2015, over 17,000 of nearly 337,000 workers in El Paso commuted from outside city limits[13]. This coupled with the incoming traffic at the area POEs results in traffic congestion and strain on the transportation network, especially during peak periods. A look at volume-to-capacity (V/C) ratios from the regional Travel Demand Model (TDM) can provide insight to the relationship between vehicle travel demand and roadway capacity for the region. The V/C ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). A V/C ratio less than 0.75 generally indicates that adequate capacity is available, and vehicles are not expected to experience extensive queues and delays. As the V/C ratio rises above 0.75, traffic flow becomes unstable, and traffic operations begin to break down.

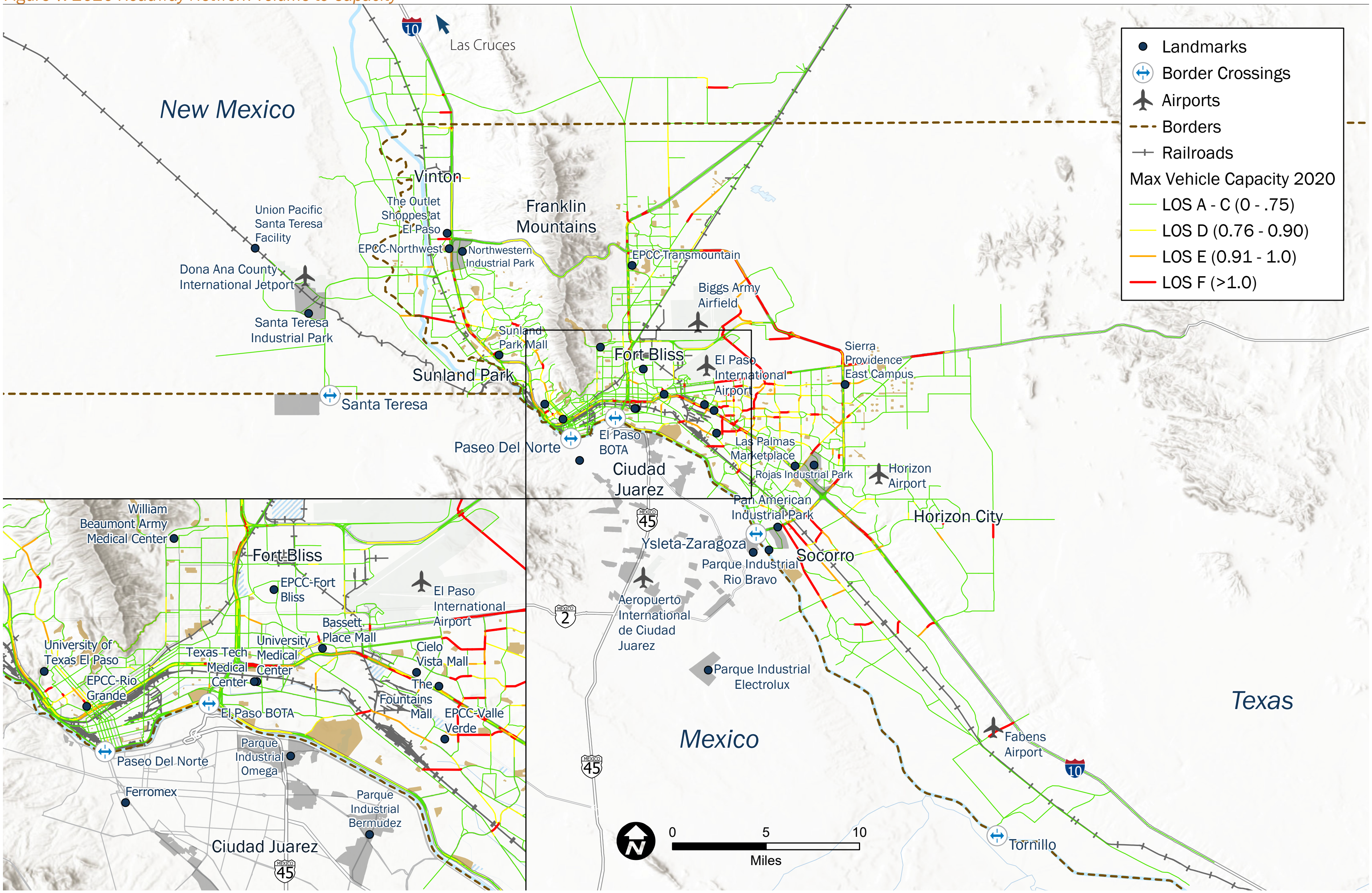
2020 V/C ratios are shown in *Figure 7*. A letter grade between A and F has been assigned to a range of V/C ratios. The letter grade represents the level of service (LOS) a driver would experience on the road. LOS A represents optimum mobility conditions, while LOS F represents a complete breakdown in traffic operations, e.g. stop and go conditions.

Key takeaways from the 2020 V/C ratio analysis include:

- 50% of the region's travel demand occurs on the principal arterial system
- 72% of the congested roadways include I-10 and principal arterials
- 48% of I-10 is at or above capacity
- 28% of the principal arterial network is at or above capacity

[13]*Source: 2011-2015 ACS Commuting Flows*

Figure 7. 2020 Roadway Network Volume to Capacity



The LOS-V/C maps are based on peak hour traffic (worst peak in 24 hour period)

MCA Foundation Listening Session, Source: HNTB

Several roadways within the borderplex are experiencing high levels of congestion. A selection of roadways with the highest level of congestion are shown in *Table 2*.

All segments listed are currently in either TxDOT's planning phase, project development phase, or scheduled for construction with exception of Global Reach Drive. Loop 375/Purple Heart Freeway from Spur 601 to US 62/180 (Montana Avenue) is scheduled to be widened within the next four years. Loop 375/Purple Heart Freeway from Spur 601/Liberty Expressway to Dyer Street is slated to be widened within the next five to 10 years. US 62/180 (Montana Avenue) Phase 1 from Global Reach Drive to FM 659 (Zaragoza Road) is scheduled for construction to add capacity to include frontage roads and grade separations. SH 20/Alameda Avenue from Loop 375/Purple Heart Freeway to Passmore Road is contained in the recently completed SH 20/Alameda Avenue Corridor Study. This study provides a comprehensive plan with short-, mid- and long-term recommendations. I-10 is currently undergoing a comprehensive study, Reimagine I-10, to assess the needs and requirements for the region's busiest urban freeway. Several major alternatives to increase capacity and increase trip reliability are being considered. Four study segments have been identified:

- Segment 1: NM/TX state line to Executive Center Boulevard
- Segment 2: Executive Center Boulevard to Copia Street
- Segment 3: Copia Street to Airway Boulevard
- Segment 4: Zaragoza Road to FM 3380

FM 258/Socorro Road from Loop 375/Americas Avenue to FM 1110 was studied under the Border Highway East Planning and Environmental Linkages (PEL) study. This study examined multiple alternatives, all of which would alleviate congestion along FM 258/Socorro. Operational improvements on FM 258/Socorro and the proposed Border Highway East freeway facility will bring relief to FM 258/Socorro. A small section of FM 3255/MLK Boulevard from Jon Cunningham Boulevard to US 54 is also experiencing congestion. Operational, safety improvements, and roadway restoration are planned within the next four years.

Table 2. Existing (2020) Roadways with Highest V/C

Street Name	Classification	From	To	Miles	Maximum V/C	TxDOT Efforts Underway
Loop 375/Purple Heart Freeway	Expressway	US 54	US 62/180 (Montana Avenue)	10.6	2.32	Yes
US 62/180 (Montana Avenue)	Principal Arterial	I-10	East of FM 659 (Zaragoza Road)	3.5	2.24	Yes
Global Reach Drive	Principal Arterial	Spur 601/Liberty Expressway	US 62/ 180 (Montana Avenue)	3.0	1.75	n/a (off-system)
SH 20/Alameda Avenue	Principal Arterial	Loop 375/Americas Avenue	Passmore Road	4.6	1.45	Yes
I-10 Segment 2	Freeway	Executive Center Boulevard	Loop 478/Copia Street	5.6	1.44	Yes
FM 258/Socorro Road	Principal Arterial	Loop 375/Americas Avenue	FM 1110	5	1.44	Yes
FM 3255/MLK Boulevard	Principal Arterial	Jon Cunningham Boulevard	US 54	.52	1.36	Yes
I-10 Segment 1	Freeway	NM/TX State Line	Executive Center Boulevard	16.8	1.30	Yes

A V/C analysis was also conducted the forecast year of 2045 *(Figure 8)*. The 2045 analysis includes all fiscally constrained improvements in the long-range plan. Key takeaways from the 2045 V/C ratio analysis include:

- 30% increase in regional travel demand
- 51% of the region's demand occurs on the principal arterial system
- 68% of the congested roadways include I-10 and principal arterials
- 51% of I-10 is at or above capacity
- 42% of the principal arterial network is at or above capacity
- 51% increase in congestion on the region's principal arterial system
- 35% increase in vehicle hours traveled (VHT)

As expected, highways and principal arterials will continue to handle the bulk of the demand. The principal arterial system is expected to see a 50 percent increase in demand by 2045. While the region's principal arterial network currently averages one lane in each direction, a robust principal arterial network should provide a minimum of two lanes in each direction. Controlled access facilities, including regional expressways, should also be a feature of a principal arterial system to move high volumes of traffic between major origins and destinations within the region.

Travel demand model results by functional class for 2020 and 2045 can be found in *Appendix D. Roadway Network Analysis*.

Air Quality Conformity & Congestion Management

Nonconformity related to traffic congestion has led to delayed projects, unrealized projects, and loss of transportation funding. During the RMS efforts, the MPO also advanced its Congestion Management Plan (CMP) which identifies key congested corridors and recommends strategies to address congestion. The RMS findings on congested roadways were shared with the CMP ad-hoc committee. Several of the congested corridors identified by the RMS efforts, shown in *Table 2*, correspond to those corridors identified in the CMP. Both RMS and CMP agree that the principal arterial system is experiencing heavy congestion, with arterials making up approximately 65 percent of the congested facilities. Roadway network congestion is increasing, and the region will need to take action to meets its goals.

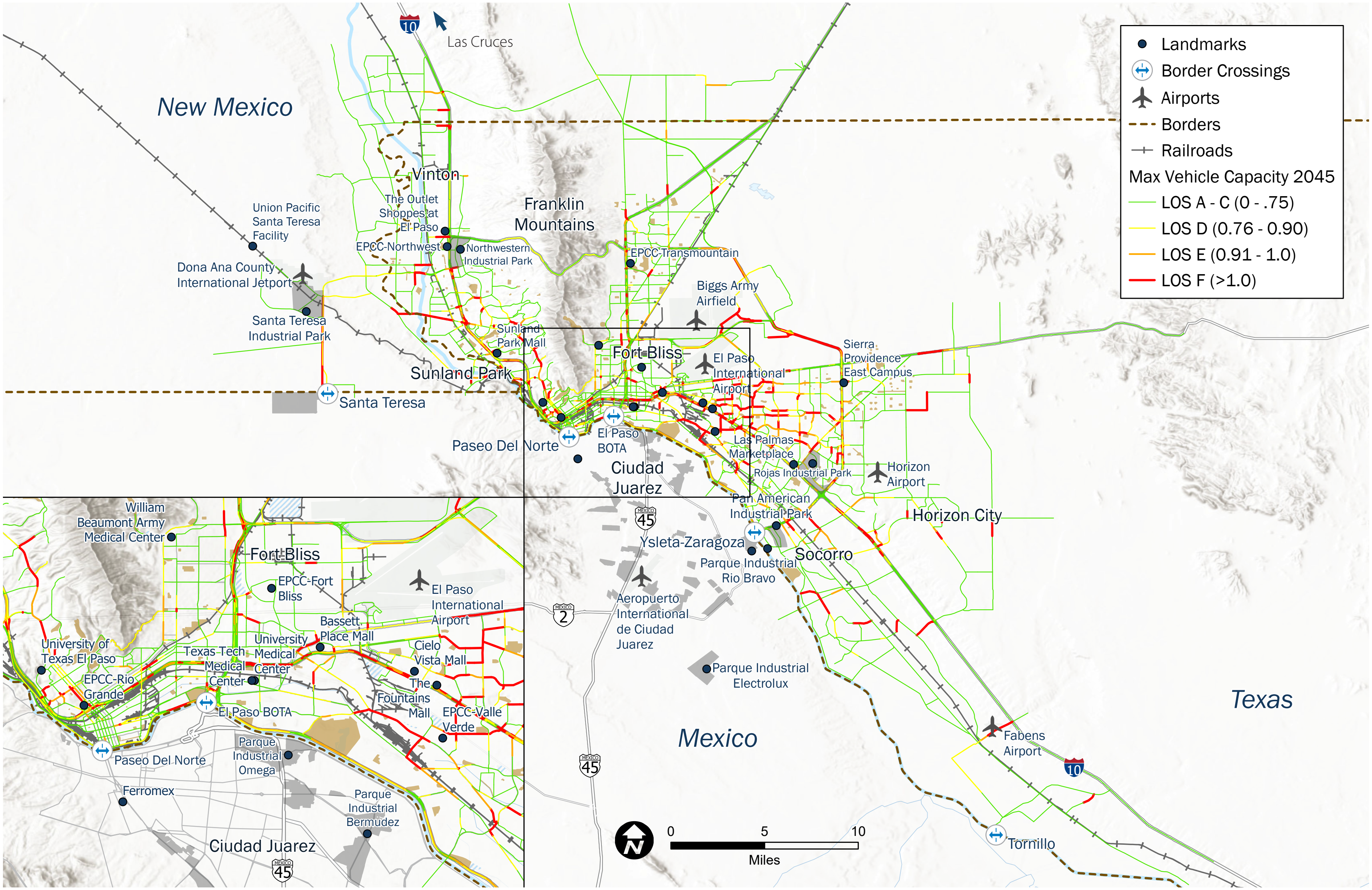
Another measure is Texas' Top 100 Most Congested Roadways, which is updated periodically. Included in the list are the following regional roadways as of 2018:

- Rank 69: I-10 from Mesa Street/SH 20 (Downtown) to Patriot Freeway/US 54 (Segments 1 and 2 of Reimagine I-10)
- Rank 71: North Mesa Street/SH 20 from Executive Center Boulevard to Texas Avenue (Downtown)
- Rank 84: I-10 from North Mesa Street/SH 20 to West Paisano Drive/US 85 (Segment 1 of Reimagine I-10)
- Rank 99: North Mesa Street/SH 20 from I-10 to Executive Center Boulevard.

These roadway segments were also identified by RMS and CMP efforts. A complete list of the CMP congested roadway segments can be found in *Appendix D. Roadway Network Analysis*

Source: HNTB

Figure 8. 2045 Roadway Network Volume to Capacity



The LOS-V/C maps are based on peak hour traffic (worst peak in 24 hour period)

Source: U.S. Customs & Border Protection

International Crossings

As previously mentioned, the RMS focus area is positioned such that activity at the ports of entry play a significant role in the overall economy and quality of life experienced by area residents. In addition to providing access for the residents who live in the region, transportation corridors that support these POEs are also critical to sustaining the movement of people and freight across the border. For this reason, providing connectivity, and improving access to and from these ports is a priority.

With input from the City of El Paso's Bridges Steering Committee coupled with local knowledge, the RMS team identified key corridors along the U.S.-Mexico border that provide access to area POEs. Starting with the El Paso TDM network as a base, roadway corridors were assessed using the following criteria:

- Corridors that support POEs and provide congestion relief to the highways
- Corridors that support local traffic (non-freight) between the POEs
- Highway segments that support the most trips to industrial parks
- Corridors used in Mexico for cross-border trips

The RMS team was able to isolate preferences with regard to travel routes. The group identified the Bridge of the Americas (BOTA) and Ysleta-Zaragoza ports of entry as the most commonly used border crossings, which was expected due to their central locations and proximity to freeway connections. BOTA is the only toll-free POE and Ysleta-Zaragoza is the only El Paso POE that allows transport of hazardous materials, making both crossings even more desirable for freight transport. As for transportation corridors within the U.S., the most commonly selected routes to industrial parks were I-10, US 54, and Loop 375. In Mexico, top routes identified for cross-border trips were Avenue Tecnológico, Boulevard Juan Pablo II, Avenue Bermudez, and Avenue Independencia.

The City of Sunland Park conducted a feasibility study in 2018 for a proposed new border crossing[14]. Feedback regarding the proposed POE was captured during the RMS stakeholder listening sessions. Respondents felt the Sunland Park POE:

- Is more likely to get support from Mexico than from the U.S.
- Could improve border wait times for all of the region's international POEs
- Does not currently have supporting highway infrastructure
- Would rank lower in priority when compared to the Paso del Norte, Ysleta-Zaragoza, and Santa Teresa crossings for development and improvements.

Complete results from this analysis are provided in *Appendix E. Cross Border Analysis*.

[14] *Sunland Park Border Crossing Environmental Feasibility Study, August 2018, accessed at http://www.sunlandpark-nm.gov/B%20Environmental%20Feasibility%20Study.pdf*

Regional Transit

A key theme that surfaced from the RMS listening sessions was the idea of providing regional transit service. Stakeholders agreed a transit alternative that fits within the existing regional infrastructure is important to the success of the area. In concert with investing in roadway widening projects, participants noted, investing in transportation improvements that provide an alternative to the single occupant vehicle will be needed as the region continues to expand.

Sun Metro has been the primary provider of transit service in the borderplex since the agency's inception in 1987. Operating primarily within the City of El Paso, Sun Metro runs 62 local and express routes, three Brio RTS routes, a rail streetcar, and route 83 which serves the City of Sunland Park[15]. Other transit providers in the region include El Paso County Transit, which provides transit services in rural areas, and the Mexican bus rapid transit (BRT) system, ViveBús. In Southern New Mexico, the South Central Regional Transit District (SCRTD) provides fixed route transit service for Sunland Park, Santa Teresa and Chaparral. It also connects to key transit hubs in El Paso.

Using information provided by regional transit providers and independent research, an assessment that focused on existing fixed-route, shared mobility and intercity transit options available in the region was conducted to pinpoint current and future transit needs. Short-, mid-, and long-term opportunities were identified for enhancing the overall quality and attractiveness of the transit system. The assessment also gauged how the transit system and associated transit-supportive land uses can be an effective transportation solution to improve overall future mobility in the region as various partners consider next steps.

Many large projects that were identified in the transit assessment have already been implemented or are under construction, such as the expansion of the Sun Metro Brio service and advancement of transit-oriented developments. Critical next steps are to deploy flexible route services to rural communities, integrate metropolitan and rural transit service into a seamless fare system and consolidate access to intercity bus services in the downtown area, which are needed to create a truly regional transit system. In terms of the ability to move greater volumes of people through a given corridor, public transportation can offer increased capacity without increasing actual roadway capacity.

Sun Metro has recently implemented Brio rapid transit service on three of the busiest roadways in the region — Mesa Street, Dyer Street, and Alameda Avenue — providing another option for commuters and improving roadway capacity to move more people.

While Sun Metro and El Paso County Transit continue to implement system upgrades, other longer-term opportunities to expand the transit network have already been identified. TxDOT is currently conducting an advanced planning study called Reimagine I-10 for the I-10 corridor to evaluate transportation needs along I-10 in El Paso. As part of the study, TxDOT is considering a reconfiguration of the I-10 right of way through downtown that could support the installation of adaptive-use lanes for the Brio. Additionally, transit extensions that serve Horizon City and UTEP, as well as improvements to the cross-border transit option between downtown El Paso and Ciudad Juárez will be key as increased growth and activity in these areas of the region continue. A complete report of the regional transit assessment is included in *Appendix F. Regional* Transit Assessment.

We need to take advantage of our uniqueness of being on the border.

State Representative Evelina "Lina" Ortega

[15]*As of May 2019*

E-scooter sharing in downtown El Paso, Source: HNTB

Active Transportation Solutions

Like many areas around the country, the borderplex is experiencing a trend where users would like to see a more robust bicycle and pedestrian transportation network. Local jurisdictions are working to improve the ability of residents and visitors to access active transportation solutions such as enhanced sidewalks, dedicated bike lanes, improved lighting, and more protections for cyclists on roadways. This is being accomplished through the adoption of plans by the City of El Paso and County of El Paso that have goals to achieve further walkable, livable, and sustainable land-use and transportation patterns.

Recent data indicate the mode share for trips in the region (excluding Juárez) is estimated at 91 percent for automobiles, 8 percent for non-motorized modes (with 0.3 percent bikes), and 1 percent for transit[16]. In comparison, recent estimates for trips in Juárez show approximately 52 percent for automobile; 28 percent non-motorized travel (with 0.4 percent for bikes); and 20 percent for transit.

The RMS team compiled a summary of regional bicycle and pedestrian plans prepared by TxDOT, the City of El Paso, the County of El Paso, and NMDOT to understand current connectivity and gaps in the region-wide system. In addition, a listening session was held with the Velo Paso Bicycle-Pedestrian coalition to gather feedback. The team found that while some investment has been made to the bicycle and pedestrian network, many needs still exist within the region, specifically:

- Illustrative networks for bicycle and pedestrian facilities require significant capital monies to create a complete network with seamless linkages. No single revenue source will be able to fund all the identified connectivity improvements desired by residents and municipalities.

- Existing bike facilities may not be comfortable or accommodating for all riders such as families with younger children or riders with less experience. A similar issue for sidewalks is that they may not serve all users due to no lighting, lack of buffer from high speed traffic, or absence of connectivity to schools.

- Addressing connectivity to/from key activity centers in existing and developing areas is challenging due to the distance between activity areas and housing.

- Accommodating car, bike, and pedestrian facilities on roadways sometimes impacts one or two modes of capacity and/or design features.

[16]US Census Bureau. American Community Survey 2013-2017 5-Year: Means of Transportation to Work for Workers 16 Years and Over; INEGI 2010

The previous studies highlight several examples of roadway projects that combine bike and pedestrian facility programming in the region. This practice, as well as incorporating these facilities into incoming land development projects, can be an effective way to build active transportation infrastructure that can serve the needs of many types of users. Additionally, partnering with transit providers and developers can reduce vehicle miles traveled and promote urban development that directs density to the appropriate sites that can support more pedestrian and bike trips. A detailed summary of the current state of active transportation facilities in the region is included in *Appendix G. Bike and Pedestrian Facilities Summary* for reference.

Table 3. Mode Choice by Percent

Mode of Commute	El Paso-Las Cruces Metro Area	Ciudad Juárez
Automobile	91	52
Non-Motorized Travel	8	28
Bikes	0.31	0.40
Transit	1	20

Bike sharing in downtown El Paso, Source: HNTB

Source: HNTB

Freight Rail Operations

The El Paso-Las Cruces-Juárez region will continue to be an important hub for freight rail. El Paso is home to multiple rail yards, including Union Pacific's (UP) Santa Teresa Intermodal Ramp, which serves as a major hub for east-west rail transport. Although much of the rail traffic in El Paso is UP's through-traffic coming from the west coast and going to other parts of the country, export and import trade at the U.S./Mexico International Border Crossings also generates rail traffic. Current operational issues resulting from inefficient international crossings in downtown El Paso and Juárez have created bottlenecks in the area. Solutions that address bottlenecks at these crossings need to be multimodal and adaptive to changing physical and political landscapes. Maximizing the use of rail transport is one solution.

RMS conducted a high level assessment of BNSF and UP railroad corridors in the borderplex, including the potential opportunities related to mobility within the region. Existing conditions of railroad crossing with major roadways, highways, and freeway were evaluated and future conditions were forecasted. Corridor inventories, crash analyses and intersection analyses were employed to rank intersections by potential impacts. Existing data reveal an increasing trend for inbound rail shipments in the borderplex. *Figure 9* summarizes annual inbound train crossing counts between 1996 and 2018.

In addition to the technical assessment, targeted listening sessions with New Mexico Border Authority (NMBA), NMDOT, and the State of Chihuahua were held to gauge stakeholder interests. Feedback from the meetings highlights that a bi-national rail bypass involving three railroad owners (Ferromex, UP, and BNSF), that would result in El Paso freight traffic being diverted to the Santa Teresa POE, continues to be a high priority for the states of New Mexico and Chihuahua. The bypass would divert El Paso-Juárez freight rail traffic to Santa Teresa and result in:

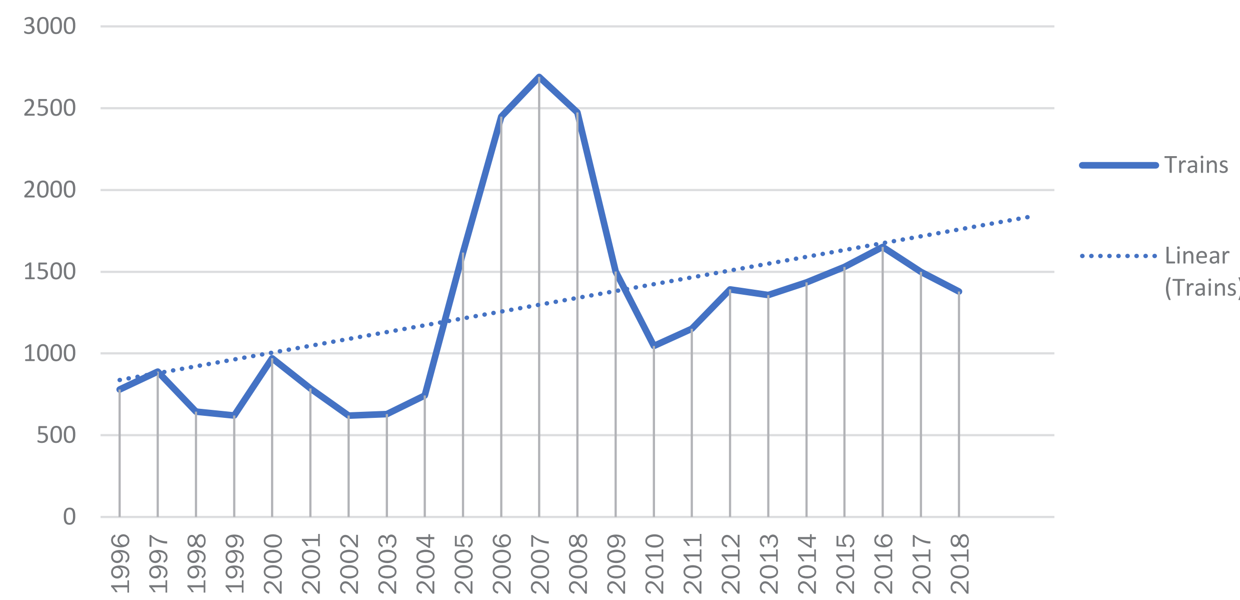
- The potential to alleviate rail and roadway congestion in downtown El Paso and Juárez
- The relocation of the downtown El Paso BNSF Intermodal Facility, and creating new acreage downtown for redevelopment
- The potential for a future cross-border streetcar project on former freight rail infrastructure
- The prospect of increased real estate development and economic activity in the Santa Teresa area beyond the activity already anticipated
- The potential to increase public safety as a result of moving trains away from densely populated areas, such as the Doniphan Drive corridor on El Paso's westside and the Chihuahuaita neighborhood on El Paso's southside.

In short, the bypass could significantly grow the region's bi-national economy. Today, the bypass faces major challenges for implementation, including funding, a required presidential permit, and agreements with all three railroad owners.

The detailed report with findings is provided in *Appendix H. Freight Rail Analysis*.

> *Freight is important for El Paso and we need to plan for its growth.*
>
> *El Paso Mayor Dee Margo*

Figure 9. Historic Annual Train Counts



Source: BTS, 2019

CHAPTER 5
Going Forward

The RMS Implementation Plan is introduced. Starting with the regional vision that was crafted from stakeholder listening sessions and identified needs, an evaluation matrix for future projects is introduced with several potential project scenarios for the RMS focus area. The chapter also references key next steps for those looking to be involved in future efforts.


Help define the future of our region.
Mobility.
Livability.
Economic Development.

Sun Metro Listening Session, Source: HNTB

The RMS team listened and learned what was most important to the stakeholders and this report is the resulting product that translates those desires into potential ideas for future consideration. RMS is both a process and a resource to inform decision-making. The RMS process provides the opportunity to realize a vision, but the conversation is never considered complete. RMS intends to catalyze on the strength of its stakeholder participation now and going forward. This report will help TxDOT and future partner champions understand how and where to direct resources more effectively as projects and plans are delivered more effectively and with fewer delays.

El Paso County Listening Session, Source: HNTB

Regional Vision

Through open dialogue with multiple stakeholders and partnering agencies, the RMS aims to establish the support for and provide early direction to a comprehensive regional vision strengthened in a collaborative spirit and powered by multiple champions working together to build El Paso's future. While several key themes emerged as RMS unfolded, it has become evident that an overarching vision with buy-in from all stakeholders was the critical link that would guide the region and allow its leaders to speak with one voice. Though the initial phase of RMS focused on creating a dialogue and building partnerships, stakeholders encouraged the team to look ahead and identify ways to reach the needs of the community in a proactive way. Stakeholders were not solely interested in promoting individual projects, but rather in developing a logical sequence of initiatives that would reach the needs of the entire community. The following is the basis for their vision for the region:

- Seamless multimodal transportation network
- Robust economy
- Collaborative leadership that speaks with one voice

This is the starting point for a larger conversation. Building on an identification of needs, a high level analysis of investment and enhancement scenarios informs the regional vision, which in turns helps guide investment decisions. Using RMS goals and regional needs as a guide, evaluation measures were crafted to assist policy-makers in developing potential scenarios that will assist with project development and strategy implementation. The intent is that potential scenarios will be evaluated based on the accomplishments by each measure. Evaluation measures are summarized in *Table 4*.

Success will be evident when a blend of goals is achieved. Projects or plans designed to achieve mobility and congestion relief will be far more favorable and ultimately receive a higher level of support when coupled with livability and quality of life considerations as well as catalyzed economic development potential.

Table 4. Evaluation Measures

Goals	Need	Criteria
Livability	Leadership	• Tri-State Regional Partnership: El Paso, Southern Dona Ana County, Ciudad Juárez • Public support • Private industry support
	Quality of Life	• Safety: Grade separations for rail crossings, geometric redesign to reduce accidents, floodways and crossings • Environmental sustainability and community cohesion
Mobility	Innovative Finance	• Leverage available funds from a variety of sources: local match, public-private partnerships, ROW donations
	Traffic Flow/Connectivity	• Key regional corridors for connectivity/gap completion) • ITS • Congestion Relief: LOS and travel time
	Multimodal Transportation	• Considers roadway, bridges, bike, pedestrian, transit, rail, air/land ports
Economic Competitiveness	Economic Development Opportunities and Income Growth	• National and Regional Significance: Global trade and freight corridors • Regional economic development and growth initiatives

Vintage electric streetcar in downtown El Paso, Source: HNTB

Prioritization & Process

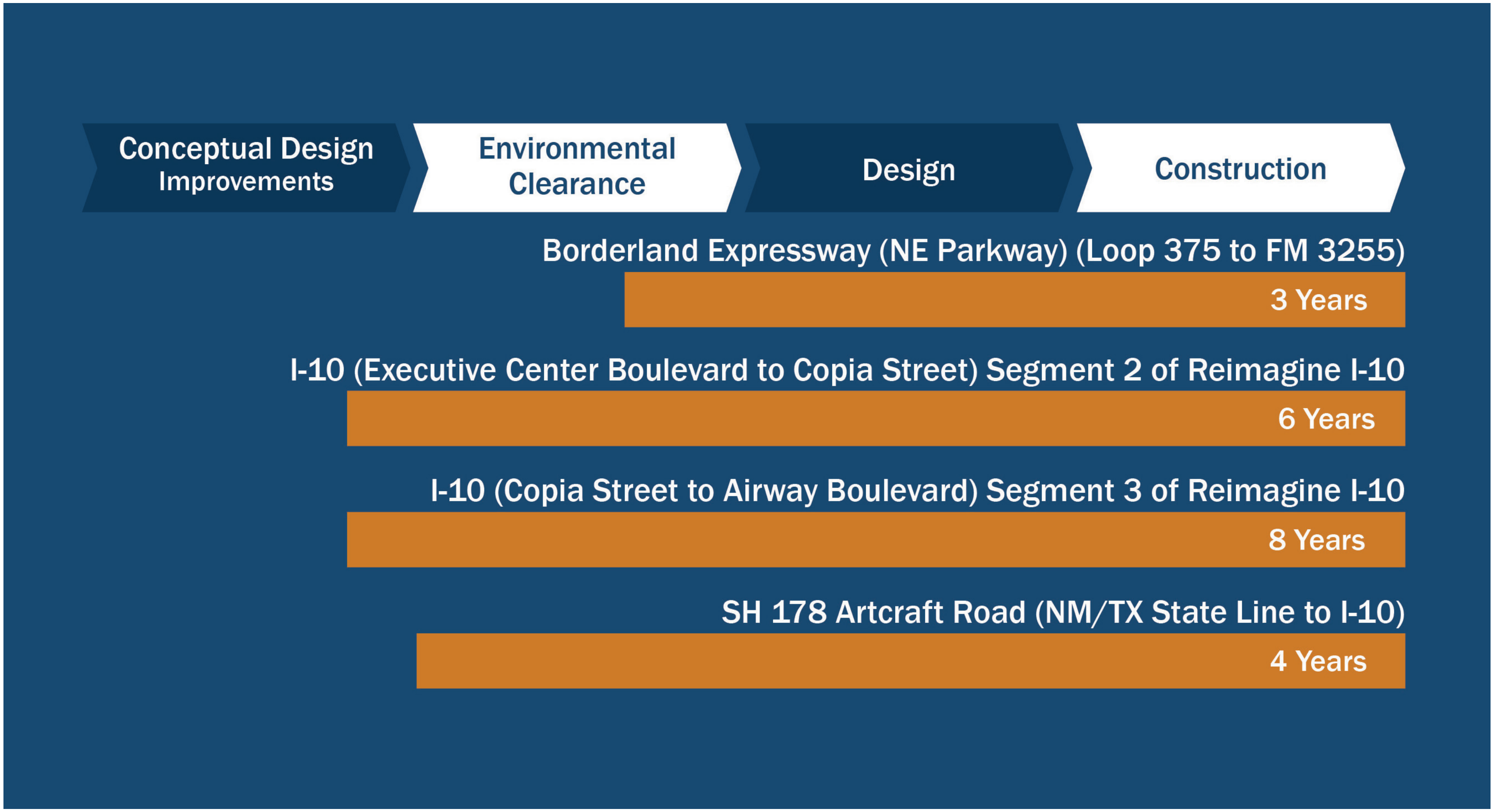
There are processes in place to move projects forward to realization. To determine readiness, any proposed project will be assessed on how well it aligns with planning and programming requirements.

If a project will use federal funds, requires FHWA or TxDOT approvals, or is deemed regionally significant, the first steps are to ensure the project is placed in the current version of the metropolitan transportation plan (MTP) and the Transportation Improvement Program (TIP) for the local MPO. After a project is added to the TIP, it is then submitted for inclusion in the Statewide Transportation Improvement Plan (STIP). The responsible agency then receives a federal letter of authority that allows the project to proceed with planning, development, or construction, depending on the project scope. After a project has been properly scoped and selected for advancement, a feasibility study is then conducted to determine constructability, constraints and fatal flaws. Next, preliminary designs are developed, and environmental compliance is carried out. The final phase before construction can begin is the letting stage, which involves a request and receipt of bids, followed by selection of the most responsive bid.

TxDOT evaluated several projects that were deemed significant to the region and had broad community support at different levels to better understand specific challenges and opportunities. Feedback through the RMS listening sessions re-confirmed support the four keystone projects and affirms the path TxDOT is currently taking with these projects. *Figure 10* is a development process graphic developed to understand the current project status and associated timeframe for completion in a snapshot that may confirm project prioritization. *Appendix I. Keystone Projects* provides details on each of the projects.

RMS memorializes more than existing projects. It documents the desire of its stakeholders to join all aspects of an evolving region with the prioritization of projects realized and un-realized, big ideas and over-arching regional mobility direction. This may include studies for additional or improved technologies for the POEs, which are currently being discussed at the City of El Paso Bridges Steering Committee; expansion opportunity at the Santa Teresa POE; new or improved international crossings in locations like Sunland Park and Santa Teresa; development of a Regional Multimodal Transportation Network Plan; updating TxDOT's Border Transportation Master Plan; and preparing a Regional Transit Service Plan – all of which will generate additional future projects. Cost, funding, and partnerships may be layered in to aid in decision making. The next step will be to begin priority decisions among all partner agencies.

Figure 10. TxDOT Keystone Projects



Bike rider in downtown El Paso, Source: HNTB

Implementation Strategies

The processes alone are not built to change the way implementation can affect a regional vision. TxDOT understands that it cannot be the lone agency to address all regional needs. The RMS process suggests that agencies should capitalize on the opportunity to better align project prioritization with stakeholder desires by integrating their visioning processes. Going forward, regions that demonstrate how a transportation investment will increase the broader quality of life with the goals of livability, economic vitality and mobility, will be the ones that realize a significant share of the limited transportation funding available for investment -- speaking with one voice and common goals.

Working through a champion, like the El Paso MPO, the region would swiftly maneuver mutually agreed upon implementation strategies that could include:

- A project development process protocol organized by the El Paso MPO, municipal, local, county and state representation, transit agencies and TxDOT to initiate plan and project design and investments supporting mobility, livability and economic potential.

- Development of an interagency funding approach that addresses capital expenditures and operation and maintenance responsibilities. This will enable more sustainable outcomes so that the vitality of major investments by any given public partner can be sustained and contribute to long-term life span.

- Agreement among the stakeholders that funding priorities are limited, and trade-offs must be made in order to supplement priority decisions. This will enable a public agency to adjust planning, design and funding accordingly to achieve priorities.

These are only the first steps in creating a vision for the region respecting mobility, quality of life, and economic development. Implementing the vision demands continued shepherding and joint participation. Continued communication is key to the success of the process. Maintaining ongoing, collaborative relationships with stakeholders will remain a priority as the RMS continues to evolve with the region. For these reasons, the El Paso MPO should be where leaders come together, sharing a cooperative vision with fair oversight and equal committee representation to identify priorities and viable solutions.

Source: HNTB


MEXICO

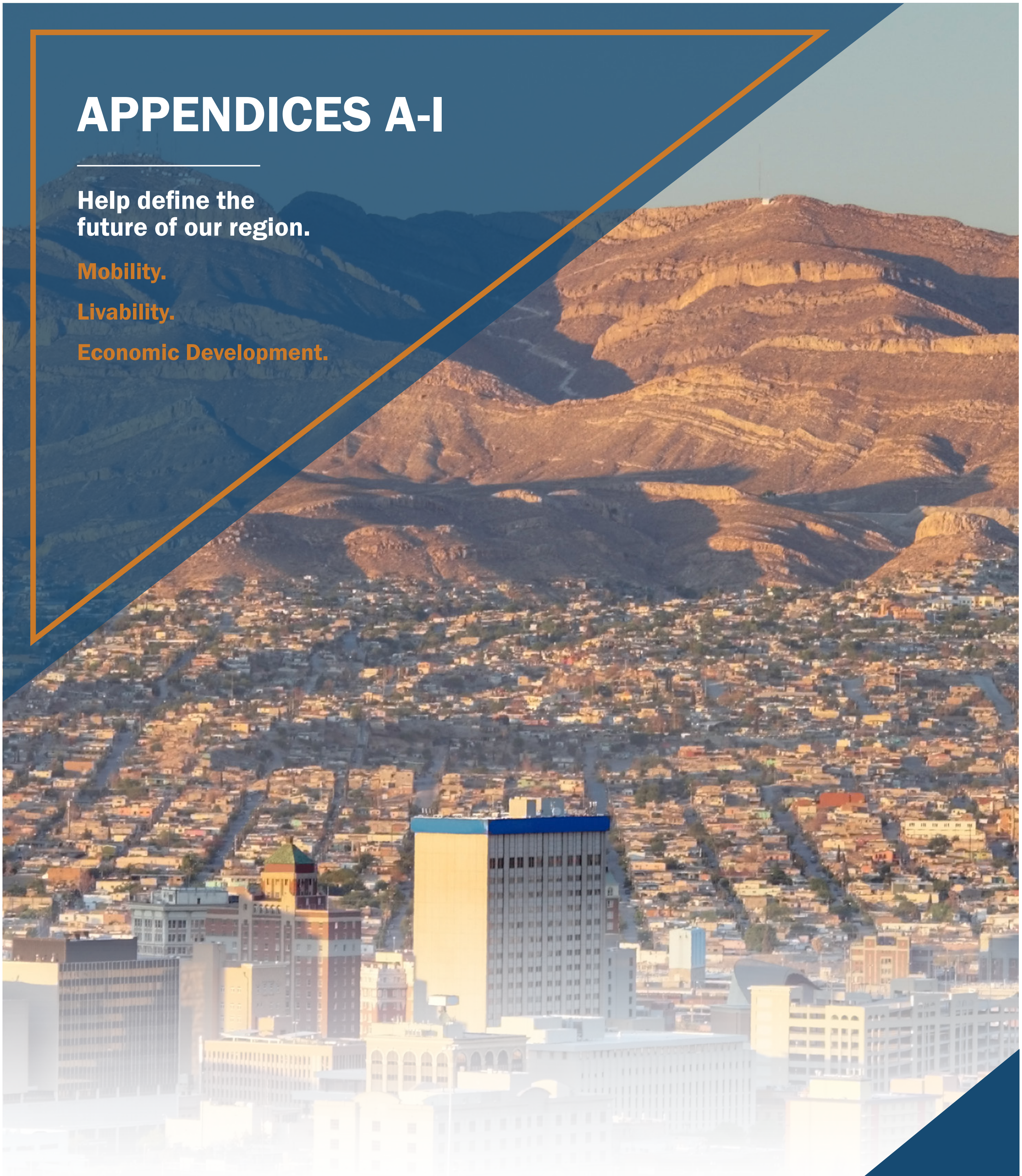
APPENDICES A-I

Help define the future of our region.

Mobility.

Livability.

Economic Development.



El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

APPENDIX A

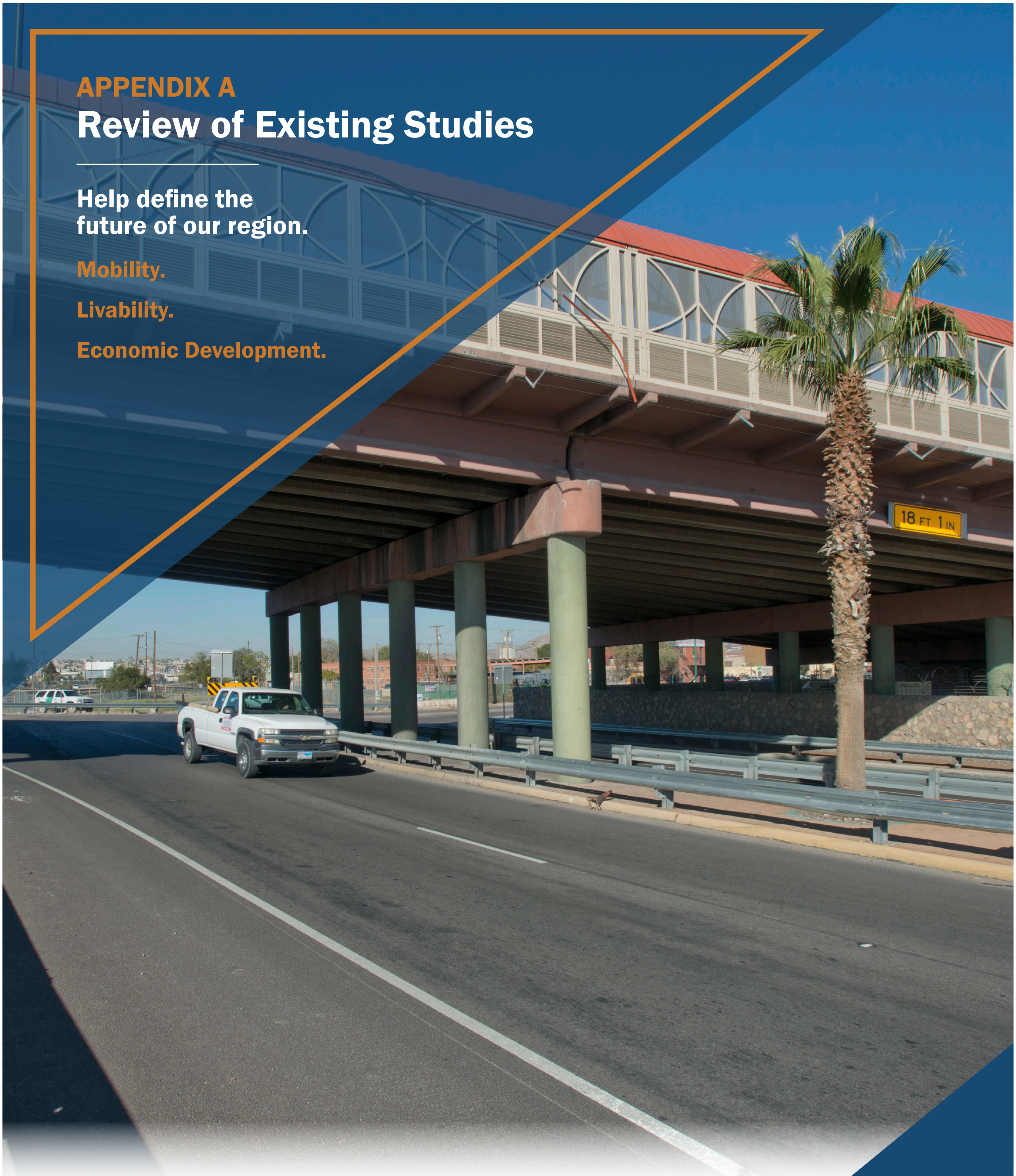
Review of Existing Studies

Help define the future of our region.

Mobility.

Livability.

Economic Development.



El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS

REGIONAL MOBILITY STRATEGY

Contents

Introduction

Planning/Projects in the Borderplex Region

The purpose of this document is to provide a summary of regionally significant studies completed to date related to programmed and planned projects within the Borderplex region (Region), which encompasses El Paso County, TX; southern Doña Ana County, New Mexico; and Ciudad Juárez, Chihuahua. This summary provides valuable input necessary for the development of the larger ***Regional Mobility Strategy (RMS)***. Many of the projects discussed in these studies are referenced in the El Paso Metropolitan Planning Organization (MPO) *Destino 2045 Metropolitan Transportation Plan* (MTP), *TxDOT Unified Transportation Plan 2018* (UTP) and *City of El Paso Capital Improvement Program* (CIP). Plans, frameworks and assessments with topics ranging from specific project feasibility studies to comprehensive regional planning documents are also included in this summary.

The Borderplex Economy and the Transportation Network

The Borderplex economy is closely tied to the reliability and performance of the transportation network. Within the Borderplex, there are three major United States military installations: Fort Bliss, Holloman Air Force Base and White Sands Missile Range. Combined, these cover more than 2 million acres of land used for research, development, testing and evaluation, which makes the region attractive to industries tied to aerospace, aviation and defense contracting, but also creates demand for a robust roadway system.

The Region also has the second largest per capita manufacturing area in the United States. There are $48.1 billion in annual exports into the U.S. from Ciudad Juárez, surpassing Tijuana in foreign purchases from maquilas, which ship supplies across the border to support corporate industries demanding a range of electronics, automotive parts, plastics and metals. With recent success, this market sector continues to grow and develop, signaling greater demand on an already stressed transportation network.[1] While Union Pacific recently constructed a bi-modal hub near the Santa Teresa-Jerónimo POE to support truck-to-rail operations and refueling, it was designed to meet the railroad's existing supply and is located too far from current maquila factories to offer much in the way of relief rail service or expansion. Rail lines traveling through the center of Ciudad Juárez and El Paso create traffic congestion and delays.

The high level of manufacturing, international trade and logistics, and distribution activity in the Region makes infrastructure a critical element of a healthy economy. The Region has six inland Ports-of-Entry (POEs), or crossing stations along the border between the United States and Mexico. The current infrastructural and operational capacity of POEs are insufficient to handle the amount of freight traffic, and long delays generate costs related to employee time and lost contracts for businesses that depend on the interstate movement of cargo. Further, rail infrastructure in the region is not currently configured to offer any additional logistical assistance with the transportation of manufactured goods, adding to the stress on POEs and

[1] see Borderplex Alliance 2020 Strategic Plan.

on the road network that feeds them. Increased border crossing capacity is needed to sustain and grow these cross-border market sectors.

As to be expected, the regional economies on both sides of the border are closely linked in a complex variety of ways. Bottlenecks at POEs take a toll on the regional economy by posing obstacles to activities such as cross-border shopping, timely delivery of cargo, and the performance of general business obligations for firms with cross-border operations. The economic costs of border-crossing delays are sizable for the United States, as well as for the Borderplex. Increasing infrastructural and operational capacity of POEs to handle freight demands flowing in both directions can help alleviate congestion and lead to substantial economic benefits.[4]

Summary of Findings from Study Review

In reviewing the full collection of studies completed to date that are included in this document, several priorities are identified based on how often they are discussed throughout. Most of the studies summarized in this report cover projects that are associated with Ports-of-Entry POEs, while several are associated with Sun Metro facilities, Brio and Streetcar. There are projects discussed on the Mexico side of the border, several in Northeast El Paso, a few other regional mobility improvements such as those recommended for I-10 and SH 20, and a few key projects in New Mexico. See Table 1 for more detail.

The most common projects are associated with capacity and operational improvements to POEs on both sides of the border, including discussion about a new Sunland-Anapra POE just west of the Texas-New Mexico border, and the addition of a railroad facility at the Santa Teresa-Jerónimo POE. There are several proposed projects on both sides of the border that serve the purpose of improving access to POEs and offer relief to congested roadways currently being used for this function. There is consensus among these studies that delay from congestion at POEs has a negative economic impact on the Region, making these improvements a top priority with respect to the economic competitiveness of the Borderplex.

Another common project that is discussed on both sides of the border is the proposed West Railway Bypass that starts south of Ciudad Juárez, crosses at Santa Teresa-Jerónimo POE, and ties back into both Union Pacific and Burlington Northern & Santa Fe (BNSF) railroads in New Mexico. This is perhaps the most financially demanding proposed improvement that is currently unfunded, estimated to cost more than $100 million on both the Chihuahua and New Mexico sides of the border. Funding this project on the Mexico side would require it to be prioritized in the *Plan Nacional de Desarrollo 2019-2024*, which will set the agenda for the next Administration.[5] There are several potential funding mechanisms available on the U.S. side, the most feasible of which would require prioritization on several levels to be competitive. This regionally significant project would involve three railroads: Ferromex, Union Pacific and BNSF.

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[4] see Borderplex Economic Outlook to 2018.
[5] This document will be developed by the incoming Obrador Administration.

Table 1. Project Types by Study

Plans/Studies Reviewed	POEs	Mexico	NE EP	Transit	Bike/Ped	El Paso	NM
Borderplex Alliance Plan	✓	✓		✓			
UTEP Borderplex Outlook	✓						
EP/ST-Chihuahua Plan	✓	✓	✓	✓			
NM-Chihuahua Plan	✓	✓			✓		✓
Santa Teresa Strategic Plan	✓						
NM Multimodal Plan		✓			✓		✓
El Paso Horizon 2040 MTP	✓		✓	✓	✓	✓	
El Paso CMP	✓		✓	✓	✓	✓	
TxDOT UTP	✓		✓	✓		✓	
Ciudad Juárez Plan	✓	✓	✓	✓	✓		
City of El Paso CIP	✓		✓	✓	✓	✓	
Sun Metro Strategic Plan				✓			
EP County Rural Transit				✓			
Commuter Rail Study				✓			✓
TxDOT Corridor Studies			✓			✓	
NE El Paso Traffic Study			✓		✓		

Note: The column headings in this table represent common groups of capital projects found throughout the reviewed studies. These include Ports-of-Entry, projects in Mexico, Northeast El Paso (NE EP), Transit-related projects, Bike/Ped projects, regional projects in El Paso County, and projects in New Mexico (NM). This information does not include every single project described in each document, though it does provide a snapshot of consistency among priorities discussed throughout the collection of documents.

The third most prominent set of mobility improvements referenced throughout the studies completed to date includes the construction of Northeast Parkway, and related improvements to Loop 375, U.S 54 and U.S 62, among other roadway facilities. These projects are identified in the TxDOT UTP and the El Paso MPO's *Horizon 2040* MTP, which indicates that several roadways within the study area will experience over-capacity or severely congested conditions under the 2040 No-Build scenario. While there is significant growth potential in northeast El Paso, there are several roadways in the area that are already operating near or above capacity.

The *Santa Teresa Border Area Transportation Needs Assessment* (document #5 in this review) and the *New Mexico–Chihuahua Border Master Plan* (document #4) each provide good information on proposed projects identified as significant to New Mexico as well as Mexico. The *El Paso/Santa Teresa–Chihuahua Border Master Plan* (document #3) provides further insight on projects significant to Mexico in the Region.

Opportunities Moving Forward

While there are several projects that address specific local and regional passenger travel demands on the road network, proposals for grade-separations in strategic locations, and improvements to capacity at POEs, there is little discussion about interpreting the unique and complex freight travel demands as a separate system layered on top of the passenger network. The Central Business Districts of El Paso and Ciudad Juárez, the two largest markets in the Region, are in the same general vicinity of the Region on either side of the border. Like many cities, these areas have the highest density of employment, and trip attractors and generators on their respective sides, resulting in high demand for passenger travel. Non-freight cross-border traffic that supports international retail, business and employment opportunities is also high in this area. At the same time, this happens to be where the railroad border crossings are located and where some of the busiest POE freight crossings generally occur (apart from Zaragoza POE), which contribute to the congestion conditions on the regional roadway infrastructure.

Among the studies reviewed, the Santa Teresa International Rail Bypass project offers one potential solution. This proposed project could help to reconfigure how truck-to-rail operations are managed and how rail traffic flows through the Borderplex offering relief and increasing safety at railroad crossings with the possibility of identifying other opportunities to support the cross-border economy. There are also new passenger-only POEs offered as an idea, though these would be primarily located away from where much of that type of demand currently exists.

In the previous *Metropolitan Transportation Plan, Horizon 2040*, there was discussion of a concept called the Freight Shuttle System (FSS) that offered an idea for moving freight trailers across the border in a separate system using automated shuttles. Each shuttle carries a trailer across the border to a location where the trailer could then be linked up with a truck and taken to its destination. While this concept would require private-sector coordination, buy-in and investment on a relatively large scale, it offers an idea for how the cross-border freight system could be reimagined and perhaps managed in a completely different way. Concepts like the FSS may prove too cumbersome for the public-sector to take the lead, though seeking out these types of solutions to the unique logistical needs of the Borderplex may offer economic development opportunities to attract high-skilled labor and foster new entrepreneurial collaboration.

A role the public sector can play in seeking innovative cross-border solutions such as this is to help determine their feasibility. Cross-border logistics require specialized customs and security operations, as well as a coordinated commitment by governmental entities at local, state and national levels on both sides of the border to determine how a reimagined cross-border freight paradigm would be able to function according to their needs and requirements. In addition to this, feasibility could be better understood if accurate counts, speeds, origins and destinations for freight and passengers could be accurately inputted and modeled to determine potential congestion mitigation strategies throughout the Region as a complete system. This type of travel demand model, accounting for specialized freight operations in a cross-border environment, may need to go beyond the traditional regional model and provide a clearer understanding of how far freight trucks are traveling to and from the POEs.

As part of a complete regional travel demand model, growth projections for population and employment for the whole Borderplex and the relationship of that growth to land use and location throughout the region would be necessary. A travel demand model is an analytical tool that MPOs are required to use to determine demand for transportation facilities, and thus, justify investment in facilities where demand is greater than supply. By supporting appropriate data collection and model development, innovative cross-border solutions can be tested for feasibility and offer the private-sector the information necessary to consider different ways to establish partnerships and solutions that can be profitable and mitigate congestion from freight operations on the overall transportation network.

Document Overview

This document outlines a review of studies related to the Region that have been completed to date. These studies offer insight specific to mobility improvements that have previously been discussed, are being developed or are under construction. The sequence of studies included below is regional economic development studies, regional transportation strategies for the entire Borderplex, and plans for specific geographies, systems, and projects. Each study is given a high-level summary that includes the following:

- Document Reviewed – basic information about who commissioned the reviewed document, where it can be found online and when it was completed or adopted.
- Document Summary – key points about what can generally be found within the document related to regional mobility.
- Related Documents – other key documents, most of which are not included within this review, that may include further information that would be relevant to the discussion.
- Programmed/Planned Projects – a list of projects or project-related information that can be found within the document. There are often several more projects than what is listed for each document, though this review provides a summary of key mobility improvements that are either characterized as a priority and/or require major financial commitments or wide multijurisdictional coordination.

Studies Completed to Date

1. Borderplex Alliance 2020 Strategic Plan

Document Reviewed
PDF available through the Borderplex Alliance website, completed 2015.

Document Summary
- This document is meant to provide a blueprint for leveraging assets within the tri-state, bi-national region that will allow it to compete globally, grow emerging industry sectors and attract new investments and job opportunities.
- The Borderplex Alliance has a regional steering committee with task forces specializing in the six target industries of Defense & Aerospace, Advanced Manufacturing, Advanced Logistics, Business Support Services, Life Sciences and Tourism, as well as the focus areas of Regional Planning, Education & Workforce, and Entrepreneurship.
- This document provides knowledge from intensive outreach of the Borderplex market area, and focuses on the six target industries for attraction and diversity. It sets out to

achieve three overarching goals to ensure future economic prosperity and build a reputation for quality into all elements of the Borderplex market:

  - Spearhead Regional Collaboration and Planning
  - Become Known for Quality
  - Spur Innovation & Entrepreneurism

Related Documents

- The Borderplex Alliance 2017 Annual Report, completed in 2017
  - Includes a letter from the chief executive officer, and a series of metrics, meetings and accomplishments from that year.

Programmed/Planned Projects

- Most of the projects identified in this document are related to economic development and policy actions that support the Borderplex Alliance goals of.
- The document acknowledges support for partnerships between maquila plants in Ciudad Juárez and logistics companies in El Paso and Santa Teresa, promoting bi-modal freight transportation.
- A key strategy for Spearheading Regional Collaboration identified in the document is to work with the Camino Real Regional Mobility Authority (CRRMA) toward making improvements to border-crossing logistics.
- Two strategies for Becoming Known for Quality are Improving both Regional Infrastructure and Destination Factor. As part of these strategies, the report supports transit connectivity between major activity centers such as linking the downtowns and airports in some way.
- There is acknowledgement of U.S. companies starting to show a preference to "nearshore" manufacturing to Mexico to save on the cost of transportation. This would bring more traffic to the U.S.-Mexico Border.
- The document points out that the Union Pacific's new Santa Teresa station was built for fueling and improved logistics of their existing market. It explains that the railroad does not see the viability of increasing north-south rail transportation in the region, but instead supports the expansion of bi-modal truck-to-rail methods.

2. University of Texas at El Paso Border Regional Modeling Project (BRMP)

Document Reviewed

Borderplex Economic Outlook to 2018

PDF available through the University of Texas at El Paso website, completed in 2016

Document Summary

- The Border Region Modeling Project is an independent research unit within the Department of Economics & Finance at the University of Texas at El Paso.
- A Borderplex Econometric Forecasting Model has been developed that accounts for demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, water consumption, and cross-border

manufacturing in a geographic area covering El Paso, Texas; Ciudad Juárez, México; Chihuahua City, México; and Las Cruces, New Mexico.

- The Borderplex Economic Outlook is an economic forecast report published annually for this geographic area and contains recent historical data and forecasts for more than 190 variables.
- The report acknowledges the economic interdependence between El Paso and Ciudad Juárez, the importance of smoothly-functioning ports-of-entry for economic sustainability and the negative impact on various economic sectors due to long wait times at these POEs.
- Regarding cross-border transportation and logistics, traffic is expected to continue rising, although the rise in pedestrian and passenger border crossings is expected to tail off slightly.

Related Documents

- El Paso/Santa Teresa-Chihuahua Border Master Plan: Appendix D – El Paso Regional Ports of Entry Operations Plan Recommendations, completed in 2011
    - This document provides a broader view of potential economic ramifications of extended wait times by examining both direct and indirect costs and evaluating the effects on multiple economic sectors, estimating that hundreds of thousands of jobs depend on cross-border commerce.
- Improving Economic Outcomes by Reducing Border Delays, completed in 2008
    - This document estimates national output losses related to southern border crossing delays and suggests that border delays were also responsible for job losses, lost wages, and foregone tax revenues.

Programmed/Planned Projects

- While this document does not identify specific programmed or planned projects, it does suggest that capacity and operational improvements made to POEs can have a positive economic impact on both sides of the border.
- This document identifies cross-border delays at POEs as having a negative impact on the economy and therefore supports improvements to POEs, also identifying which markets are primarily responsible for various cross-border traffic.

3. El Paso/Santa Teresa-Chihuahua Border Master Plan

Document Reviewed

PDF available through the TxDOT International Relations website, completed 2013

Document Summary

- This document sought stakeholder input from all involved in POE projects and the transportation infrastructure serving those POEs to understand the POE and transportation planning processes on both sides of the border.

- The Border Master Plan is meant to develop and implement plans for prioritizing and promoting POE and related transportation projects, including evaluation criteria and rankings over the short, medium, and long terms.
- Establishes a process that will ensure continued dialog among federal, state, regional, and local stakeholder agencies on both sides of the border to assure continued coordination on current and future POE and supporting transportation infrastructure needs and projects.
- This document includes a helpful documented "State of the Practice" section for POE and transportation infrastructure planning on both sides of the border, including federal, state, and local agencies, resources and processes on both sides.
- On the U.S. side, 35 POE projects, 43 road and interchange projects, 5 transit projects, and 2 rail projects were identified, On the Mexican side, 23 POE projects, 51 road and interchange projects, 1 transit project, and 3 rail projects were identified. The highest priority project of each of these types was identified by county on the U.S. side and municipality on the Mexico side.
- In addition to providing a set of prioritized POE-related projects, this document ultimately recommends the following:
    - Continuing the formal dialogue to keep stakeholders and regional priorities up-to-date; and,
    - Including exploration of funding opportunities for the highest-priority projects and developing the technical capacity to evaluate the potential regional impact of investments.

<u>Related Documents</u>

- On the U.S. side of the border, there is a heavy reliance on statewide planning documents such as long-range plans, unified transportation programs and transportation improvement programs, as well as regional planning documents such as metropolitan and rural transportation plans that identify transportation priorities that are programed for some state federal funding and competitive for other federal sources. Locally funded projects are typically reflected in the MTPs.
- Plan Nacional de Desarrollo 2013-2018 (in Spanish only), completed in 2013
    - This is Mexico's most important document, issued every six years, when a new president comes into power. It provides the blueprint, specific goals, and commitments for the ensuing years.
    - The document is not only updated every six years, but is dramatically changed to satisfy each president's agenda. There is no specific format established for this document, and some National Development Plans have a longer planning horizon than others.
- In addition to the National Development Plan on the Mexico side, there is the Programa Sectorial de Comunicaciones y Transportes 2007–2012 (The Communications and Transportation Sectoral Program 2007–2012)

  - Sectoral plans adopt or elaborate the National Development Plan's goals and commitments in a specific sector like Transportation and Communications.

- Like the National Development Plan, there are State and Municipal Development Plans that reflect the respective Governor and Mayor's priorities. It is required that there is some level of consistency with the Nation Plan, though with overlapping term lengths, there may be inconsistency with the current administration's goals.

Programmed/Planned Projects

- The most urgent POE project identified on the U.S. side is the Freight Shuttle System (FSS) near the Ysleta-Zaragoza POE. The top three POE projects and highest-priority Road Project on the U.S. side include adding capacity to the Ysleta-Zaragoza POE.
- Adding capacity to U.S 62 (Montana Avenue) between Zaragoza Road and Global Reach Drive is the number two roadway priority on the U.S. side.
- Transit priorities on the U.S. side all surround implementing the Sun Metro Brio rapid transit system. A Park & Ride and Transit Center at the Bridge of the Americas was in the top ten POE priorities on the U.S. side.
- Most of the top ten POE priorities on the Mexico side involve making capacity improvements or constructing administrative facilities at various POEs in the region, with particular focus on the Presidio-Ojinaga POE.
- The number two POE priority on the Mexico side is to build a new non-commercial POE at Anapra-Sunland Park, while the number six POE priority is to construct a new rail POE at Santa Teresa-Jerónimo POE to divert cargo away from the urban area of Ciudad Juárez along MEX-45D (Samalayuca-Jerónimo Beltway). The West Railway Bypass is also the top railroad priority on the Mexico side.
- The top roadway priority on the Mexico side is to complete the access loop around Ciudad Juárez to the Guadalupe/Tornillo POE. This is followed by various capacity improvements to MEX-2 and 48, feeding the POEs.
- Transit priorities on the Mexico side all surround making general improvements to public transportation, including the development of a Bus Rapid Transit (BRT) system connecting to important destinations, including the POEs.

4. New Mexico-Chihuahua Border Master Plan

Document Reviewed

PDF available through the NMDOT International Programs website, completed in 2015

Document Summary

- The purpose of this study is to develop an integrated Border Master Plan (BMP) to improve the efficiency and effectiveness of New Mexico-Chihuahua cross-border traffic.

- The BMP takes a binational comprehensive approach to coordinate the planning and delivery of projects to improve land ports of entry (LPOE) and the transportation infrastructure serving these ports in the New Mexico-Chihuahua border region.
- This document makes the following recommendations:
    - Formation of a binational Implementation Funding Committee (IMC) including representatives from the highest levels of affected government and stakeholders with a direct vested interest in project implementation.
    - Create a Performance Assessment to track progress on implementing high-priority projects and understand the overall improvement of transportation systems and services.
    - NMDOT should continue working with the Secretaría de Comunicaciones y Transportes to obtain a fully developed Travel Demand Model for the area of influence within the State of Chihuahua.
    - NMDOT should continue working with all appropriate federal and state agencies on both side of the border to obtain comprehensive wait time statistics for each of its three POEs.

Related Documents

- El Paso/Santa Teresa-Chihuahua Border Master Plan, completed in 2013
    - This document (outlined in more detail above) is essentially TxDOT's counterpart with similar motivation, though more focused on the El Paso Region rather than all three New Mexico POEs.
- Santa Teresa International Rail Feasibility Corridor Study Report, completed in 2016
    - Considers alternative ways to link Mexico's proposed West Railway Bypass to the Union Pacific Lordsburg Subdivision (UPRR) in New Mexico and the BNSF El Paso Subdivision (BNSF) in Texas or New Mexico. A hybrid version of alternatives A and C was chosen as the preferred alternative, which connects to UPRR just north of the Santa Teresa Intermodal Facility and to BNSF just north of the Texas Border.

Programmed/Planned Projects

- The most urgent POE project identified on the U.S. side in this document is the expansion and reconstruction of the Columbus POE. The number three and most expensive POE-related project is construction of a new rail POE at the Santa Teresa-Jerónimo POE. The Sunland Park-Anapra POE is identified fourth on this list. POE priorities on the Mexico side mirror those on the U.S. side.
- The highest-priority multimodal project identified for the U.S. side in this document is reconstruction and added capacity to NM 136 from the Santa Teresa-Jerónimo POE to the Texas border. Ranked number nine on this list is the construction of a proposed facility (High Mesa Road) that runs parallel to I-10 between Santa Teresa and Las Cruces.

- The report included discussion of three railroad projects on the U.S. side including a proposed freight connection between the Santa Teresa-Jerónimo POE and the UPRR and BNSF mainlines (see related documents for this study), as well as passenger rail connections (Commuter between Las Cruces and El Paso & High-Speed from Denver to El Paso).
- The highest priority multimodal project on the Mexico side in this document is constructing a new connection to the El Berrendo POE, closer to Arizona. As part of this network improvement on the Mexico side, a major improvement to a 170-mile stretch of MEX-2 between Ciudad Juárez and the El Berrendo POE is identified as number three on the multimodal priority list.
- Another high-priority multimodal project (number five) on the Mexico side is to add capacity to Calle 16 de Septiembre and continue the facility further west to provide access to both the proposed Sunland Park-Anapra POE and Santa Teresa-Jerónimo POE, while bypassing the Rancho Anapra community.
- The highest-priority railroad project on the Mexico side listed in this document is the proposed West Railway Bypass along MEX-45D to the Santa Teresa-Jerónimo POE.

5. Santa Teresa Needs Assessment and Strategic Plan

Document Reviewed

PDF available through NMDOT International Programs website, completed in 2016

Document Summary

- The Santa Teresa Border Area Transportation Needs Assessment and Strategic Plan (STBAT Strategic Plan) is an aggregation of all previous regional plans, studies and reports, and intended to be a decision-making tool to help determine the highest priority transportation infrastructure projects for the Santa Teresa border region based on economic competitiveness, quality of life, state of good repair, safety and environmental sustainability.
- This document has a strong emphasis on freight mobility, however, other transportation modes such as personal vehicles, transit, pedestrian and bicycle facilities are included as well.
- The process of determining the highest priority recommendations is supported by a Needs Assessment of the existing transportation infrastructure network that identifies current and projected economic development growth and needs.
- Ultimately, the study is designed to provide local, regional, state, and national entities with concrete, viable recommendations to guide their transportation policy decisions given identified constraints and opportunities.

Related Documents

- New Mexico-Chihuahua Border Master Plan (BMP), completed in 2015
    - The purpose of this study is to develop an integrated BMP to improve the efficiency and effectiveness of New Mexico-Chihuahua cross-border traffic.

  - The BMP takes a binational, comprehensive approach to coordinate the planning and delivery of projects to improve land ports of entry (LPOE) and the transportation infrastructure serving these ports in the New Mexico-Chihuahua border region.

- New Mexico 2040 Plan, completed in 2015
  - The New Mexico 2040 Plan provides a strategic framework to guide NMDOT's transportation decision-making in the years to come.
  - This document is covered in greater detail below.

- One Valley, One Vision 2040 Regional Plan, completed in 2012
  - This document serves as a guiding framework for mindful decision-making when planning and implementing future development within the region.
  - It covers the broad aspects of what the residents of Doña Ana County would like to see in terms of development. It does not provide detailed direction on any of its plan elements; the local comprehensive plans serve this function.
  - The intent of this document is to serve as a platform for use in developing more detailed comprehensive, master, and site plans. It may also serve as guidance on policy, programming, and capital improvement decisions.

Programmed/Planned Projects

- The most urgent project needs identified in the Implementation Plan are engineering studies for making capacity and operational improvements to roadways near Doña Ana Airport and roadways connecting to the Texas border.
- Additionally, this document prioritizes coordination policies with MPO regional travel demand activities and commissioning a study that focuses specifically on the economic impacts caused by border delays at New Mexico Ports-of-Entry (POEs).
- Implementing improvements for and connections to the Santa Teresa-Jerónimo POE, as well as constructing a new Sunland Park/Anapra POE with a connection via Sunland Park Drive has been characterized as low priority, or as a longer-term project in this document. These recommended improvements have a higher priority in the El Paso MPO MTP.

6. New Mexico 2040 Multimodal Plan

Document Reviewed

PDF available through the NMDOT website, completed in 2015

Document Summary

- The Plan identifies goals along with strategies and performance measures for each goal, which together, comprise the core components that will guide all aspects of NMDOT decision-making. These goals were selected using a collaborative, stakeholder driven process. The benefits of investment in one goal area are likely to impact other goal areas as well.

- This document provides NMDOT with a framework for how the agency strategically prioritizes projects moving forward. It acknowledges the need for the agency to align with the plan, embrace modes other than private automobiles and identify gaps in skillsets that make it a challenge to implement the 2040 Plan.
- This plan does not offer an outline of prioritized projects, but rather an outline of how NMDOT should prioritize them moving forward. A related freight plan identifies where there are needs to improve the movement of freight in the state.

<u>Related Documents</u>

- New Mexico Freight Plan 2040, completed in 2015
    - This document captures the current state of freight transportation in New Mexico, and looks ahead at 25 years of growth and progress, out to 2040.
    - It includes a proposed set of freight rail capacity, operations and safety improvements in New Mexico that will grow the amount of freight shipped by rail in the State.

<u>Programmed/Planned Projects</u>

- The New Mexico Freight Plan includes the Santa Teresa rail relocation discussed in further detail as part of the Santa Teresa International Rail Feasibility Corridor Study Report.

7. El Paso Metropolitan Transportation Plan (MTP) Destino 2045

<u>Document Reviewed</u>

PDF available through El Paso MPO website, approved in 2018

<u>Document Summary</u>

- This document includes more than 160 projects that aim to provide a range of travel opportunities to the public. The fiscally constrained plan was developed in coordination with El Paso MPO stakeholders.
- Roadway projects included in the 2040 MTP are generally planned in areas where the most socioeconomic growth is projected to be and where network expansion needs are the greatest.
- Projects identified in the fiscally constrained plan are grouped into four phases (Implementation – 2019-2022, Short-Term – 2023-2028, Medium-Term – 2029-2040 and Long-Term – 2041-2045), and five program categories (New/Expanded Roadway, Public Transit, Active Transportation, Cross Border Travel and Operations and Maintenance).
- The demographic profile is based on the 2010 census with a validated base year of 2012, and covers a period up to the horizon year 2045. The profile includes a forecast of population for the years of 2020, 2030, 2040 and 2045.
- Population within the El Paso MPO boundary is expected to grow by about 510,000 people by the year 2045.
- The document contains a good summary of cross-border shipping activity and its relationship to transportation network performance. Forecasted congestion levels

contribute to an expected increase in wait times at ports-of-entry (POEs), which could have a negative impact on the regional economy.

Related Documents

- *El Paso MPO Amended Horizon 2040 MTP*, approved in 2017
  - Previous version of El Paso MTP, which included an Amended List of projects that has been updated in the current version, Destino 2045.
- *Vision 2020: Comprehensive and Strategic Plan (Horizon City)*, completed June 2011
  - Guiding document for future growth of land use and infrastructure in Horizon City, Texas. The major thoroughfare plan related to this study was last updated in 2017 indicating how roads in Horizon City would be integrated with the regional network.

Programmed/Planned Projects

- The 160 projects found in the plan include several capacity and operational enhancements to roadways as well as various bridge replacements. There is also funding set aside for preventative maintenance to the TxDOT system.
- There are transit-related projects included in this plan, which are referenced in more detail below under the Sun Metro Strategic Plan.
- In the implementation phase (2019-2022), major capital projects include capacity enhancements to Loop 375 and US 62 (Montana Avenue) in east El Paso; interchange improvements to US 54 at I-10, I-110 and Loop 375; various active transportation bike and pedestrian improvements throughout the MPO region; and widening I-10 in west El Paso.
- In the short-term phase (2023-2028), major capital projects include capacity enhancements to US 54, Loop 375, Spur 601 and Global Reach Drive in northeast El Paso; capacity enhancements to FM 659 and US 62 in east El Paso; and capacity enhancements to NM 404 in southern Doña Ana County.
- Another important short-term enhancement includes an upgrade to the City of El Paso Traffic Management Center and signal control equipment city-wide.
- A major project that begins in the short-term and is completed in the medium-term is the new Border Highway East (BHE) from Loop 375 near the Zaragoza POE to San Elizario, TX. Associated improvements include ITS enhancements that provide cross-border travel information to travelers and freight carriers using the Zaragoza POE, as well as a new arterial that will connect the BHE to I-10.
- In the medium-term phase (2029-2040), major capital projects include building a new Borderland Expressway (see Northeast Corridor below) in northeast El Paso; widening I-10 through downtown El Paso; capacity and operational enhancements to SH 20 and related roadways in southeast El Paso; and a new interchange at Loop 375 and U.S 62.
- In the long-term phase, the largest project included is a major upgrade to U.S 54 (Patriot Hwy) that include overpasses with main lanes.

8. El Paso Congestion Management Process (CMP)

Document Reviewed

PDF available through El Paso MPO website, approved in 2013

Document Summary

- This document contains a framework for updating the CMP, including tasks that involve data collection needs/methods, linkages to mechanisms for project prioritization and long-range transportation planning. The document describes the eight steps for a CMP as outlined by FHWA.
- The CMP examines sources of congestion, evaluates alternative mobility strategies for alleviating congestion and monitors the performance of these strategies.
- Contains a set of regional goals and objectives for congestion management, which address pedestrian and bicycle mobility choices, implementing congestion mitigation improvements, minimizing air quality impacts and promoting accessibility for all.
- Describes the CMP roadway network as including all roadways functionally classified as principal arterials and above, consistent with MAP-21 guidance.
- Defines congestion and identifies the most congested roadways in the Region.
- Lists travel demand management, traffic optimization, public transportation, roadway capacity and other non-CMP strategies for the Region.
- Identifies performance measures related to the goals and objectives that are specific, measurable, agreed upon, realistic and time-specific.
- Incudes a data collection and data management plan that is intended to help identify changes over time and assist in the monitoring and evaluation process. The plan includes data gathering (only on congested segments), collecting traffic counts and speed data, as well as support for the regional travel demand model.
- Recommends a regular update cycle that includes an annual CMP report documenting performance, project completion, status of congestion mitigation strategies and a look-ahead, coordinated with the Transportation Improvement Program (TIP) update.

Related Documents

- Performance Indicators Report, completed in 2015
    - Provides measured analysis of congested roadways and determines related projects to include in the TIP amendment.
- Transportation Improvement Program (TIP) 2017-2020
    - The TIP is a short-range program of transportation improvements to be funded with federal funds, or that are considered regionally significant, funded with non-federal funds, and consistent with the *Destino 2045 MTP*.

Programmed/Planned Projects

- Projects listed under the CMP are pulled from the list of approved projects in the MTP, and categorized by congestion mitigation strategy types: travel demand management, traffic operational improvements, public transportation, and roadway capacity projects.

9. TxDOT Unified Transportation Program (UTP) 2018

Document Reviewed
PDF available through the TxDOT website, approved in 2017

Document Summary

- This document is a listing of projects and programs that are planned to be constructed and/or developed within the next ten years. Project development includes activities such as preliminary engineering work, environmental analysis, right-of-way acquisition and design.
- While the UTP is neither a budget nor a guarantee that projects will be built, it is a critical tool in guiding transportation project development within the long-term planning context.
- In addition, it serves as a communication tool for stakeholders and the public in understanding TxDOT's project development commitments.
- Most projects identified in the 2018 UTP for the El Paso District are within El Paso County

Related Documents

- Texas Transportation Plan 2040, completed in 2015
    - This document guides planning and programming decisions for the development, management, and operation of the statewide, multimodal transportation system in Texas over the next 25 years.
- Statewide Transportation Improvement Program (STIP), latest revision in 2018
    - This document incorporates metropolitan and rural area Transportation Improvement Programs (TIPs) into a 2017-2020 Statewide Transportation Improvement Program (STIP) as required under MAP-21.
- Horizon 2040, completed in 2013.
    - As outlined in more detail above, this is a fiscally constrained plan of capital projects in El Paso developed over the course of two years in coordination with El Paso MPO stakeholders.

Programmed/Planned Projects
Below is a listing of facilities with approved projects from the UTP in El Paso County:

- U.S. 62 (Montana Avenue) – Brio RTS Improvements, frontage roads, main lanes and grade separations on a stretch between Airway Boulevard and Zaragoza Road.

- State Loop 375 – Managed Lane facilities, ramp reconfigurations at Zaragoza POE and capacity improvements, all on the east side of Loop between Zaragoza POE and Business 54 (Dyer Street).
- FM 659 (Zaragoza Road) – Operational improvements to Loop 375 intersection and capacity improvements between U.S. 62 (Montana Drive) and FM 76 (North Loop Drive).
- U.S. 54 – construction of main lanes and grade separations between Kenworthy and McCombs Streets, as well as interchange improvements at Loop 375 (Cesar Chavez).

10. Ciudad Juárez Plan de Desarrollo Urbano Sostensible

Document Reviewed
PDF available through the IMIP website (in Spanish only), completed in 2016

Document Summary

- This document aims to promote a sustainable city development model that improves the quality of life of the citizens of Ciudad Juárez with strategies for mitigating the expansion of the urban sprawl and promoting the consolidation of the city.
- The study acknowledges that there is potential for intense growth near POEs at Santa Teresa-Jerónimo, Sunland Park-Anapra and Guadalupe-Tornillo.
- This document promotes an Urban Consolidation Strategy for Ciudad Juárez, which includes a reduction of development in outlying areas to limit expansion. This strategy supports an increase in housing density and defines areas where more efficient use of services can reduce the overall impact on the natural environment and improve the overall quality of life and economic vitality.
- The plan promotes the development of Urban Corridors as connecting elements of central areas in the city making use of premium mass transit services such as BRT, addressing high vehicle traffic, and supporting commercial density and services.
- Regarding regional mobility, the report emphasizes a need for binational coordination to make the biggest projects become a reality.
- The BRT discussion within this document includes the need for dedicated bus lanes along major transit corridors in Ciudad Juárez, as well as car and bicycle parking at stations and infrastructure for safe bicycle mobility.

Related Documents

- El Paso/Santa Teresa-Chihuahua Border Master Plan, completed in 2013
    - This document (outlined in more detail above) is essentially TxDOT's inventory of priority infrastructure projects at or related to improving traffic at POEs.
- New Mexico-Chihuahua Border Master Plan (BMP), completed in 2015
    - This document (outlined in more detail above) is essentially NMDOT's inventory of priority infrastructure projects at or related to improving traffic at POEs.

Programmed/Planned Projects

- This document discusses the West Railway Bypass as an important need for the city, which was prioritized with the last federal administration, though not with the current one. There is a general desire to divert as much cargo around the city center as possible.
- This document discusses the implementation of "Green Ports," which refers to new POEs that support the use sustainable transportation such as bike, transit and pedestrian crossing of the border.
- This document also discusses the improvement and implementation of BRT and general public transit service feeding into that. There is discussion of improving connectivity using public transit to the Ciudad Juárez Airport and across the border to El Paso.

11. City of El Paso Capital Improvement Program (CIP)

Document Reviewed

Quarterly Status Report PDF available through City of El Paso Capital Improvement website, approved January 2018.

Document Summary

- Updated January 2018, the FY18 1st Quarter Capital Project Report provides a rundown of active projects and serves as a compilation of "fact sheets" on each project that tell a story of why each project was approved and what it aims to accomplish for the community.
- Each Fact Sheet (one-page front and back) includes a listing of key information about a project, information about the project, milestones, schedule, goals and benefits and how the project aligns with other city/regional initiatives on the front, along with public outreach efforts, funding changes, project history and any relevant maps or photos that may offer further detail.

Related Documents

- Active Project Status Report, updated April 2018
    - This document includes a spreadsheet indicating each project's council district, contact person, project stage, lead department, user department, budget source, budget amount, design status and construction status. Projects are grouped by council district. This includes a roadway resurfacing summary by council daQAistrict including what was most recently completed and what is currently under contract.
- Plan El Paso, adopted 2012
    - This document is the Comprehensive Plan for the City of El Paso, which is intended to be a policy guide for the next 25 years and beyond. While much of the plan includes discussion related to land use and development, it does cover

transportation goals and the relationship of land use policy to improved mobility options.

- City of El Paso Bike Plan, completed 2016
    - This document is intended to guide City staff and elected officials in deciding what streets are best for bicycling, how to make those streets safer for cyclists and what other policies and programs can support changes in the street.

Programmed/Planned Projects

- There are about 200 capital projects representing over $800 million of investment that range from mobility improvements to parks and public facilities.
- Fact Sheets with updated information related to Brio (RTS) and Streetcar projects can be found in the Quarterly Status Report.
- There are POE improvements planned that include the addition of Bluetooth Wait Systems at Stanton and Paso Del Norte POEs as well as capacity and operational improvements to roadways near Zaragoza POE.
- In addition to the Brio RTS and Streetcar improvements, there are several planned improvements in the CIP that involve making capacity and facility upgrades to existing transit facilities, improvements to 112 bus stop locations and the new Northgate Transit Center and Parking Garage.
- There are several bicycle facility improvements being made across the City of El Paso ranging from bike paths and lanes to bicycle repair stations. There are also several pedestrian trail and sidewalk improvements included throughout the CIP, including some associated with enhancing the pedestrian experience near Brio stations.

12. Sun Metro Strategic Plan

At the time of this draft document's preparation, the latest Sun Metro Strategic Plan was not yet available for review. This document should be available from Sun Metro by the end of summer 2018. It will be incorporated at that time. There is information about Sun Metro's current capital projects available on their website discussed below, as well as in the City of El Paso Capital Improvement Program and Destino 2045 Metropolitan Transportation Plan, both discussed above.

Document Reviewed

Information available on the Sun Metro website.

Document Summary

- Sun Metro's vision is to make transit a more accessible, attractive, and viable travel option, transitioning from a "hub-and-spoke" to a "node" system in an effort to allow shorter routes and faster travel times throughout the city. Building new terminals throughout the city is one step toward making this vision a reality.
- The Capital Improvements page of the Sun Metro website identifies two Brio RTS routes and the Streetcar as their primary capital projects, all discussed below.

Related Documents

- Quarterly Status Report PDF available through City of El Paso Capital Improvement website, approved January 2018.
    - This document makes more specific reference to Sun Metro capital improvements since the agency is a part of the City of El Paso.
- Alternative Transportation Modes and Technology Applications for Multimodal Transportation Planning in the El Paso Region, completed 2016
    - Produced by Texas Transportation Institute (TTI) for the MPO, this document contains methodologies, data, analysis, and tools to develop a regional multimodal transportation plan for alternative transportation modes (i.e. transit, bicycling, and walking).
    - It examines the key centers and corridors in a region and ensures that there is a connected circulation network for all these alternative travel modes. With multimodal transportation improvements, a region gains more efficient and safer transportation choices for travelers.
- Destino 2045 Metropolitan Transportation Plan (MTP), adopted in 2018
    - A brief Transit Gap Analysis was included in the MTP that takes a regional look (U.S. side) at the transit supply, demand and performance.
    - The document suggests that there should be improved connectivity between the transit system and active transportation infrastructure.

Programmed/Planned Projects

- The Sun Metro Capital Improvements page includes discussion about both the Alameda and Dyer Brio routes, which include new shaded bus stops, sidewalk and ramp upgrades, message signs, customer amenities, landscaping, lighting and ticket vending machines. The City is also making pedestrian connectivity improvements to facilitate safer access to the Dyer Brio route.
- The El Paso Streetcar Project is a 4.8-mile route from south El Paso through Downtown, to the University of Texas at El Paso campus. Construction includes utility relocation, construction of a new storage and maintenance facility, sidewalk repairs, installation of rail, placement of 27 stops, complete reconstruction of some streets, and resurfacing work on other streets.
- City of El Paso CIP Quarterly Update, referenced earlier in this document, discusses infrastructural and capacity upgrades being made to the Mission Valley Transfer Center to support additional services associated with the Alameda Brio. Similar upgrades are being made to the Downtown Transfer Center to accommodate all new Brio RTS routes.
- Northgate Transit Center and Parking Garage, which opened in May 2018, is a new TIGER-funded transit passenger facility located at Dyer St. and Diana Drive that will support transfers between the Dyer Brio and other bus routes, as well as offer Park & Ride accommodations.

- Bike and Pedestrian enhancements are being made to University Avenue in part to improve safety and connectivity to the Mesa Brio route and Streetcar.
- *Destino 2045*, referenced earlier in this document, identifies a few additional major transit projects including a series of pedestrian enhancements such as sidewalks and landscaping along the Montana Brio route by 2020, and a Park & Ride in west El Paso near I-10 and Transmountain by the early 2020s.
- An extension of the El Paso Streetcar east from downtown to University Medical Center is included on the project list with a cost of about $143 million by the early 2020s.
- Transit is identified as a potential solution for cross-border pedestrian traffic to find a more efficient way to move pedestrians between the two downtowns of El Paso and Ciudad Juárez. The precise means is not specified (pedestrian bridge, transit service, etc.), though it has an estimated cost of almost $150 million by the early 2020s.
- In line with the cross-border travel project and with the potential for increased transit demand and colocation of public and private, intercity and international transit services, is a Downtown Transit Center project identified with a cost of $42 million by the mid-2020s.

13. El Paso County Rural Transit Plan

At the time of this draft document's preparation, the El Paso County Rural Transit Plan was not made available for review. There is a document available that will be incorporated in this review upon receiving it.

14. Las Cruces-El Paso Commuter Rail Feasibility Study

<u>Document Reviewed</u>
PDF available through the South Central Regional Transit website, completed in 2017

<u>Document Summary</u>

- This document explores the feasibility of implementing passenger rail service from Las Cruces to El Paso. It determines that while there is an adequate socio-economic base for Commuter Rail and strong public support for improved transit connectivity, there are indications of weak demand for rail service in the corridor at this time.
- The study indicates that the willingness of BNSF to allow use of its El Paso Subdivision for passenger services is not clear. It is rare that a major freight carrier makes use of any capacity available for freight services without substantial investment and improvement to their operating environment.
- Ridership projections from this study show an average demand in the corridor when compared to peer commuter rail services. This result is highly dependent upon there being stations with connectivity to public transit and terminal stations in thriving downtown areas. Currently, there is not much density around eight proposed stations along the route.
- The study suggests that the service could be feasible assuming the large capital cost and partnership with BNSF can be accomplished and recommends the following steps:

- Establish a partnership for the development of passenger rail with the appropriate partners in El Paso.
- Implement Transit-Oriented Development policies in station areas and establish value-capture revenue sources to support the financial plan.
- Consider engaging a short line railroad as a negotiating and operating partner.
- Position passenger rail service for the broadest range of federal and state funding sources.
- Pursue niche ridership markets

Related Documents

- South Central Council of Governments Rail Feasibility Study, completed in 2009
    - This document makes recommendations on station locations, operating statistics, capital costs, operational costs and potential ridership. The 2017, document updated all the data from the 2009 study and built on it, adding additional dimensions of analysis.
- Transport 2040 – Mesilla Valley MPO MTP, completed in 2015
    - This document is the Metropolitan Transportation Plan for the Mesilla Valley MPO, which includes a large portion of Doña Ana County where the City of Las Cruces is located just north of El Paso.
    - This document acknowledges the feasibility study, but does not include anything in the Transportation Improvement Plan (TIP).

Programmed/Planned Projects

- This document solely covers the feasibility of a commuter rail connection between Las Cruces and El Paso.

15. TxDOT Corridor Studies

Documents Reviewed

Each TxDOT District, including the El Paso District, maintains an updated list of the most recent and ongoing project studies on their website (accessed March 2018).

Document Summary

- Before TxDOT projects are built, a study is conducted to determine how effective it would be in meeting a transportation need while also ensuring it will not negatively impact the surrounding area. Some of these projects then move beyond the study phase and proceed to construction.

Programmed/Planned Projects

- *Reimagine I-10* – This is an advanced planning study for a 55-mile segment of the Interstate 10 Corridor running through the El Paso region from the New Mexico/Texas state line to Tornillo, TX. The purpose of the study is to analyze and evaluate the current and future transportation needs and to reimagine how the corridor could operate by developing unique solutions for this area. This study is ongoing and early in the process at the time of this summary's preparation. More information can be found on the project website (accessed March 2018).

  - Project goals and objectives include improving mobility and circulation in the corridor, minimizing impacts to the built and natural environments, offering innovative transportation alternatives, increasing safety through good design, ensuring the project maximizes value and benefits, and leverages new technology to improve mobility in the corridor.

- *Mesa Street (SH 20)* – This study provides an evaluation of all transportation aspects associated with the 9.8-mile Mesa Street (SH 20) corridor, from Doniphan Drive (SH 20) through downtown to the Loop 375 Border Highway. The final deliverable will be a master plan including short, mid- and long-term recommendations for multimodal solutions to improve the corridor. This study is ongoing and nearing completion at the time of this summary's preparation. More information can be found on the project website (accessed March 2018).
  - Project goals and objectives include maximizing safety, managing congestion and increasing overall transportation reliability in the corridor.
  - Sun Metro began operating the first of four Brio RTS routes in 2016 along the Mesa Corridor from the Santa Fe Transfer Center downtown, to the Westside Transfer Center near I-10 west.

- *Doniphan Drive (SH 20)* – This study provides an evaluation of all transportation aspects associated with the 15-mile Doniphan Drive (SH 20) corridor, from the Texas/New Mexico border to Racetrack Drive. The final deliverable will be a corridor plan that documents the community's vision for transportation and development through 2040, and includes short, mid and long-term recommendations for solutions in the corridor. This study is ongoing and nearing completion at the time of this summary's preparation. More information can be found on the project website (accessed March 2018).
  - The study identifies three conceptual design alternatives that primarily differ in proposed right-of-way width and use of congestion management solutions like bicycle and pedestrian amenities.

- *Alameda Avenue (SH 20)* – This study provides an evaluation of all transportation aspects associated with the 35-mile Texas/Alameda Avenue (SH 20) corridor, from Mesa Street (SH 20) in downtown El Paso to Shaffer Street, just south of Tornillo, TX. The final deliverable will be a corridor plan that documents the community's vision for transportation and development through 2040, and includes short-, mid- and long-term recommendations for solutions in the corridor. This study is ongoing and early in the process at the time of this summary's preparation. More information can be found on the project website (accessed March 2018).

- Together, the Alameda, Mesa and Doniphan Corridor Plans, all component segments of SH 20, represent a parallel and more local arterial-level alternative route to the full extent of the *Reimagine I-10* study area.
- Sun Metro plans to begin operating its second of four Brio RTS routes in 2018 along 14.5 miles of the Alameda Corridor from the Santa Fe Transfer Center downtown, to the Mission Valley Transfer Center at Zaragoza Road.

- *Horizon Boulevard (FM 1281)* – This study provides an evaluation of all transportation aspects associated with the 9.4-mile Horizon Boulevard (FM 1281) corridor, from Alameda Avenue (SH 20) to Ascencion Street just east of Horizon City. The final deliverable will be a corridor master plan that documents the community's vision for transportation in the corridor, and includes short, mid and long-term recommendations. This study is ongoing and early in the process at the time of this summary's preparation. More information can be found on the project website (accessed March 2018).

- *Loop 375 Border Highway East Planning & Environmental Linkages Study* – This study was completed in 2014 and adopted by the El Paso MPO in 2015. It includes Loop 375 in southeast El Paso near the Zaragoza POE, and extends south to Tornillo near the Fabens POE, between I-10 and the Rio Grande. The study documents transportation needs identified by the general public as well as local, state and federal agencies. Key issues include a lack of connectivity to I-10, congestion along east-west arterials, high freight volumes, at-grade railroad crossings, and increased traffic from increased international trade. Alternative solutions are analyzed and include capacity improvements, new alignments, and multimodal solutions. The study recommends moving 10 roadway projects into the NEPA environmental process, including added capacity to existing facilities and construction of new facilities. This is where number of lanes, construction approach, alignment location and funding will be finalized and determined. More information can be found on the project website (accessed March 2018).

16. Northeast El Paso Traffic Study

Document Reviewed

PDF available through the TxDOT El Paso District Office at (915) 790-4340, completed 2017

Document Summary

- This document provides information that can be used in determining future transportation improvements for the area surrounding the Northeast Parkway, a major planned highway improvement within the study area.

- It is identified that the *Horizon 2040 MTP* indicates that several roadways within the study area will experience over-capacity or severely congested conditions under the 2040 No-Build scenario.
- There is significant growth potential within the study area at the same time there are several roadways within the study area that are operating near or above capacity.
- Significant differences are found between the model's base year employment data and the employment estimates, with the model's total study area and TAZ-level employment more than 40% lower than the total estimated employment.
- This document provides planning, design and implementation considerations to acknowledge moving forward, which include potential hot spots, design principles and operational practices.

<u>Related Documents</u>

- El Paso Metropolitan Transportation Plan (MTP) Destino 2045, completed in 2018
    - This document is the most recently adopted plan for the El Paso MPO. The Travel Demand Model was an integral part of completing this traffic analysis.

<u>Programmed/Planned Projects</u>

- New Northeast Parkway facility connecting Loop 375 just north of Biggs Army Airfield with MLK Boulevard near the Texas-New Mexico border.
- Operational and capacity improvements to U.S. 54 between Hondo Pass Drive and McCombs Street.
- Capacity improvements to Loop 375 and MLK Boulevard near where those facilities will tie in to the Northeast Parkway.

<u>Note</u>: The Scope of Work for this subtask includes up to 18 Studies, leaving room for up to two additional studies to include in this document for review, which may or may not be included in the final version of this review.

APPENDIX B

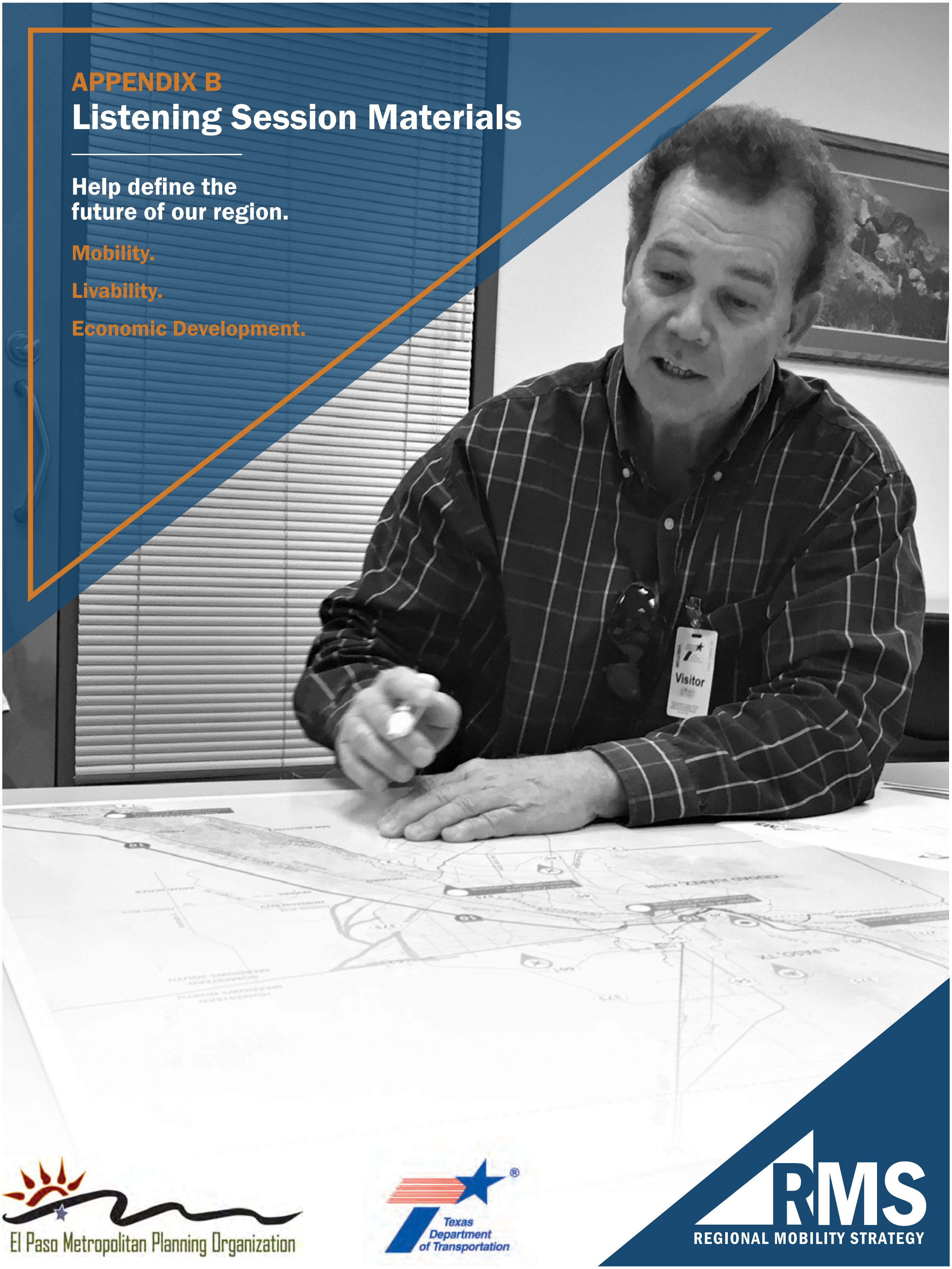
Listening Session Materials

Help define the future of our region.

Mobility.

Livability.

Economic Development.

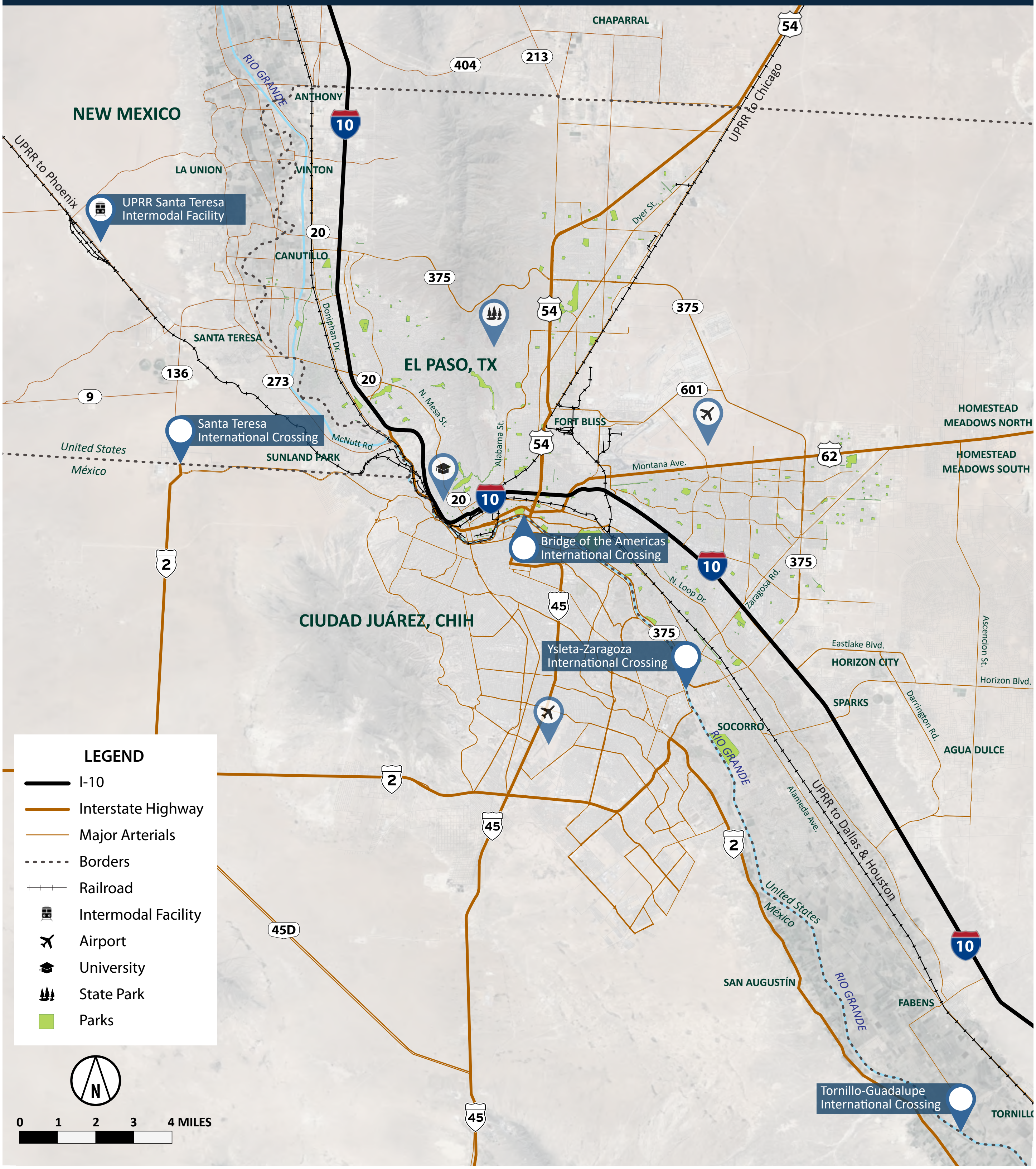


El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

FOCUS AREA



NEW MEXICO
EL PASO, TX
CIUDAD JUÁREZ, CHIH
CHAPARRAL
ANTHONY
LA UNION
VINTON
CANUTILLO
SANTA TERESA
SUNLAND PARK
FORT BLISS
HOMESTEAD MEADOWS NORTH
HOMESTEAD MEADOWS SOUTH
HORIZON CITY
SPARKS
SOCORRO
AGUA DULCE
SAN AGUSTÍN
FABENS
TORNILLO
RIO GRANDE
United States
México
UPRR to Phoenix
UPRR to Chicago
UPRR to Dallas & Houston
UPRR Santa Teresa Intermodal Facility
Santa Teresa International Crossing
Bridge of the Americas International Crossing
Ysleta-Zaragoza International Crossing
Tornillo-Guadalupe International Crossing
Doniphan Dr.
N. Mesa St.
Alabama St.
McNutt Rd
Dyer St.
Montana Ave.
N. Loop Dr.
Zaragosa Rd.
Eastlake Blvd.
Horizon Blvd.
Ascencion St.
Darrington Rd.
Alameda Ave.
10
54
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213
20
375
601
62
136
9
273
2
45
45D
LEGEND
I-10
Interstate Highway
Major Arterials
Borders
Railroad
Intermodal Facility
Airport
University
State Park
Parks
N
0 1 2 3 4 MILES

REGIONAL MAP

RMS REGIONAL MOBILITY STRATEGY

Texas Department of Transportation

Revised: 9/4/2019

Appendix B-2

RMS Fact Sheet

RMS
REGIONAL MOBILITY STRATEGY

The El Paso District of the Texas Department of Transportation (TxDOT) is conducting an assessment of the transportation network within the region. The assessment will support the collective vision of regional stakeholders and mobility agencies. The Regional Mobility Strategy (RMS), will identify opportunities to improve the movement of goods and people in the region, in partnership with the region's growth and economic trends and quality of life priorities for El Paso County, Texas; southern Doña Ana County, New Mexico; and Ciudad Juárez, Chihuahua.

Your participation will impact the future of mobility, livability and economic development in the region.

What is the purpose?

- Understand the needs for both mobility and land development in the region
- Support regional development initiatives
- Create and complement a collective vision and provide priorities for future transportation development, economics and policies
- Provide a tool for decision makers

Why develop it?

- Consider multiple transportation and urban design challenges
- Include new partners with a stake in transportation planning and implementation
- Promote a safe, livable and sustainable multimodal infrastructure system
- Evaluate modal opportunities and leverage and optimize the transportation system network while achieving value for the region

How will it be used?

- Determine and prioritize short, mid and long-term projects that improve the movement of goods and people within the region
- Deliver key information in developing multimodal mobility improvements
- Coordinate associated development connectivity and funding priorities
- Identify opportunities for financing and funding a mobility vision
- Guide future growth

Texas Department of Transportation®

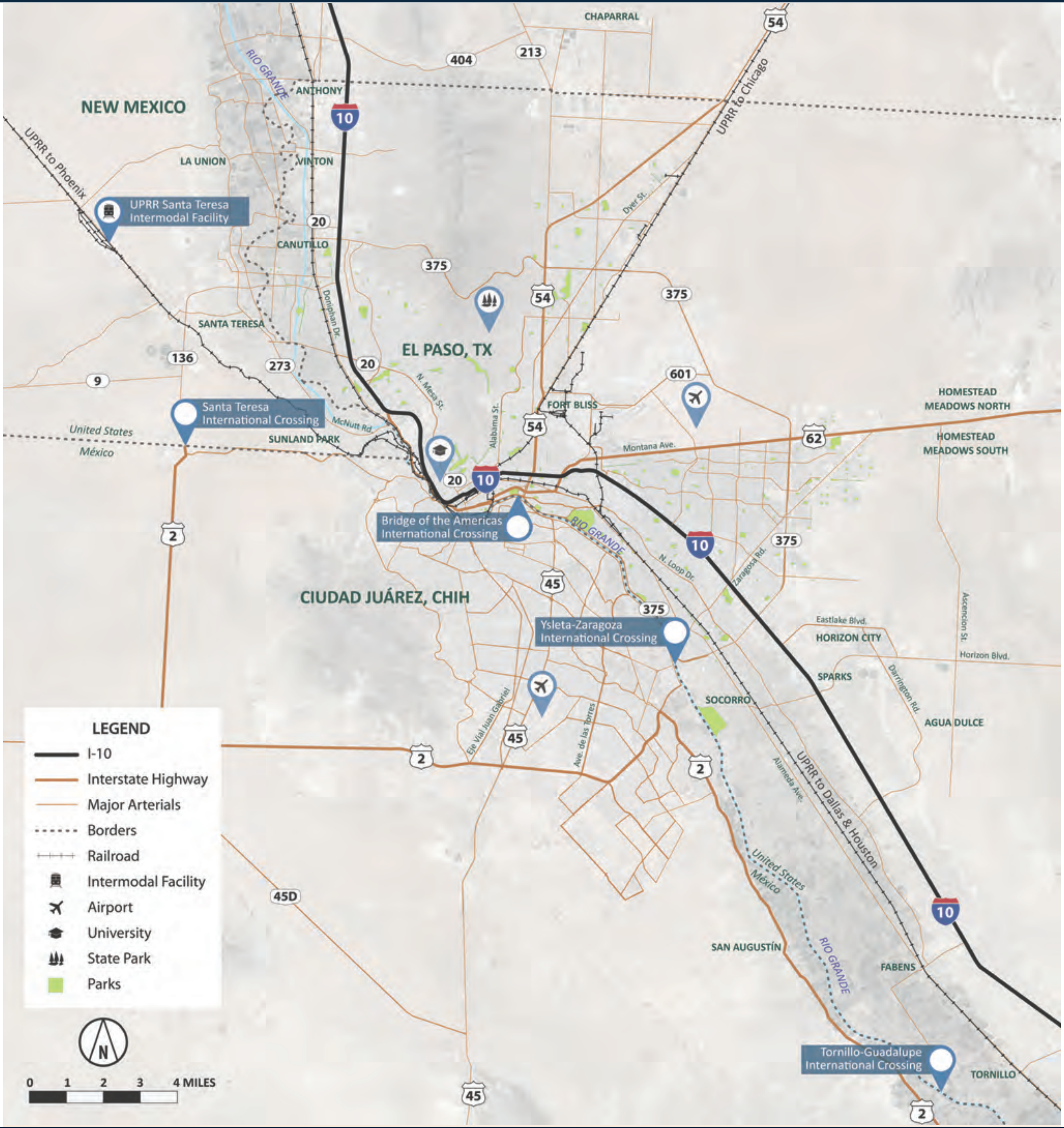
Photos: Franklin Mountains State Park Texas *Found on Bing from https://tpwd.texas.gov/state-parks/franklin-mountains* | Union Pacific Railroad *Found on Bing from seekingalpha.com https://binged.it/2GvYU9p* | I-10 in El Paso Photo Provided by HNTB

What's the plan?

The RMS will begin by listening. We want to hear from you, participating stakeholders and partnering agencies, to collectively establish a vision for the regional transportation network (highways, railroads, transit, bicycle, and pedestrian traffic) that supports future growth and economic vitality.

How to get there?

- Evaluate the current and future operational conditions of key highway corridors in the region to identify constraints and areas of opportunity
- Identify potential opportunities for increased arterial connectivity by working with the local governments in Texas and New Mexico.
- Explore enhanced multimodal opportunities using existing data and the needs discussed by the transit and rail agencies
- Coordinate with local governments on planned and desired multimodal facilities to increase non-vehicular connectivity for commuters
- Coordinate with the local, state and federal stakeholders involved in the movement of goods and people across the international border
- Provide recommendations for project prioritization based on agency and stakeholder input received that supports the region's vision



Appendix B-3

RMS Portrait Handout

RMS

REGIONAL MOBILITY STRATEGY

What makes a strong region?

We believe strength is in numbers – the power of many people collectively sharing creative mobility ideas to shape the future of the El Paso region.

Changing views, needs, and expectations for greater neighborhood and regional connectivity and livability are motivating communities to re-examine traditional and innovative transportation solutions.

Recognizing the opportunity and responsibility to improve movement of goods and people within its region, the Texas Department of Transportation (TxDOT) El Paso District is initiating the Regional Mobility Strategy (RMS) to understand the opportunities and implications associated with future major transportation and community investments, and to prioritize those investments.

Through open dialogue with multiple stakeholders and partnering agencies, the RMS aims to establish a comprehensive regional vision strengthened in a collaborative spirit and powered by multiple champions working together to build El Paso's future.

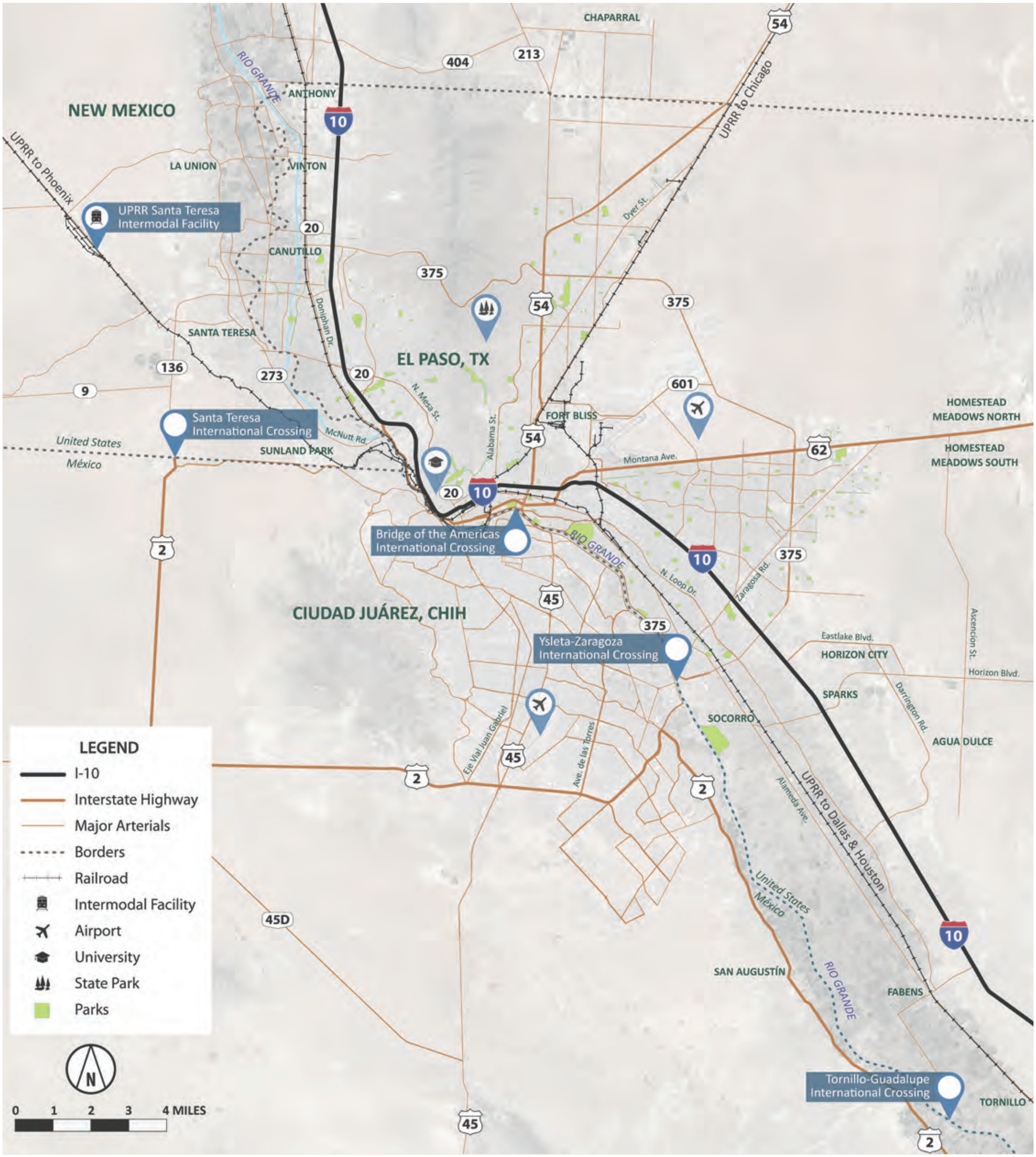
TxDOT funded and stakeholder driven, the RMS will focus on improving project design with multimodal solutions that contribute to both transportation mobility and economic vitality for the residents of this region. The RMS will identify opportunities that provide a path forward for decision making, design and funding prioritization for projects that will promote economic development in the region. It will evaluate infrastructure, policy, and technology opportunities at the regional level that would:

- Address safety issues
- Decrease travel times
- Increase connectivity
- Improve level of service
- Increase network reliability and redundancy
- Provide additional modal opportunities
- Preserve community character, cohesion and quality of life
- Identify projects for funding and implementation
- Promote economic development opportunities

Your participation will impact the future of mobility, livability and economic development in the region.

Texas Department of Transportation

Photos: Franklin Mountains State Park Texas *Found on Bing from https://tpwd.texas.gov/state-parks/franklin-mountains* | Union Pacific Railroad *Found on Bing from seekingalpha.com https://binged.it/2GvYU9p* | I-10 in El Paso Photo Provided by HNTB



NEW MEXICO
EL PASO, TX
CIUDAD JUÁREZ, CHIH
CHAPARRAL
ANTHONY
LA UNION
VINTON
CANUTILLO
SANTA TERESA
SUNLAND PARK
FORT BLISS
HOMESTEAD MEADOWS NORTH
HOMESTEAD MEADOWS SOUTH
HORIZON CITY
SPARKS
SOCORRO
AGUA DULCE
SAN AUGUSTÍN
FABENS
TORNILLO
UPRR to Phoenix
UPRR to Chicago
UPRR to Dallas & Houston
UPRR Santa Teresa Intermodal Facility
Santa Teresa International Crossing
Bridge of the Americas International Crossing
Ysleta-Zaragoza International Crossing
Tornillo-Guadalupe International Crossing
RIO GRANDE
United States
México
Doniphan Dr.
N. Mesa St.
Alabama St.
McNutt Rd.
Dyer St.
Montana Ave.
N. Loop Dr.
Zaragosa Rd.
Eastlake Blvd.
Horizon Blvd.
Ascencion St.
Darrington Rd.
Alameda Ave.
Eje Vial Juan Gabriel
Ave. de las Torres
10
20
54
62
213
273
375
404
601
136
9
2
45
45D
LEGEND
I-10
Interstate Highway
Major Arterials
Borders
Railroad
Intermodal Facility
Airport
University
State Park
Parks
N
0 1 2 3 4 MILES

Appendix B-4 RMS

Questionnaire

Subject:

Date:

Location:

Listening Team:

1. Please list your top three concerns for transportation mobility in the El Paso Region with 1 being the highest priority.

    1.
    2.
    3.

2. What is your knowledge of planned, proposed or conceptual projects or planned development for properties, facilities or neighborhoods that may impact the region?

3. What are the biggest obstacles to improving regional transportation mobility?

4. Where do you see opportunities for improved transportation mobility?

5. What are your thoughts regarding local versus regional impacts due to planned, current or future transportation improvements (including roadway, transit, bicycle, pedestrian)?

6. Where do you see land development pressure or land use potential to accommodate growth concerns?

7. What are your thoughts regarding transportation infrastructure in the region?

8. What are your thoughts on policies that impact the region associated to transportation?

9. What are your environmental questions or concerns associated with transportation?

10. How do you see regional coordination or cooperation among agencies?

11. Rank the following in priority order:

_____ Quality of life and neighborhood character

_____ Regional mobility

_____ International border connection

_____ Multi-modal options

_____ Safety improvements

_____ Arterial street connections

_____ Economic development and future growth

_____ Parks and open space

_____ Policy, partnership and funding considerations

_____ Other(s) please list.

Cuestionario

1. Por favor indique cuales son los tres temas de mayor preocupación relacionadas con la movilidad en la región de Ciudad Juárez, con el 1 indicando el de más alta prioridad.
    1.
    2.
    3.
2. ¿Cuáles son los proyectos conceptuales, en desarrollo, o en ejecución que podrían tener un impacto mayor en la región?
3. ¿Cuáles son los obstáculos principales para mejorar la movilidad regional?
4. ¿Dónde están las oportunidades para mejorar la movilidad regional?
5. ¿Cuál es su opinión sobre el balance entre los impactos locales y los regionales debido a las mejoras a la red de transporte dentro de la región, incluyendo vialidades, transporte público, infraestructura para ciclistas y peatones?
6. ¿Dónde observa que haya presión para el desarrollo de suelo o donde exista potencial para acomodar el crecimiento?
7. ¿Cuál es su opinión sobre el estado actual de la infraestructura de transporte en la región?
8. ¿Qué piensa acerca de las políticas de transporte que impactan a la región?
9. ¿Cuáles son sus mayores preocupaciones sobre el tema del medio ambiente relacionadas con el transporte?
10. ¿Qué opina sobre la coordinación y cooperación entre agencias locales, regionales, estatales y binacionales?
11. Clasifique los siguientes en orden de prioridad:

    ____ Calidad de vida
    ____ Movilidad regional
    ____ Conexión de la frontera internacional
    ____ Opciones multimodales
    ____ Mejoras de seguridad
    ____ Conexiones de calles arteriales
    ____ Desarrollo económico y crecimiento futuro
    ____ Parques y áreas públicas
    ____ Políticas para fondear y financiar proyectos
    ____ Otro(s)

Appendix B-5

Presentations

TEXAS DEPARTMENT OF TRANSPORTATION

RMS

REGIONAL MOBILITY STRATEGY

Briefing to El Paso MPO TPB

June 21, 2019

Prepared by HNTB Corporation



What is the RMS?

- Response to perceived lack of vision and leadership
- Assessment of transportation network within region
- Collective vision of regional stakeholders, mobility agencies
- Focus on mobility, land-use and quality of life

Your participation will impact the future of mobility, livability and economic development in the region.

What is the purpose?	Why develop it?	How will it be used?
✓ Understand the needs for future mobility and land development ✓ Support regional mobility initiatives ✓ Provide priorities for future transportation development, economics and policies ✓ Provide a tool for decision makers	✓ Consider transportation and urban design challenges ✓ Include new partners with a stake in transportation planning and implementation ✓ Promote safe, livable and sustainable multimodal infrastructure system	✓ Deliver key information in developing multimodal mobility improvements ✓ Identify opportunities for financing and funding a mobility vision ✓ Inform process to develop implementation plans

RMS Elements: Existing Studies

Collected and analyzed over 15 studies from difference sources:

- Tri-state area (New Mexico, Texas, Chihuahua)
- Multi-agency (Federal, State, MPO, City, County)
- What is the starting point?

RMS Elements: Stakeholder Engagement

- Stakeholder Involvement Plan
- Listening Sessions, up to 30
- Regional Stakeholder Coordination Meetings

STAKEHOLDER LISTENING SESSIONS

- Mayor Perea
- Borderplex Alliance
- Border Industrial Association
- NMDOT
- CRRMA
- UTEP

- Borderplex Alliance
- Govt. of State of Chihuahua
- IMIP
- UTEP

- Representative Pickett
- Representative Ortega
- Mayor Margo
- Commissioner Ortega

- Medical Center of the Americas
- El Paso Chamber
- Borderplex Alliance

- Sun Metro
- CRRMA
- El Paso Mobility Coalition
- El Paso County

- UTEP

STAKEHOLDER CLASSIFICATION

- Elected Officials (5)
- Businesses/Private Sectors (4)
- Transportation/Government Agencies (7)
- Academic (1)

Major Themes from Listening Sessions

Leadership

Economic Development & Income Growth

Traffic Flow / Connectivity

CSS / Multi-modal

Quality of Life

Funding

Policies

Technology

CSS – Context Sensitive Solutions

RMS Elements: Transit

Collected and analyzed:

- Sun Metro’s strategic plan
- County of El Paso Regional Transit Study
- Potential expansions and partnerships for regional and cross-border opportunities

RMS Elements: Bicycle and Pedestrian

- Analyzed pedestrian and bike plans within the region (i.e., TxDOT, City of El Paso, County, public-private partnerships)
- Will identify gaps and opportunities

RMS Elements: Freight Rail Analysis – BNSF & UPRR

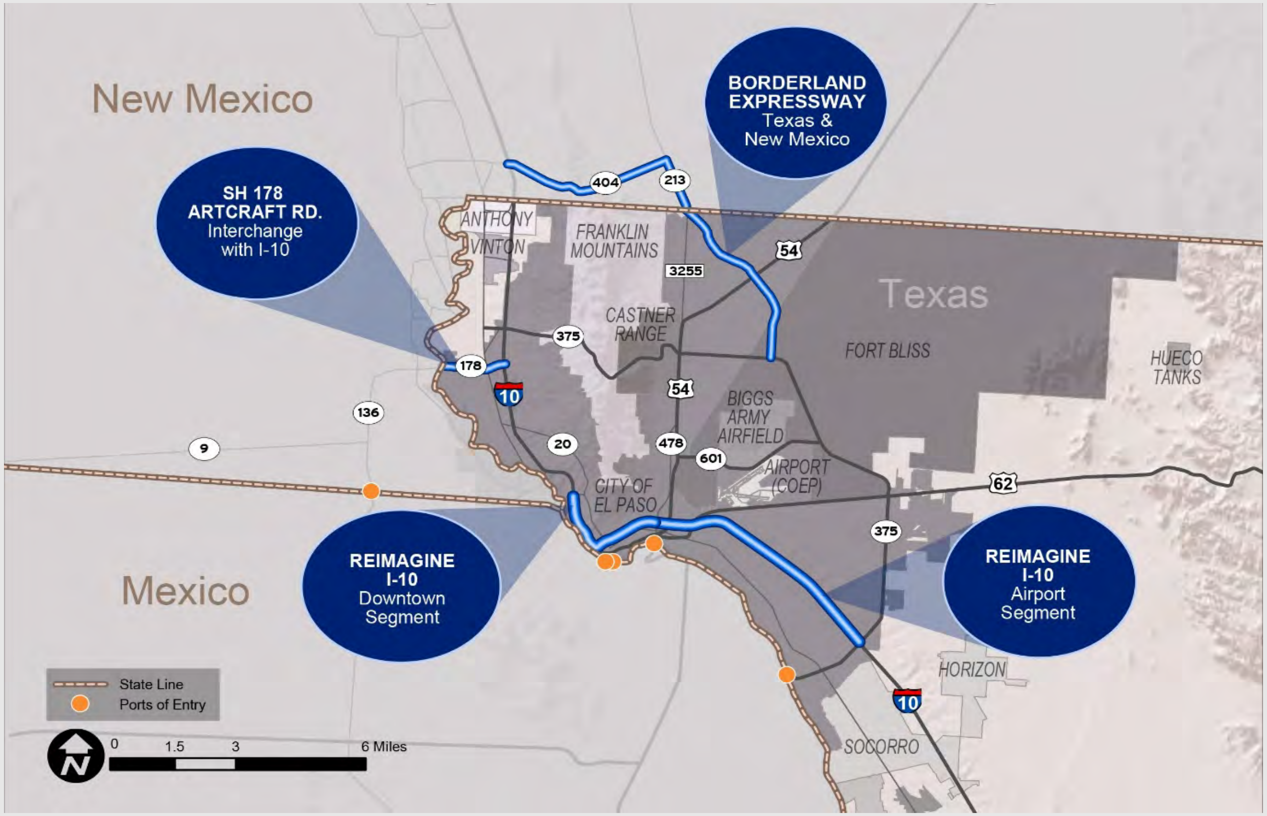
- **BNSF Corridor**
  - Expanded on Doniphan Drive Corridor Study data
  - Opportunities along US85 (Paisano) and SH20 (Doniphan)
- **UPRR Corridors**
  - Microsimulation, impacts (delay, emissions) at at-grade intersections
  - Improved freight rail operations and safety
- **Passenger Rail on Freight Rail Corridors?**

RMS Elements: Cross-border analysis

- Current cross-border data analysis
- Determine origin-destination pairs
- Support
  - Texas-Mexico Border Transportation Master Plan
  - New Mexico-Chihuahua Border Master Plan

RMS Elements: Highway Analysis Highlights

- Potential new connections/capacity expansion.
- “Outside the box” and unconstrained environment
- Through stakeholder listening sessions, identified support for 4 regionally significant projects :



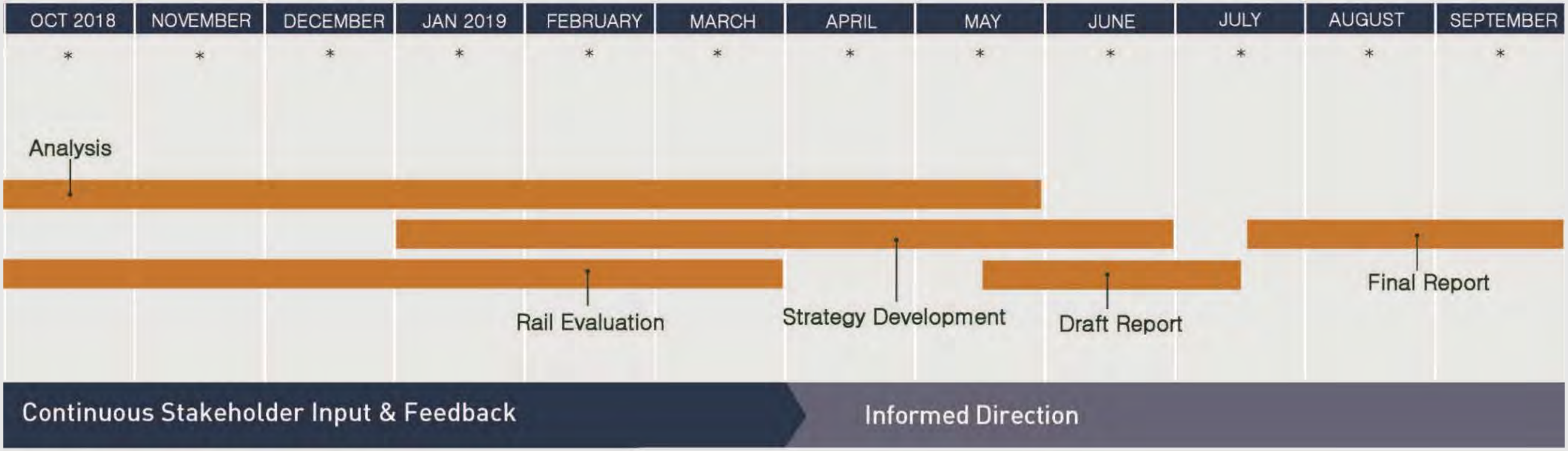
What's Next? Mobility Analysis

- **Symmetry & economies of scale in regional planning?**
  - El Paso County, Southern Doña Ana County, Ciudad Juárez
- **Key regional corridors for connectivity?**
  - Not constrained – think BIG and OUTSIDE THE BOX
  - Multimodal conditions (Roadway, transit, bike/ped)
  - Land-use trends
- **Future conditions will significantly impact regional network?**
  - Global trade and freight corridors
  - Regional economic development and growth initiatives

What's Next? RMS Implementation

- **Mobility Strategy Implementation Plan**
  - Well-defined priorities
  - Regional Consensus – **One Voice**
    - MPO
    - TxDOT & NMDOT
    - CRRMA
    - El Paso Mobility Coalition
    - City of El Paso and other Local Partners
  - Logical sequencing of projects
  - Financial Strategy
    - Local skin in the game
    - Federal and State resources

RMS Project Schedule



* Monthly Coordination meetings as requested

Contact Information

TxDOT – El Paso District

Thelma Ramirez

Thelma.Ramirez@txdot.gov

(915) 790-4243

El Paso MPO

Eduardo Calvo, AICP

ecalvo@elpasompo.org

(915) 212-0258

HNTB

Kelvin Kroeker, PE

kkroeker@hntb.com

(915) 637-1062

Appendix B-6

Stakeholder Outreach

- Sample invitation letter and enclosures
- Sample invitation email and attachments

Sample Letter of Invitation

Texas Department of Transportation

13301 GATEWAY BOULEVARD WEST, EL PASO, TEXAS 79928 | 915.790.4200 | WWW.TXDOT.GOV

October 18, 2018

Mr. Jon Barela
Chief Executive Officer
The Borderplex Alliance
123 W. Mills Avenue, Suite 111
El Paso, TX 79901

Dear Mr. Barela:

The El Paso District of the Texas Department of Transportation (TxDOT) is seeking your participation in the development of a comprehensive transportation mobility vision that will be delivered as the Regional Mobility Strategy (RMS).

The RMS is beginning with your input on the El Paso Region's current and future needs, challenges and opportunities. Following a stakeholder input phase, the team will synthesize the feedback provided, along with current and planned project data collected across all modes of transportation to identify feasible mobility solutions.

Your input and collaboration are essential components to the development of recommendations that support a sustainable multi-modal infrastructure system for the future.

Please anticipate a call to schedule a meeting at a time that is convenient to you.

Our team looks forward to speaking with you. As a partner, we welcome your participation in this process.

Sincerely,

Robert Bielek

Robert Bielek, DPA, P.E.
El Paso District Engineer

Subject:

Date:

Location:

Listening Team:

1. Please list your top three concerns for transportation mobility in the El Paso Region with 1 being the highest priority.

    1.
    2.
    3.

2. What is your knowledge of planned, proposed or conceptual projects or planned development for properties, facilities or neighborhoods that may impact the region?

3. What are the biggest obstacles to improving regional transportation mobility?

4. Where do you see opportunities for improved transportation mobility?

5. What are your thoughts regarding local versus regional impacts due to planned, current or future transportation improvements (including roadway, transit, bicycle, pedestrian)?

6. Where do you see land development pressure or land use potential to accommodate growth concerns?

7. What are your thoughts regarding transportation infrastructure in the region?

8. What are your thoughts on policies that impact the region associated to transportation?

9. What are your environmental questions or concerns associated with transportation?

10. How do you see regional coordination or cooperation among agencies?

11. Rank the following in priority order:

_____ Quality of life and neighborhood character

_____ Regional mobility

_____ International border connection

_____ Multi-modal options

_____ Safety improvements

_____ Arterial street connections

_____ Economic development and future growth

_____ Parks and open space

_____ Policy, partnership and funding considerations

_____ Other(s) please list.

RMS
REGIONAL MOBILITY STRATEGY

The El Paso District of the Texas Department of Transportation (TxDOT) is conducting an assessment of the transportation network within the region. The assessment will support the collective vision of regional stakeholders and mobility agencies. The Regional Mobility Strategy (RMS), will identify opportunities to improve the movement of goods and people in the region, in partnership with the region's growth and economic trends and quality of life priorities for El Paso County, Texas; southern Doña Ana County, New Mexico; and Ciudad Juárez, Chihuahua.

Your participation will impact the future of mobility, livability and economic development in the region.

What is the purpose?

- Understand the needs for both mobility and land development in the region
- Support regional development initiatives
- Create and complement a collective vision and provide priorities for future transportation development, economics and policies
- Provide a tool for decision makers

Why develop it?

- Consider multiple transportation and urban design challenges
- Include new partners with a stake in transportation planning and implementation
- Promote a safe, livable and sustainable multimodal infrastructure system
- Evaluate modal opportunities and leverage and optimize the transportation system network while achieving value for the region

How will it be used?

- Determine and prioritize short, mid and long-term projects that improve the movement of goods and people within the region
- Deliver key information in developing multimodal mobility improvements
- Coordinate associated development connectivity and funding priorities
- Identify opportunities for financing and funding a mobility vision
- Guide future growth

Texas Department of Transportation®

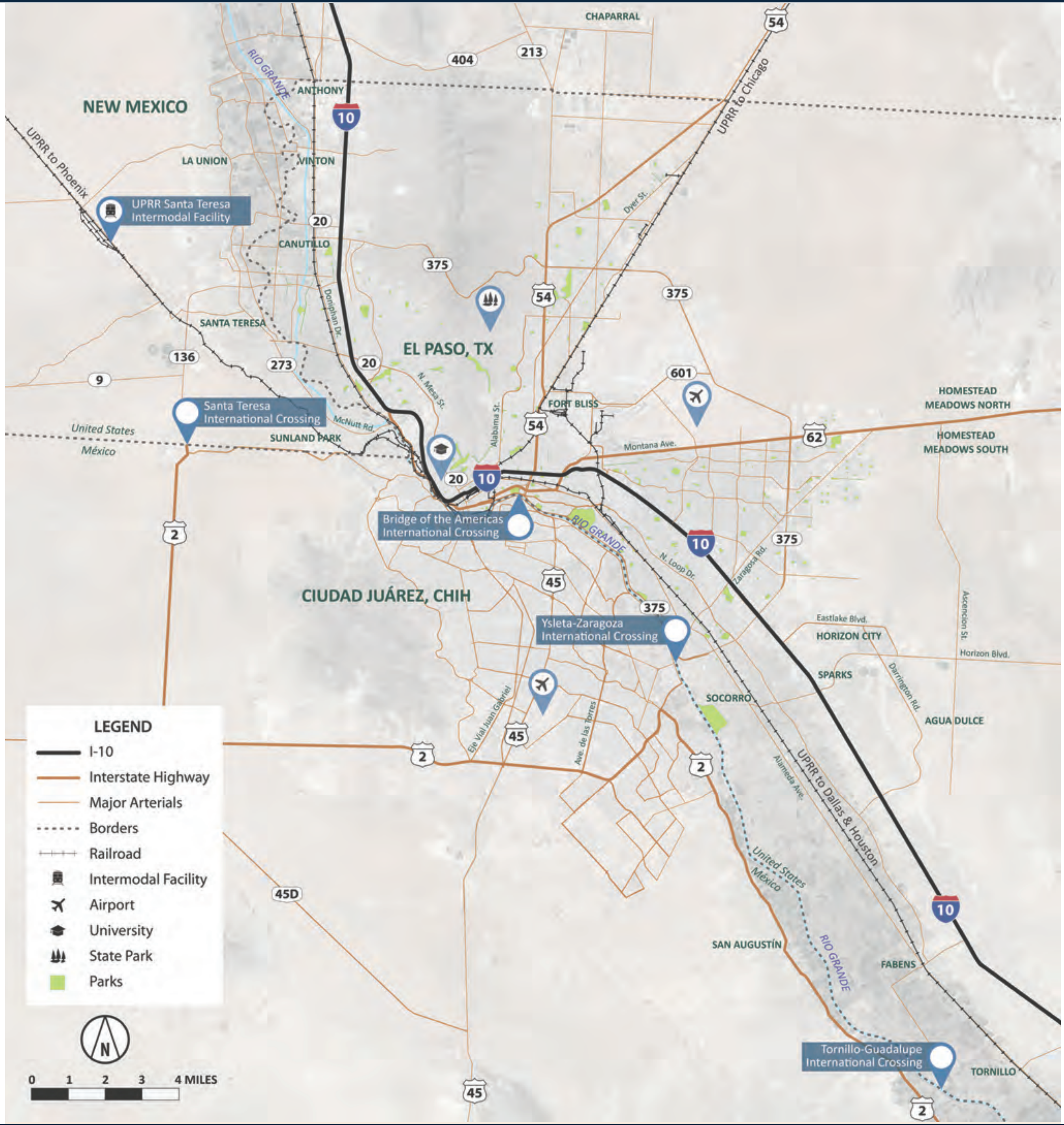
Photos: Franklin Mountains State Park Texas *Found on Bing from https://tpwd.texas.gov/state-parks/franklin-mountains* | Union Pacific Railroad *Found on Bing from seekingalpha.com https://binged.it/2GvYU9p* | I-10 in El Paso Photo Provided by HNTB

What's the plan?

The RMS will begin by listening. We want to hear from you, participating stakeholders and partnering agencies, to collectively establish a vision for the regional transportation network (highways, railroads, transit, bicycle, and pedestrian traffic) that supports future growth and economic vitality.

How to get there?

- Evaluate the current and future operational conditions of key highway corridors in the region to identify constraints and areas of opportunity
- Identify potential opportunities for increased arterial connectivity by working with the local governments in Texas and New Mexico.
- Explore enhanced multimodal opportunities using existing data and the needs discussed by the transit and rail agencies
- Coordinate with local governments on planned and desired multimodal facilities to increase non-vehicular connectivity for commuters
- Coordinate with the local, state and federal stakeholders involved in the movement of goods and people across the international border
- Provide recommendations for project prioritization based on agency and stakeholder input received that supports the region's vision



Sample Email Invitation

From: rmselp <rmselp@txdot.gov>
Sent: Monday, October 22, 2018 6:03 PM
To: ted4@hfpsolutions.com
Cc: RMS@hntb.com; Hugo Hernandez; Jennifer Wright
Subject: Meeting Request - Regional Mobility Strategy (RMS) TXDOT El Paso

Dear Mr. Houghton,

The El Paso District of the Texas Department of Transportation (TxDOT) is seeking your participation in the development of a comprehensive transportation mobility vision that will be developed into a Regional Mobility Strategy (RMS).

Your participation will help determine the El Paso region's current and future needs, challenges, and opportunities. The input we receive from you and other stakeholders will be synthesized, along with data collected across all modes of transportation, to identify feasible mobility solutions.

You may expect a call from a RMS representative who will be asking to schedule a meeting. To help prepare for the meeting, please find some engagement materials pasted below.

Our team looks forward to speaking with you.

Sincerely,

Robert Bielek, DPA, P.E.
El Paso District Engineer

ENGAGEMENT MATERIALS

1. Please list your top three concerns for transportation mobility in the El Paso Region with 1 being the highest priority.
    1.
    2.
    3.
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9. What are your environmental questions or concerns associated to transportation?

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11. Rank the following in priority order:
    ____ Quality of life and neighborhood character
    ____ Regional mobility
    ____ International border connection
    ____ Multi-modal options
    ____ Safety improvements
    ____ Arterial street connections
    ____ Economic development and future growth
    ____ Parks and open space
    ____ Policy, partnership and funding considerations
    ____ Other(s) please list.

RMS
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- Provide a tool for decision makers

Why develop it?

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- Identify opportunities for financing and funding a mobility vision
- Guide future growth

Texas Department of Transportation®

Photos: **Franklin Mountains State Park Texas** *Found on Bing from https://tpwd.texas.gov/state-parks/franklin-mountains* **Union Pacific Railroad** *Found on Bing from seekingalpha.com https://binged.it/2GvYU9p* **I-10 in El Paso** Photo Provided by HNTB

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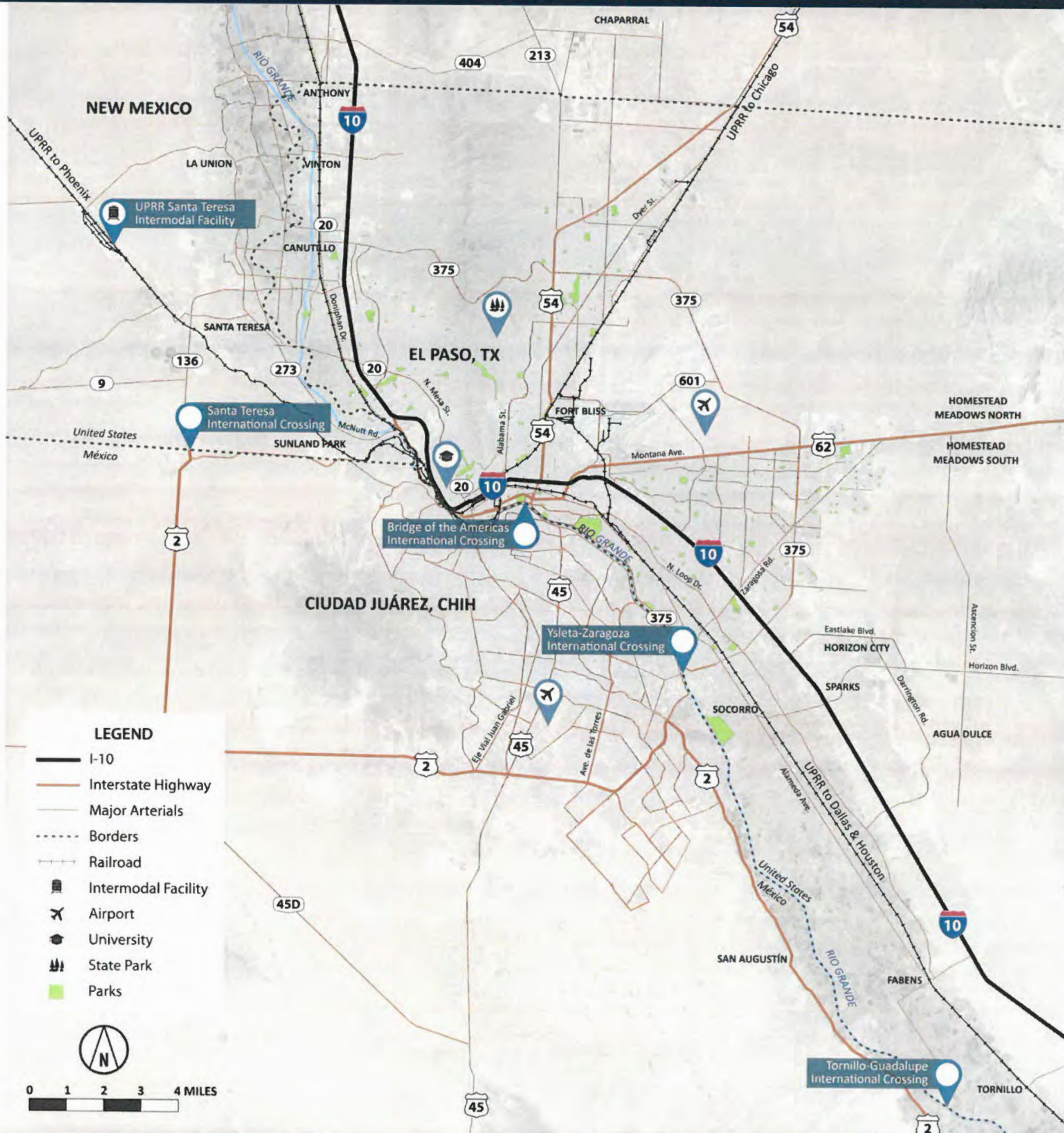
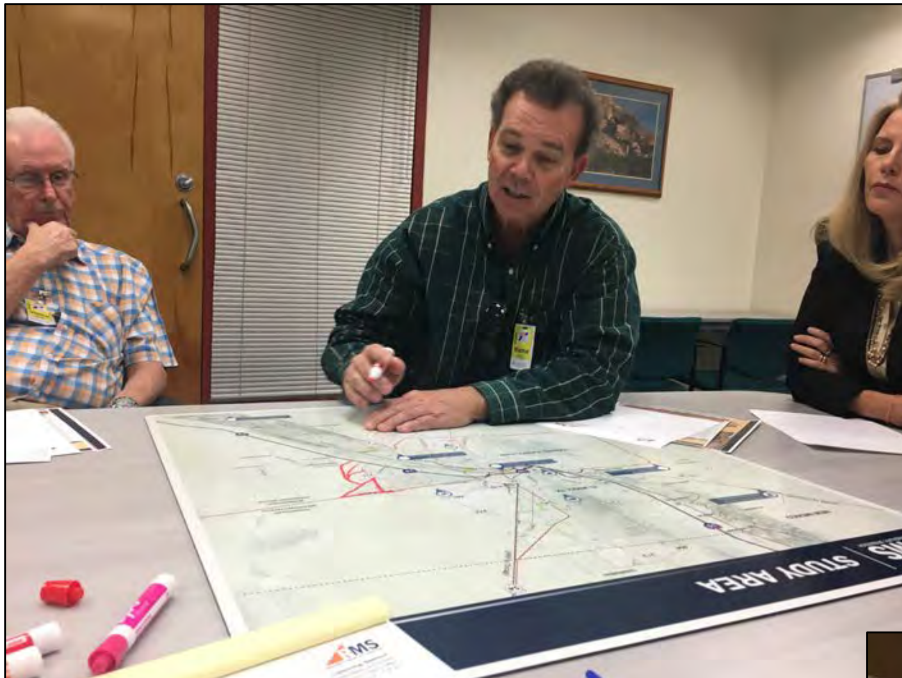
- o Provide recommendations for project prioritization based on agency and stakeholder input received that supports the region's vision



Appendix B-7

Sampling of Listening Session Photos



State Representative Joe Pickett – October 29, 2018

State Representative Lina Ortega – October 30, 2018

President of the Medical Center of the Americas (MCA) Foundation, Emma Schwartz – November 6, 2018.

Jon Barela, CEO of Borderplex Alliance – November 8, 2018

City Engineer Sam Rodriguez (left), Director of Grant Funded Capital Programs Yvette Hernandez (middle), and El Paso Mayor Dee Margo (not pictured) – November 14, 2018

Sun Metro Executive Director Jay Banasiak (center), Sun Metro Assistant Director Frank Benavidez (left), and Sun Metro Planner Claudia Garcia (right) – November 27, 2018

The Hunt Institute for Global Competitiveness Associate Director Mayra Maldonado (center), Research Economist Rafael Perez (left), and Executive Director Patrick Schaefer (not pictured) – February 26, 2019

State of Chihuahua officials Anna Alvarez Monge, Fabian Santana Márquez, Gustavo Elizondo, Pervinca Esparza Rosas, Brianda Herrera, Jaime Campos, Teresa Piñón, Alejandra de la Vega, and Luis Felipe Siquerios – May 14, 2019

Town of Horizon City Horizon City Economic Development Corporation Executive Director Michael Hernandez (left), Horizon City Councilman Walter Miller (middle), and Teresa Quezada of Horizon City's Capital Projects and Transportation Planning (right) – June 14, 2019

APPENDIX C

RMS Themes Matrix

Help define the future of our region.

Mobility.

Livability.

Economic Development.

El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS

REGIONAL MOBILITY STRATEGY

Stakeholder Key

Jon Barela, Borderplex Alliance CEO

Camino Real Regional Mobility Authority (CRRMA) & Borderplex Alliance
Susan Melendez, CRRMA Board Chair
Raymond Telles, CRRMA Executive Director
Robert Studer, CRRMA Director of Financing
Carlos A. Martinez, Office of State Representative Cesar Blanco
Robert Palacios, Union Pacific Strategic Planning
Daniel Marquez, El Paso County Associate Engineer
Kassandra Huhn, Director of Economic Research, Borderplex Alliance
Tony Ramirez, VP of Economic Development, Borderplex Alliance

City of El Paso
Dee Margo, Mayor
Yvette Hernandez, Director of Grant Funded Programs
Sam Rodriquez, City Engineer

County of El Paso
Vince Perez, El Paso County Commissioner, Precinct 3
Jose Landeros, Director of Planning & Development
Sal Alonzo, Transportation Program Engineer

Nicolás López Duarte, Instituto Municipal de Investigacion y Planeacion, Chief Planner

Jerry Pacheco, New Mexico Border Industrial Association CEO & President
Chris Lyons, President, Paseo del Norte Limited Partnership

New Mexico Department of Transportation (NMDOT)
Trent Doolittle, District One Engineer
Harold Love, Assistant District One Engineer

El Paso Chamber of Commerce - Mobility Coalition
Ted Houghton, Chair of El Paso Mobility Coalition Executive Committee, Owner of Houghton Financial Partners
David Michael Jerome, President & CEO, El Paso Chamber
Carlos Keating, Chairman of the Board, El Paso Chamber
Stephen Voglewede, Director of Innovation & Performance, El Paso Chamber
Jack Chapman, WestStar Bank Board of Governors and El Paso Chamber Board of Directors
Amy Hernandez, Office of State Representative Joe Moody, District 78
The Honorable Cesar J. Blanco, District 76, State Representative
Carlos A. Martinez, Office of State Representative Cesar Blanco
Ted Marquez, Deputy City Manager for Public Works & Transportation, City of El Paso
Cassandra Hernandez, Councilmember, District 3, City of El Paso
Stanley Jobe, Jobe Materials
Steve Ortega, Attorney at Law
Jose Reyes, El Paso Region Manager, Dannenbaum
Hector Esparza, Senior Designer, Dannenbaum

Hunt Institute for Global Competitiveness
Patrick Schaefer, Executive Director
Mayra Maldonado, Associate Director
Rafael Perez, Research Economist

Tom Fullerton, UTEP, Department of Economics & Finance, Border Region Modeling Project

Tommy Gonzalez, El Paso City Manager

Hunt Institute for Global Competitiveness
Patrick Schaefer, Executive Director
Mayra Maldonado, Associate Director
Rafael Perez, Research Economist

Chris Lyons, President, Paseo del Norte Limited Partnership

Medical Center of the Americas Foundation (MCA)
Emma Schwartz, MCA Foundation President
Nahum Apodaca, MCA Foundation Planning Manager

New Mexico Border Authority
Erika De La O, Interim Director
David Espinoza, Budget Analyst

New Mexico Department of Transportation (NMDOT)
Trent Doolittle, District One Engineer
Harold Love, Assistant District One Engineer

Evelina Ortega, Texas State Representative, District 77

Jerry Pacheco, New Mexico Border Industrial Association CEO & President

Javier Perea, City of Sunland Park Mayor

Joe Pickett, Texas State Representative, District 79

State of Chihuahua
Victor Vargas, Urban Development, Innovation, Economic Development
Alejandra de la Vega Arizpe, Secretary of Innovation & Economic Development
Fabian Santana Márquez, Secretary of Innovation & Urban Development
Gustavo Elizondo, Secretary of Public Works
Jaime Campos Castuera, Director of Industry
Anna Álvarez Monge, Binational Projects Coordinator, Department of Industry
Pervinca Esparza Rosas, Head of Department of Urban Mobility
Luis Felipe Siqueiros Falomir, Secretary of Urban Development & Ecology
Teresa Piñón, Director General, Institute for Workforce Training for the State of Chihuahua

Town of Horizon City
Walter Miller, Councilman and Former Mayor
Teresa Quezada, Consultant, QDMS Consulting
Michael Hernandez, Executive Director, Economic Development Corporation

Velo Paso Bicycle-Pedestrian Coalition
Scott White, Policy Director
Melissa Lugo, Equity Director
Catherine Cort, Secretary

Traffic Flow & Connectivity

Summarized below is the feedback received from stakeholders during listening sessions regarding traffic flow and roadway connectivity. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Jon Barela

- Northeast Parkway is key
- Tornillo is a weak connection, cold storage opportunities
- 7 Focus areas: Manufacturing, Business services, Defense & aviation, Biomedical, Transp/logistics, High tech, Tourism

CRRMA & Borderplex Alliance

- Robert E Lee connectivity
- Ports of entry (POE) are critical
- Santa Teresa rail bypass is good
- Imbalances: Roads vs Rail
- Ports including multimodal
- EP, LC, JZ multimodal

City of El Paso

- Ports of Entry congestion
- Need more rail access
- MCA campus is priority
- I-10 reconstruction

County of El Paso

- Need roadway connectivity in east El Paso
- Move freight hubs outside the city

Nicolás López Duarte

- Privately owned BRT (carries 50K per day)
- Planning additional BRT (carries 50K per day)
- Border Hwy - Mexico - Planning to complete a loop
- AUP - loop connectivity project (will be defining land use for economic development)
- Infrastructure is in place to support an additional cross-border connection at Yarbrough
- Santa Teresa rail bypass seen as a benefit
- New roads leading to Zaragoza POE

El Paso Chamber of Commerce - Mobility Coalition

- Three priorities for the coalition (Rebuild I-10, advance the MCA, build Northeast Pkwy)

Tom Fullerton

- Productivity/alternate routes needed
- Anthony bypass is valuable, acts like a loop
- Build the Northeast Parkway
- Need loops/redunancy/reliability

Tommy Gonzalez

- Complete frontage roads
- Supports NE Parkway (need outer loop)
- Downtown toll to build deck park
- Santa Teresa rail bypass
- Ports of Entry aesthetics to El Paso

Hunt Institute for Global Competitiveness

- Not enough highway capacity at ports
- Topographic and geographic challenges (mountain, border, rail)
- Idea: tunnel through the mountain

Medical Center of the Americas Foundation

- Cross-border movements that facilitate movement of bio- sensitive materials
- Completing connections to Juarez/Tornillo POE
- Signage to MCA campus can be improved
- Street grid connectors on MCA campus
- Improve the Raynolds bridge

New Mexico Border Authority

- Lack of connectivity - only one way in and out of Santa Teresa POE. Need new crossing, must be in MPO long-range plan, Border Master Plan
- Connecting NM 136 to Sunland Park and McNutt Road
- Connect McNutt Road (NM 273) to Highway 9
- Difference of opinion on annexing or not annexing Santa Teresa
- Need for international rail crossing in New Mexico; consider private funding
- Roadway connection between City of Anthony to Santa Teresa
- Need for new HAZMAT route

NMDOT

- NMDOT priorities: safety, congestion relief, move freight efficiently
- City of Sunland Park advocating for extension of NM 9 and NM 273

Evelina Ortega

- Reconstruct I-10
- Northeast Parkway
- Segment 3 of I-10 (Airport)
- Artcraft
- Improve ports of entry

Jerry Pacheco

- Improve Artcraft and I-10
- Moving wind blades
- Santa Teresa POE is at capacity and need expansion of commercial
- Extend St. Francis to NM 273
- On Mexico side, need Anapra bypass
- Improve Santa Teresa Airport Road
- Santa Teresa rail bypass (support from Ferromex)
- A rail spur to UPRR is preferred instead of full bypass

Javier Perea

- Congestion on Artcraft Road is a problem
- Problem: POE traffic goes to NM 178; but, does not stop at Sunland Park
- HAZMAT emergency response from Sunland Park to Santa Teresa needs to be faster
- We need the Borderland Expressway to NM 404
- Connectivity with NM 9 and McNutt would be good
- Improve border wait times

Joe Pickett

- New loop around El Paso, far east side connectivity & development
- Downtown congestion along I-10 is an issue for freight
- Priority projects:
    - Border West Expressway (non-tolled)
    - Northeast Parkway
    - I-10 reconstruction
    - Go-10 and BWE completion

State of Chihuahua

- Investment in the Avenida de las Torres to provide a connection with the roadway that runs along the river, with six bridge underpasses to provide a continuous flow and reduce travel time
- Tornillo provides a relief route for cargo going to El Paso
- Eighty-five percent of trucks come from Juarez, 10% from the rest of Chihuahua, and 5% from other states in Mexico
- Bypass for Guadalupe-Tornillo crossing
- Roadway loop concept - anillo vial periferico for connectivity and promotion of higher density land uses

Town of Horizon City

- New interchange needed near Tigua Road
- Darrington Road needs to be improved/widened, which would help Horizon's industrial park and truck routes
- Another interchange, near Lockheed's missile plant could be an option
- Need more north/south roads
- An outer loop from the Tornillo Port of Entry to Montana Avenue will be the next Planning and Environmental Linkages (PEL) initiative. This will alleviate congestion on I-10

Sun Metro

- Fix I-10 congestion, especially in downtown section
- Reverse HOV lanes needed on I-10 (HOV not needed in both directions)
- Dedicated lanes for buses on POE bridges could help
- RTS from the bullring in Juarez to Paisano in El Paso would face issues with Customs; no issues with Mexico
- Create a seamless transit system for the region
- Fast automated mass transit service needed between airport and downtown (Brio is one step)

Velo Paso Bicycle-Pedestrian Coalition

- City is car-centric; the bicycle/pedestrian infrastructure is lacking;
- Bike lanes to get in and out of UTEP campus needed
- Bike lanes need to be built for transportation, not just recreation
- Connections to intersections
- Safety should be a focus; need more crosswalks; include safe pedestrian routes in project design
- Bicycle and pedestrian access and safety at border crossings needs to be improved. Need bike lanes at ports of entry

Regional Growth & Economic Development

Jon Barela

- Need rail-served properties
- Workforce issues
- Brain drain is a myth
- Value-added food production
- El Paso vibe is happening, is good

CRRMA & Borderplex Alliance

- Need rail-served properties
- Trade is key
- Move rail out of downtown
- Bring companies and industry
- Quality of life

City of El Paso

- Port of entry (POE) wait times and inadequate staffing
- Trucks backing up on Paisano
- Need for rail-served properties to attract industry
- Need to attract more commercial to balance tax base
- MCA campus (dental school)
- Northeast and eastside rapid growth is due to readily available water/infrastructure
- We lost the garment industry
- Bring more business with higher salaries

County of El Paso

- El Paso is not growing, it's shifting
- Move freight hubs outside the city
- Harness potential as international destination
- County focus is on Fabens Airport, UTEP aerospace research in Fabens, and Tornillo POE

Nicolás López Duarte

- TTI freight study
- Lack of properties with rail spurs
- Identify value-added manufacturing
- Grow medical tourism
- Master plan encourages growth southeast with housing to support
- Unemployment is low

Tom Fullerton

- Improve standard of living
- Higher salaries
- Improve infrastructure
- We need toll roads
- Toll the Bridge of the Americas (for capacity & technology)
- Brain drain is myth
- Improve education
- Infrastructure maintenance and development

Tommy Gonzalez

- Frontage roads bring growth/development
- Accommodate freight
- Downtown deck park (quality of life projects)
- Cohen redevelopment
- MCA/TTUHSC

Hunt Institute for Global Competitiveness

- We need to build for the new economy (logistics and services)

Medical Center of the Americas Foundation

- Reframe partnerships with Fort Bliss
- Attract manufacturers and users of manufacturers
- Improve cross border connections
- Grow job opportunitis, not growth in numbers

New Mexico Border Authority

- International rail crossing supports industry growth and economic development

NMDOT

- NMDOT priorities: safety, congestion relief, move freight efficiently
- City of Sunland Park advocating for extension of NM 9 and NM 273

Evelina Ortega

- A (better jobs, better pay)
- Fort Bliss
- Border/International city
- Support infill, stop sprawl
- Emphasis on freight movement

Jerry Pacheco

- Grow logistics
- Grow value-added manufacturing
- NMBIA supports housing in San Jeronimo
- Have an oversize/overweight zone
- UP rail inland POE
- Need industrial developer to make Santa Teresa happen

Summarized below is the feedback received from stakeholders during listening sessions regarding regional growth and economic development. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Javier Perea

- Sunland Park goal is to improve quality of life
- Sunland Park goal is to create entertainment corridor around casino/riverwalk concept
- Sunland Park goal is to leverage St. Francis Road (NM 136 to McNutt) to alleviate Artcraft Road congestion
- Folks moving from El Paso, no net growth for the region
- Problem: Sunland Park is a bedroom community to El Paso. Revenue is lost due to no shopping or other commercial activities.
- Stop sprawl
- 3,000 new homes near Artcraft recently approved by City Council
- Growth should be achieved in a sustainable manner

Joe Pickett

- International Trade
- Fort Bliss
- Location of Butterfield Trail

State of Chihuahua

- Connect industrial parks: Bermudez, Independencia Blvd, and the zone around Electrolux
- For every three or four jobs in Juarez, one is created in El Paso
- Trade with Taiwan, China, and Korea has spurred development in San Jerónimo
- Intermodal yard located near Highway 45 at southern edge of the urban area is a project identified by IMIP
- We are not promoting basic manufacturing, but technology, design, and engineering
- Planned 2019-2020 - extension of Zaragoza Boulevard, leads to a high-density residential area and manufacturing/maquila area

State of Chihuahua

- Building boom due to investment by China
- Manufacturers have moved production to other places such as Laredo due to border crossing delays in El Paso
- The automotive cluster in Chihuahua has its sights set on the railway route to Silicon Valley
- There is interest in incentivizing the use of rail transport
- In March, $170 million dollars were directly lost by industry due to penalties for late shipments, extra time for workers and truckers

Sun Metro

- Stop sprawl; it's bad for mass transit
- Downtown will continue to grow, especially after arena is built
- International routes part of long-term vision
- International terminal part of medium-term vision
- New Sun Metro Union Station Depot
- Sun Metro needs to work with TxDOT on extending streetcar to MCA

Town of Horizon City

- Create more economic activity and increase its tax base
- Activate industrial parks into bigger industrial centers. Near I-10 and Eastlake there is development on the northeast side.
- Horizon City has met with UTEP and the Medical Center of the Americas (MCA) Foundation to talk about challenges, startups, and building up the industry
- More than 70% of residents have to leave town to go to work
- Horizon residents don't have a reason to go downtown, except for entertainment. From Horizon's standpoint, the McRae Boulevard and Lee Trevino Drive area is the new center now for El Paso County

Town of Horizon City

- More commercial developments in town. City is landlocked because of Ascencion Street and the 87-acre fractured land ownership
- Tornillo airstrip, Lockheed Missile, accelerator with UTEP for a TOD site, UTEP research at Fabens, and the Blue Origin in Van Horn

Velo Paso Bicycle-Pedestrian Coalition

- There is no bike plan for the region
- Small communities don't have the resources themselves, but if part of a larger regional plan, they can see change become a reality
- Start small. Start implementing change at the neighborhood level, transform it, measure change, go from there
- Create bike and pedestrian-friendly environment downtown - this will make the area economically vibrant, not more parking and strip malls

Policies

Summarized below is the feedback received from stakeholders during listening sessions regarding policies. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Jon Barela

- POE staffing not adequate
- Quality of life
- Regional coordination is tough
- Retain Fort Bliss retirees
- Infill/sprawl balance

CRRMA & Borderplex Alliance

- Need a port authority
- Emphasis on trade
- Wage increases preferred over growth
- Policies needed to control land use (parking, sprawl)
- Infill/Land Use: Incentivize renovation of inner city homes

City of El Paso

- Port of Entry (POE), CBP, Homeland Security coordination
- Balance the tax base: Tax base comes from residential and not from commercial/industrial
- Count of population
- Infill/sprawl policy needed
- Frustrated with MPO's Conformity issues

County of El Paso

- Need infill incentives
- Disincentivize sprawl
- Encourage subdivision development policies
- Move freight hubs outside the city
- Tax base needs fixing
- Incentivize Mexico to build out infrastructure
- Environmental process drags on

Nicolás López Duarte

- Fill instead of outward growth
- Fill defined by "loop"
- Priority POE Santa Teresa, Zaragoza, PDN
- Substantial # reside in Juarez and commute to work in El Paso
- Capture of data to understand impact on infrastructure

El Paso Chamber of Commerce - Mobility Coalition

- Need to agree on priorities

Tom Fullerton

- We need toll roads
- Toll the Bridge of the Americas (for capacity & technology)

Tommy Gonzalez

- Plan for eastside development
- Access = better tax base
- Wants infill - housing, industry
- "It's good enough for El Paso" attitude
- Quality of life projects are critical

Hunt Institute for Global Competitiveness

- Different policies divide us and prevent a scalable economy (prevents economy of scale)
- Quality of growth vs quantity (sprawl of infrastructure)
- Need interlocal/binational agreements for a level playing field
- International and NM traffic doesn't get counted
- Idea: use gas sales to capture international thru traffic numbers for funding formulas

Medical Center of the Americas Foundation

- Promote medical device industry
- Promote biomedical manufacturing industry
- Find opportunities between military and medical
- Harness the potential
- Make Cumberland residential area serviceable to MCA campus employees and students

NMDOT

- NMDOT priorities: safety, congestion relief, move freight efficiently
- City of Sunland Park advocating for extension of NM 9 and NM 273

Evelina Ortega

- Funding equity for El Paso
- Downtown parking

Jerry Pacheco

- Can CRRMA help incentivize Mexico to buildout infrastructure?

Javier Perea

- Sunland Park goal is to improve quality of life
- Sunland Park goal is to create entertainment corridor around casino/riverwalk concept
- Sunland Park goal is to leverage St. Francis Road (NM 136 to McNutt) to alleviate Artcraft Road congestion
- Folks moving from El Paso, no net growth for the region
- Problem: Sunland Park is a bedroom community to El Paso. Revenue is lost due to no shopping or other commercial activities.
- Stop sprawl
- 3,000 new homes near Artcraft recently approved by City Council
- Growth should be achieved in a sustainable manner

Joe Pickett

- Remove tolls
- Philosophy of tolling
- El Paso is developer friendly
- Transportation always reactive, need proactive
- Prop 7/additional funding

State of Chihuahua

- China trade tariffs have sparked new interest in bringing industry to Mexico
- There is a new state urban development law
- Border agents being reassigned from crossings to immigration issues/work has caused delays
- Time for implementation of projects must be reduced. There is no need to wait for the rail companies to give their approval
- Regional planning councils for better coordination between states and municipal governments

Sun Metro

- Sun Metro does not have a formal long range plan at this time
- TxDOT-owned ROW limits where shelters and benches can be built
- ADA-compliant bus stops are important - want to-achieve "accessibility plus"

Town of Horizon City

- An update to the comprehensive plan will reflect changing demographics, a younger population, higher educational attainment, and income
- The Metropolitan Transportation Plan's (MTP) financial constraints dampen the vision. It is very technical
- Strategic growth, no sprawl, TOD
- It makes more sense to have bus kiss and rides
- Senate Bill 1402 sets minimum standards for new development for properties 25 years old or older. It could be a possible solution for the county

Velo Paso Bicycle-Pedestrian Coalition

- Public engagement is important
- Policies need to be pushed for transit, pedestrian, and bikes
- City doing work on construction codes, this presents an opportunity for change to go back to traditional grid
- Bike lanes need to be built for transportation, not just recreation
- Look at "LOS for people" not just LOS for drivers/vehicles
- Indicate assumptions up front - X% for cars, X% for pedestrians, X% bike
- Need paradigm shift of people moving to bike/ped modes. Start with changing land use pattern and ensuring safety
- Bicycle/pedestrian projects help impact the economy, health, and air qualit in positive ways

Multimodal

Summarized below is the feedback received from stakeholders during listening sessions regarding multimodal. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Jon Barela

- Active transportation
- Investigate mass transit opportunities (light rail, rail faster than buses)
- Mixed use developments (single family units)

CRRMA & Borderplex Alliance

- Need rail access
- Employers to accommodate active transportation
- Provide paths/lanes
- Packaging of transit

County of El Paso

- Need a seamless mass transit system (TTI report)
- Encourage subdivision development policies
- Need bike lane networks; better connectivity
- Need to complete trails and sidewalks that lead to schools/parks

Nicolás López Duarte

- Bike share/bike plan (3 zones created for bikes)
- Transit corridor
- Repurposing unused tracks into cross border passenger rail

Tom Fullerton

- Need loops/redundancy/reliability
- Need boulevards to connect communities
- Improve mobile opportunities

Tommy Gonzalez

- Accommodate freight
- Need active transportation (hike/bike)

Medical Center of the Americas Foundation

- MCA campus is already well connectd to downtown

NMDOT

- NMDOT does not support a light rail (bad experience with Rail Runner)

Evelina Ortega

- Buses/light rail
- Integrated system
- Emphasis on freight movement

Jerry Pacheco

- Rail/trucks are important

Javier Perea

- Need to change people’s driving habits; walking and biking needs to be encouraged
- Walkability needs to improve in southern Sunland Park (downtown)

State of Chihuahua

- Rail not preferred due to scheduling and inflexibility but that could change with current delays at border crossing
- Upsurge in cargo plane use to avoid delays at border
- Focus on public transit. Public transit routes being restructured
- Existing rail crossing in downtown will help with future light rail connectivity. Macro plan being presented in phases
- The binational railway crossing in San Jeronimo-Santa Teresa should be developed, including a binational yard.
- Training program for drivers to ensure Mexican drivers are familiar with laws in Texas
- Avenida de las Torres multimodal corridor with HOVs bike infrastructure and bus

Sun Metro

- Ridership by people coming from Mexico is low
- Alameda ridership is high
- Ridership is good near Cielo Vista
- Expand Brio Rapid Transit System (RTS)
- RTS from the bullring in Juarez to Paisano in El Paso would face issues with Customs; no issues with Mexico
- Sun Metro would like to build a international, intermodal terminal
- Parking in downtown is a problem, and will get worse
- Fast automated mass transit service needed between airport and downtown
- ADA-compliant bus stops are important - want to achieve “accessibility plus”

Town of Horizon City

- Attract students from nearby communities to University of Texas at El Paso (UTEP). Need express route into UTEP in the morning, circulator in the middle of day, and return express route from UTEP in middle of the evening
- The four priority projects because they do not include consideration of multimodal, land use, bike/pedestrian, and technology
- 87 acres across from city hall for redevelopment, possibly transit-oriented development (TOD)
- Transit to make Horizon City a destination
- The city needs express routes to the east to the center and to the west

Velo Paso Bicycle-Pedestrian Coalition

- Better signage needed
- No connections from existing bike/ped
- Infrastructure to major roadways or between trails
- Bicycle and transit modes need to take ADA users into account

Technology

Summarized below is the feedback received from stakeholders during listening sessions regarding technology. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Jon Barela

- Connected vehicles
- Foundation for high tech workforce
- Better ITS

CRRMA & Borderplex Alliance

- Streamline security/inspections at port of entries (POEs)
- Electric car plugins

City of El Paso

- Maximize tech at POEs

County of El Paso

- Technology innovation needed at POEs
- Innovative travel: Autonomous vehicles and subterranean travel
- County focus is on Fabens Airport, UTEP aerospace research in Fabens, and Tornillo POE

Tom Fullerton

- Toll the Bridge of the Americas (for capacity & technology)

Tommy Gonzalez

- Maximize tech at POEs
- Rider 49 to put ITS on bridges

Medical Center of the Americas Foundation

- Improve cross border movements
- Low-tech border crossings is an issue
- Traffic lights timing

New Mexico Border Authority

- Technology improvements being implemented at POEs

Evelina Ortega

- Autonomous trucks
- Future look

Javier Perea

- Toll the Bridge of the Americas (for capacity & technology)

Joe Pickett

- Intelligent Transportation System (ITS)/Traffic signals

State of Chihuahua

- There has been rezoning to accommodate fiber. This will require investments in utilities
- Promotion of use of technology at border crossings
- Wind turbine blades are transported through the Santa Teresa crossing
- There is a focus on training centers and training for work in technology

Sun Metro

- Fast automated mass transit service needed between airport and downtown (Brio is one step)

Town of Horizon City

- Ridesharing app to help college students carpool
- Wi-Fi equipped shuttles
- Focus on jobs in automation and artificial intelligence

Funding

Summarized below is the feedback received from stakeholders during listening sessions regarding funding. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

City of El Paso

- POE lack of funding
- Rider 49 scratches the surface
- Maintenance is underfunded

County of El Paso

- Need more CMAQ funding
- Region does not get its fair share

El Paso Chamber of Commerce - Mobility Coalition

- Educate Austin
- Obtain Metro designation for El Paso
- Go after TxDOT Category 12 funding. El Paso is underfunded

Tom Fullerton

- We need toll roads
- Toll the Bridge of the Americas (for capacity & technology)

Tommy Gonzalez

- Downtown toll lane to support deck park

Hunt Institute for Global Competitiveness

- International and NM traffic doesn't get counted for formulas
- TxDOT formula doesn't make sense (funding disparity to this area)

Medical Center of the Americas Foundation

- Increase TxDOT funding

NMDOT

- NMDOT has severe funding limitiations

Evelina Ortega

- Determine priorities for funding
- El Paso Metro designation

Jerry Pacheco

- Can CRRMA help?
- NMDOT funding limitations
- Expand PPP and 559 program

Javier Perea

- New Mexico funding for roads is limited

Joe Pickett

- Concerned with lack of understanding of funding

Javier Perea

- NM funding for roads is limited

State of Chihuahua

- New highway from Samalayunca to Tornillo. Construction funds have been identified by the federal government and the state needs to acquire the property. The federal government has said that by 2022 it will invest $430 million.
- For the second Bus Rapid Transit corridor, 300-400 million pesos are waiting for approval to be invested in the corridor
- Municipalities and IMIP can subsidize or finance public works on a large scale, such as public corridors, with bicycle lanes or HOV lanes. In September, if the federal government approves, there will be resources

Town of Horizon City

- All funding sources are being considered, including Transportation Infrastructure Finance and Innovation Act (TIFIA) and Build America

Velo Paso Bicycle-Pedestrian Coalition

- Less than 1% of federal funds go to shared-use path and bike lane improvements

Leadership

Summarized below is the feedback received from stakeholders during listening sessions regarding leadership. Each listening session is identified in bold font and corresponds to the Stakeholder Key located at the start of Appendix C.

Jon Barela

- Regional coordination is tough

City of El Paso

- Fix Central Appraisal District
- Support the chamber's regional mobility coalition
- Promotion of our City
- Communities of excellence initiative

County of El Paso

- More visionary thinking is needed
- Harness potential as international destination
- MPO should be where leaders come together
- TxDOT and MPO do not collaborate because TxDOT is the major player
- More cross border collaboration needed

CRRMA & Borderplex Alliance

- Effective management of ports of entry

El Paso Chamber of Commerce - Mobility Coalition

- El Paso not engaged with Austin
- MPO to educate its board
- El Paso should speak with a single voice

Tom Fullerton

- There are fiefdoms (territorialities)

Tommy Gonzalez

- Lack of coordination (tension) between TxDOT and City
- MPO lacks vision & strategy
- MPO structure (too many politicians on the board)

Hunt Institute for Global Competitiveness

- Must overcome puzzle of jurisdiction
- Must educate others on our region's challenges
- Must promote El Paso (self promotion)
- Animosity between regional leaders inhibits growth

Medical Center of the Americas Foundation

- El Paso doesn't promote itself enough
- Reframe partnerships with Fort Bliss
- Brain drain is real

New Mexico Border Authority

- Territorial mentality; agency cooperation is fragmented; no communication between railroads

NMDOT

- TxDOT coordination with NMDOT District 1 and 2
- NMBIA holds cards close to the vest, NMDOT is kept out of the loop

Evelina Ortega

- Priorities for funding
- MPO needs leadership role
- Need a cooperative vision
- El Paso Metro designation

Jerry Pacheco

- NMDOT not helping
- Get 3 railroads to cooperate

Javier Perea

- Conformity issues are big for MPO and Sunland Park
- MPO is fragmented
- Texas and New Mexico don't mix
- Various boards don't do much
- Albuquerque and Santa Fe don't know Sunland Park

Joe Pickett

- Developers first, infrastructure follows
- Texas Transportation Commission - presenting as one voice
- Prioritize projects, needs
- MPO will not be leading soon

State of Chihuahua

- Local government officials should exert more pressure on the United States' administration to create favorable policies and remove damaging ones
- Need exemption to the presidential permit. This is already within the limits of the current permit for the crossing

Sun Metro

- Sun Metro needs to work on millennial strategy
- Create a seamless transit system for the region (coordination with NM)
- Sun Metro needs to work with TxDOT on extending streetcar
- Partnerships with UTEP, MCA, Fort Bliss, City of Socorro

Town of Horizon City

- The El Paso Mobility Coalition at the El Paso Chamber needs a comprehensive plan, not a push for just one downtown project
- Horizon City needs better collaboration with the City of Socorro to find a common ground

Velo Paso Bicycle-Pedestrian Coalition

- Need more involvement of bicycle and pedestrian group leaders to shape policy. Change needs to start at the grassroots level

APPENDIX D

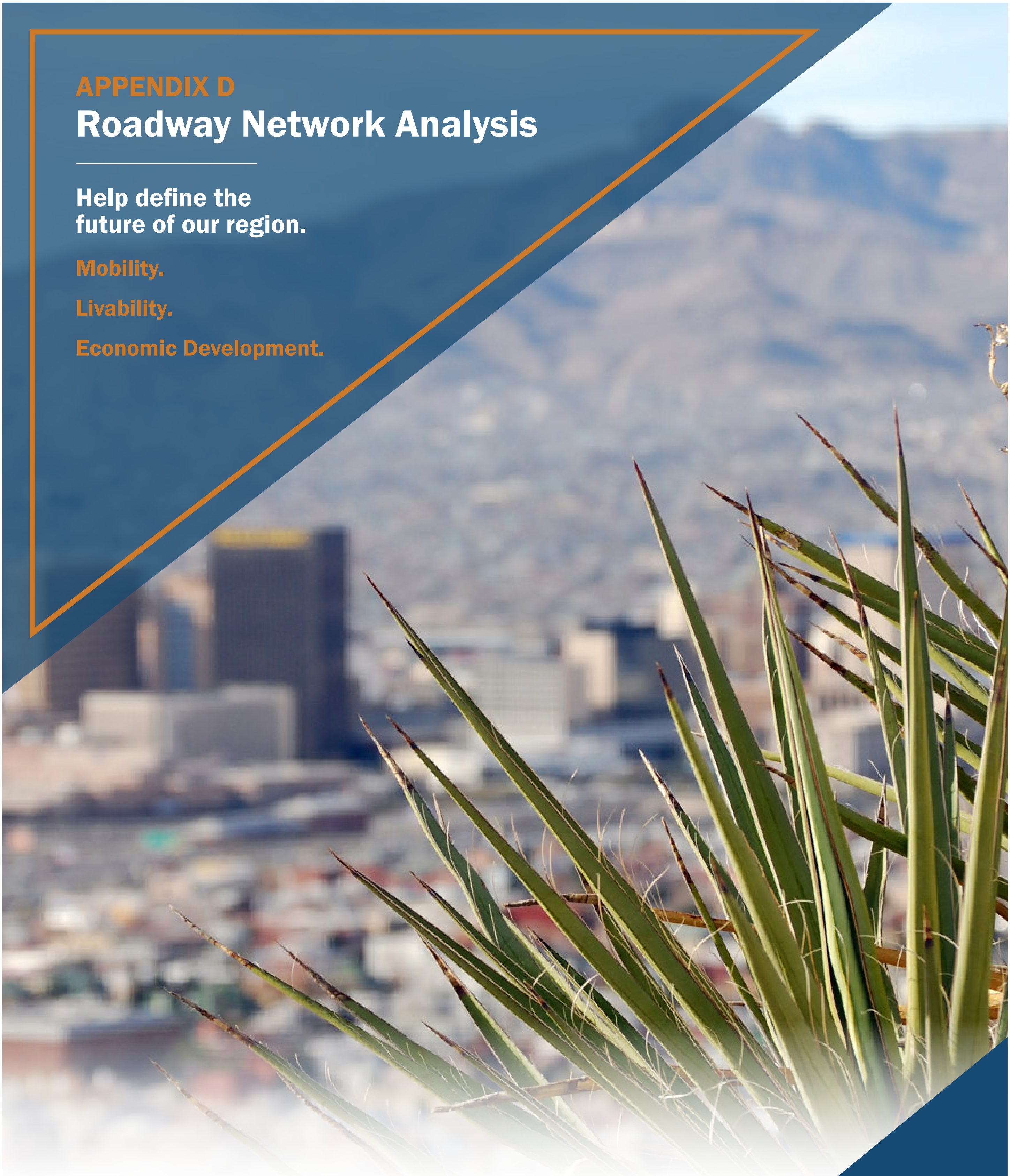
Roadway Network Analysis

Help define the future of our region.

Mobility.

Livability.

Economic Development.



El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS REGIONAL MOBILITY STRATEGY

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1.0 Roadway Network Analysis

1.1 Regional Mobility Background

The RMS study area encompasses the following areas:

1. El Paso, Texas
2. Southern Dona Ana County, New Mexico; and
3. Ciudad Juarez, Chihuahua (as it connects to the US)

According the latest Metropolitan Transportation Plan forecasts, the combined population of these three areas is expected to grow to over 1.4 million people, which is about a 50% increase between 2012 and 2045. Much of this projected population growth is expected to occur in east and northeast El Paso as well as areas such as Sunland Park and Santa Teresa in New Mexico just west of El Paso.

Located on the Rio Grande, El Paso is just across the border from Ciudad Juárez, Chihuahua, Mexico. The two cities, along with Las Cruces, which is in the neighboring state of New Mexico, form a binational metropolitan area, sometimes referred as El Paso–Juárez–Las Cruces, with a regional population of over 2.7 million people making it the largest bilingual-binational work force in the Western Hemisphere.

1.2 Roadway Network Congestion

Most recent estimates released by the US Census Bureau indicated that in 2015, over 17,000 of nearly 337,000 workers in El Paso commuted from outside city limits[1]. This coupled with the incoming traffic at the area POEs results in traffic congestion and strain on the transportation network, especially during peak periods. A look at volume-to-capacity (V/C) ratios from the regional Travel Demand Model (TDM) can provide insight to the relationship between vehicle travel demand and roadway capacity for the region[2]. The V/C ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). A V/C ratio less than 0.75 generally indicates that adequate capacity is available, and vehicles are not expected to experience extensive queues and delays. As the V/C ratio rises above 0.75, traffic flow becomes unstable, and traffic operations begin to break down. It is important to note that this analysis did not include roadways located on the Mexican side of the border.

2020 V/C ratios are shown below in **Table 1** and displayed graphically in **Figure 1 2020 Roadway Network Volume to Capacity.** A letter grade between A and F has been assigned to a range of V/C ratios. The letter grade represents the level of service (LOS) a driver would experience on the road. LOS A represents optimum mobility conditions, while LOS F represents a complete breakdown in traffic operations, e.g. stop and go conditions. Key takeaways from the 2020 V/C ratio analysis include:

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[1] Source: 2011-2015 ACS Commuting Flows
[2] Source: El Paso MPO 2045 Destino Regional Travel Demand Model

- 50% of the region's travel demand occurs on the principal arterial system
- 72% of the congested roadways include I-10 and principal arterials
- 48% of I-10 is at or above capacity
- 28% of the principal arterial network is at or above capacity

Table 1. Existing (2020) Roadways with Highest V/C

Street Name	Classification	From	To	Miles	Maximum V/C	TxDOT Efforts Underway?
Loop 375/Purple Heart Freeway	Expressway	US 54	US 62/180 (Montana Avenue)	10.6	2.32	Yes
US 62/180 (Montana Avenue)	Principal Arterial	I-10	East of FM 659 (Zaragoza Road)	3.5	2.24	Yes
Global Reach Drive	Principal Arterial	Spur 601/Liberty Expressway	US 62/ 180 (Montana Avenue)	3.0	1.75	n/a (off-system)
SH 20/Alameda Avenue	Principal Arterial	Loop 375/ Americas Avenue	Passmore Road	4.6	1.45	Yes
I-10 Segment 2	Freeway	Executive Center Blvd.	Loop 478/Copia Street	5.6	1.44	Yes
FM 258/Socorro Road	Principal Arterial	Loop 375/ Americas Avenue	FM 1110	5	1.44	Yes
FM 3255/MLK Boulevard	Principal Arterial	Jon Cunningham Boulevard	US 54	.52	1.36	Yes
I-10 Segment 1	Freeway	NM/TX State Line	Executive Center Boulevard	16.8	1.30	Yes

All segments listed above are currently in either TxDOT's planning phase, project development phase, or scheduled for construction with exception of Global Reach Drive. Loop 375/Purple Heart Freeway from Spur 601 to US 62/180 (Montana Avenue) is scheduled to be widened within the next four years. Loop 375/Purple Heart Freeway from Spur 601/Liberty Expressway to Dyer Street is slated to be widened within the next five to 10 years. US 62/180 (Montana Avenue) Phase 1 from Global Reach Drive to FM 659 (Zaragoza Road) is scheduled for construction to add capacity to include frontage roads and grade separations. SH 20/Alameda Avenue from Loop 375/Purple Heart Freeway to Passmore Road is contained in the recently completed SH 20/Alameda Avenue Corridor Study, which provides a comprehensive plan with short, mid and long-term recommendations.

I-10 is currently undergoing a comprehensive study, Reimagine I-10, to assess the needs and requirements for the region's busiest urban freeway. Several major alternatives to increase capacity and increase trip reliability are being considered. Four study segments have been identified:

Segment 1: NM/TX state line to Executive Center Boulevard
Segment 2: Executive Center Boulevard to Reynolds Street
Segment 3: Reynolds Street to Zaragoza Road
Segment 4: Zaragoza Road to FM 3380

FM 258/Socorro Road from Loop 375/Americas Avenue to FM 1110 was studied under the Border Highway East Planning and Environmental Linkages (PEL) study. This study examined multiple alternatives, all of which would alleviate congestion along FM 258/Socorro. Operational improvements on FM 258/Socorro and the proposed Border Highway East freeway facility will bring relief to FM 258/Socorro. A small section of FM 3255/MLK Boulevard from Jon Cunningham Boulevard to US 54 is also experiencing congestion. Operational, safety improvements, and roadway restoration are planned within the next four years.

A V/C analysis was also conducted the forecast year of 2045 (Figure 2). The 2045 analysis includes all fiscally constrained improvements in the long-range plan. Key takeaways from the 2045 V/C ratio analysis include:

- 30% increase in regional travel demand
- 51% of the regions demand occurs on the principal arterial system
- 68% of the congested roadways include I-10 and principal arterials
- 51% of I-10 is at or above capacity
- 42% of the principal arterial network is at or above capacity
- 51% increase in congestion on the regions principal arterial system
- 35% increase in vehicle hours traveled (VHT)

Figure 1. 2020 Roadway Network Volume to Capacity

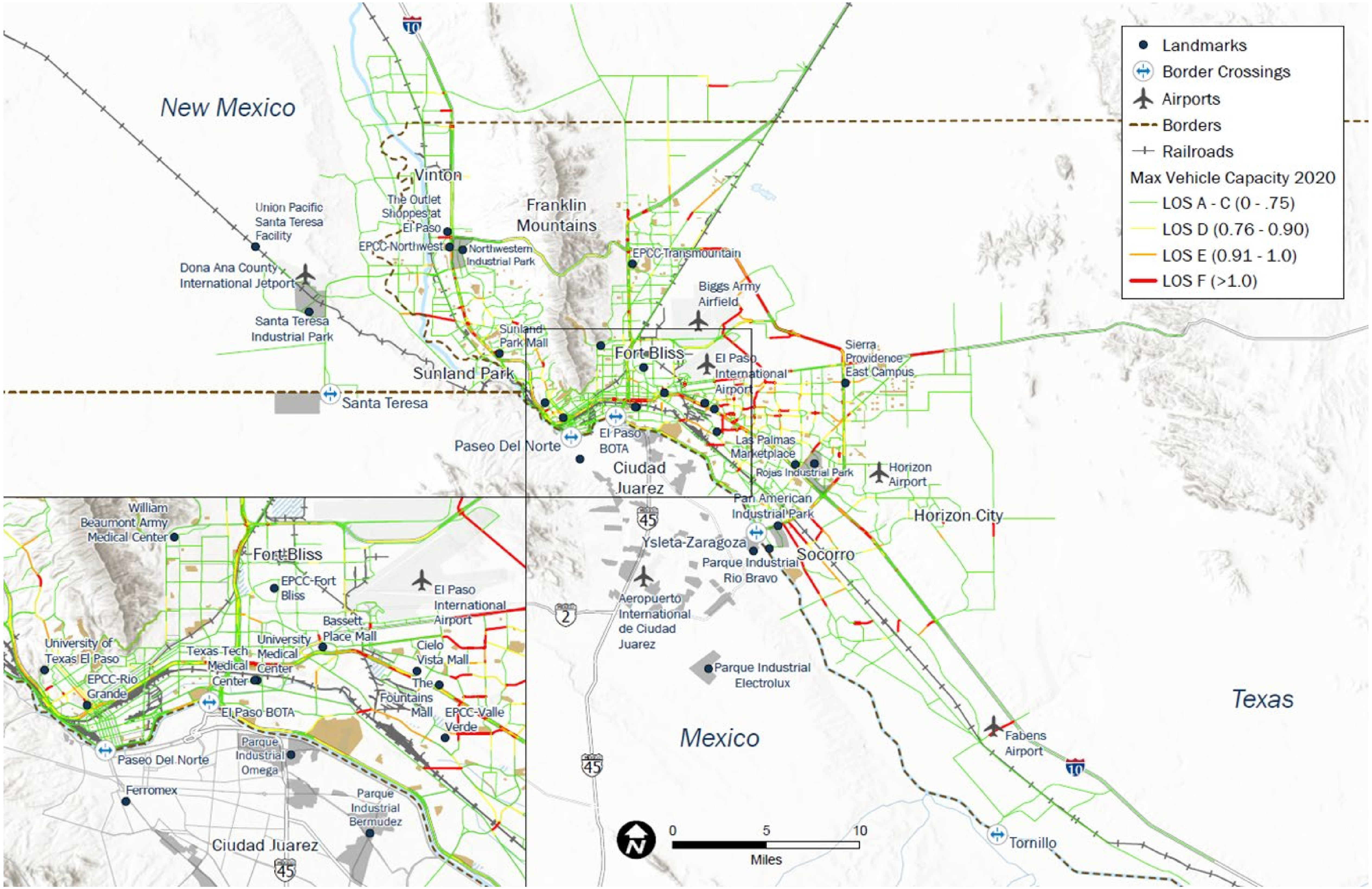
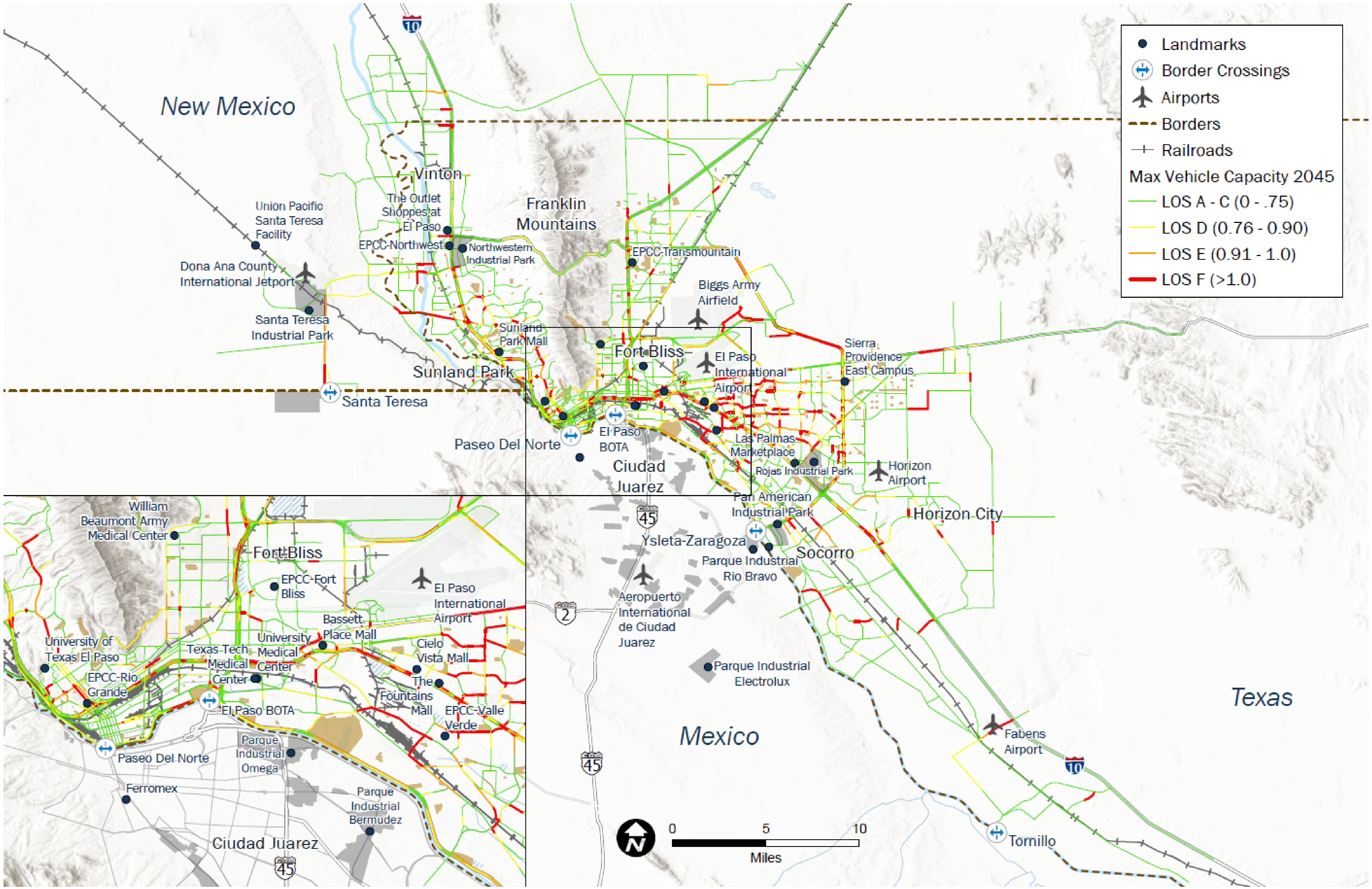


Figure 2. 2045 Roadway Network Volume to Capacity



As expected, highways and principal arterials will continue to handle the bulk of the demand. The principal arterial system is expected to see a 50 percent increase in demand by 2045. While the region's principal arterial network currently averages one lane in each direction, a robust principal arterial network should provide a minimum of two lanes in each direction. Controlled access facilities, including regional expressways, should also be a feature of a principal arterial system to move high volumes of traffic between major origins and destinations within the region.

1.3 Air Quality Conformity and Congestion Management

Nonconformity related to traffic congestion has led to delayed projects, unrealized projects, and loss of transportation funding. During the RMS efforts, the MPO advanced its congestion management plan (CMP) which identifies key congested corridors and recommended strategies to address congestion. The RMS findings on congested roadways were shared with the CMP ad-hoc committee. Several of the congested corridors identified by the RMS efforts, shown in Table 1 above, correspond to those corridors identified in the CMP. Both RMS and CMP agree that the principal arterial system is experiencing heavy congestion, with arterials making up approximately 65 percent of the congested facilities. Roadway network congestion is increasing, and the region will need to take action to meets its goals. A complete list of the CMP congested roadway segments is shown in Table 2.

For measure, the RMS team reviewed Texas' Top 100 Most Congested Roadways. Included in the list are the following regional roadways as of 2018:

- Rank 69: I-10 from Mesa Street/SH 20 (Downtown) to Patriot Freeway/US 54 (Segments 1 and 2 of Reimagine I-10)
- Rank 71: North Mesa Street/SH 20 from Executive Center Blvd. to Texas Avenue (Downtown)
- Rank 84: I-10 from North Mesa Street/SH 20 to West Paisano Drive/US 85 (Segment 1 of Reimagine I-10)
- Rank 99: North Mesa Street/SH 20 from I-10 to Executive Center Boulevard.

These roadway segments were also identified by RMS and CMP efforts.

Table 2. Congestion Management Plan Segments

CMP Segment ID	Road Name	From	To
Arterials			
A1	N Mesa St / SH 20	Executive Center Blvd	Texas Ave
A2	N Mesa St / SH 20	IH 10 / US 180 / US 85	Executive Center Blvd
A3	N Zaragoza Rd / FM 659	Gateway Blvd / IH 10	Joe Battle Blvd / TX 375 Loop
A4	Lee Trevino	Montana Ave / US 180 / US 62	Gateway Blvd / IH 10
A5	Montwood Dr	Lee Trevino Dr	N Zaragoza Rd
A6	N Yarbrough Dr	Montana Ave / US 180 / US 62	Gateway Blvd / IH 10
A7	Doniphan / SH 20	Talbot Ave / SL 375	Canam Hwy / IH 10/ US 180
A8	N Loop Dr / FM 76	N Americas Ave / SL 375	Horizon Blvd / FM 1281
A9	Montana Ave / US 180 / US 62	Gateway Blvd / IH 10	Global Reach Dr
A10	N Loop Dr / FM 76	North Carolina Dr	N Americas Ave / SL 375
A11	Global Reach Dr	Liberty Expy/ Spur 601	Montana Ave / US 180 / US 62
A12	Alameda Ave/ SH 20	Americas Ave/Loop 375	Passmore Rd
A13	Montwood Dr	Viscount Blvd	Lee Treviño
A14	Delta/North Loop	Alameda Ave	Hunter Dr
A15	Socorro Rd/258	Americas Ave/Loop 375	Passmore Rd
Highways			
H1	Mainlanes - IH 10	N Mesa St / SH 20	Patriot Fwy / US 54
H2	Mainlanes - IH 10	Patriot Fwy / US 54	Hawkins Blvd
H3	Mainlanes - IH 10	W Paisano Dr / US 85	N Mesa St / SH 20
H4	Mainlanes - IH 10	Hawkins Blvd	Lee Trevino Dr
H5	Mainlanes - Joe Battle Blvd / Loop 375	IH-10	Pellicano Dr
H6	Mainlanes - IH 10	Mesa Ave	Redd Rd
H7	Mainlanes - IH 10	Eastlake Dr	Horizon Blvd / FM 1281
H8	Mainlanes - Patriot Freeway	Ellenthorpe Ave	Pershing

1.4 Vehicle Miles Traveled (VMT)

To illustrate the growing demand in the region and to identify which facilities will handle this demand, a review of network lane miles and current and projected vehicle miles traveled (VMT) by roadway type was completed. It is widely accepted that a desirable regional transportation network has an average of 4 lane miles for every centerline mile. The RMS focus area has on average 2 lane miles for every centerline mile, indicating that there is an overrepresentation of 2-lane roadways in the region and that most facilities in the region may be under-sized to handle traffic demand.

To further this point, a look at VMT in the RMS area shows that travel is expected to increase by approximately 30 percent from 2020 to 2045. Freeways, expressways and principal arterials will continue to handle the bulk of the demand; however, there is a notable increase in the amount that will be carried by collector roads (**Tables 3 and 4**). Similarly, the number of vehicle hours traveled (VHT) which represents the time that travelers spend in route, is forecasted to increase by 35 percent from 2020 to 2045[3].

Table 3. Traffic Demand Model Network VMT Ranges by Roadway Type (2020)

	CBD	Fringe	Urban	Suburban	Rural	**Total**
Freeways	109,690	2,540,850	777,997	647,943	1,081,089	**5,157,569**
Expressways	15,771	1,029,913	2,157,017	698,362	315,573	**4,216,636**
Principal Arterials	65,097	1,847,101	2,069,636	934,235	700,936	**5,617,005**
Minor Arterials	39,377	897,060	1,031,281	215,704	237,469	**2,420,891**
Collectors and Frontage Roads	3,306	544,265	480,802	218,837	241,067	**1,488,277**
Local Streets	0	33,924	37,823	13,963	24,728	**110,438**
Ramps	30,474	404,372	209,602	48,435	12,565	**705,449**
Total	**263,715**	**7,297,485**	**6,764,158**	**2,777,478**	**2,613,429**	**19,716,266**

Table 4. Traffic Demand Model Network VMT Ranges by Roadway Type (2045)

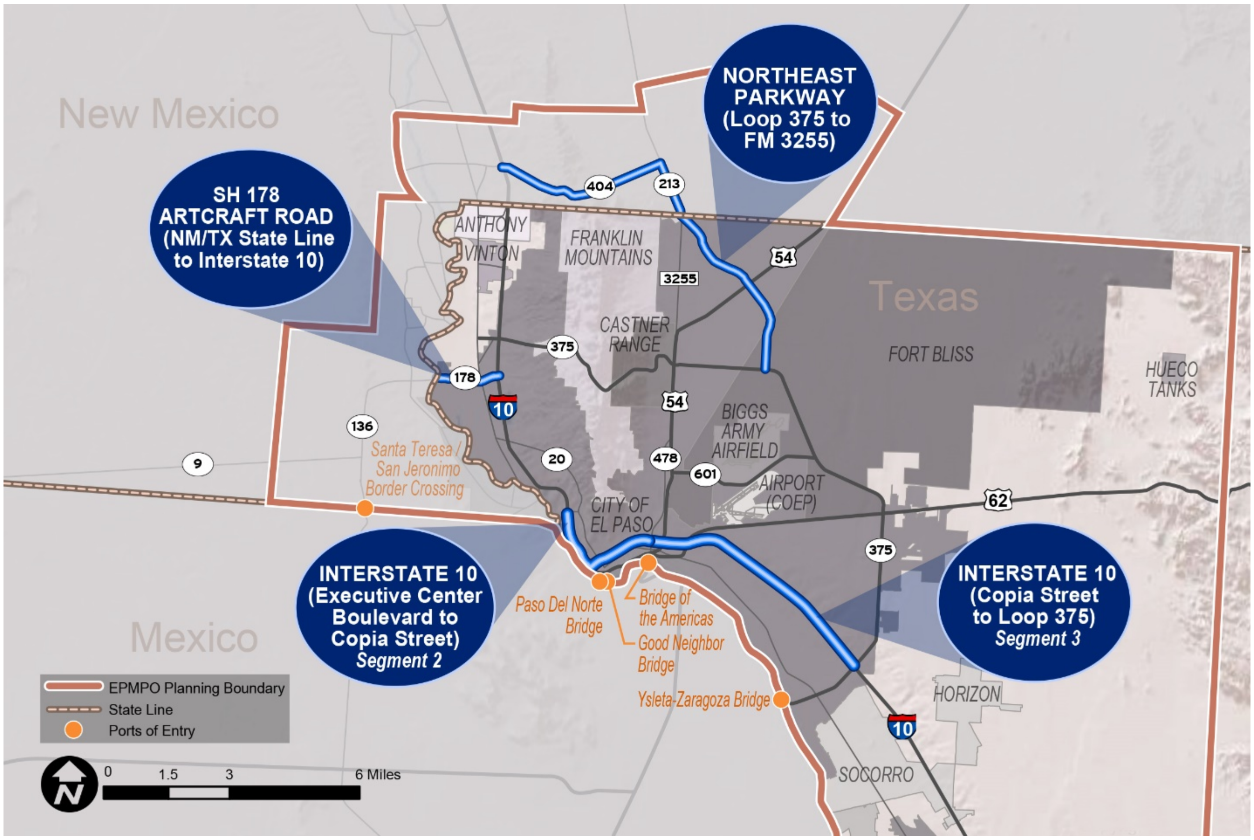
	CBD	Fringe	Urban	Suburban	Rural	**Total**
Freeways	136,675	3,114,309	1,350,339	693,394	1,033,041	**6,327,757**
Expressways	20,551	2,237,383	2,345,979	1,064,845	851,336	**6,520,093**
Principal Arterials	87,132	3,055,504	1,827,971	827,045	663,680	**6,461,332**
Minor Arterials	54,128	1,765,788	895,026	238,400	301,940	**3,255,282**
Collectors and Frontage Roads	3,703	928,807	585,320	258,287	314,053	**2,090,172**
Local Streets	0	60,370	42,179	2,929	35,006	**140,485**
Ramps	30,492	657,740	196,316	38,861	7,540	**930,950**
Total	**332,682**	**11,819,901**	**7,243,130**	**3,123,761**	**3,206,596**	**25,726,070**

[3] Source: Destino.

2.0 Identifying Significant Corridors

Using information from the regional travel demand model, the RMS team evaluated projects significant to the region that appeared to have broad community support to better understand the specific challenges and opportunities for each one. The team conducted analysis for significant corridors in the region. **Figure 3** is a project location map that identifies where each project is located within the region. A brief description for each project and estimated project schedule (**Figure 4**) is also provided below.

Figure 3. Major Transportation Corridors



2.1 Major Transportation Corridors

- **Northeast Parkway Project Profile**

The Northeast Parkway addresses regional system linkages as well as capacity. The circumferential route around northern El Paso performs would function as an alternate route to I-10, particularly during planned re-construction of each of the I-10 Segment projects. See **Appendix D-1** for additional project detail.

- **SH 178 (Artcraft Road) NM/TX State Line to Interstate 10 Project Profile**

The SH 178 (Artcraft Road) project between the New Mexico State Line and I-10 will address high volumes of traffic along the corridor and better serve intermodal communities including the UPRR intermodal yard and the Santa Teresa Port of Entry. See **Appendix D-1** for additional project detail.

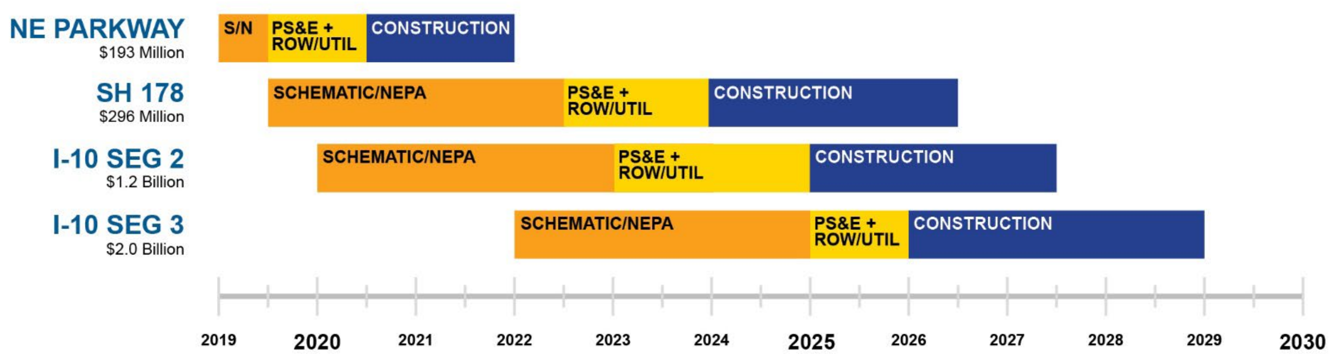
- **I-10 Executive Center Blvd to US-54 (Segment 2) Project Profile**

The I-10 Executive Center Blvd to US-54 project will address pavement and bridge maintenance issues along this corridor necessary to maintain a facility over 50 years of age. See **Appendix D-1** for additional project detail.

- **I-10 - US-54 to State Loop 375 (Segment 3) Project Profile**

The I-10 – US-54 to State Loop 375 project will reconstruct mainlanes, retaining walks, bridges, ramps and cross streets to address the maintenance needs of an aging facility with high traffic volumes. See **Appendix D-1** for additional project detail.

Figure 4. Project Schedules



2.2 Minor Transportation Corridors

A high-level preliminary conceptual review was also conducted for the projects outlined below. Additional detailed review would likely need to more adequately evaluate the feasibility of specific alignments before advancing these projects.

Artcraft (SH 178) and I-10 Frontage Roads Intersections Project Profile

The Artcraft Drive (SH 178) project will address short term intersection turning radii issues and long term needs for direct connectors that will both continue to facilitate transport of oversized loads (i.e. blades for wind farms) traveling from Mexico to States of Texas and New Mexico. Many oversized loads traveling on this roadway are delivering renewable energy sector materials. See **Appendix D-1** for additional project detail.

Mesa Park Drive

The feasibility analysis to extend Mesa Park Drive, from the I-10/Mesa Park interchange (under construction) to US-85 (Paisano Drive), a distance of approximately 0.85 miles, was performed in support of TxDOT's interest in providing connectivity between I-10 and parallel routes to improve mobility options to the west side of El Paso. See **Appendix D-1** for additional project detail.

APPENDIX E

Cross Border Analysis

Help define the
future of our region.

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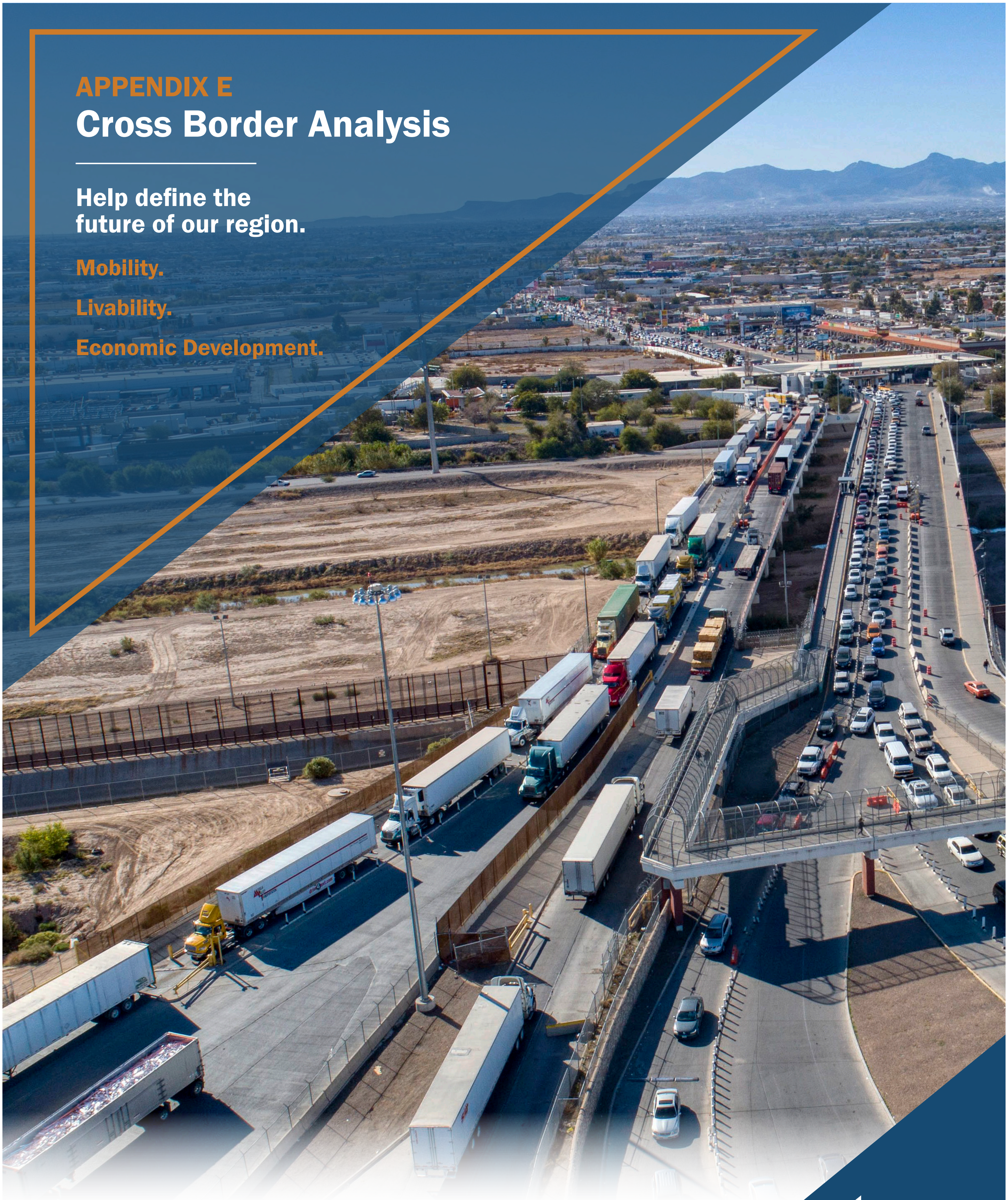

El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

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Appendices

1.0 Analysis Background

1.1 Regional Mobility Study Background

The Regional Mobility Strategy (RMS) will evaluate regional mobility challenges and opportunities in the El Paso region and surrounding areas. The RMS study area encompasses the following areas:

1) El Paso, Texas;
2) Southern Dona Ana County, New Mexico; and
3) Ciudad Juárez, Chihuahua (as it connects to the US).

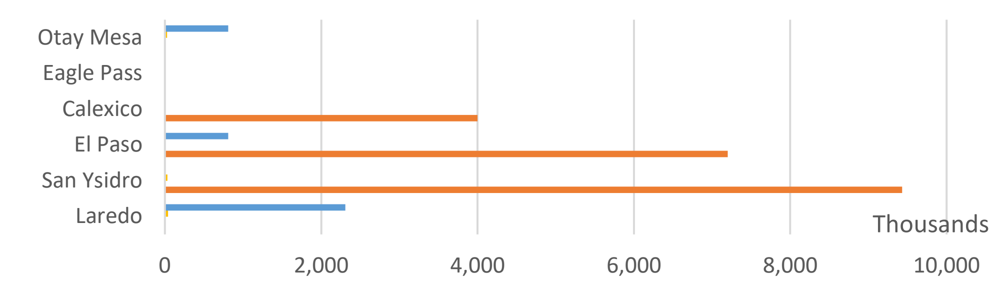
According the latest Metropolitan Transportation Plan forecasts, the regional population of El Paso is expected to grow to over 1.4 million people, which is roughly a 50% increase between 2012 and 2045. Much of this projected population growth is expected to occur in east and northeast El Paso, as well as Sunland Park and Santa Teresa in New Mexico just west of El Paso. Located on the Rio Grande, El Paso is just across the border from Ciudad Juárez, Chihuahua, Mexico. The two cities, along with Las Cruces, New Mexico, form a binational metropolitan area, sometimes referred to as El Paso–Juárez–Las Cruces, with a regional population of over 2.7 million people.

1.2 Cross-Border Analysis

The RMS focus area is positioned such that activity at the ports of entry (POE) plays a significant role in the overall economy and quality of life experienced by area residents. In addition to providing access for the residents that live in the region, transportation corridors that support area ports of entry are also critical to sustaining the movement of people and freight across the border. As shown in the figure below, the El Paso POE is among the busiest inland ports in the US and contributes significantly to the local, regional and national economies. In 2018 alone the POE contributed over $81 billion to the economy, which is a good indicator that US residents across the country benefit from this intense cross-border trade with Mexico and numerous other countries that ship their products through these POEs[1].

[1] USTradeNumbers-World City, Inc. (2019). El Paso Border Crossing, Texas. Retrieved from https://www.ustradenumbers.com/port/el-paso-border-crossing-texas

Figure 1: Busiest Ports by Mode (2019)



	Laredo	San Ysidro	El Paso	Calexico	Eagle Pass	Otay Mesa
Trucks	2,310,000		810,935			810,935
Buses	38996	32058				28533
Trains	4251		1379		3452	
Pedestrians		9,430,000	7,200,000	4,000,000		

Trucks Buses Trains Pedestrians

Source: Bureau of Transportation Statistics, US Department of Transportation, 2018

Maintaining a safe and consistent flow of traffic along the US southern border will ensure the benefits of trade of continue to be realized. Delay and congestion can decrease the performance of the roadway system in terms of:

1. Reliability of manufacturing and delivery cycles of goods and common resources;
2. Predictability of bridge users' travel time and routes to education, employment, recreation and healthcare;
3. Overall safety and frequency of crashes; and
4. Rates of emissions or other environmental impacts.

For this reason, the RMS team conducted an assessment of cross-border traffic patterns. The team focus the assessment on the area encompassed by the El Paso, Santa Teresa, and Tornillo-Fabens ports of entry, which consisted of a total of five international bridges, as well as a land crossing as illustrated in **Figure 2**.[2,3] The primary tasks were to gather historical and current crossing data to identify border crossing trends and to review data from available public sources to determine existing origin-destination (O-D) patterns and traffic generators

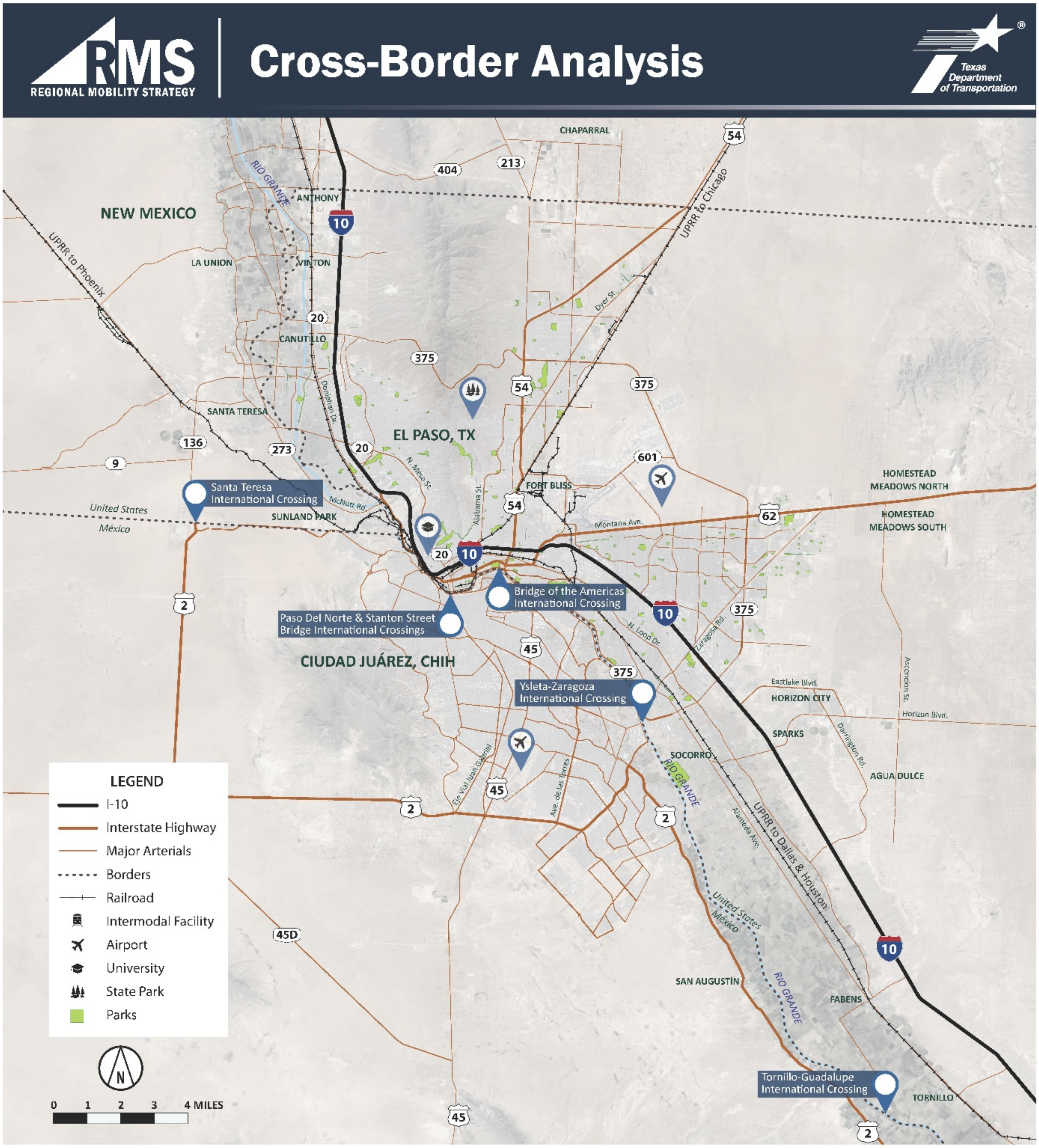
[2] US Customs and Border Protection (CBP) and the Bureau of Transportation Statistics (BTS) only report information at the POE level instead of at the crossing level.

[3] A POE is defined as a group of border crossings where a customs district operates . Crossing level information provides information on each individual bridge crossing. For example, the El Paso POE includes the Bridge of the Americas, the Ysleta-Zaragoza, and the Paso del Norte-Stanton border crossings.

on both sides of the border. For purposes of this assessment, cross-border transportation data were defined as data related to the movement of people and goods across the US-Mexico border by privately owned vehicles, commercial vehicles, and rail[4]. This is further discussed in **Section 4.0** of this report.

[4] Cambridge Systematics (2019, January). Comprehensive Assessment of Current Cross-Border Data Sharing, Data Collection Practices, Data Gaps, and Data Needs. Page 1-0

Figure 2: Border Crossing within the RMS



2.0 Cross Border Origins and Destinations

To better understand origins and destinations of cross border travel, the RMS team participated in a series of Bridges Steering Committee meetings organized by the City of El Paso International Bridges Department in 2019. This effort was to engage with local stakeholders to identify common origins and destinations across the border, regularly used highways and streets, as well as most frequently used border crossings. Using available data and local knowledge, the group identified and mapped common origins and destinations in the region and identified key corridors along the US-Mexico border that provide access to area POEs.

Starting with the El Paso and Juárez roadway networks overlain with industrial parks and major activity centers as a base, the group attempted to fill the gaps in data typically found in traditional origin-destination data sources by answering the questions below:

- What are the most common origins, both local and national?
- What are the most common destinations, both local and national?
- What are the most common routes and border crossings?
- What percentage of cross border traffic is local drayage?
- What percentage of cross border traffic is national freight?

While the exercise was not intended to be quantitative, it did provide key insights into cross-border movements that may be useful information in future planning efforts. The group undertook an exercise to map origins and destinations on both sides of the border (**Figure 3**). Most of the discussion focused around northbound/inbound trips to the US. Key origins identified for freight entering the US were Aeropuerto Internacional de Ciudad Juárez, Parque Industrial Bermudez and Parque Industrial Juárez. Key destinations for freight entering the US were Airport Industrial Park, Pan American Industrial Park, Rojas Industrial Park, Santa Teresa Industrial Park and Northwestern Industrial Park. While key origins for personal vehicles were not identified by the group, stakeholders were able to pinpoint several key destinations for these trips, including:

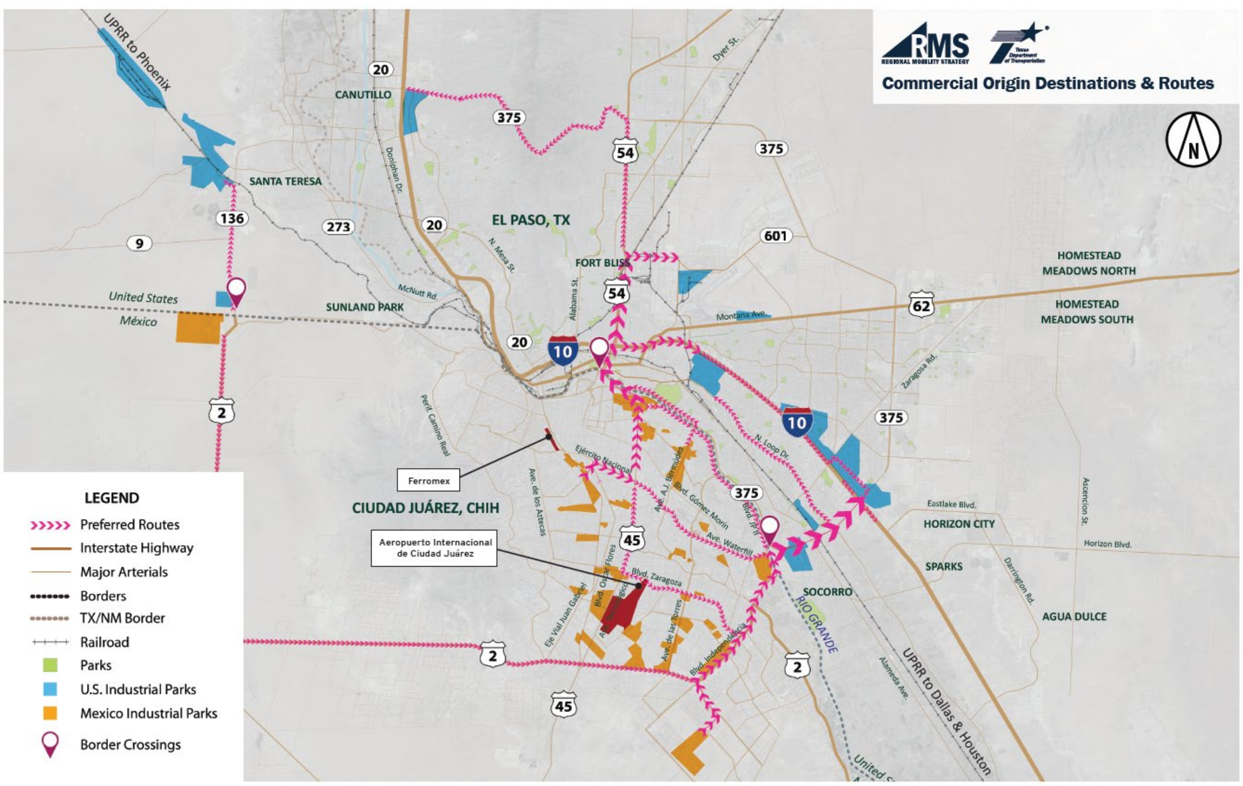
- The Outlet Shoppes at El Paso
- Cielo Vista/Fountains Mall
- The El Paso Airport
- UTEP
- Bassett Place; and
- Las Palmas Marketplace

In addition to identifying key origins and destinations, the group was also able to isolate preferences with regard to travel routes. The group identified the BOTA and Zaragoza ports of entry as the most commonly used border crossings, which was expected due to their central locations and proximity to freeway connections. The group noted that BOTA is the only free option and that Ysleta-Zaragoza is the only POE that allows transport of hazardous materials, which makes them even more desirable for freight transport. As for transportation corridors within the US, the most commonly selected routes to industrial parks were I-10, US 54, and Loop 375. In Mexico, top routes identified for cross-border trips were Avenue Tecnologico, Boulevard Juan Pablo II, Avenue Bermudez and Avenue Independencia.

While the group was unable to provide specific feedback as to the movement of freight within the US, some insight was gleaned from two of the major operators in the area. The operators explained that while all loads are destined for transfers in El Paso, the majority of freight goes on to destinations in the US including major transportation hubs in Memphis, Los Angeles, Chicago, and Miami. This system of transfers is necessary since current federal regulations do not permit Mexican truckers to transport loads directly from Mexico to points outside the 15-mile commercial zone beyond El Paso's corporate limits[5]. Instead the loads are brought to the US by drayage companies, and then loads are then transferred to US "over the road" or long-haul companies.

More detailed information can be found in **Appendix A-1.**

Figure 3. Commercial Origin and Designations



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5 El Paso's commercial zone defined at: https://www.govinfo.gov/content/pkg/CFR-2018-title49-vol5/xml/CFR-2018-title49-vol5-sec372-247.xml

3.0 Historical Cross-Border Data and Trends

During the RMS team's review of available cross-border data, the TxDOT's Transportation Planning and Programming Division (TPP) initiated the Texas-Mexico Border Transportation Master Plan (BTMP), a statewide project with several goals and data needs that overlap with those of the RMS effort. Both RMS and BTMP recognized the limited availability of primary data sources. It was determined that data collection from sources, including INRIX, TranSearch, American Transportation Institute (ATRI) and National Performance Management Research Data Set (NPMRDS) would not be collected for the RMS study, since it is likely that such data would be sourced in the future as the BTMP recommendations are carried out.

In the absence of such data, the RMS team used crossing data gathered from desktop level research to perform this analysis. The scope of data included total crossings of buses, pedestrians, privately owned vehicles, trains and commercial vehicles for the years of 1996, 2000, 2005, 2010, and 2018. Due to the unavailability or incompleteness of data at the local level, data for this analysis was primarily collected from the US Department of Transportation Bureau of Transportation Statistics, which refines data from US CBP, among others.

The analysis conducted by the RMS team provides a 20-year history of vehicle and pedestrian travel in the El Paso region since the North American Free Trade Agreement (NAFTA) went into effect on January 1, 1994. More detailed information for each POE can be found in **Appendix A-2.** The year 1996 is the earliest year with complete data available for each mode of transportation. As shown in **Table 1**, the El Paso POE constitutes the largest portion of the inbound border traffic in the region. To gain a better understanding of travel at each of the El Paso POE bridges, a review of data from BTS was completed. This data revealed that nearly 13 million inbound trips into the U.S. were taken across these three bridges in 2018.

Table 1. Total Vehicle & Pedestrians Crossings

Year	POE	Total Vehicle & Pedestrian Inbound Crossings (All Modes)
2018	El Paso (includes BOTA and City Bridges)	13,211,694
	Tornillo-Guadalupe	375,638
	Santa Teresa	644,114
2015	El Paso (includes BOTA and City Bridges)	13,027,161
	Tornillo-Guadalupe	270,156
	Santa Teresa	629,844
2010	El Paso (includes BOTA and City Bridges)	10,702,220
	Tornillo-Guadalupe	359,794
	Santa Teresa	558,289
2005	El Paso (includes BOTA and City Bridges)	16,730,004
	Tornillo-Guadalupe	625,409
	Santa Teresa	291,546
2000	El Paso (includes BOTA and City Bridges)	17,426,917
	Tornillo-Guadalupe	705,837
	Santa Teresa	115,284
1996	El Paso (includes BOTA and City Bridges)	15,657,765
	Tornillo-Guadalupe	627,617
	Santa Teresa	99,374

Source: BTS, 2019

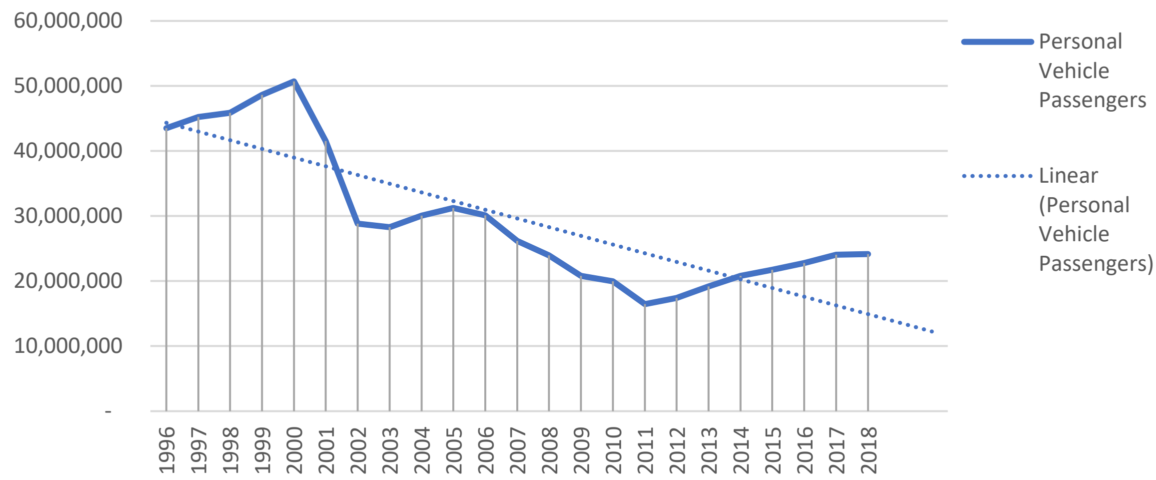
3.1 Passenger Vehicles and Pedestrian Volumes

Passenger vehicles and pedestrian crossings consistently make up the highest proportion of all border crossings. Since the 1970s workers have been attracted to manufacturing jobs in the area and it is not uncommon for workers to live on one side of the US/Mexican border and work on the other side. Additionally, Mexican nationals travel northbound to shop at retail businesses each year and spend an estimated $2 billion purchasing commodities in the greater El Paso region.[6] While detailed origin-destination data was not collected for this effort, it can also be reasonably assumed that other purposes for these trips are to access jobs, education, recreation, and healthcare.

Based on BTS data, combined inbound passenger vehicle traffic counts for the El Paso POEs ranged from approximately 16.5 million to 50.7 million during the 20-year period between 1996 to 2018. A closer look at **Figure 4** reveals that inbound passenger vehicle trips sharply declined from 2000 to 2003 and continued to steadily decrease until 2011. In 2012, inbound trips then began to steadily increase from approximately 17.4 million passenger vehicles to 24.1 million.

[6] State of Texas Comptroller. Port of Entry: El Paso, Economic Impact 20105. https://comptroller.texas.gov/economy/economic-data/ports/el-paso.php. Last Accessed on 5/28/2019.

Figure 4: Historic Annual Inbound Passenger Vehicle Counts



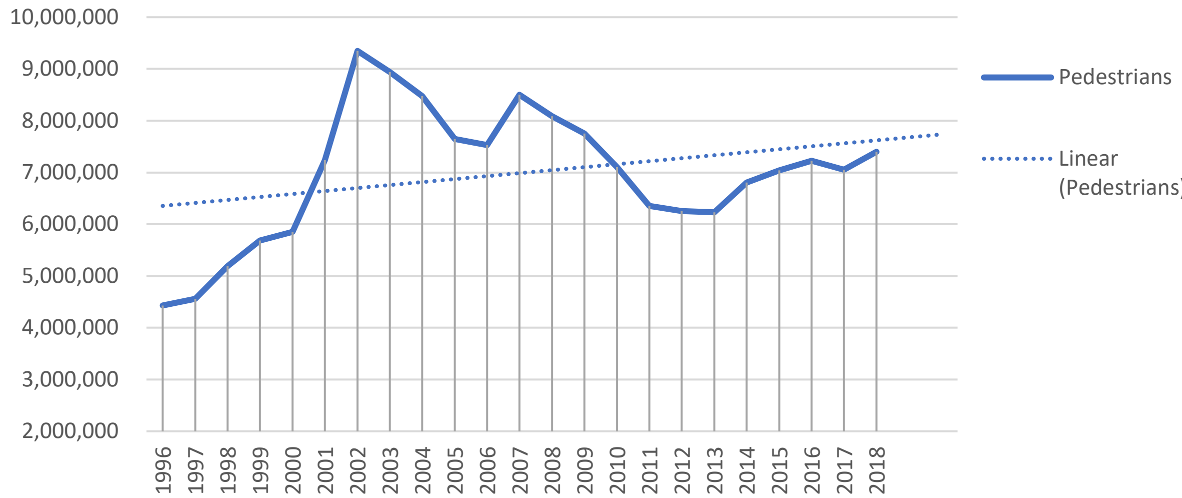
SOURCE: BTS, 2019

On average, inbound passenger vehicle counts decreased by 3 percent each year.

In contrast, pedestrian crossings for the same four POEs have risen over the 20-year period by approximately 2.9 million since 1996. As illustrated in **Figure 5**, the overall trend reveals a gradual increase but there is significant variability in annual counts year to year[7].

[7] The standard deviation, which indicates the amount of variation, is approximately 1.3 million pedestrian crossings.

Figure 5: Historic Annual Inbound Pedestrian Counts



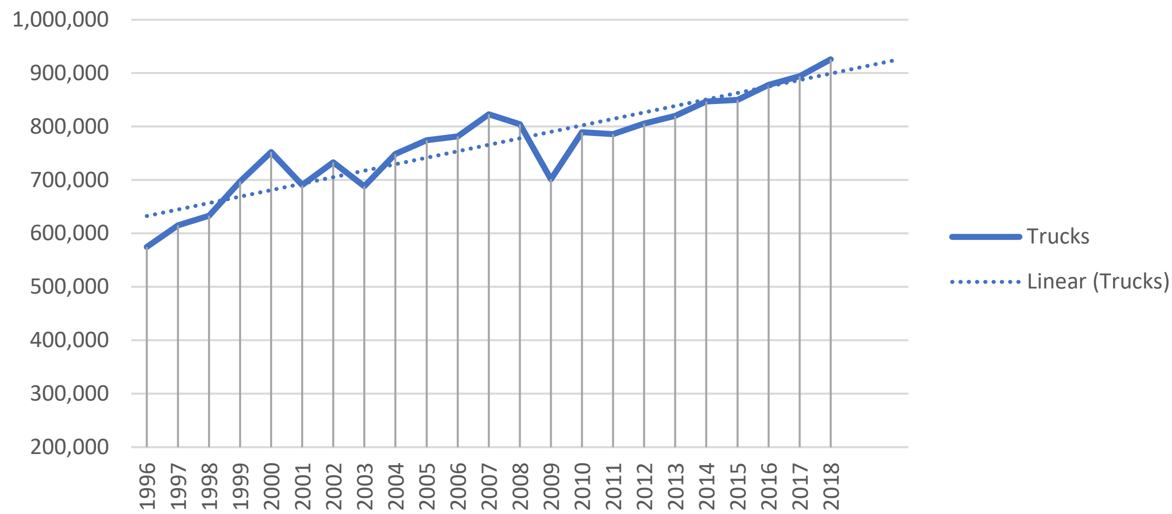
Source: BTS, 2019

On average, inbound pedestrian counts grew by 3 percent each year.

3.2 Freight Truck Volumes

Currently, commercial freight traffic crosses at BOTA, Ysleta-Zaragoza and Santa Teresa crossings. Freight traveling northbound beyond the regional network typically will access I-10 destined for freight terminals at locations such as Los Angeles and Houston. As shown in **Figure 6,** inbound truck freight traffic has increased slowly and steadily by approximately 350,000 vehicles over the 20-year period.

Figure 6: Historic Freight Truck Annual Counts



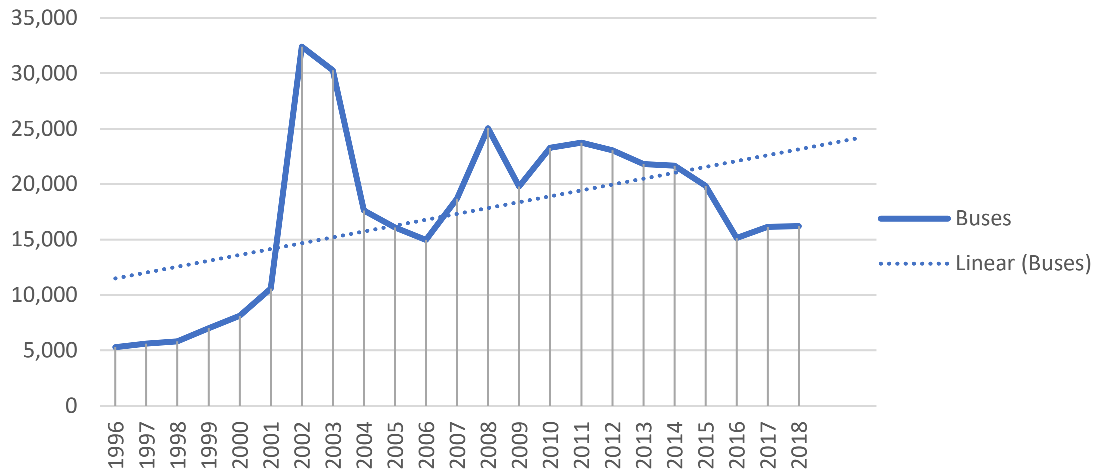
Source: BTS, 2019

On average, inbound truck freight grew by 2 percent each year.

3.3 Transit-Bus Volumes

Transit or bus modes are important for the crossings in urbanized areas, such as the bridges in downtown El Paso and BOTA. These modes are significantly less prevalent in rural areas. As a result, this data is not available for the Tornillo-Fabens POE. As shown in **Figure 7,** inbound trips by bus have been increasing from 780 in 1996 to 1,379 in 2018. However, inbound bus counts show an overall decrease in annual counts since 2011.

Figure 7: Historic Bus Annual Crossing Counts



Source: BTS, 2019

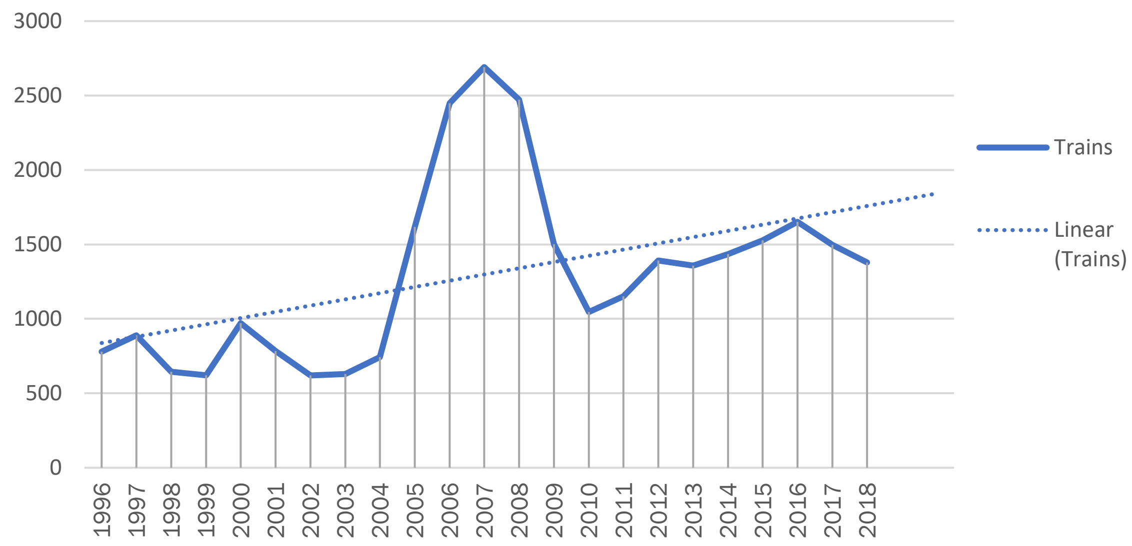
On average, inbound trips by bus grew by 5 percent each year.

3.4 Freight-Rail Volumes

Rail is often the preferable mode to transport goods if the cargo is not time-sensitive and is large.[8] The shipment of goods using rail is primarily operated by private companies. In the El Paso region, Union Pacific Railroad (UPRR) transports the highest amount of rail tonnage, followed by BNSF Railway (BNSF) and the Mexican railroad, Ferrocarril Mexicano (or Ferromex)[9]. Existing data reveal an increasing trend for inbound rail shipments in the El Paso region, specifically at the two downtown El Paso rail bridges to the east and west of the Paso Del Norte bridge. As shown in **Figure 8,** there was a spike in annual inbound train crossing counts between 2005 and 2009.

[8] Source: https://www.fhwa.dot.gov/policy/2015cpr/chap1.cfm
[9] TxDOT. El Paso Region Freight Study, Phase II Final Report. https://ftp.dot.state.tx.us/pub/txdot-info/rail/freight/el_paso_2.pdf. Last accessed on May 28, 2019.

Figure 8 : Historic Annual Train Counts



Source: BTS, 2019

Although, there was a spike in annual inbound train crossing counts between 2005 and 2009. On average, inbound train crossing grew by 3 percent each year.

3.5 Overall Trends

When considered as a whole, border crossing trends in the region suggest an increase in travel within the region. Specifically, inbound passenger vehicle traffic counts for the City of El Paso International bridges, the Bridge of the Americas, Tornillo-Guadalupe, and Santa Teresa POEs combined ranged from approximately 16.5 million to 50.7 million over the 20-year period. Inbound passenger vehicles decreased until 2012 and then began to steadily increase from approximately 17.4 million passenger vehicles to 24.1 million.

Moreover, pedestrian crossings for the same four POEs rose over the 20-year period by approximately 2.9 million since 1996. The overall trend is a gradual increase, but there is significant variability in annual counts year to year. The amount of variation is approximately 1.3 million pedestrian crossings.

Inbound truck freight traffic has increased slowly and steadily by approximately 350,000 vehicles over the 20-year period, while, inbound trips by bus have been increasing from 780 in 1996 to 1,379 in 2018. However, inbound bus counts show an overall decrease in annual counts since 2011.

Finally, existing data reveal an increasing trend for inbound rail shipments in the El Paso region, specifically at the two downtown El Paso rail bridges to the east and west of the Paso Del Norte bridge, with a spike in annual inbound train crossing counts between 2005 and 2009.

4.0 Data Needs and Availability

An assessment prepared by Cambridge Systematics and the Texas Transportation Institute is a key reference for this analysis[10]. The assessment provides a comprehensive review of current cross-border data sharing, collection practices, gaps and needs. It was prepared under a Federal Highway Administration (FHWA) contract in response to discussions held by Joint Working Committee (JWC) member agencies regarding the challenges to gather, evaluate and utilize data for cross-border activities along the US-Mexico international border. At this time, Task 2 of the assessment is complete and was reviewed by the RMS for applicability. Task 2 consists of data mapping and inventory, identifies top-tier data and provides a user-friendly application on which data should be used based on project needs. Having the inventory will help projects or activities to have a solid starting point for data collection to avoid starting from scratch every time. Task 2 has four main objectives:

- To identify cross-border transportation **data uses and needs** by JWC member agencies and other stakeholders for planning, modeling, and operations of border crossings or land ports of entry
- To identify cross-border transportation **data sources**
- To assess the identified cross-border transportation data from a **data user perspective**
- To assess the identified cross-border transportation data from a **data collector perspective**

These objectives were met through the identification of primary data sources and surveying multiple agencies and states along the US-Mexico border. This assessment identifies and inventories the top-tier data sources and provides a robust description of their attributes, including cross-border transportation data name and brief description, sponsoring organization, data availability (public, private, or commercial), geographic resolution, temporal resolution, coverage, latency, data format, collection practice/methodology, freight data attributes, and passenger data attributes.

The next phase of this Cambridge-TTI project, Task 3, includes collecting additional information on current and future cross-border transportation data needs and gaps. This information will be used to inform the final phase which is the final report. The final report is intended to provide JWC member agencies and other border partners in the US and Mexico with the same definition and understanding of the terminology used in the cross-border transportation environment.

The overall objective of the project is to assist JWC members, which include the TxDOT El Paso District, to improve the collection and use of data for cross border projects. While this sounds simplistic, there is a great need to understand the data that is available and to use it in a consistent manner so that stakeholders can perform cross-border activities more efficiently.

[10] Cambridge Systematics (2019, January). Comprehensive Assessment of Current Cross-Border Data Sharing, Data Collection Practices, Data Gaps, and Data Needs.

Starting with terminology, the report suggests that data sources and uses be standardized as much as possible to simplify the process.

Next phases of the assessment, in particular the data needs and gap analysis, will uncover other needs. Once completed, the results will provide stakeholders (agencies, consultants, local governments, committees, etc.) with a comprehensive tool for planning purposes. This tool is like a menu and will guide planners and decision makers with a consistent set of data and how it is best used to support project objectives.

Future data needs identified in the assessment include the following:

- True origins and destinations of freight crossing movements by freight mode and travel direction;
- Crossing volumes by vehicle type, lane type and travel direction;
- Crossing volume by freight mode and travel direction;
- Value and weight of freight crossing shipping by freight mode and travel direction;
- Vetted hourly crossing counts for all transportation modes for all international bridges by direction and lane type; and
- Dynamic lane assignments for passenger vehicles for all international bridges.

4.1 Trip Generation, Origin-Destination and Route Choice Data

Understanding historic and current demand at each crossing is important as it allows transportation planners to identify growth trends and potential infrastructure needs. However, understanding the underlying factors that contribute to that demand is critical. Two key pieces of information that were not available at the time of this study and can be used to identify the factors which contribute to demand behavior at each POE are origin-destination and route choice data.

Origin-destination data provides insight into the origins and destinations of people and freight. Route choice provides insight into the roadways people and freight chose to use to travel between their origins and destinations. Traditionally, this data has only been available from Commuting Flows (Journey to Work) data collected by the US Census Bureau or related to travel demand model (TDM) updates by regional planning agencies. While useful, the data is often dated and does not facilitate real-time analysis.

The rise of internet and digital media has allowed some advances in the availability of true O-D data. Recently, FHWA developed the HEPGIS application, which is an interactive, web-based geographic map server that enables users to navigate, view, and print geospatial maps using only their web browser[11]. In addition to map and table functionalities, the HEPGIS application has unique matrix manipulation capabilities producing O-D desire line maps based on input

[11] Cambridge Systematics (2019, January). Comprehensive Assessment of Current Cross-Border Data Sharing, Data Collection Practices, Data Gaps, and Data Needs. Page B-16

from the interactive user interface.[12] Today real-time data is also captured by cell phone, Bluetooth, and GPS devices and sold to transportation agencies to assist with planning, modeling and operations decisions. Several "big data" vendors that offer this service include Metropia, AirSage, INRIX, Streetlight, TOMTOM, and SMATS. Other efforts underway by agencies with the region, such as the City of El Paso's International Bridges Department, include collaboration with these companies to capture data at several crossings.

Once available, this data will compliment efforts by TxDOT and municipal governments to improve the roadway network, by:

- Helping to identify priority projects on state and regional roadways that may experience poor level of service (LOS) due to border crossings.
- Determining how different roadway improvements or alternatives may relieve or improve traffic conditions near or at border crossings.
- Evaluating how new border crossings or improvements can shift traffic and improve TxDOT and regional roadways.
- Providing relevant data for environmental clearance or National Environmental Policy Act (NEPA) reporting.
- Determining how distribution of different land uses or development could result in traffic impacts near or at border crossings.[13]

4.2 Emerging Data and Efforts by Others

Border Transportation Master Plan (BTMP)

TxDOT is currently working with binational federal, state, regional, and private sector stakeholders to undertake development of the Texas-Mexico Border Transportation Master Plan (BTMP). The BTMP is a comprehensive, multimodal, binational plan that will identify transportation issues, needs, challenges, and opportunities and strategies of moving people and goods across the border and in the border regions and beyond. The primary goal of the plan is to develop potential transportation investment strategies that support binational, state, regional, and local economic competitiveness.

The BTMP encompasses all the international bridges and POEs along the Texas-Mexico border, including those in the El Paso region. This study is expected to collect the type of data needed to fully analyze border crossing activity; including O-D and route choice data. TxDOT El Paso District staff is coordinating with the TxDOT BTMP team on data needs. In the future, once this data is acquired for the BTMP, the findings should be made available to the TxDOT border districts to further their cross-border analysis. Within El Paso such data can be incorporated into planning studies.

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[12] Cambridge Systematics (2019, January). Comprehensive Assessment of Current Cross-Border Data Sharing, Data Collection Practices, Data Gaps, and Data Needs. Page 3-28

[13] Hardesty, Larry. MIT News (2016, August). "Inferring Urban Travel Patterns from Cellphone Data. Retrieved from http://news.mit.edu/2016/urban-travel-patterns-cellphone-data-0829

In May 2019, as part of a stakeholder involvement session for this effort, participants discussed the current state of cross border data and TxDOT Transportation Planning and Programming (TPP) representatives provided an overview of the project's next steps which will entail:

- A survey targeted toward border metropolitan planning organizations (MPOs);
- Coordination with INRIX to acquire missing data;
- Possible acquisition of Streetlight data and a merging of big data with SAM;
- The use of existing TPP agreements and additional agreements if needed between TxDOT and data providers to acquire data;
- A final product of data that can be shareable.

A similarly named New Mexico border plan was initiated by the New Mexico DOT during the course of this study in May 2019. Opportunities to coordinate and share information should be pursued.

Statewide Analysis Model (SAM)

TxDOT TPP Division maintains a robust statewide travel demand model, referred to as the Texas Statewide Analysis Model (SAM). The SAM is a primary tool for evaluating intercity transportation projects throughout Texas. The SAM provides decisions-makers with a picture of future travel demand and how proposed transportation projects can serve the needs of the state.

The fourth version of the SAM was just recently completed in April 2019. The SAM-V4 is a state of the practice multimodal travel model that provides highway traffic forecasts for highway passenger travel, highway freight transport, intercity and high-speed passenger rail ridership, freight rail tonnage and train forecasts, and forecasts of air passenger travel to and from Texas airports. The SAM-V4 provides travel forecasts at a level of detail suitable for use in comparative analyses of large-scale transportation corridor projects and other large-scale investments. The model can also be used to perform analyses of the transportation outcomes and economic impacts of state-level transportation, land use, and economic policy decisions and strategies.

City of El Paso International Bridges Department

The City of El Paso is currently collaborating with TTI, CBP and Metropia to capture and communicate hourly crossing times and wait times by bridge, mode and lane type. While the data is useful for the City's purposes of dissemination, this effort does not archive data in a manner to facilitate overall trend analysis. However, the data coupled with ITS could help with communicating border crossing wait times by displaying messages on strategically placed dynamic message signs. Additional ITS devices are being proposed for upcoming implementation. Vehicle detection devices would aide in collecting data to calculate border crossing times and closed-circuit television (CCTV) would allow for monitoring of the border crossings.

Texas Transportation Institute (TTI)[14]

The Border Crossing Information System (BCIS) funded by TxDOT and developed by TTI, provides expected wait times and expected crossing times for US-bound commercial vehicles; expected wait times of US-bound and Mexico-bound passenger vehicles, and historic data of actual wait times and actual crossing times. BCIS data contains truck crossings and wait times for southbound movements (i.e., trucks crossing from Mexico to the United States) for 10 crossings (eight in Texas and two in Arizona) only. It does not differentiate by lane type.

US Customs and Border Protection (CBP)

US CBP captures the number of in-bound (Mexico to US) vehicles and time they arrive at primary inspection booths at all crossings. Volume data is provided in response to specific requests by data collectors, and wait time information is disseminated in conjunction with the City of El Paso, but otherwise the data is not available to the public[15] nor does the data facilitate an overall trends analysis for the region.

Metropia

Metropia[16] combines personal mobility data from its smartphone app to determine predictions of future traffic to guide travel behavior and share data with transportation agencies to prioritize and evaluate strategies to accommodate day-to-day demand and increase system mobility and reliability. Metropia aims to achieve safety, system performance improvements, and enable real-time operational interventions.

In 2016, Metropia was launched in El Paso as a joint project of TxDOT, the Camino Real Regional Mobility Authority (CRRMA) and the El Paso Metropolitan Planning Organization (MPO). The agencies provided funding in return for "crowd sourced" O-D, routing and travel time data, while app users benefit from algorithms to predict, balance and recommend travel behavior. Results show that the app platform had some effect on travel behavior. In 2017 Metropia expanded its app to operate across the six bridges and crossings, providing wait times, congestion information, and recommending routing for cross border traffic.

In March 2019, Metropia presented a workshop summarizing the past years of data collected. TxDOT representatives attended the workshop and heard a summary of the past several years of data from the congestion-management platform. Metropia presented a series of conclusions including:

- Incentives are proven to be influential
- Trip purpose determines the extent to which a user will affect their departure time
- "Baby steps" are more likely to be satisfied than "big asks"
- Instant feedback on user action is useful to trigger small behavior changes
- Data is "free" and will be useful to transportation agencies

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[14] Border Crossing Information System. https://bcis.tti.tamu.edu/ . Last accessed on May 22, 2019.
[15] City of El Paso International Bridges. https://www.elpasotexas.gov/international-bridges/wait-times. Last accessed May 23, 2019.
[16] Metropia App. https://metropia.com/metropia-mobile-app. Last accessed, May 21, 2019

The group discussed how the data could facilitate transportation planning, operations, and research activities. The activities of the workshop focused on explanations of the data types and contents, data access process, and example data analytics applications.

INRIX

INRIX works with the public and private sectors, as well as automakers on projects to improve daily operations, optimize roadway performance, and plan future mobility networks. INRIX is currently involved in several ongoing statewide procurements in Texas and has a partnership with the Texas Transportation Institute (TTI) to work on various travel models. As a leading private sector provider of travel time information for travelers and shippers, INRIX provides driving and mobility intelligence data for automakers, including BMW. INRIX is also a source of real-time data for freight vehicles and offers solutions for fleet managers.

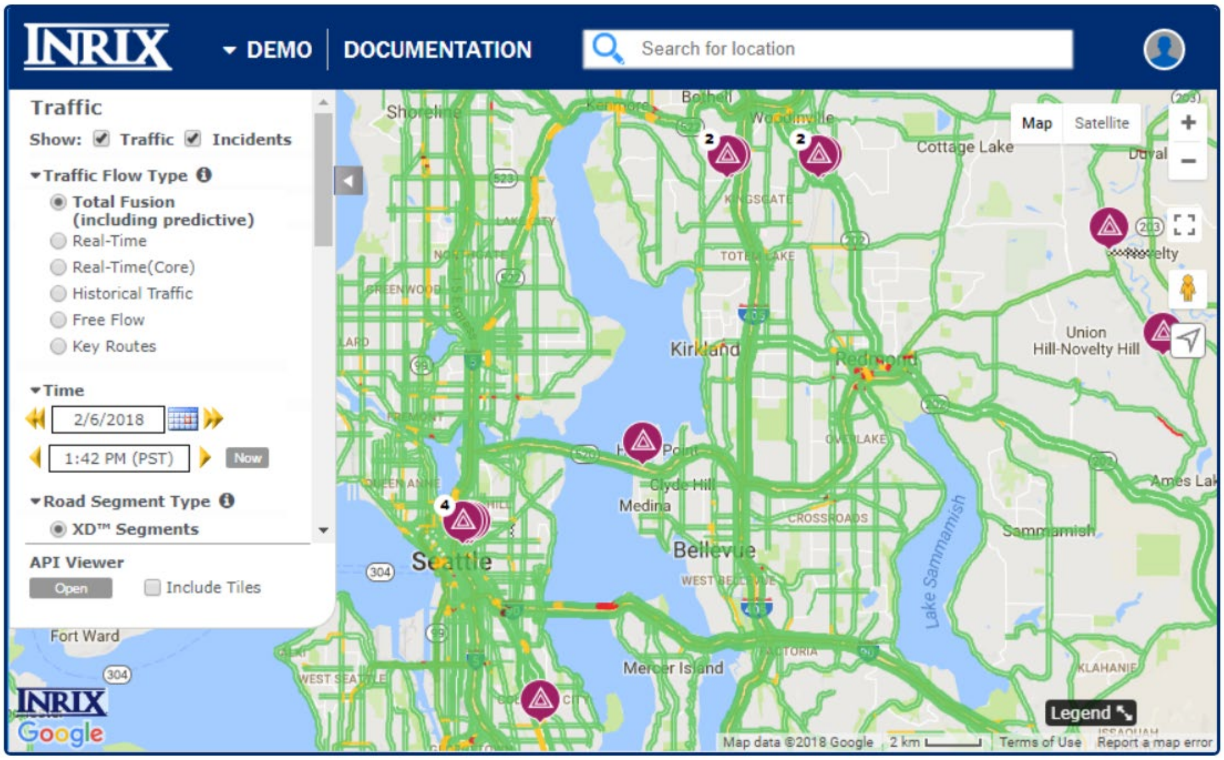
INRIX provides raw data, collected from users' cell phones as they travel through a region. The data is then processed using GIS-based tools. The INRIX Traffic App personalizes routes to avoid the worst traffic, recommends trips and departure times, and provides automatic, intelligence alerts to keep users aware of changing road conditions[17]. This in turn, allows data end-users to derive traffic volume data and speed data. INRIX also utilizes Trip Engine and Trip Path to connect strings of information together and provide "paths" of travel, respectively. The paths produced from Trip Path is a list of road segment identification numbers for each trip, achieved by combining Global Positioning System (GPS) pins with road segment data to accurately calculate the complete route of a trip[18].

Two key parameters needed to access INRIX data are the size of the geographical area and the length of time for which data will be collected. Study area limits can be shaped to fit the needs of the study; however, the amount of data can grow very quickly in size and cost, so it is important to focus on how the data will be used when defining the study. The dataset includes the coordinates and time of day for each hit of cell phone user, which allows INRIX to track its path and travel time, among other things. These variables can be used to compare the travel patterns and understand the changes in driver behavior once they understand the reduction of capacity on a given roadway. However, since the INRIX study area ends at the US-Mexico border, data for vehicle crossing the border is typically lost. Data loss can also occur when vehicles make stops more than 10 minutes during trips.

INRIX provides potential users two options to test the data they provide. One option to view INRIX data is via the internet. Potential users can request a login account and use an interactive web map as shown in Figure 9.

[17] INRIX, http://www.INRIX.com/mobile-apps/, 2019
[18] INRIX, www.INRIX.com /blog/2019/05/trip-paths/, 2019

FIGURE 9. INRIX Interactive Web Map



Another option to view or understand INRIX data, is through contact with an INRIX service representative. Potential users can provide the INRIX representative with a shape file of the study area that they are interested in. INRIX representatives will "pull" a sample time period and report the findings. This allows potential users to examine a small sample of traffic flow patterns and characteristics. As of the date of this report, the RMS is in the process of scheduling a similar demonstration with INRIX for the El Paso region.

5.0 Summary

Activity at El Paso area ports of entry plays a key role in the local and national economies represented in the region. In addition to providing access for residents that live in the region, transportation corridors that support the border crossings and POEs are critical to sustaining the movement of people and goods across the border. For these reasons, providing connectivity and improving access to and from these ports is a priority.

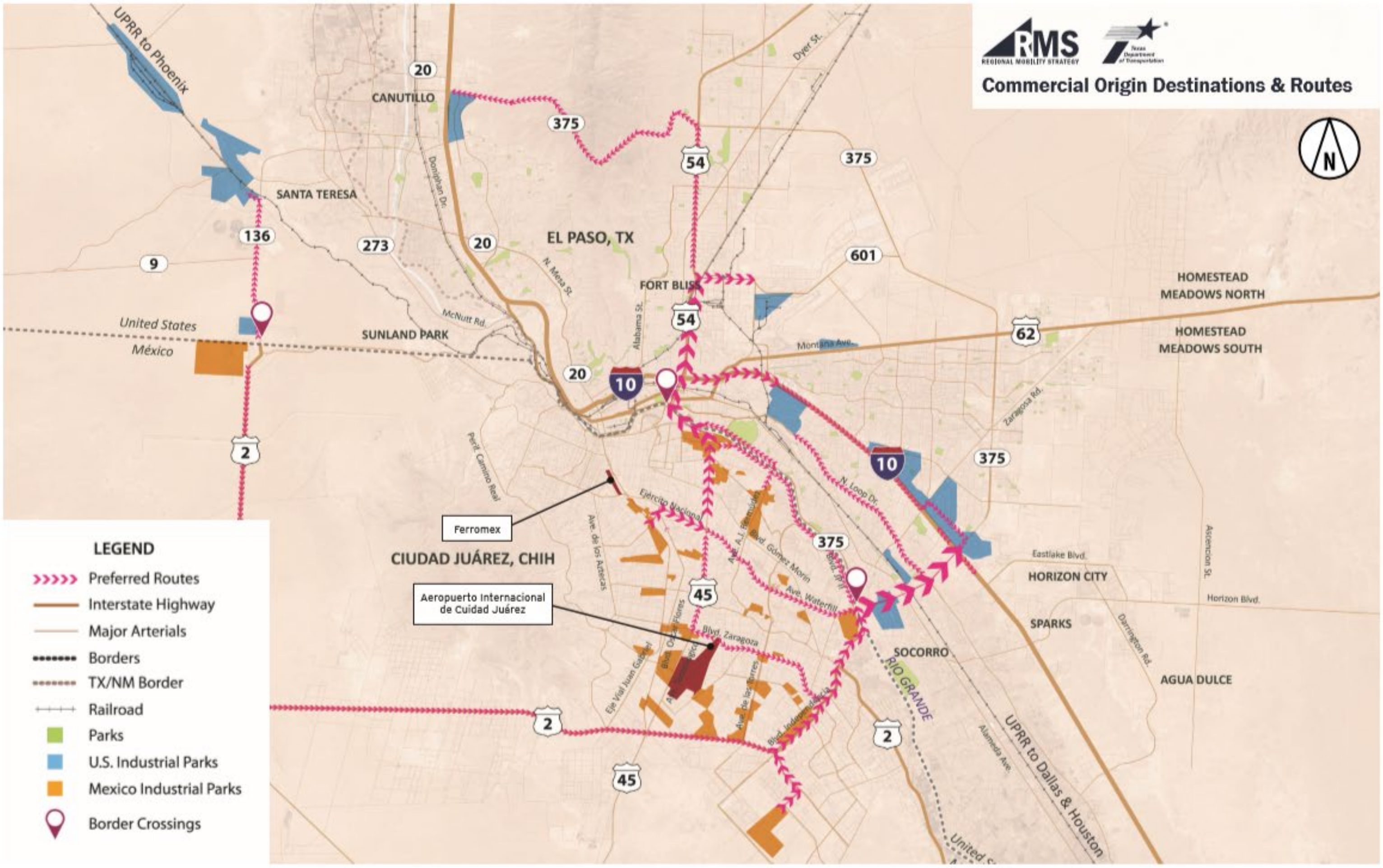
To accomplish this, primary travel data is essential to understand the existing needs and plan for the future. While historical data allows us to observe that the travel demand along the border is generally increasing for the various modes, readily available real-time data that can be used to determine origin-destination patterns, and traffic generators and attractors on both sides of the border is still needed to accurately depict travel behaviors and demands. Similarly, feedback from local stakeholders allows us to isolate preferences with regard to travel routes; however, quantitative data would be required to support these preferences when identifying potential corridors for investments by local, state and federal entities.

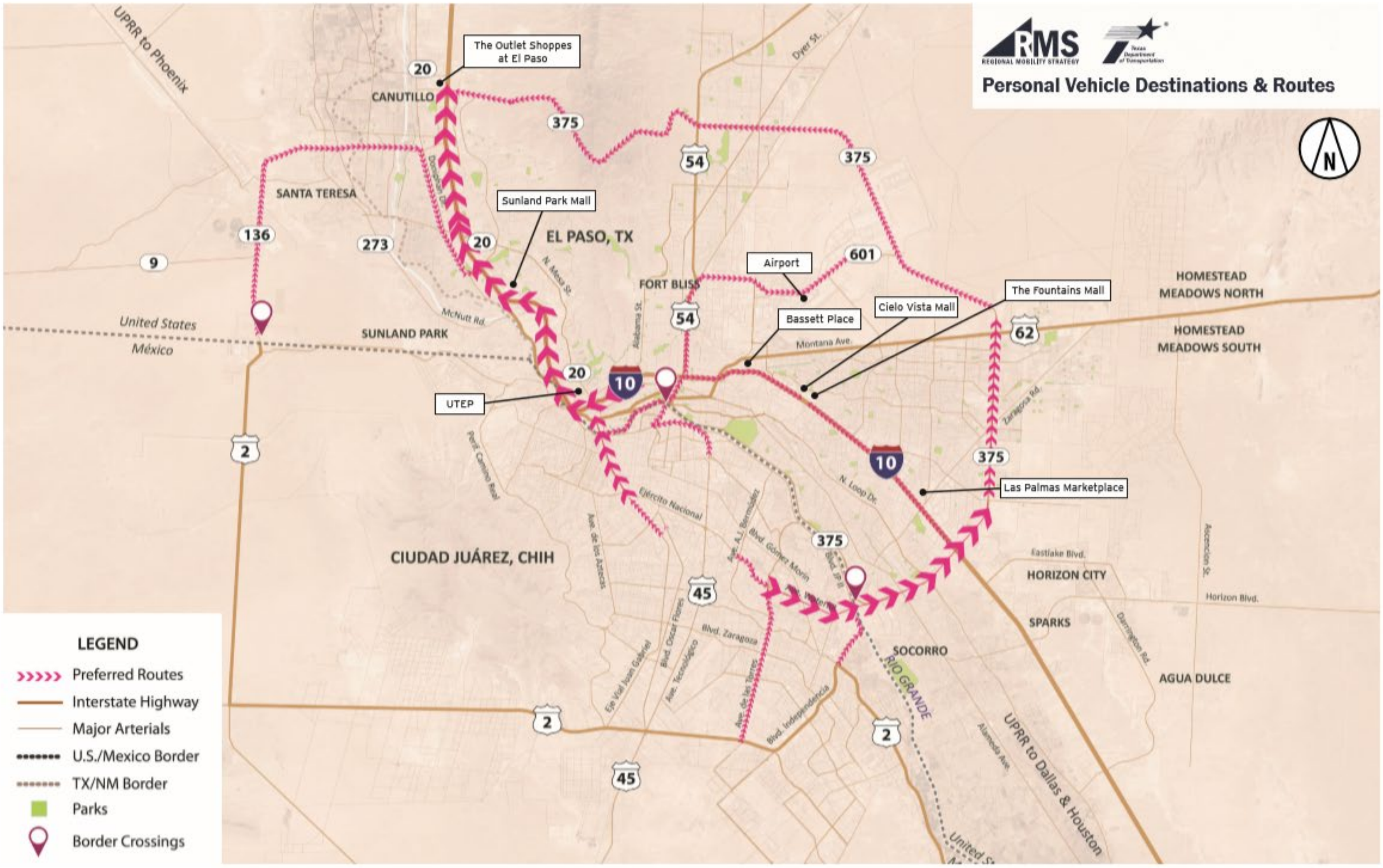
The intent of this assessment is to help paint a picture of the current state of cross-border travel along the US-Mexico border and highlight the need for a comprehensive approach among the stakeholders for collecting data that can be used for planning and operations in the region. As shown in the previous sections, complete data for people, vehicles and freight that come into and go out of this region is currently lacking. Useful, traditional data, particularly origin-destination and route choice data, is often outdated and does not lend itself to real-time analysis. Additionally, emerging "big data", from providers such as FHWA HEPGIS, Metropia, INRIX, Streetlight, are promising and have the potential to be used in future border-crossing plans and studies.

TxDOT El Paso District, along with the El Paso MPO and local governments, should continue to work with the BTMP team, FHWA's JWC, NMDOT and other stakeholders to identify ways to efficiently collect and maintain data for short-range and long-range planning efforts that ensure infrastructure near and at the border crossings is adequate to meet future demand. Further, TxDOT El Paso District in partnership with other stakeholders should continue to support more comprehensive border planning efforts, such as the BTMP effort, by developing a set of recommendations that could improve the transportation network surrounding the POEs, improve quality of life, and increase mobility for the El Paso–Juárez–Las Cruces area.

Appendix A-1 – Meeting Materials and Data from Bridges Steering Committee

Resulting Maps





RMS
Personal Vehicle Destinations & Routes
N
The Outlet Shoppes at El Paso
Sunland Park Mall
Airport
Bassett Place
Cielo Vista Mall
The Fountains Mall
UTEP
Las Palmas Marketplace
CANUTILLO
SANTA TERESA
EL PASO, TX
FORT BLISS
SUNLAND PARK
United States
México
CIUDAD JUÁREZ, CHIH
HOMESTEAD MEADOWS NORTH
HOMESTEAD MEADOWS SOUTH
HORIZON CITY
SPARKS
SOCORRO
AGUA DULCE
RIO GRANDE
UPRR to Phoenix
UPRR to Dallas & Houston
LEGEND
Preferred Routes
Interstate Highway
Major Arterials
U.S./Mexico Border
TX/NM Border
Parks
Border Crossings

PowerPoint Slides- Bridges Steering Committee: August 1st, 2019

BRIDGES STEERING COMMITTEE

August 1st, 2019

Background Information

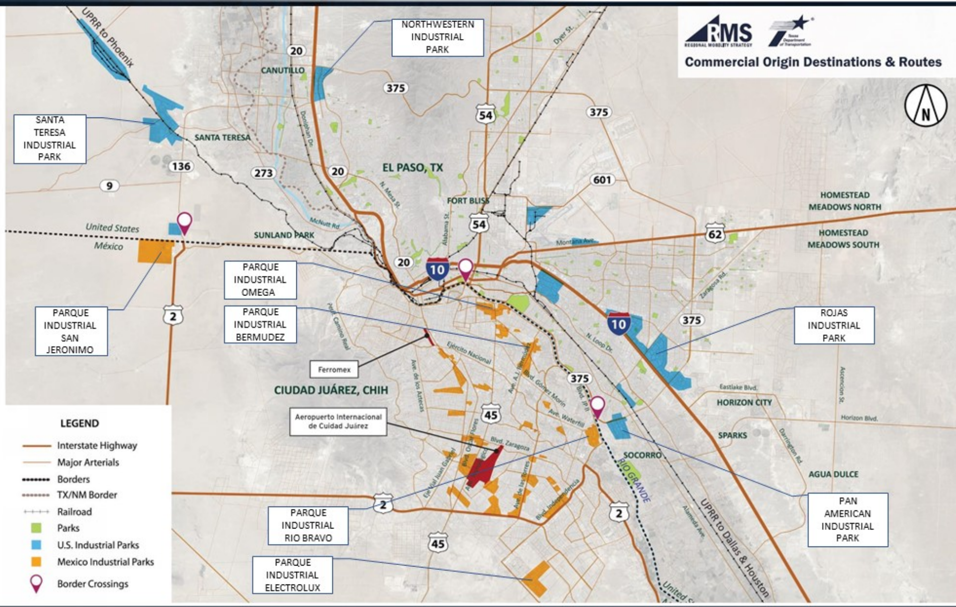
- Existing Volume Data
- Crossing Times
- External Trips
- Internal Trips

What is missing?

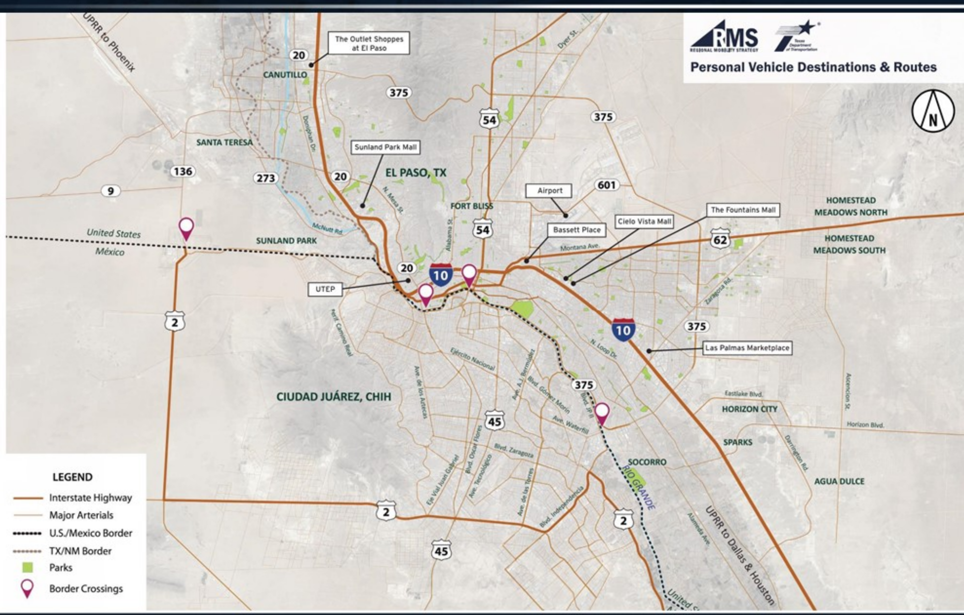
- Origins-Destinations
- Commercial/POV Crossing Routes
- Local vs National Traffic

Need your Input – Local Level

- Commercial - Drayage Traffic
  - Most common origin-destinations?
  - Most common crossing points?
  - Most common routes?
- POVs – Personal Experience
  - Most common destinations?
  - Most common crossing points?
  - Most common routes?



Commercial Origin Destinations & Routes
NORTHWESTERN INDUSTRIAL PARK
SANTA TERESA INDUSTRIAL PARK
PARQUE INDUSTRIAL SAN JERONIMO
PARQUE INDUSTRIAL OMEGA
PARQUE INDUSTRIAL BERMUDEZ
Ferromex
Aeropuerto Internacional de Cuidad Juárez
PARQUE INDUSTRIAL RIO BRAVO
PARQUE INDUSTRIAL ELECTROLUX
ROJAS INDUSTRIAL PARK
PAN AMERICAN INDUSTRIAL PARK
UPRR to Phoenix
UPRR to Dallas & Houston
CANUTILLO
SANTA TERESA
SUNLAND PARK
EL PASO, TX
FORT BLISS
CIUDAD JUÁREZ, CHIH
HOMESTEAD MEADOWS NORTH
HOMESTEAD MEADOWS SOUTH
HORIZON CITY
SPARKS
SOCORRO
AGUA DULCE
RIO GRANDE
United States
México
LEGEND
Interstate Highway
Major Arterials
Borders
TX/NM Border
Railroad
Parks
U.S. Industrial Parks
Mexico Industrial Parks
Border Crossings



Personal Vehicle Destinations & Routes
The Outlet Shoppes at El Paso
Sunland Park Mall
Airport
Bassett Place
Cielo Vista Mall
The Fountains Mall
UTEP
Las Palmas Marketplace
UPRR to Phoenix
UPRR to Dallas & Houston
CANUTILLO
SANTA TERESA
SUNLAND PARK
EL PASO, TX
FORT BLISS
CIUDAD JUÁREZ, CHIH
HOMESTEAD MEADOWS NORTH
HOMESTEAD MEADOWS SOUTH
HORIZON CITY
SPARKS
SOCORRO
AGUA DULCE
RIO GRANDE
United States
México
LEGEND
Interstate Highway
Major Arterials
U.S./Mexico Border
TX/NM Border
Parks
Border Crossings

Need your Input – United States National Level

Need your Input – Mexico National Level

Next Steps

- Input to Border Transportation Master Plan
- Future travel survey
- September committee meeting

Questions?

Meeting Notes: August 1st, 2019

Regional Mobility Strategy and Fort Hancock

Draft Meeting Notes

CSJ 2151-10-424

Date & Time: August 1, 9:00 AM MST

Location: City 2 Building, 4th Foor Conference Room

Purpose: Bridges Steering Committee Meeting

Attended:

Name	Representing
Monica Lombrana	City of El Paso
David Coronado	City of El Paso
Eddie Romero	City of El Paso
Jesus Mendoza	City of El Paso
Paul Stresow	City of El Paso
Carlos Olmedo	City of El Paso
Sergio Sierra	Regal Beloit
Officer Cordova	EPPD
John Gill	GSA
Alice Torres	CBP
John Rivera	CBP
Cesar D. Gomez	CBP
Maria Nava	CBP
Jeff Shelton	TTI
Jose Landeros	County of El Paso
Joaquin Rodriguez	
Jesus Cerna	El Paso County
Thelma Ramirez	TxDOT
Samuel Ramirez	TxDOT
Adriana Rodriguez	TxDOT
Cecilia Levine	MFI-Intl
Justin Sanchez	Sunset Customs Brokers
Fabian Orpinel	
Kenia Barboa	Fideicomiso
Agustin Pimentel	Desarrollo Económico de Ciudad Juárez
Guillermo Quezada	USDOT
Jimmy Roman	Trans-Expedite INC

Claudia Valles	El Paso MPO
Salvador Gonzalez	El Paso MPO
Eduardo Calvo	El Paso MPO
Sonia Perez	El Paso MPO
Kelvin Kroeker	HNTB
Jaime Saenz	HNTB

Meeting Notes:

Salvador Gonzalez presented on the Pending Action Items for the Texas-Mexico Border Master Plan:

- Kelvin assisted by briefly describing the current information available through third parties such as CBP, City of El Paso International Bridges Dept., Metropia, etc.
- Existing available information includes crossing volumes and crossing times.
- Kelvin explained what information is missing:
  - What percentage of cross border traffic is local drayage?
  - What percentage of cross border traffic is national freight?
  - Most common origins, local and national?
  - Most common destinations, local and national?
  - Most common routes and border crossings?
- Salvador showed how input from stakeholder would help gather the missing information; he showed 4 maps: first, 2 local maps showing the El Paso-Juárez metropolitan area and 2 national maps showing Mexico on a national level and the US on a national level.
  - First map depicted most common industrial parks on both sides of the border. He asked the audience to highlight the most common origins and destinations as well as the routes and border crossings for drayage/commercial traffic.
  - Second map showed the most common destinations in the El Paso area for POV traffic, such as shopping malls, UTEP and the airport. He asked the participants, from a personal experience standpoint, to highlight the most common destinations and border crossings in El Paso.
  - Third map illustrated Mexico on a national level with its most important highways. He asked the audience – specifically the ones in

    - the transportation/freight business - to mark the most common origins, destinations and highways being traveled by them.
    - Fourth map depicted the US on a national level with its most important highways. Same as with the third map, he asked the participants to highlight the most common origins, destinations and highways being used by their trucks.
- Local maps had around 10 participants providing information with 8-6 providing valuable information.
- National maps had 2 participants providing information, both providing important information.
- Presentation concluded by Salvador thanking the audience for their input.

Other notes:

- Update on County's Marcelino Serna Port of Entry. Jose Landeros of the County presented. Key points included:
    - Underutilization of this port, and the reassignment of CBP agents to busier ports.
    - Agustin Pimentel– Regarding Samalayuca bypass, city and state are working with federal government. Meanwhile overpasses on Hwy 2 are being constructed to help expedite traffic.
    - Jose Landeros mentioned that County has broadened its scope to see it as a regional port system.
    - Another participant mentioned that security has to be there or trucking industry won't use it if it's too risky.
    - Cecilia Levine – mentioned that industry lobbied against the bridge for security reasons. Would have been better to invest in current bridges, with technology, etc.?
    - Jose Landeros explained that conversations are underway with RMA managing bridges as a system, a network. Also, RMA may be able to help with building the bypass.
    - Monica Lombrana – Confirmed that City wants to think of bridges as a network.
    - Eduardo Calvo –heard in Chihuahua that the bypass project is not starting any time soon due to ROW issues with the state, lawsuits, ejidos, etc.

The Mesoscopic Binational Modeling project was presented by Jeff Shelton of TTI. Key points included:

- Multi resolution modeling, because mobility is complex.
- Many variables with working at Bridges, so we're doing "what if"
- Mesoscopic: regional level. It is not on a clock or time of the day. Can't do queue or accidents.

- No one platform is good for everything: macroscopic, or microscopic both have their purposes.
- MRM – Mesoscopic Regional Modeling. Which can be useful for tolling, vehicle restrictions.
- Austin ICM – Modeled I-35 existing and then with ITS and showed a graph, a heat map, side by side.
- Presentation showed a video with a simulated bridge collapse near BOTA and I-10. The graphics included travel volumes shown as widths of lines (thicker/thinner) before event, immediately after the event, and long-term.
- TTI also has an economic impact study which shows costs of transport before and then after improvements.
- Presentation contained a map of routes in Juárez, with thicker/thinner lines that show routes. Jeff explained that University in Juárez gathered this data.
- Eduardo Calvo commented that MPO hopes to have TDM base year done in 1 year. It would be a binational model.

All notes are assumed final if no comments are received within 3 business days.

Appendix A-2 - Historic and Current Port-of-Entry Traffic Volumes

El Paso Region Border Crossings

Regional Mobility Strategy

		Southbound Traffic (to Mexico)					Northbound Traffic (to United States)				
Year	Port-of-Entry	Pedestrians	Trucks-Freights	Rail	Privately Owned Vehicles	Buses	Pedestrians	Trucks-Freights	Rail	Privately Owned Vehicles	Buses
2017	*City of El Paso, International Bridges*	*4,184,944*	*472,634*	*0*	*3,976,015*	*0*	*6,960,165*	*854,273*	*1,368*	*12,513,065*	*18,697*
2017	Bridge of the Americas	**	**	**	**	**	1,030,474	269,885	1,466	3,883,830	7,197
2017	Ysleta-Zaragoza Bridge*	529,043	472,634	0	2,781,366	0	1,295,982	509,307	0	4,934,164	
2017	Stanton*	604,694	0	0	1,194,649	0	0	0	0	1,237,289	0
2017	Paso Del Norte*	3,051,207	0	0	0	0	4,601,047	0	0	2,995,942	8,701
2017	Tornillo-Guadalupe				225,455		33,164	107	0	301,153	0
2017	Santa Teresa						176,746	114,285	0	671,895	253
	2017	**4,184,944**	**472,634**	**0**	**4,201,470**	**0**	**14,097,578**	**1,747,857**	**2,834**	**26,537,338**	**34,848**
2015	*City of El Paso, International Bridges*	*4,334,176*	*366,961*	*0*	*4,097,432*	*0*	*7,537,100*	*751,506*	*1,361*	*10,197,262*	*22,669*
2015	Bridge of the Americas	**	**	**	**	**	939,519	496,802	2,262	3,859,726	9,722
2015	Ysleta-Zaragoza Bridge*	486,754	366,961	0	2,737,718	0	1,102,812	261,272	0	4,322,741	0
2015	Stanton*	661,757	0	0	1,359,714	0	0	0	0	1,203,746	0
	Paso Del Norte*	3,185,665	0	0	0	0	4,720,805	0	0	2,871,979	10,017
2015	Tornillo-Guadalupe				139,425		39,030	0	0	290,530	0
2015	Santa Teresa						148,955	114,285		670,994	176
	2015	**4,334,176**	**366,961**	**0**	**4,236,857**	**0**	**14,488,221**	**1,623,865**	**3,623**	**23,416,978**	**42,584**
2010	*City of El Paso, International Bridges*	*4,912,671*	*331,970*	*0*	*3,483,120*	*0*	*5,684,952*	*656,569*	*1,052*	*9,139,351*	*27,253*
2010	Bridge of the Americas	**	**	**	**	**					
2010	Ysleta-Zaragoza Bridge*	564,291	331,970	0	2,243,656	0					
2010	Stanton*	1,053,873	0	0	1,239,464	0					
2010	Paso Del Norte*	3,294,507	0	0	0	0					
2010	Tornillo-Guadalupe						43,952	0	0	322,697	0
2010	Santa Teresa						120,734	86,769	0	478,100	321
	2010	**4,912,671**	**331,970**	**0**	**3,483,120**	**0**	**5,849,638**	**743,338**	**1,052**	**9,940,148**	**27,574**
2005	*City of El Paso, International Bridges*	*5,569,782*	*306,406*	*0*	*4,745,048*	*0*	*4,562,002*	*749,274*	*1,918*	*13,287,557*	*16,362*
2005	Bridge of the Americas	**	**	**	**	**					
2005	Ysleta-Zaragoza Bridge*	0	306,406	0	3,196,498	0					
2005	Stanton*	1,596,194	0	0	1,548,550	0					
2005	Paso Del Norte*	3,973,588	0	0	0	0					
2005	Tornillo-Guadalupe						14,786	0	0	467,628	0
2005	Santa Teresa						16,408	39,961	0	277,194	80
	2005	**5,569,782**	**306,406**	**0**	**4,745,048**	**0**	**4,593,196**	**789,235**	**1,918**	**14,032,379**	**16,442**
2000	*City of El Paso, International Bridges*	*5,503,418*	*349,096*	*0*	*5,329,706*	*0*	*7,171,838*	*761,890*	*1,010*	*13,855,064*	*8,915*
2000	Bridge of the Americas	**	**	**	**	**					
2000	Ysleta-Zaragoza Bridge*	0	349,096	0	3,181,311	0					
2000	Stanton*	1,535,917	0		2,148,395	0					
2000	Paso Del Norte*	3,967,501	0	0	0	0					
2000	Tornillo-Guadalupe						19,505	177	0	468,503	0
2000	Santa Teresa						3,312	24,355	0	79,092	38
	2000	**5,503,418**	**349,096**	**0**	**5,329,706**	**0**	**7,194,655**	**786,422**	**1,010**	**14,402,659**	**8,953**
1996	*City of El Paso, International Bridges*	*4,615,409*	*284,019*	*0*	*4,807,929*	*0*	*4,035,389*	*609,550*	*851*	*12,642,867*	*4,984*
1996	Bridge of the Americas	**	**	**	**	**					
1996	Ysleta-Zaragoza Bridge*	72,751	284,019	0	2,567,362						
1996	Stanton*	1,314,558	0	0	2,240,567	0					
1996	Paso Del Norte*	3,228,100	0	0	0	0					
1996	Tornillo-Guadalupe						25,292	124	0	551,112	0
1996	Santa Teresa						315	19,978	0	71,032	0
	1996	**4,615,409**	**284,019**	**0**	**4,807,929**	**0**	**4,060,996**	**629,652**	**851**	**13,265,011**	**4,984**

Northbound Traffic: Source: https://www.bts.gov/content/border-crossingentry-data
Southbound Traffic: Source: POE bridge operators, requests have been submitted via email and voicemail to the other POEs as of 4/12/2019
*Source: City of El Paso, International Bridges = Ysleta + Stanton + Paso del Norte bridges annual counts. MPO Website for Northbound travel.
**SB entrance to Mexico is not tolled or monitored heavily, therefore counts are not collected and are unknown.

APPENDIX F

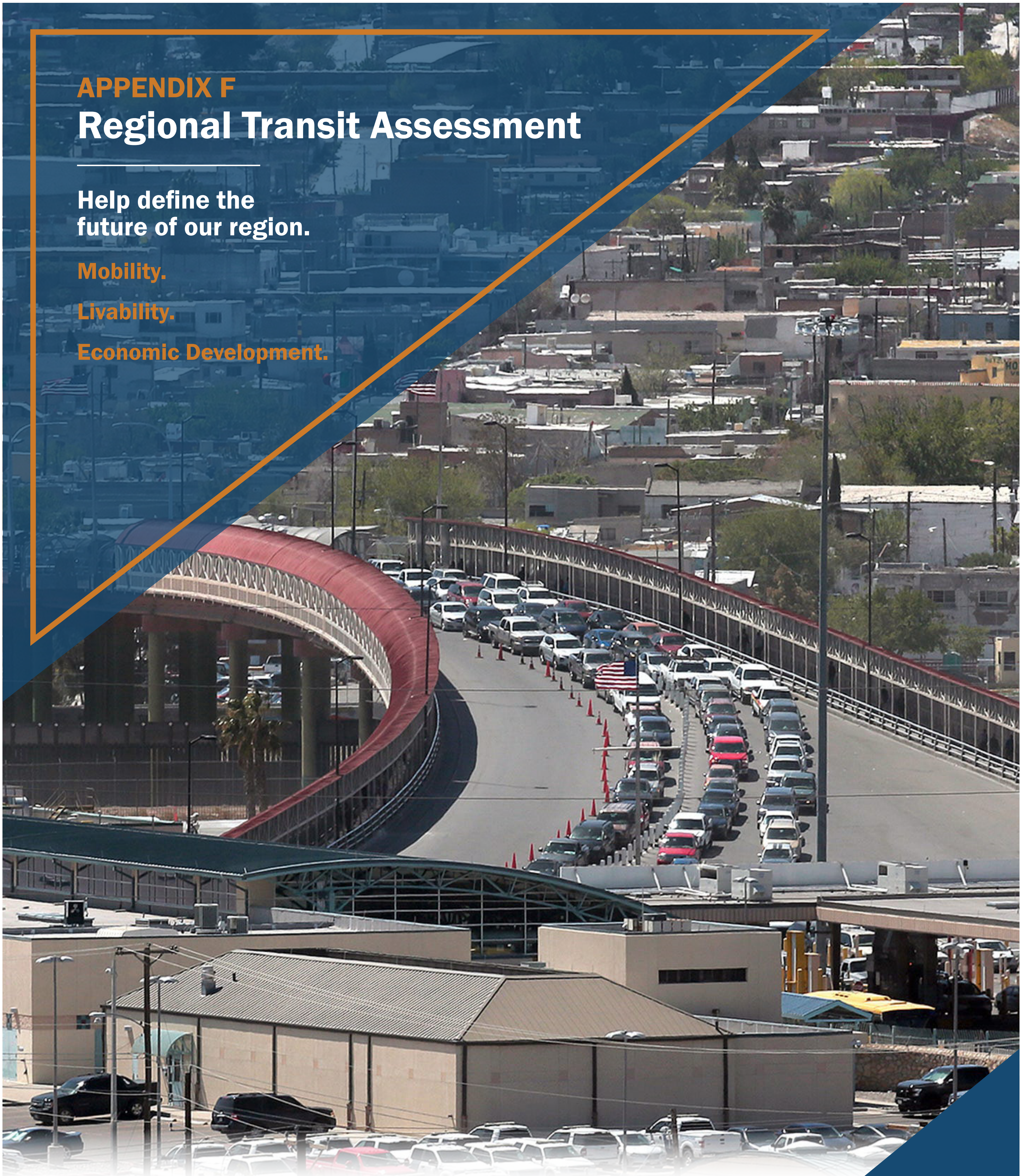
Regional Transit Assessment

Help define the future of our region.

Mobility.

Livability.

Economic Development.



El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

Contents

1.0 Public Transportation in the Borderplex Region

The purpose of this document is to conduct a planning-level assessment of current and future transit service needs based on input contributed by transit providers in the El Paso region and independent research of services available. The document discusses existing fixed-route, shared mobility and intercity transit options available in El Paso as well as some of the short, mid- and long-term opportunities that have been identified for enhancing the overall quality and attractiveness of the transit system. There is discussion about how the transit system and associated transit-supportive land uses can be an effective transportation solution to improve overall future mobility in the region and further opportunities that could be acknowledged as various partners in El Paso consider next steps.

1.1 Regional Growth and Connectivity

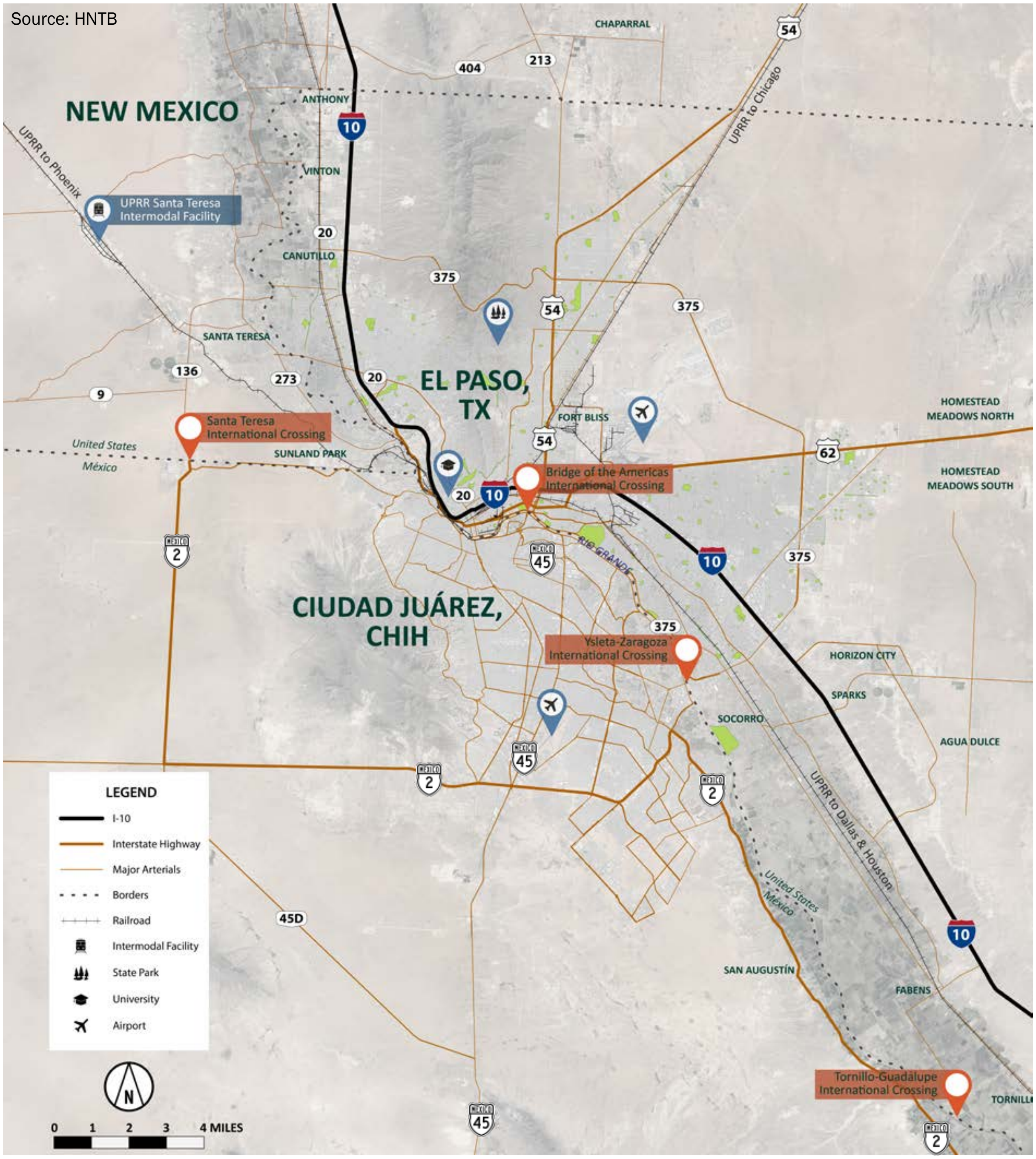
The City of El Paso is the county seat of El Paso County, Texas, located in the western-most corner of Texas. As of July 2018, the population estimate from the U.S. Census was 683,600, making it the 20th most populous city in the United States. According to the latest Metropolitan Transportation Plan forecasts, the regional population of El Paso is expected to grow to over 1.4 million people, which is about a 50% increase between 2012 and 2045. Much of this projected population growth is expected to occur in east and northeast El Paso as well as areas such as Sunland Park and Santa Teresa in New Mexico just west of El Paso.

Located on the Rio Grande, El Paso is just across the border from Ciudad Juárez, Chihuahua, Mexico. The two cities, along with Las Cruces, which is in the neighboring state of New Mexico, form a binational metropolitan area, sometimes referred to as El Paso–Juárez–Las Cruces Borderplex, with a regional population of over 2.7 million people making it the largest binational work force in the Western Hemisphere.

In addition to the border, the Franklin Mountains are located just north of central El Paso splitting west and northeast El Paso, and Fort Bliss occupies a large portion of El Paso County splitting northeast and east El Paso. With the border following the river southeast of El Paso, Mission Valley is another portion of the city located south of I-10. It is important to identify these specific portions of El Paso and their apparent geographic barriers because it effectively creates a series of almost three independent road networks, neighborhoods and employment centers that together create a unique urban form across the international border from another large metropolitan area.

One of the most commonly used measures for a transit system's effectiveness is ridership, which is essentially the number of individual, or "unlinked" trips that a route or the entire system carries per hour, day or year. Ridership as an output is a direct outcome of origins and destinations that are served and how convenient it is to serve the trips between them. Convenience can be measured by the frequency of a service and ease of access to it. Favorable ridership is sustained by the quality and reliability of the service experience.

Figure 1: Regional Mobility Strategy project area map



1.2 Overview of Public Transit Providers in the Borderplex Region

The primary public transit provider in the region on the U.S. side is Sun Metro, which is a Metropolitan Transit Department authorized by Chapter 453 of the Texas Transportation Code and owned by the City of El Paso. Most of Sun Metro's operational funding comes from a one-half cent sales tax, which amounts to approximately $44 million annually. Sun Metro also receives about $14 million in operating funds from the Federal Transit Administration and another $8 million collected from fares. Capital funds generally vary from year-to-year and come from a combination of local and federal sources.

The rural Transit provider in the region is El Paso County Transit, which is a Rural Transit District authorized by Chapter 458 of the Texas Transportation Code and owned by El Paso County. This is a much smaller operation than Sun Metro and receives the majority of its funding from Section 5311 Federal formula grants, which are specified for rural areas. These grants amount to about $1.6 million annually, while approximately $1.2 million in state and local funds are collected and about $700,000 is recovered through fares.

A third public transit provider operating on the New Mexico side of the border is the South Central Regional Transit District (SCRTD), which is a Regional Transit District authorized by Chapter 73, Article 25 of New Mexico Statutes and serves as a stand-alone governmental agency. Like El Paso County Transit, SCRTD is a rural transit provider offering connections to Sun Metro.

While there are also transit services available in Ciudad Juárez, this document does not go into detail about those services other than a brief discussion about the Bus Rapid Transit system there called ViveBús. There is currently no fixed-route public transportation connection between transit services in El Paso and Ciudad Juárez, though there are some bus options allowing people to travel between the two cities. There is an opportunity to establish an easier connection between rapid transit services available in both cities to better support opportunities available to people that depend upon traveling between the cities.

1.3 Transit Planning for the Borderplex Region

The most recently published comprehensive planning document associated with Sun Metro is the City of El Paso's plan from 2012 called *Plan El Paso*. This outlined the buildout of the Brio Rapid Transit System (RTS), implementation of regional Transit Centers and formal incentivization of Transit-Oriented Development (TOD) in conjunction with these investments. As these directives are being realized, some critical next steps include assessing how to better integrate local and county transit services and fare structures, consolidating access to intercity bus services downtown, studying the feasibility of extending the Streetcar, and improving the cross-border transit options between downtown El Paso and Ciudad Juárez.

Other opportunities for transit planning in the Borderplex Region include developing community-driven Station Area Plans for designated TOD locations, planning for further expansion or long-term improvement of the Brio system, finding ways to leverage potential investments that will be associated with TxDOT's *Reimagine I-10* initiative, and conducting a comprehensive operational analysis for the entire transit service area. The latter would help to determine if there are opportunities to re-appropriate resources to improve the most productive routes and integrate with County services in areas where it can be more effective than Sun Metro fixed-route service. There are also opportunities for incorporating technology and programming standard practices for improving data collection to supplement short-term decision making related to enhancing both the user experience and asset management.

2.0 Existing Fixed-Route Transit Network

The fixed-route bus network on the U.S. side of the Borderplex region is primarily operated by Sun Metro, though El Paso County Transit does operate a few fixed-routes as well. Most buses seen in El Paso operate on a fixed-route system. This type of service is simply defined by the transit route passing through a series of predetermined stops where riders can get on and off the bus on a regular schedule. Fixed-route services are generally classified as local, limited or express, which reflects the spacing of stops along the route.

Figure 2: Sun Metro Fixed-Route Bus

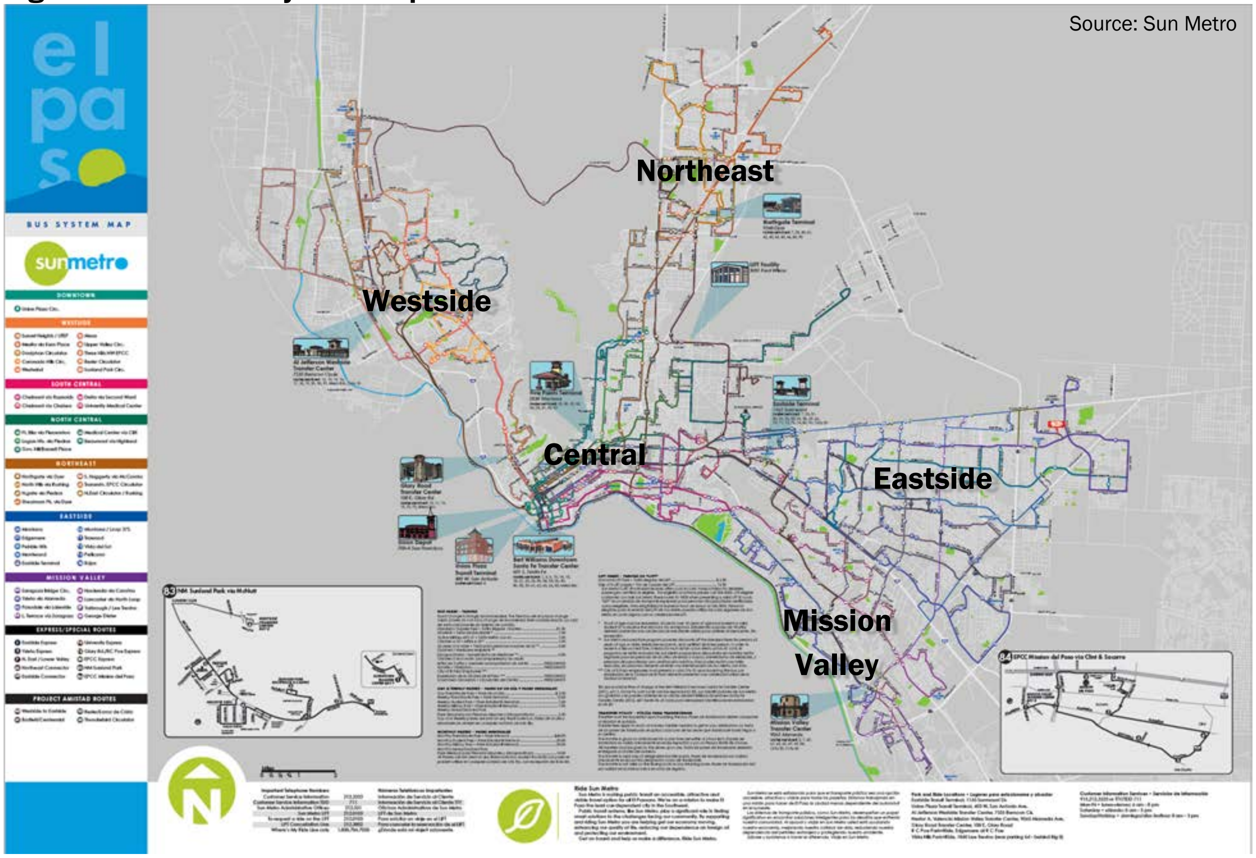
Local fixed-route is the most common transit service and often the backbone of a transit system, serving stops located anywhere from 2 blocks to a quarter-mile apart, while express is usually serving longer distance commuter trips between park & ride facilities and major employment centers with significant segments of the route often using the highway network. Fixed-route is primarily used in urbanized areas and is most effective in more densely populated areas with high travel demand. Fixed-route usage and the frequency of service are often tied closely together. Routes that serve their stops more frequently are usually in places where ridership can be expected to be higher. A fixed-route's ability to arrive at stops on time according to the published schedule makes it more predictable and therefore more reliable to the end user. Routes that carry more passengers per hour of operation are considered to be more productive. Their productivity is often used to determine whether a route requires more frequent service, less frequent service or whether resources should be reinvested entirely elsewhere in the system.

The components of the fixed-route network in El Paso include the standard bus network, Brio RTS, downtown Streetcar, rural transit routes and a series of passenger facilities that allow passengers to transfer between routes and services.

2.1 Sun Metro Bus Network

The Sun Metro Bus Network serves as the backbone for the regional transit network. Operating primarily within the City of El Paso, Sun Metro runs 62 routes, including 51 local bus routes and 9 express bus routes, as well as the Mesa Brio RTS route and downtown Streetcar (as of May 2019), which are discussed in more detail below. Local bus services are offered to the Westside, Eastside, Northeast, Mission Valley and North and South Central El

Figure 3: Sun Metro System Map



Paso. Sun Metro is also contracted to operate a bus route to Sunland Park. The transit system uses 35 feet and 40 feet buses as well as smaller "cut-away" vans (see Figure 8) for their fixed-route bus services, all of which are in compliance with the Americans with Disabilities Act (ADA). Local route frequencies range from every 15 minutes in busier areas to every 60 minutes in outlying areas, throughout the day. Express route frequencies range from every 20 minutes to 60 minutes during peak commute times only. Express routes currently use I-10 East, US 54 and parts of Loop 375.

2.2 Rapid Transit – Brio & ViveBús

In fall 2014, Sun Metro began operation of the Brio Rapid Transit System (RTS) service on Mesa Street (SH 20) between the Downtown Transit Center on Santa Fe Street and the Westside Transit Center on Remcon Circle. Mesa Brio is the first of four planned RTS routes in El Paso, which include uniquely branded 60' articulated buses and utilize signal priority along Mesa, allowing the bus to move through the corridor more reliably.

Figure 4: Sun Metro Brio RTS Bus

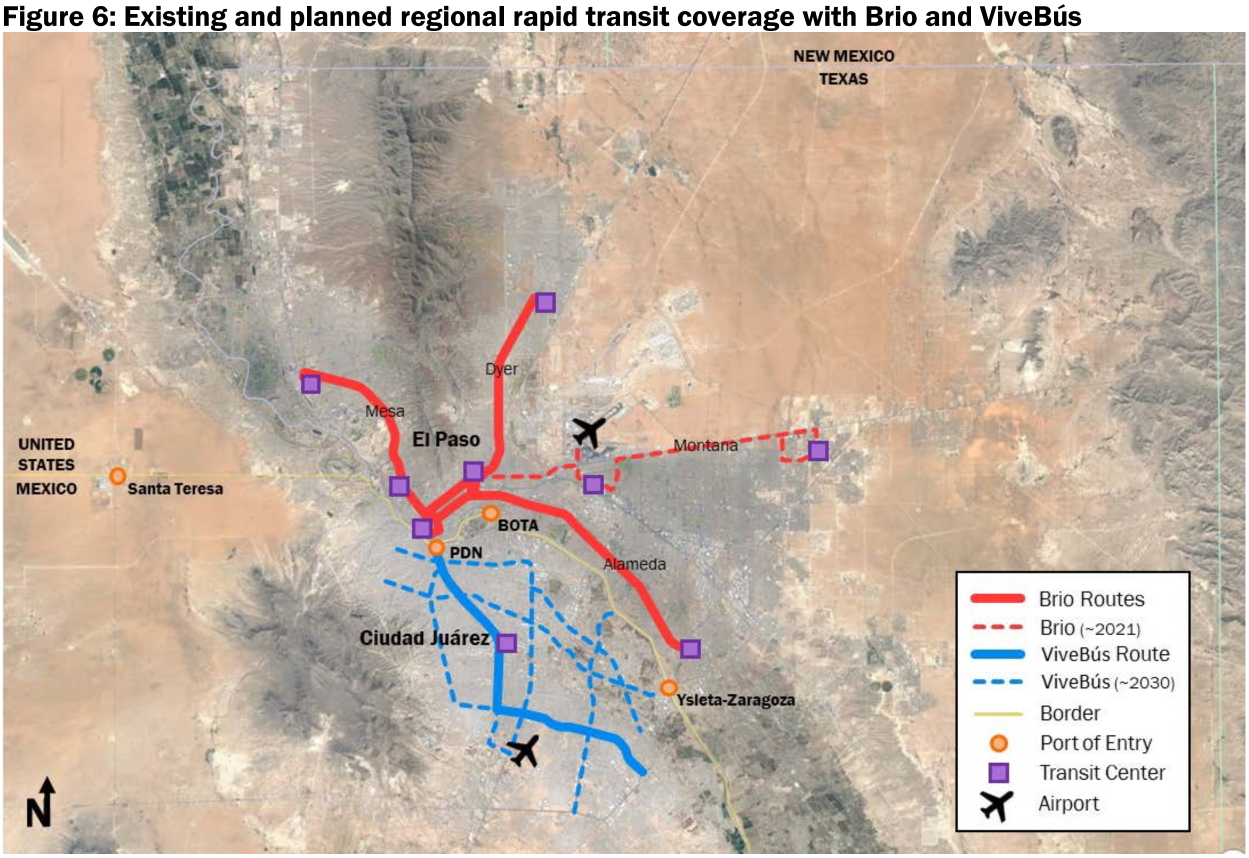
Brio-branded and landscaped stations located about a mile apart are served every 10 minutes during peak hours and every 15 minutes throughout the rest of the day. The Alameda and Dyer Brio routes will be the next in service, which are both expected to begin operation in 2019, to be followed by Montana Brio in 2021. When complete, the Brio RTS will provide a structure for frequent high-capacity service for the region that may be fed by the local bus and rural transit network as well as connect with intercity and cross-border transit services.

In late-2013, Ciudad Juárez began operation of the first route of its Bus Rapid Transit (BRT) system called ViveBús, running south from downtown along Avenida Francisco Villa and Vial Juan Gabriel, then continuing east along Bulevar Zaragoza and Calle Henequen to Bulevar Independenica. According to the 2016 Comprehensive Plan for Ciudad Juárez, there are five additional routes planned to be implemented by 2030. The second route will connect downtown Ciudad

Source: YoCiudadano

Figure 5: ViveBús BRT in Ciudad Juárez

Figure 6: Existing and planned regional rapid transit coverage with Brio and ViveBús



Source: HNTB

Juárez to the airport primarily using Paseo Triunfo de la Republica and Avenidas Tecnológico. The system is being planned in coordination with feeder bus routes operated by another transit provider called INTRA as well as a comprehensive bike network. ViveBús operates in fully dedicated lanes down the center of city streets. The primary downtown station served by ViveBús is adjacent to the Paso del Norte port-of-entry, while the station at Calle Henequen and Bulevar Independencia is located about five miles south of Sun Metro's Mission Valley Transit Center through the Ysleta-Zaragoza port-of-entry.

2.3 El Paso Streetcar

In November 2018, the El Paso Streetcar began carrying passengers from downtown up to Glory Road Transit Center near University of Texas at El Paso (UTEP). Two routes, a Downtown Loop and Figure-Eight Loop run on a single 4.8-mile track that operates in mixed traffic with an overhead electric wire that provides traction power to each Streetcar. These loops run on 10-15-minute and 25-30-minute schedules respectively throughout the day. Both loops provide access to Paso del Norte port-of-entry, several businesses and restaurants, Southwest University Park, government buildings, historic neighborhoods, while the Figure-Eight Uptown loop continues north to hospitals and UTEP among many other prominent locations. Improvements to the parallel bike and pedestrian networks as well as connection to the Mesa Brio and Sun Metro Bus Network make the Streetcar a potential Economic Development amenity for downtown El Paso.

Source: Downtown El Paso

Figure 7: El Paso Streetcar

2.4 Rural Fixed Route

El Paso County Transit runs five rural fixed routes serving communities in El Paso County outside of the City of El Paso, each connecting to one of three Sun Metro Transit Centers, and therefore, the Sun Metro Bus Network. While this service has a regular fixed schedule, there are no bus stops along these routes and passengers walking on the same side of the road can waive down an El Paso County Transit bus to get on board. These routes are served with "cut-away" vans. There are currently no additional fixed-route services in unincorporated El Paso County.

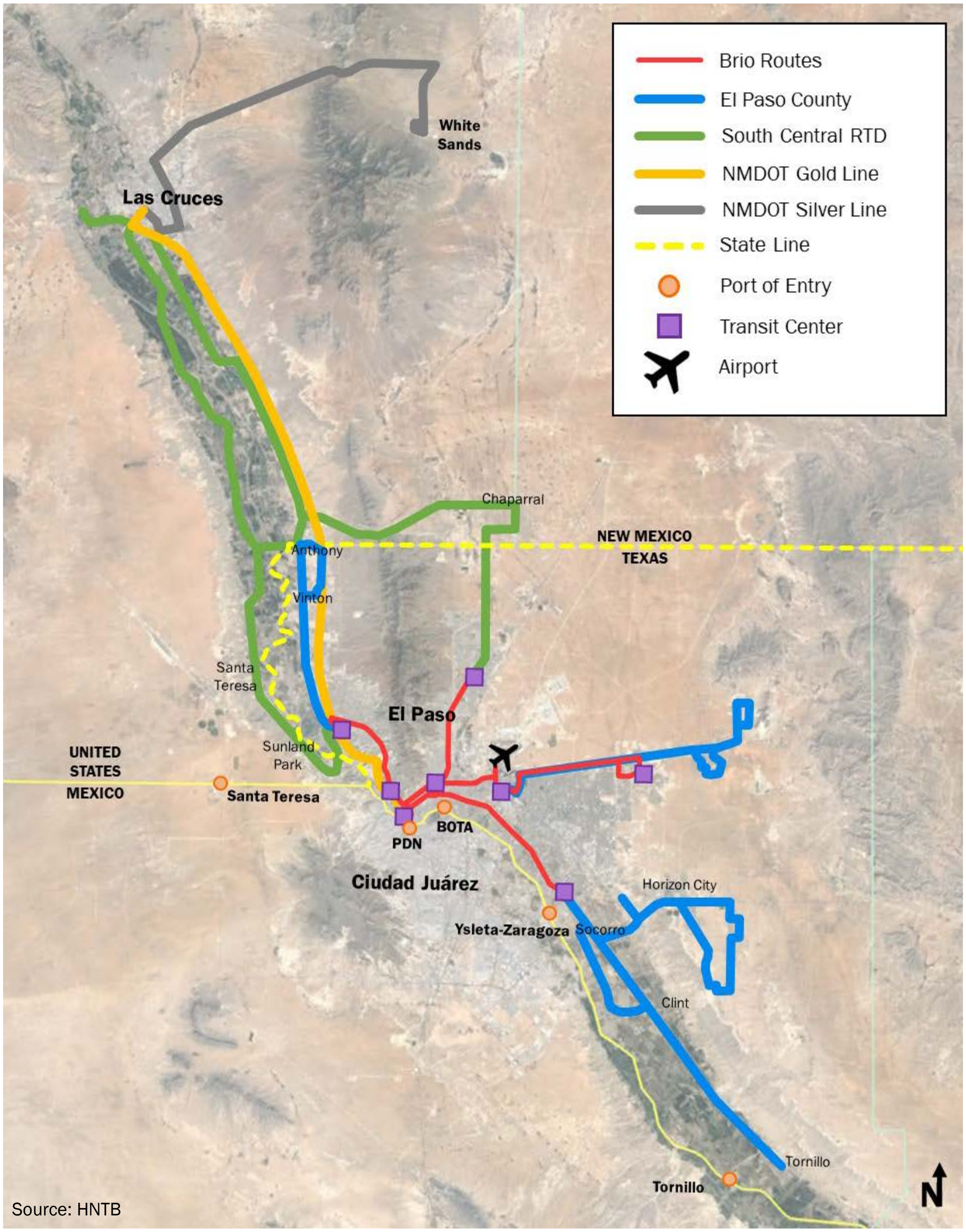
Source: El Paso County

Figure 8: El Paso County Rural Transit Bus

SCRTD operates four rural fixed routes making connections between Anthony, NM and Las Cruces, Sunland Park/Santa Teresa and Chaparral. The Sunland Park/Santa Teresa and Chaparral connections offer continued service to Sun Metro's Westside and Northgate Transit

Centers respectively, while the two routes to Las Cruces both serve the Mesilla Valley Intermodal Transit Terminal. SCRTD offers critical connections for people in these communities to have access to jobs, services, retail and amenities in El Paso and Las Cruces. Like El Paso County Transit, SCRTD serves its routes with "cut-away" vans.

Figure 9: Rural Fixed Route and Commuter services in relation to Sun Metro Brio/Transit Centers



2.5 Transit Centers

Key components of the existing fixed-route transit network are the seven Sun Metro Transit Centers located throughout the City of El Paso. Transit Centers are typically centrally located passenger facilities in different parts of the service area that provide an opportunity for several bus routes to stop within a comfortable walk distance from one another, offering passenger amenities and opportunities for transit supportive land uses to be located in proximity to this level of transit service. Unlike typical bus stops that are located curb-side along the street, Transit Centers are located off-street on their own property. This allows Sun Metro to better program bus routes to allow for operator breaks and recovery time for the set schedules of each route. Most of Sun Metro's Transit Centers offer free parking for passengers that park & ride and offer customer service amenities such as transit fare sales, restrooms and free WiFi. Four of Sun Metro's Transit Centers also offer connections to rural fixed routes operated by El Paso County Transit and SCRTD.

Source: El Paso Inc.

Figure 10: Westside Transit Center on Remcon Cir.

3.0 Shared Mobility Services

Shared Mobility Services available in El Paso County include both public and private options. This type of service can be broadly defined as transportation services and resources that are shared among users, either concurrently or one after another including public transit, ridehailing services, bikesharing, scooters and vanpools. Some rides are scheduled in advance, while others are available on-demand, typically through a mobile application. Shared Mobility services do not operate on fixed routes or schedules. Service types in this category that are scheduled such as Sun Metro LIFT paratransit services vary from day to day and time of day. Other types of scheduled services like vanpools or carpools are arranged by drivers and riders ahead of time, usually with a regular meeting location where riders can park their cars before making the remainder of their trip by van or another person's car.

On-Demand services are accessed at a moment's notice when the user requires a ride to either complete the final leg of a trip or to make a complete trip. Ridehailing services such as Taxis, Uber and Lyft may be accessed with a phone call or through a mobile application. Bikeshare and Scooters are on-demand mobility resources accessed at a docking station similar to B-cycle or through a mobile application. These options are typically used to complete the final leg of a trip or to make a short trip within a certain area.

3.1 Sun Metro LIFT Service

The LIFT is a scheduled paratransit service operated by Sun Metro for ADA paratransit-eligible clients. This service provides origin to destination (curb-to-curb) transportation using small ADA accessible buses and regular passenger vehicles through contracted service. All LIFT operators are specially trained to be aware and sensitive to accommodation of a wide range of persons with disabilities. The LIFT shares similar hours of operation that are offered by Sun Metro for fixed-route bus services and covers the entire City of El Paso as well as extending ¾ mile beyond any fixed route bus stop.

Figure 11: The LIFT

3.2 Ridehailing and Bike Share Services

Ridehailing services such as Taxis, Uber and Lyft are available in El Paso County on-demand. While Taxi service is typically available by waiving down a taxi or calling a dispatcher, services like Uber and Lyft use online platforms to connect passengers with drivers who use personal, non-commercial, vehicles. This type of service has become the most common form of shared mobility across the country and even internationally.

Non-motorized resources such as e-scooters and bikes are becoming common forms of personal shared mobility options as well. E-scooters have only recently been introduced in El Paso (April 2019), though there has been a bike share program available through SunCycle (El Paso B-cycle) for some time. This system can be accessed through any one of the 16 SunCycle stations located in downtown El Paso and throughout parts of the westside near UTEP. Bikes can be checked out at these locations and checked back in at any other SunCycle station.

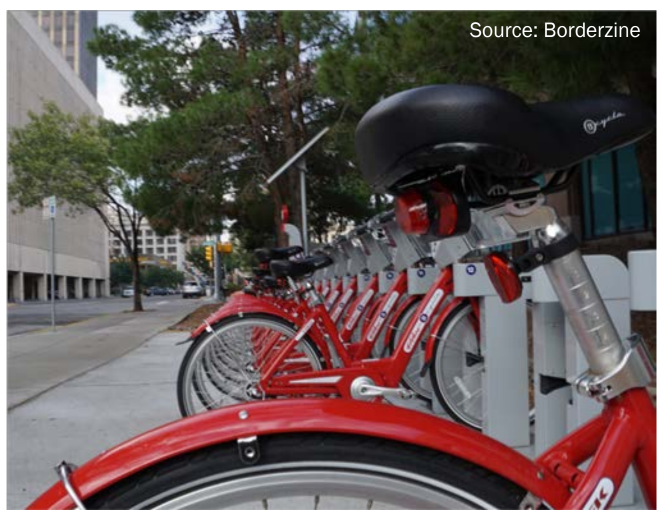


Figure 12: SunCycle Station in downtown El Paso

Bikesharing has the potential to play an important role in bridging some of the gaps in existing transportation networks, as well as encouraging individuals to use multiple transportation modes. Potential bikesharing benefits include: increased mobility, lower transportation costs and health benefits. Ridehailing companies such as Uber and Lyft have begun to branch out into scooter and bikesharing to reduce cost for shorter trips and expand their overall market footprint.

3.3 Vámanos Vanpool

Sponsored by El Paso County Transit, Vámanos Vanpool is a ridesharing platform available to residents of El Paso County that provides them with an option to travel to and from work while saving on daily commuting costs. Vans are provided through a partnership with Enterprise, a car rental company that often partners with public transit providers for Vanpool services. One of the Vanpool users will drive for a discount, while the other users drive or ride to a location where the van is parked and share a ride in the van for a nominal fee for the remainder of their commute. Vámanos Vanpool has been relatively successful in El Paso with many users sharing rides to jobs at U.S. military bases and ports-of-entry in the Borderplex region among other employment centers. Vanpool trips may be entirely within El Paso County or to employment centers in New Mexico. The majority of this service is paid for by the user or their employer, while the rest is covered using public Congestion Mitigation and Air Quality (CMAQ) funds.

Figure 13: Vámanos Vanpool

4.0 Intercity Services

Intercity services offering connections to El Paso and the Borderplex region are both public and private/for-profit. On the public authority side, the New Mexico Department of Transportation (NMDOT) operates the Gold Route intercity bus between El Paso and Las Cruces. For-profit intercity services include connections primarily through Amtrak rail services at El Paso Union Depot on San Francisco Avenue and through Greyhound bus services at the El Paso Bus Station on San Antonio Avenue. Additional private intercity bus services are offered through smaller operations from multiple independent locations in Downtown El Paso such as Americanos USA, Los Paisanos Autobuses, Omnibus Americanos, Tornado Bus Company and Los Angeles Limousine Express among others. Many of these bus lines including Greyhound, provide international connections between El Paso and destinations in Mexico. Another carrier based in Ciudad Juárez, Transborde, operates a service between several stops in Ciudad Juárez and El Paso, connecting to local bus services in both cities.

Intercity services carry passengers much longer distances than more localized fixed-route services. There are often just one or two stops in any city along a particular route compared to the dozens of stops within a city that may be served by local transit services. Many of these services may be considered a fixed-route operation since they often have a specific route serving the same stops on a regular schedule. Frequency of these routes can range from hourly to once-a-day or even just a couple departures per week.

4.1 New Mexico Department of Transportation (NMDOT) Gold Line

NMDOT operates six commuter bus routes in northern New Mexico serving connections from Santa Fe and Albuquerque to surrounding cities. Similarly, NMDOT operates two commuter bus routes in southern New Mexico serving connections from Las Cruces to White Sands Missile Range (Silver Line) and El Paso (Gold Line). The Gold Line runs on a regular schedule, departing every 60-90 minutes during both the AM and PM peak hours every weekday, serving the Mesilla Valley Intermodal Transit Terminal and New Mexico State University in Las Cruces as well as a stop in Anthony, Texas, the El Paso Westside Transit Center on Remcon Circle and the El Paso Downtown Transit Center, making direct connections to local transit services in El Paso and Las Cruces, and the Silver Route connecting to White Sands Missile Range (see Figure 9).

Figure 14: NMDOT Park & Ride Bus

4.2 Private/For-Profit Services

Amtrak is a national government-owned, for-profit passenger rail carrier that offers service in Texas and many other parts of the country by operating on freight rail rights-of-way through contracted trackage rights. Amtrak is the only passenger rail service available from El Paso and can be accessed through El Paso Union Depot on San Francisco Avenue. The Sunset Limited and Texas Eagle Routes both offer service between Los Angeles, California and San Antonio via El Paso. The Sunset Limited continues from San Antonio to Houston and New Orleans, Louisiana, while the Texas Eagle continues on to Dallas, St. Louis, Missouri and Chicago, Illinois. Amtrak also operates a connecting bus service from El Paso Union Station to Las Cruces and on to Albuquerque, New Mexico. In total, El Paso Union Station offers access to trains headed in each direction, three times per week.

Figure 15: El Paso Union Depot

Greyhound Lines is a private bus carrier that operates nationwide with partner carriers serving routes into Canada and Mexico. Several routes either pass through or originate in El Paso with service from El Paso Bus Station on San Antonio Avenue in downtown. Routes passing through El Paso include multiple routes with connections from Los Angeles to Dallas and Los Angeles to San Antonio, connecting to different destinations on the way. Routes originating in El Paso offer service to Denver, Colorado, Phoenix, Arizona, Amarillo, Lubbock, and San Antonio. International connections into Mexico from El Paso are served through smaller partner carriers, and require a transfer in Ciudad Juárez, though fares are integrated through Greyhound's website or ticket counter. El Paso Bus Station serves several Greyhound bus routes per day, seven days per week.

Source: Roadside Architecture

Figure 16: El Paso Bus Station

4.3 Cross-Border Transit Service

Americanos USA is the primary Greyhound partner carrier offering international connections from El Paso. This carrier also offers service to Dallas. Other private bus carriers such as Los Paisanos Autobuses, Omnibus Americanos, Tornado Bus Company and Los Angeles Limousine Express among others offer limited service from El Paso to other cities in the U.S. and Mexico. Americanos USA has its own bus station on Santa Fe Street near the Paso Del Norte port-of-entry that it serves in addition to El Paso Bus Station. Other carriers have their own locations in and around downtown El Paso. Carriers in addition to these such as Autobuses Expreso Futura and Transportes Chihuahuenses offer a wider range of connections throughout Mexico from Ciudad Juárez.

Source: El Sol de Hermosillo

Figure 17: Central de Autobuses Ciudad Juárez

Transborde is a bus service based in Ciudad Juárez that offers local fixed-route services between locations in El Paso and Ciudad Juárez seven days a week every 30-60 minutes. These routes connect locations in Ciudad Juárez such as the Airport, U.S. Consulate, Bus

Station and downtown with locations in El Paso such as the Airport, Cielo Vista Mall, Bassett Place Mall, and several points of interest and private bus stations in downtown as well as Sun Metro's Downtown Transit Center. Fares for Transborde range from $2 to $20 depending on how far a passenger wishes to travel along a given route.

Currently, when any bus is crossing the border between the U.S. and Mexico, passengers are required to get off the bus with their belongings at the border to have their passports, tickets and belongings checked, then get back on the bus to continue along their route. While necessary and consistent with any other cross-border travel, this requirement makes the trip by bus cumbersome and could include delays at ports-of-entry depending on wait times.


Source: Reuters

Figure 18: Transborde bus crossing the border

5.0 Planning for the Future

El Paso and the Borderplex Region have experienced much growth and prosperity in the last decade. This has been marked by population growth, a growing binational economy, increasing job and retail opportunities and investment in transportation and development. Related specifically to transportation, many large capital projects have been implemented, are under construction or on the horizon in the Borderplex. In step with many major cities across the United States, El Paso is investing in itself and beginning to diversify the range of mobility options available to its residents.

Related more specifically to the regional transit network, Sun Metro is in the process of building out the Brio RTS network that will have all four of the initial lines operational by 2021. El Paso County Transit has recently completed a study that is proposing action for expanding the footprint of rural transit services to cover all of El Paso County. The El Paso Streetcar has begun operation in downtown serving as a central city circulator and an improvement to the many emerging pedestrian-focused amenities found in downtown and the near westside.

Some critical next steps include figuring out how to integrate metropolitan and rural public transit services into a seamless fare and trip planning system to the end user, looking for a way to consolidate access to intercity bus services downtown, determining how and whether to expand on the initial investment in Streetcar, and improving the experience and quality of cross-border transit options between downtown El Paso and Ciudad Juárez.

5.1 A Seamless Transit Network

As part of a recent Regional Transit Study commissioned by El Paso County Transit, alternative scenarios for reconfiguring rural transit services were evaluated, and options for integrating

Source: Sun Metro

Figure 19: Farebox transaction on Sun Metro

these services into the existing Sun Metro fixed-route network were identified for further consideration. While El Paso County adjusted its fare structure to match that of Sun Metro in 2017, fare collection for both systems remains separate and apart. Residents of El Paso County are currently able to board one of five El Paso County Transit routes and connect to the Sun Metro fixed-route network at the Westside Transit Center on Remcon Circle, Eastside Transit Center on Sunmount Drive or Mission Valley Transit Center on Alameda Avenue. To do this, when boarding an El Paso County Transit Bus, the passenger will pay a fare with exact change then ride to one of these three transit centers. While convenient to physically transfer from an El Paso County bus to a Sun Metro bus, the passenger will then pay another whole fare, rather than a transfer fee, again, with exact change. Monthly passes for El Paso County Transit are available by mail or by going to their main offices located in downtown El Paso on Overland Avenue. Monthly Passes are also available for Sun Metro services at five ticket offices across the service area or at any ticket vending machine (TVM) located at one of seven transit centers or any Brio station. Monthly passes have the benefit of giving a passenger access to unlimited rides on the entire system for the whole month, allowing them to realize a cost savings compared to purchasing an individual fare for each ride. Under the current arrangement however, a passenger using both systems would need to purchase a monthly pass for each system.

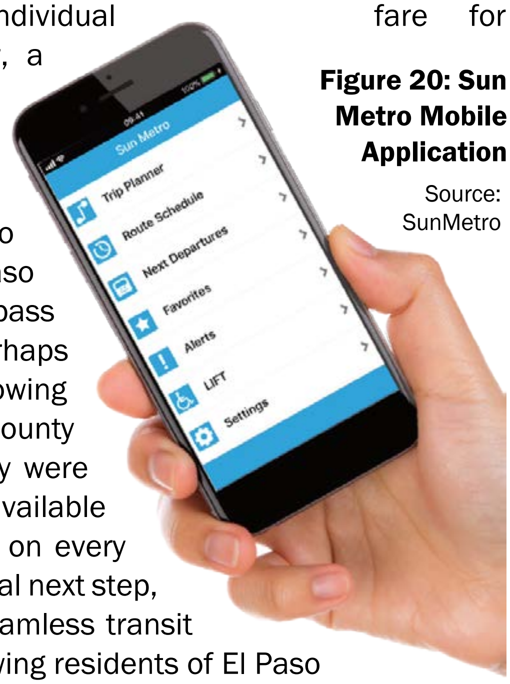


Figure 20: Sun Metro Mobile Application

Source: SunMetro

A seamless transit network for El Paso would mean that fareboxes on El Paso County Transit and Sun Metro buses would be the same, as would those on the El Paso Streetcar downtown. There would be a single monthly pass available across the Sun Metro service area and perhaps other partner retail outlets across the county allowing passengers to access unlimited rides throughout the county for the entire month, regardless of which service they were using. Day and Week passes that are currently available through Sun Metro bus fareboxes would be available on every vehicle in the system. A mobile ticketing option is a logical next step, which Sun Metro has already begun to evaluate. A seamless transit network would employ a single mobile application allowing residents of El Paso

County to access the system, schedule rides for public shared mobility services and pay fares accordingly directly from their smart phone or mobile device. Many of these platforms deployed across the country are set up to expand their functionality further into parking or private shared mobility services when launched or at some point in the future.

While it sounds simple enough to coordinate bus routes and schedules between services and systems and use similar hardware and applications to integrate the fare structure or track where your bus is located on a map in real time, this is actually quite complex since each individual service operates under a separate funding structure. Fare systems are the backbone of a system's revenue stream as it relates to the end user. Separate financial structures and reporting obligations related to each system must either be integrated under a single entity or formalized by agreement between the agencies involved. Integrating the fare structure is an achievable objective without having to undo the current authority in place for an entirely new one. An option being given consideration for facilitating a seamless county-wide transit system is to establish a Local Government Corporation (LGC) between multiple political subdivisions such as Sun Metro, the City of El Paso and El Paso County. There may be the need to include other partners in such an endeavor, though a governance, financial and operational structure will all need to be developed, finalized and agreed upon. El Paso County Transit has taken some of the first steps toward exploring the feasibility of this type of arrangement with potential partners.

5.2 Sun Metro Plans

While Sun Metro continues to complete the build-out of its Brio RTS network over the next three years, they also continue to explore short-, mid- and long-term opportunities to improve and expand public transit services further in El Paso. In the short-term, Sun Metro is in the process of making improvements to its bus stops by adding shelters and benches as well as ADA accessible connections to the overall pedestrian network. While doing this, Sun Metro is also exploring options and reviewing requirements for generating advertising revenue by wrapping buses and selling ad space on new benches, on buses and at shelters.

Figure 21: New Sun Metro shelter

In the mid-term, Sun Metro will be studying the feasibility of extending the Streetcar system beyond downtown El Paso. One of the potential options for doing so that is currently under consideration is to make a connection approximately 3.5 miles to the east of downtown to the Medical Center of the Americas area. Some of the challenges associated with this include determining which right-of-way would be most appropriate to use for such an extension and how to pay for its construction and ongoing operation.

Another mid-term initiative is to study the feasibility of building a new downtown terminal where passengers would have access to most, if not all intercity bus services as well as the Sun Metro system. One of the potential options for accomplishing this is to identify a site adjacent to the current Sun Metro Downtown Transit Center near the intersection of Santa Fe Street and Paisano Drive. This location is approximately a half-mile north of the Paso del Norte port-of-entry as well as just over a half-mile southeast of El Paso Union Depot. Such a facility would need to be designed in coordination with the multiple intercity bus carriers currently offering service to downtown El Paso including Greyhound. Each carrier would likely require berths for parking buses and passenger boarding as well as space inside a passenger facility for ticket sales, baggage check/claim and general customer service. This study would need to explore passenger amenity needs, security requirements and potentially considerations for U.S. Customs infrastructure. Like the Streetcar extension, a consolidated terminal would need to have a funding source identified for its construction and ongoing operation.

As more of a long-term initiative, Sun Metro would like to explore options for how to offer service across the border into Ciudad Juárez, making a direct connection to transit services in that city. This could include a direct connection to the proposed Downtown Terminal or another extension of the existing Streetcar service across the border. Due to the complications associated with cross-border operations however, a wide range of options would likely be included for consideration including Bus Rapid Transit, an Automated People Mover and even an Aerial Tram or Gondola system for delivering passengers directly between transit centers in both cities. This will have customs requirements, construction and operations implications as well as demand for precious right-of-way in both downtowns and at a port-of-entry if not requiring a dedicated border crossing itself.

5.3 El Paso County and TxDOT

While Sun Metro continues to develop plans for improving and expanding public transit services in El Paso, El Paso County Transit and TxDOT are also exploring ways to support an improved transit system for residents of El Paso County. The County recently completed a Regional Transit Study that evaluated alternative scenarios for reconfiguring rural transit services including relative costs and considerations for expanding fixed-route services, deploying flexible route services and implementing "dial-a-ride" services throughout El Paso County. Preferred scenarios include deploying additional routes, though converting them from fixed-route to flexible routes (flex service) and implementing a new dial-a-ride service on-demand to cover the remainder of the County.

Where fixed-route service involves a transit route making a series of predetermined stops on a regular schedule, flex service also includes a regularly scheduled route, though the bus will deviate from its route according to requests for service made in advance. Dial-a-ride service is essentially shared mobility on-demand that would not have any predetermined schedule or route, offering service to all parts of El Paso County that are not served by fixed or flex route services. In order to operate, both flex service and dial-a-ride require the support of technology and back-end infrastructure for communications, scheduling, and dispatch. These services would increase the overall cost of rural transit services, which would need to be covered in large part by new local government funding sources. El Paso County Transit has begun taking the first steps toward moving in this direction. They will need to secure funding commitments to begin offering this type of service. These discussions are also closely related to and need to be coordinated with those surrounding how to implement a seamless transit system for the residents of El Paso County.

TxDOT is currently conducting an advanced planning study for the I-10 corridor to analyze and evaluate current and future transportation needs along I-10 in El Paso. This study is called *Reimagine I-10* and meant to reimagine how the corridor operates today to develop unique mobility solutions for the El Paso area. As part of this study, TxDOT is considering a reconfiguration of the I-10 right-of-way through downtown El Paso from Santa Fe Street to Campbell Street. In this location, the Interstate is depressed with seven city streets crossing overhead including Santa Fe and Campbell. A possible option TxDOT is considering in this location would remove each of the seven bridges except for Oregon Street and Stanton Street, which is where the Streetcar crosses I-10. The Santa Fe and Stanton bridges would likely be replaced by turnarounds that would be part of a larger frontage road system for this part of downtown, leaving the space above the interstate available for several opportunities that may include potential greenspace or future transit infrastructure.

Figure 22 – Reimagine I-10 Downtown Segment – "Full Deck Concept"

Source: TxDOT

6.0 Transportation and Development

Historically, transportation improvements have been primarily informed by the supply of traffic capacity necessary to directly address current and expected roadway congestion. This approach provides little consideration for factors that influence travel demand such as trip distance between origins and destinations or availability of reliable mobility options in addition to the single-occupant car. The demand for driving is enabled when neighborhoods, jobs and retail are clustered in separate locations too far apart to walk. There is a direct relationship between how cities are organized and the necessary infrastructure to facilitate mobility between the locations to and from where people travel. In 2012, the City of El Paso adopted a comprehensive plan called *Plan El Paso*, which discusses approaching better land use policy as a transportation strategy. Principles such as density of people and land uses, mix of land uses, pedestrian-oriented design and overall walkability of the built environment help to support and facilitate making travel options other than driving more feasible.

While land development is typically a private, market-driven investment, public institutions like the City can regulate and influence those outcomes through land use policy and by committing to permanent capital investments in public realm amenities such as parks, open spaces, streetscape improvements and pedestrian safety enhancements. By prioritizing urban and even civil design to fit the pedestrian, automobile and transit travel will be safer and more convenient. The convenience comes with bringing origins and destinations closer together to reduce trip distance and by simplifying wayfinding, while diversifying travel options.

Through comprehensive planning initiatives like *Plan El Paso*, the City can have an informed dialogue with residents, and understand how best to coordinate investment in private land development public infrastructure and affordable housing near transit. Economic development occurs when there is a strong economy and available work force but can be realized more easily when there is a concerted effort to purposefully align public and private development priorities.

6.1 Downtown Revitalization

The revitalization of downtown El Paso has picked up over the last 10 years and continues to gain momentum with the renovation of some of the city's most architecturally significant historic buildings into office space, hotels and apartment lofts, as well as the introduction of new projects such as the Marriott Courtyard and WestStar Tower. Many prominent buildings remain dormant, leaving capacity for further development of downtown. The City of El Paso continues investing in downtown through tax incentives and public works projects.


Source: Southwest University Park

Figure 23: Southwest University Park

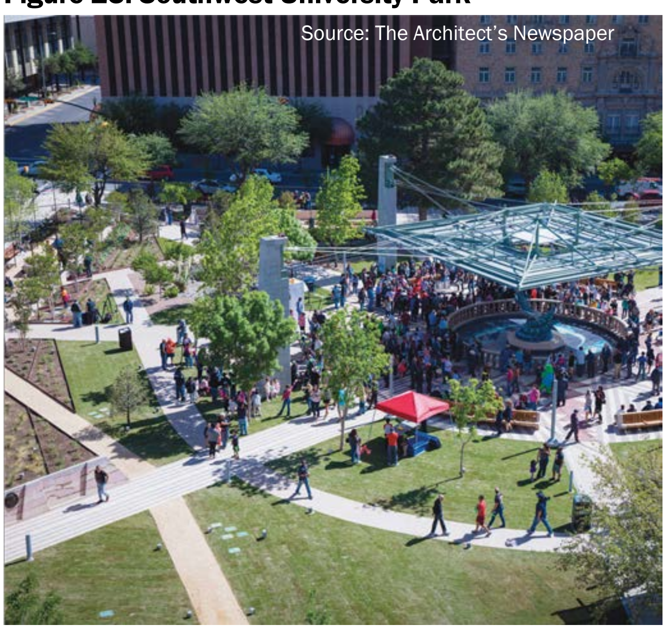

Source: The Architect's Newspaper

Figure 24: Renovated San Jacinto Plaza

City investments include the construction of Sun Metro's Downtown Transit Center in 2009, followed by the construction of Southwest University Park baseball stadium in 2014 and the renovation and reopening of San Jacinto Plaza in 2016. Most recently, El Paso completed construction and began operation of the El Paso Streetcar in late-2018. As El Paso continues to invest in permanent capital improvements to public realm amenities such as these, more investment in private development continues with even more on the horizon.

Other opportunities could be realized alongside continued investment in transportation infrastructure such as the potential reconfiguration of the downtown segment of I-10, associated with *Reimagine I-10* or by consolidating intercity bus services at a central downtown bus terminal. By making purposeful investments in the public realm in coordination with private investors, the renewal of El Paso's downtown will continue to flourish.

6.2 Plan El Paso

In 2012, The City of El Paso adopted *Plan El Paso* after two years of development, which included substantial public engagement and discussion of City priorities. *Plan El Paso* was declared *America's Best Smart Growth Plan* by the National Resources Defense Council and won the *National Award for Smart Growth Achievement* from the Environmental Protection Agency in 2011. The plan proposes strategies to bring more of the activities of daily living within walking distance and establishes a framework for developing a more diverse transportation network to include the development of transit and bicycle systems. *Plan El Paso* also recommends that revitalization focus efforts on leveraging El Paso's existing stock of homes, neighborhoods, civic buildings, streets, and public spaces. It also recommends that additions to the built environment be functional and long-lasting while being pleasant and aesthetically attractive.


Source: Plan El Paso

Figure 25: Walkable Compact Mixed-Use Development

One of the main themes of *Plan El Paso* is to give priority to reinvestment in downtown first, as well as transit-supportive infill development, revitalization of older neighborhoods and supporting investment in balanced transportation options. Much of what has happened since the plan's adoption is consistent with these policy directives. Sun Metro and the City of El Paso have begun to invest in infill development near transit centers. This type of investment as well as the prioritization of walkability improvements will need to continue around Brio stations and along the Streetcar line. A lot has changed in the last decade since *Plan El Paso* was first developed. While that plan has been effective as a guiding document for how the City prioritizes its investments, it is time to revisit how transportation and land use can grow together and revisit the prioritization of actionable objectives and tactics in a more contemporary context.

6.3 TOD with Sun Metro

One of the strategies for improving future transportation conditions identified in *Plan El Paso* is to employ more compact, mixed-use land uses in conjunction with public transit and pedestrian-friendly infrastructure investments. More specifically, the plan discusses the implementation of the four Brio RTS routes and a series of transit centers as key components of the transit system and as an organizing framework for establishing TOD communities throughout the city.

As a first step toward implementing this component of the plan, Sun Metro has established the Brio network, which is under construction as well as implementing most of the transit centers. As a critical follow-up action to this, the City of El Paso adopted a TOD Incentive Policy in May 2017, designating specific locations for where development incentives related to property and sales tax could be made available to potential investors. The purpose is to deliberately link higher-density, walkable neighborhoods to transit stations and corridors. In addition to being located within one of these designated areas, the proposed development project must incorporate a mix of land uses and follow mandatory design standards such as locating parking behind buildings and orienting principle building entrances toward the street. This type of development is designed to accommodate the pedestrian and bring activities of daily living within walking distance while supporting the development of a more diverse transportation network.

Source: Brian Wancho

Figure 26: Sun Metro Northgate Transit Center

Sun Metro and the City of El Paso have been working toward putting this policy into action within each of these designated areas and particularly adjacent to existing or future transit infrastructure investments. One example of TOD in El Paso is called Metro 31, which is located near the intersection of Dyer Street and Wren Avenue. At this location, Sun Metro has constructed its Northgate Transit Center, which opened in May 2018. While the transit center is operational, the 24-acre development is under construction. Northgate Transit Center is the future end of line for the Dyer Brio and anchors the public-private development, which is a mixed-use venture that will integrate residential, retail and commercial office spaces.

TOD is not only in line with the plan but can generate revenue for Sun Metro and the City. This happens when the City owns the property and leases it to the developer. In the case of Metro 31, the developer built and will maintain the parking structure, which Sun Metro riders can use for free. The cost of maintaining that structure is not the responsibility of Sun Metro, which is a cost savings, and Sun Metro will also control about 16,000 square feet of retail space that can generate additional lease revenue for the agency. This sort of approach can offset costs of investing in the transit network while promoting walkable communities and diversifying the overall transportation system.

7.0 Opportunities for a Regional Network

Having been nearly 10 years since beginning the development of *Plan El Paso*, a logical next step would be to prepare for updating this plan considering a lot has changed since then and many objectives and actions associated with its implementation have been completed or are under way. Revisiting the comprehensive plan can mean taking a fresh look at all parts of the plan or even drilling down further on specific components as a follow-up to the existing plan.

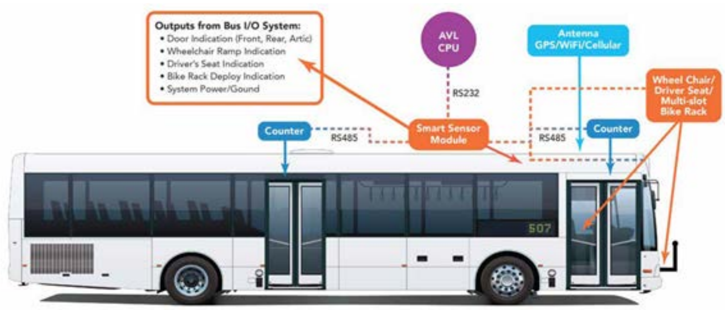
With the development of El Paso County's Regional Transit Study, an updated Metropolitan Transportation Plan and initiatives such as *Reimagine I-10* and the *Regional Mobility Strategy*, there are several opportunities to revisit the City's transportation ambitions and priorities. Even Ciudad Juárez updated its Comprehensive Plan in 2016, which might present opportunities for how to better coordinate cross-border travel in the region.

A critical piece that El Paso will need to consider is updating its data collection strategies and practices to have more readily available and up-to-date data to make the most informed decisions possible. El Paso is a unique city in the world. It is the largest binational community in the United States where the central business districts of both cities are right on the border, and one of the busiest ports-of-entry between the United States and Mexico. It is also surrounded by the State of New Mexico where there are smaller suburban and rural communities that depend on El Paso as a regional economic center. The considerations that El Paso faces when trying to make decisions are unlike any other place in the United States and therefore, must be much more flexible and creative when making decisions even just for a single jurisdiction such as the City of El Paso.

7.1 Data Collection for Transit

Some of the most useful data to a transit system include how many people are riding each route every day, where they get on and off the bus and how often, how people purchase fares and how often they use the service, who is riding, and where they are going to and coming from. This information helps transit providers determine how best to distribute their resources, how and who to market their services to and how to make the smartest use of their assets when delivering their services. There are many technologies now available that can allow transit providers to implement systems for capturing as much of this data as possible in real time or in regular intervals that allows them to make the most informed decisions possible and maximize the value of the ongoing service planning and adjustment cycle that all transit providers experience.

Some examples of these technologies include automated people counters (APCs) used to passively count how many people get on and off a bus at which locations, and mobile ticketing to monitor how people purchase fares and collect direct feedback from customers. Data collection strategies to understand who is riding and where they are going to and coming from include on-board origin-destination surveys or "who is the rider" surveys. By employing technologies that can collect data all day, every day and by programming comprehensive passenger survey methods into the regular business model, Sun Metro will be able to make more data driven short-term decisions that have the greatest impact on user experience and asset management.



Source: UTA Advanced APC

Figure 27: Advanced Automated People Counters

7.2 A Comprehensive Approach to Transit

While Sun Metro continues to implement the components of *Plan El Paso* such as the Brio RTS, Transit Centers and TOD, newer short-, mid- and long-term opportunities to expand the transit network have already been identified. These include expansion of the number of bus stops with shelters and seating, completing accessible sidewalk connections to bus stops, contemplating how and whether to extend the El Paso Streetcar, determining the feasibility of a consolidated downtown bus terminal for intercity services and exploring ways to make a direct connection into downtown Ciudad Juárez. Additionally, there is the possibility of establishing a partnership or new transit authority that could integrate the El Paso County Transit and South Central Regional Transit District systems with that of Sun Metro, facilitating a seamless fare collection system for transit across the county and even across state lines.

Other opportunities Sun Metro and the City of El Paso can consider include developing community-driven Station Area Plans for each of their TOD Incentive Areas addressing desired densities and priorities for building out pedestrian, bike and open space infrastructure in these locations to help leverage and further incentivize private investment. There are opportunities for a subsequent development phase of the Brio system that may include expansion or finding other ways to further improve service reliability for Sun Metro's rapid transit component. There is also a possibility that *Reimagine I-10* could provide opportunities such as dedicated or transit-priority lanes and some sort of priority configuration specifically in the downtown segment of I-10 that could be used by Sun Metro express services. While considering the best way to deliver the most effective service possible if integrating with an updated El Paso County Transit system and expanded SCRTD system, Sun Metro can also conduct a comprehensive operational analysis for the entire service area to determine if there are opportunities to re-appropriate its own resources to improve its most productive routes and employ the proposed County services in areas where it can be more effective than fixed-route service.

With many projects under way, others just on the horizon and the many opportunities for an expanded transit network, El Paso has an opportunity to define its own future and determine how it wants to grow the transit network. With new technologies available now that can help to improve the overall rider experience as well as operations, and with technologies on the horizon that have huge implications for how public transit plays a role in regional mobility and is offered over the next 10 to 20 years, Sun Metro and its partners in the Borderplex region have a unique opportunity to be a model for how cities collaborate across the transportation network to deliver the best mobility solutions for their residents now and in the future.

7.3 Considering Next Steps

The information below provides a recap to some of the recommended next steps discussed in this document. While it may be appropriate to consider revisiting *Plan El Paso* as a guiding policy document for the City of El Paso, revisiting the prioritization of actionable objectives and tactics in a more contemporary context, it would certainly be worthwhile to do this specifically and comprehensively for the Regional Transit Network. The items below may be done individually or together as components of a more comprehensive evaluation of next steps for the transit in the Borderplex region.

A Seamless Transit System

Explore the best way to approach formalizing an interagency governance structure to integrate transit systems in the Borderplex.

- Integrated fare collection systems including equipment and a diverse set of options for the end user to purchase transit fares.
- Comprehensive Operational Analysis for the entire Sun Metro service area to determine if there are opportunities to re-appropriate resources to improve its most productive routes and employ County services in areas where that can be more effective than Sun Metro fixed-route service.
- Determine the best method for integrating regional transit services considering interlocal agreements or a multi-jurisdictional body such as a Metropolitan Transit Authority (MTA) or something more conducive to integrating urban and rural transit services across state lines.

Bus Stops

Outline a plan for identifying where to implement transit shelters and other passenger amenities at Sun Metro bus stops including advertising opportunities and delivery methods, as well as ensuring all stops are accessible and connected to the sidewalk network.

Mobile Ticketing and Real-Time Location

Develop a plan for adding functionality to the Sun Metro app to purchase fares and track buses on a map in real time. Explore the potential for other smart city applications to integrate into the existing app such as parking availability or shared mobility coordination.

Streetcar Feasibility Study and Alternatives Analysis

Determine how and whether Streetcar should be expanded or how that investment can be leveraged. Determine mode, routing right-of-way, and a funding strategy.

Consolidated Intercity Bus Terminal

Identify carriers that would like to participate and their respective space requirements for boarding, sales, baggage check/claim and customer service. Determine passenger amenity needs, security requirements, potential Customs needs, and a funding strategy.

Cross-Border Connection between Brio and ViveBús

Consider a wide range of options to provide transit priority for making the most direct connection between both rapid transit systems. This may be done in conjunction with the Bus Terminal. Consider sponsoring the feasibility and design work for determining a preferred alternative on both sides of the border.

Long-Term Brio Plan

Identify opportunities and facility requirements for expanding the proposed Brio RTS and potentially adding more routes. Include consideration of various transit priority measures that may be applied throughout the system including but not limited to exclusive bus lanes, queue jumps, on-vehicle solutions, and geometric improvements at intersections to further improve reliability of operations.

Data Collection Plan

Identify data needs for streamlining and maximizing the effectiveness of Service Planning and Asset Management cycles. Develop a plan for implementing hardware for buses and software for coordinating systems on the back end to gather usable data regularly, and for conducting on-board Origin & Destination Surveys at regular intervals along with related Market surveys that collect demographic and other information about riders using the system.

Incorporating Reimagine I-10

Identify opportunities for dedicated or transit-priority lanes and some sort of priority configuration specifically in the downtown segment of I-10 that might be used by Sun Metro express services.

Station Area Plans

Establish land use and public investment plans in each TOD Incentive Area that include desired densities and priorities for building out permanent capital improvements to public realm amenities such as pedestrian, bike and open space infrastructure in these locations that would help leverage and further incentivize private investment.

Affordable Housing

Amend the Transit-Oriented Development Policy to include provisions for adding and maintaining affordable housing near transit investments.

Funding Strategy

Establish priorities among the regional transit needs and define a comprehensive funding strategy for capital and operational improvements across the system.

APPENDIX G

Bike & Pedestrian Facilities

Help define the future of our region.

Mobility.

Livability.

Economic Development.

El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

Contents

Introduction

The purpose of this document is to provide a summary of regionally significant bicycle and pedestrian studies and projects completed to date within the ***Regional Mobility Strategy** (RMS)*, which encompasses:

- El Paso County, Texas;
- Southern Doña Ana County, New Mexico; and
- Ciudad Juárez, Chihuahua (Region).

This document has valuable input necessary for the development of the larger RMS study. Many of the projects that are found among these studies are included in the City of El Paso Bicycle Plan (August 2016), Horizon 2040 Metropolitan Transportation Plan (MTP), the Texas Department of Transportation (TxDOT) Unified Transportation Plan 2018 (UTP) and the City of El Paso Capital Improvement Program (CIP). Several other studies that are found in this review document include plans, frameworks, and assessments with topics ranging from specific project feasibility studies like the Paso del Norte Trail to comprehensive regional planning documents. The El Paso Metropolitan Planning Organization (MPO) and Texas Transportation Institute (TTI) 2016 Multimodal Planning Report was also reviewed for information pertaining to bicycle and pedestrian conditions and recommendations in the El Paso Region. For the most part, this document will cover those relevant plans in the region from TxDOT, the El Paso MPO, the City of El Paso, the Camino Real Regional Mobility Authority (CRRMA), the University of Texas at El Paso (UTEP), the County of El Paso, the New Mexico DOT, and Ciudad Juárez, Chihuahua.

The Texas Transportation Code defines a "Bicycle" as a device that a person may ride and that is propelled by human power and has two tandem wheels at least one of which is more than 14 inches in diameter.[1] As such, this report is tailored to this definition, but recognizes that motorized or non-motorized vehicles are carrying people in a similar fashion in urban areas including dockless scooters. These dockless services, including scooters and bicycles, still rely on public roadway and sidewalk infrastructure to carry users.

Figure 1: Shared-Use Path, El Paso, Courtesy El Paso Bicycle Plan

Pedestrian facilities can either be sidewalks or designated pedestrian paths, for example, trails or walkways within urban developments. Some of these pathways may be shared-use paths that accommodate pedestrians and bicyclists. ***Figure 1*** illustrates a shared use path providing connectivity to pedestrians and cyclists.

Existing and Proposed Conditions Key Findings

This document reviews bicycle facilities and pedestrian facilities from several study data sources highlighted in ***Chart 1***. These study data sources were selected because the jurisdictional authorities listed have the majority control of off-system and on-system

[1] https://statutes.capitol.texas.gov/Docs/TN/htm/TN.541.htm

roadways. The summary of major needs identified for bicycle, pedestrian, and shared access facilities are:

- **Finding A:** Illustrative networks for bicycle and pedestrian facilities require significant capital monies to create a complete network with seamless linkages. No single revenue source will be able to fund all the identified connectivity improvements desired by residents and municipalities.
- **Finding B:** Existing bike facilities may not be comfortable or accommodating for all riders such as families with younger children or riders with less experience. A similar issue for sidewalks is they may not serve all users due to no lighting, lack of buffer from high-speed traffic, or absence of connectivity to schools.
- **Finding C:** Addressing connectivity to/from key activity centers in existing and developing areas is challenging due to the distance between activity areas and housing.
- **Finding D:** Accommodating car, bike, and pedestrian facilities on roadways sometimes impacts one or two modes capacity and/or design features.

Chart 1. Study Data Sources

Studies	Bike/Ped Plan	Document
1. TxDOT	X	▪ Strategic Direction Report: Opportunities for TxDOT's Bicycle Program (2015) ▪ Streets & Sidewalk – United States Access Board (Website, 2018) ▪ TxDOT Roadway Design Manual (RDM) (2018) ▪ Memo: Guidelines Emphasizing Bicycle and Pedestrian Accommodations (2011) ▪ Bicycle and Pedestrian Accommodations Environmental Handbook (2014)
2. El Paso MPO	X	▪ Horizon 2040 MTP (2014) ▪ Destino 2045 MTP (2017)
3. City of El Paso	X	▪ City of El Paso Bicycle Plan, August 2018 ▪ City of El Paso Parks, Recreation, and Open Spaces Plan (2006) ▪ City of El Paso Complete Streets Policy (2012)
4. CRRMA	-	▪ B-Cycle Information and Map
5. UTEP	X	▪ Campus Master Plan 2011
6. County of El Paso	-	▪ Maintain public facilities such as roadways, sidewalks, and recreation for public use.
7. Ciudad Juárez Plan	X	▪ Plan De Movilidad Ciclista (2017) ▪ Plan de Desarollo Urbano Sostenible (PDUS) (2016)
8. New Mexico Department of Transportation, NMDOT	X	▪ The New Mexico 2040 Plan (2015) ▪ Prioritized Statewide Bicycle Network Plan (2018)

Existing and Proposed Conditions – Bicycle Facilities

TxDOT

<u>Existing Conditions</u>

TxDOT right-of-way accommodates approximately 120-miles of shared roadway, 163-miles of bike lanes, 399-miles of shoulder, and 49-miles of shared use path bike facilities within the state.[2] In 2011, TxDOT issued a memo entitled “Guidelines Emphasizing Bicycle and Pedestrian Accommodations”. The memo outlines that bicycle facilities shall be considered when a TxDOT capital project is scoped, in both rural and urbanized areas. If no bicycle accommodations are planned, the managing office is required to state why no facilities are planned.

To facilitate the development of bicycle networks, TxDOT uses three guiding documents to manage bicycle facilities within its right-of-way and connect to other jurisdictional rights-of-way.

- TxDOT’s RDM: The design manual recommends referring to the American Association of State Highway Officials (AASHTO) Guide for the Development of Bicycle Facilities for the planning, design, construction, and maintenance and operations of bicycle facilities.
- Strategic Direction Report, Opportunities for TxDOT’s Bicycle Program: The document provides a strategic direction for implementing a comprehensive state-wide effort to maintaining and building more bicycle facilities.
- ADA Accessibility Guidelines (ADAAG): Largely, new facilities must comply with the most recent version of the federal ADAAG guidelines. Altered facilities that are currently ADA compliant may need to be upgraded to the newest guidelines.

Proposed

TxDOT continues to work with local municipalities to coordinate the development and implementation of upgrading and constructing new bicycle facilities. For example, the El Paso TxDOT District is currently working on the Northeast Parkway Project. The proposed project intends to address system capacity and linkage, and a route alternative to I-10 in El Paso. The proposed project is also currently illustrating a dedicated bicycle path.[3]

El Paso MPO

The Horizon 2040 MTP referenced the City of El Paso bike lane map and described general funding for infrastructure. The Destino 2045 MTP[4] includes a Multimodal Needs Assessment of both bicycle and pedestrian networks under the Active Transportation section, which conducts a comprehensive analysis of the City of El Paso bicycle accessibility and walkability. This analysis identifies infrastructure gaps as well as areas for improvement. The assessment concludes that investing in these specific areas identified and developing them can improve regional connectivity.

[2] TxDOT Strategic Direction Report: Opportunities for TxDOT’s Bicycle Program, Page 15
[3] Accessed at: https://www.txdot.gov/inside-txdot/projects/studies/el-paso/northeastpky-lp375-fm3325.html
[4] Destino 2045 Metropolitan Transportation Plan, December 2017; accessed at http://www.elpasofwd.com/PageData/?pageId=12

City of El Paso

Existing Conditions

Currently, there are over 100-miles of on-street bicycle facilities and over 30-miles of shared use paths constructed in the City of El Paso. ***Figure 2*** depicts the existing bicycle network identified in the City of El Paso's bicycle plan. The City noted three major deficiencies in the existing network, those include[5]:

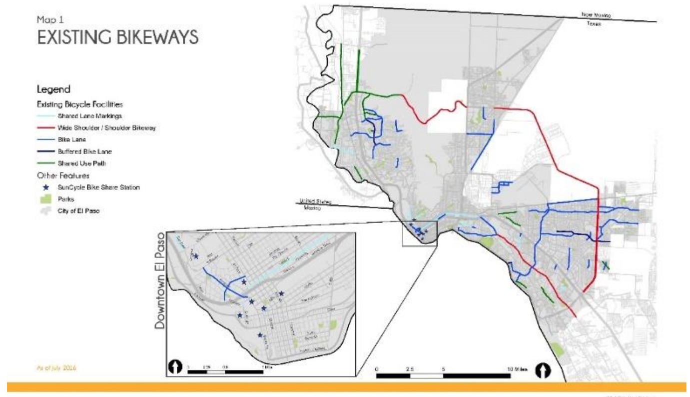


Figure 2: City of El Paso Existing Bikeway Network, August 2016

- Lack of connectivity among major activity centers including Downtown, University of Texas-El Paso, and Medical Center of the Americas. The cause is primarily because capital improvements act independently from connecting the existing network and planning process;
- Lack of facilities geared towards bicyclists who are less experienced riders, are younger, or do not feel comfortable on high-speed and/or high-volume roadways; and
- Intersection signage and markings do not increase awareness of motorists to bicyclists in areas with high traffic conflicts. Additionally, the gaps in pavement markings create confusion for those navigating intersections and multiple turning movements.

Proposed

The City of El Paso has prioritized the proposed network needs by low, medium, and high. In total, 938 miles of potential bicycle network is identified at an estimated cost ranging between $380,991,506 to $761,983,061. ***Figure 3*** illustrates the identified future facilities in El Paso's bike plan. The City will work within its Capital Improvement Department to plan, fund, and implement projects that may include bicycle facilities identified in El Paso's Bicycle Plan. The construction of bicycle facilities can capitalize on existing roadway projects such as future repaving improvements.

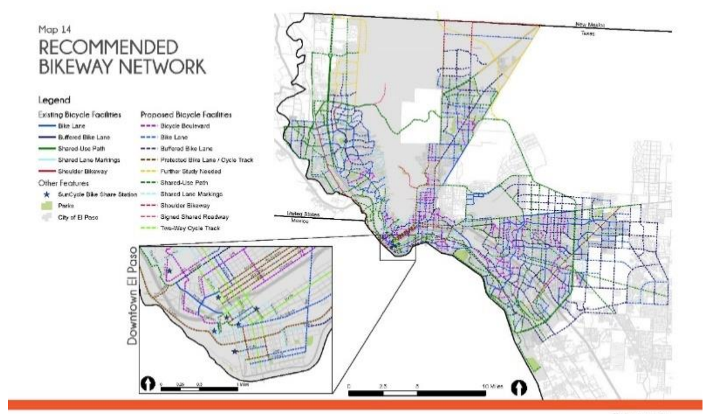


Figure 3: City of El Paso Recommended Bikeway Proposed Network, August 2016

[5] City of El Paso Bicycle Plan, Page 26

CRRMA

The CRRMA launched an El Paso bike share program in the Fall of 2015. This is a B-cycle program operated by SunCycle and includes a network of bicycles that are available for use for a fee that is paid for online or via a phone application. The 2015 launch included 80 bikes and eight stations linking downtown El Paso and the UTEP campus. In 2016, the SunCycle program expanded through the purchase of an additional 80 bikes and placement of seven additional stations. A portion of the funding for this program is from the Camino Real Regional Mobility Authority (CRRMA), MPO, City of El Paso, and UTEP. The map of El Paso's B-cycle stations is located at: [https://elpaso.bcycle.com/station-map.](https://elpaso.bcycle.com/station-map)

UTEP

UTEP has a campus master plan that includes a limited number of existing and proposed bicycle paths (http://masterplan.utep.edu/bicyclepaths.asp).

County of El Paso

The County of El Paso does not have a bike master plan. However, the County works closely with residents and municipal partners in El Paso to upgrade accommodations for pedestrians and bicyclists as transportation facilities are improved. Additionally, park facilities, such as Gallegos Park, have recreational spaces and places for walking, biking, and sports.[6]

New Mexico DOT (NMDOT)

<u>Existing Conditions</u>

The current network on NMDOT's right-of-way is mapped online with information for cyclists about width of shoulder, grade, and other existing conditions that may impact where and when a cyclist may ride.[7] The current network in the El Paso area is depicted in ***Figure 4.*** NMDOT oversees the Federal reimbursement program authorized through the FAST Act and disperses funds for active transportation projects for bicyclists, pedestrians, and trails approximately every two years. In 2016, the DOT funded 19 active transportation projects; two of those completed projects were in the adjoining Doña Ana County.[8]

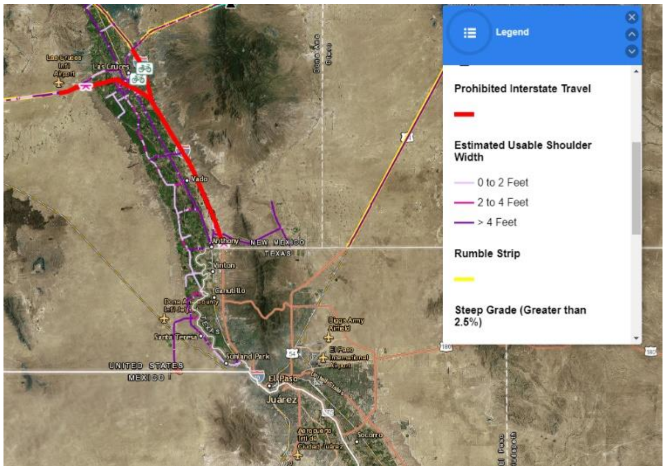


Figure 4: Online Map Bicycle Facilities by NMDOT

[6] Accessed at: https://www.epcountyparks.com/parks/
[7] Accessed at: http://nmdot.maps.arcgis.com/apps/Viewer/index.html?appid=e41ec746a4ce4eb292e919779968a291
[8] Accessed at: http://dot.state.nm.us/content/nmdot/en/Planning.html

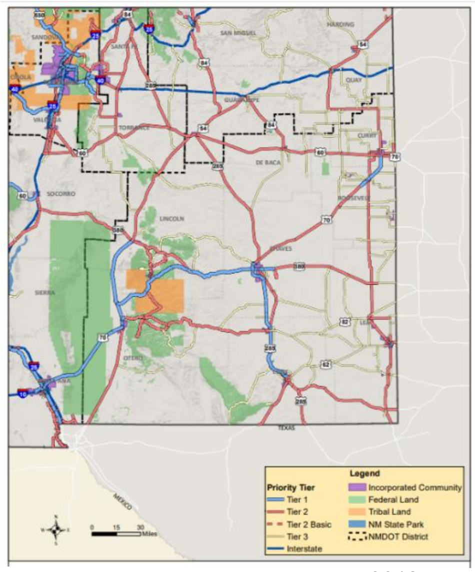


Figure 5: Proposed Priority Network, July 2018

Proposed

NMDOT is developing a Statewide plan to prioritize the bicycle network for all New Mexico's residents and visitors. The results of the study will include a priority network and design guidelines for urban and rural communities. The study is evaluating shoulder widths, traffic volumes, steep inclines, and other features that may impact conditions for cycling. The plan will be completed and used by the DOT in its planning process by September of 2018. A draft network map presented in Spring 2018 is illustrated in ***Figure 5***.

Ciudad Juárez, Chihuahua, Mexico

Existing Conditions

Ciudad Juárez, like many cities, is experiencing a trend where the public would like to see active transportation solutions such as protected bike lanes, improved lighting, and more protections for cyclists on high-speed roadways. As of 2015, the mode share for trips for the city is: 52% automobile, 28% non-motorized which includes a 0.4% bike, and 20% transit. Bike facilities existing within the city include off-road trails and some roadway improvements. Like many U.S. cities, Ciudad Juárez is changing and actively improving the facilities for multi-model travel.[9] Facilities like the Ciclopista Pablo Darancou Jr. in Ciudad Juárez for more sophisticated bicycle riders as illustrated in ***Figure 6,*** however new proposed facilities will target different user groups.

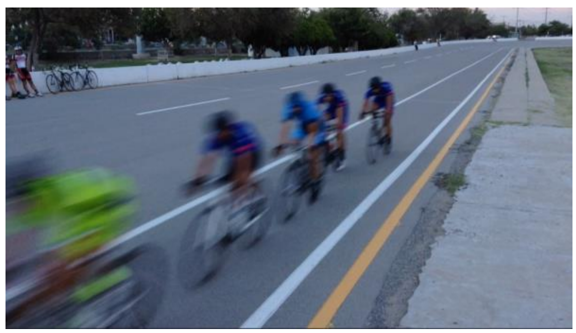


Figure 6: Ciclopista Pablo Darancou Jr.

[9] Accessed at: http://borderzine.com/2016/01/5-routes-bicycle-riders-should-try-around-ciudad-juarez/#prettyPhoto

Proposed

In 2015, Ciudad Juárez completed a Bike Master Plan entitled, Plan De Movilidad Ciclista.[10] The plan provides a framework to implement bike paths and adjoining transit facilities. Additionally, the plan identifies a set of preferred cross section designs for new facilities. The plan is depicted in ***Figure 7***, and is focused on how to connect bike routes to transit.

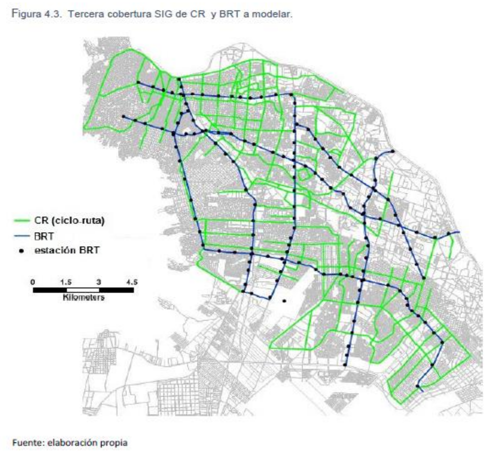


Figure 7: Third Coverage Model

Existing and Proposed Conditions – Pedestrian Facilities

TxDOT

Existing Conditions

To ensure accommodations for pedestrians are included in planning and construction, TxDOT developed the Bicycle and Pedestrian Accommodations Environmental Handbook. The handbook provides a five-step process for evaluating and identifying pedestrian facilities. This process also refers to the Federal Highway Administration's (FHWA) Pedestrian Safety Guide for Transit Agencies, as some pedestrians accessing TxDOT facilities may be traveling to/from a local bus stop. Overall, TxDOT continues to discuss and develop Active Transportation facilities for existing and proposed projects, as well as incorporates infrastructure to support pedestrian activity, like lighting and new sidewalks, into existing rights-of-way.

Proposed

Typically, pedestrian plans and projects intersect or utilize TxDOT on-system roadways as part of the overall project corridor. Hence, TxDOT helps to facilitate project activities limited to construction permitting the right-of-way and how to appropriately construct these facilities in on-system roadways. The TxDOT Public Transportation Division administers federal funding programs, including FHWA funds relating to TxDOT's Bicycle and Pedestrian Program and the Transportation Alternatives Set-Aside funds for locally sponsored bicycle and pedestrian infrastructure projects in communities with populations less than 200,000. In large urbanized areas with populations over 200,000, Transportation Alternatives (TA) Set-Aside funds are distributed directly to MPO.[11] In this way, TxDOT helps to facilitate the delivery of necessary funds for pedestrian improvements to local communities and their respective priority projects. An example of funds distributed by county is seen in ***Figure 8***.

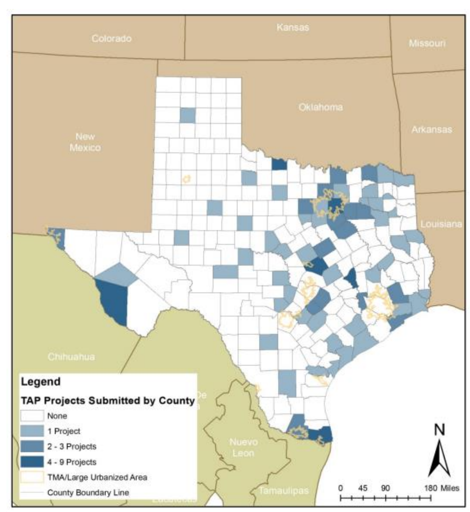


Figure 8: 2015 TAP Program/Project Information Summary

[10] Accessed at: http://netnoticias.mx/2015-06-10-982d65df/reportaje-jurez-no-est-preparado-para-los-que-usan-bicicletas-ciclistas/

[11] Accessed at: http://ftp.dot.state.tx.us/pub/txdot-info/ptn/programs/tap-summary-15.pdf

City of El Paso

<u>Existing Conditions</u>

In 2012, the City of El Paso adopted a Complete Streets Policy with the goal of achieving further walkable, livable, and sustainable land-use and transportation patterns. The policy identifies several initiatives to improve the walkable environment including: repairing sidewalks, adding treatments to existing arterials, improving the walkable network in a lattice fashion, and identifying locations where walkability improvements are a priority. The Engineering and Construction Management Department is responsible for overseeing the implementation of the capital program that includes treatments to improve walkability.

<u>Proposed</u>

Most recently, the City of Paso is in the process of completing the University Pedestrian Improvements Project.[12] The project will cost nearly $3 million dollars and provides infrastructure to support pedestrian activity such as new lighting, new landscaping, deteriorated sidewalk repair, and aesthetic improvements to encourage economic development as seen in ***Figure 9***. These types of pedestrian improvements continue to occur throughout the City, including sites where conflicts between vehicle and pedestrians are high.

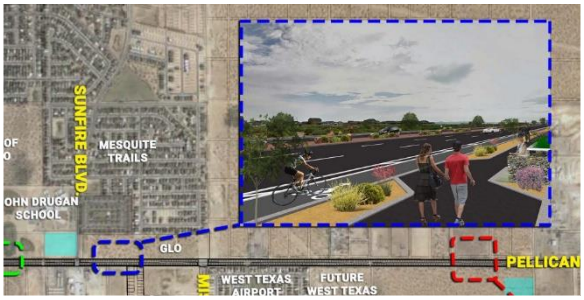


Figure 9: Pellicano Drive Widening and Build pedestrian path proposal

El Paso MPO

The Horizon 2040 MTP includes as a goal under its congestion management process and travel demand management strategies, the increase and improvement of pedestrian facilities in the region. The Destino 2045 MTP[13] includes a Multimodal Needs Assessment of both bicycle and pedestrian networks under the Active Transportation section, which conducts a comprehensive analysis of the City of El Paso bicycle accessibility and walkability. This analysis identifies infrastructure gaps as well as areas for improvement. The assessment concludes that investing in these specific areas identified and developing them can improve regional connectivity.

UTEP

UTEP has a campus master plan that includes a component outlining pedestrian circulation. (http://masterplan.utep.edu/pedestriancirculation.asp).

[12] Accessed at: https://kfoxtv.com/news/local/lights-are-up-as-part-of-university-pedestrian-improvements-project
[13] Destino 2045 Metropolitan Transportation Plan, December 2017; accessed at http://www.elpasofwd.com/PageData/?pageId=12

County of El Paso

Existing Conditions

Within the County of El Paso are international ports of entry and a binational border that is crossed by over 6.4 million pedestrians annually.[14] The safe movement of people and movement of goods for economic prosperity is a priority for the County. As such, the County has invested in the planning and delivery of new infrastructure to ensure that the over 17,000 daily pedestrian crossings can be accommodated. Additionally, the County has taken steps to ensure new projects overseen by the County's Public Works Department accommodate pedestrians, as discussed below.

Proposed

Recent proposed roadway projects, such as Eastlake Boulevard Phase 1, Pellicano Drive Widening and Build Project, and Darrington Road Widening Project, have proposed infrastructure to support pedestrian activity. Those features include vegetation for shade, lighting, and intersections designed for pedestrian crossings. Along with providing miles of new roadway capacity for a growing El Paso, the projects connect pedestrians to activity centers. Examples include pedestrian connections to a local Elementary School, and zoned commercial with new housing.[15]

New Mexico DOT

Existing Conditions

NMDOT 2040 Long Range and Multi-Modal Transportation plan contains a blueprint with which the DOT can move forward. The Plan identifies the changing demand for transportation alternatives including a decrease in youth obtaining drivers licenses, and an increase in pedestrian fatalities and serious injuries. NMDOT created a tier system of roadway improvements that applies improvements to roadways and pedestrian facilities as illustrated in ***Figure 10***. The system recognizes the insufficient funding to maintain all the infrastructure in a State of Good Repair, therefore, improvements are focused on Tier 1 corridors such as I-41. Safety improvements the DOT considers in the design and construction of pedestrian facilities include smart signals, high visibility crosswalks, and median islands.

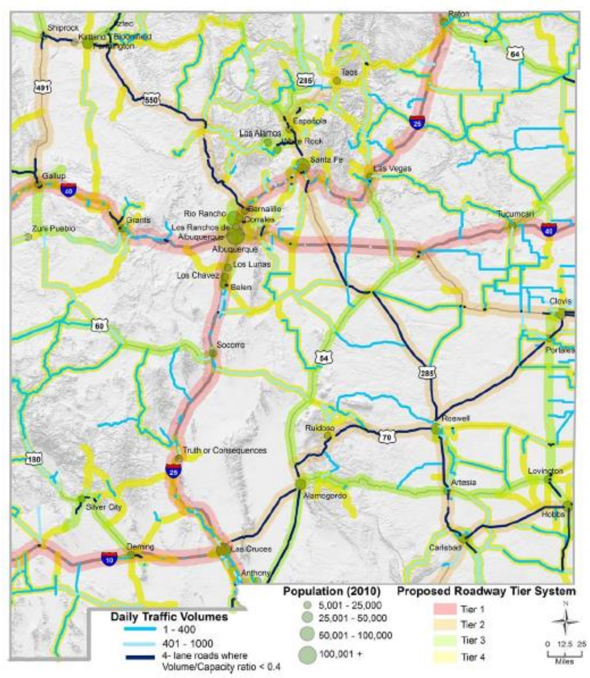


Figure 10: NMDOT priority network

[14] El Paso County Operating Budget Book – FY2017

[15] Accessed at: http://www.epcounty.com/publicworks/

Proposed

Typically, plans and projects for pedestrian facilities intersect or utilize NMDOT on-system roadways as part of the overall project corridor. NMDOT and the El Paso MPO are engaged in a Call for Projects for Active Transportation of pedestrian and bicycle facilities, safe-routes-to-school projects, infrastructure improvements that provide better access to transit, environmental mitigation, and other improvements to the transportation system. In the past Call for Projects, The El Paso area was successful in obtaining grants for activities including safe-routes-to-school and sidewalks on State Road NM 187. The El Paso area can continue to apply for this funding source in 2018 to improve walkability in the region.

Ciudad Juárez, Chihuahua

Existing Conditions

Ciudad Juárez identifies in their Existing Conditions Report entitled Plan De Desarrollo Urbano Sostenible – Diagnostico, ***Figure 11***, that the urban fabric and infrastructure does not complement pedestrian activities, for example, local markets and key activity centers that do not have adjoining sidewalk. Additionally, for those with a disability, accessing key destinations via sidewalk is challenging due to the lack of pedestrian ramps or connective pathways. Pedestrian activity is intense around the bi-national border crossing and improving pedestrian facilities for the safety of those traveling daily is a recognized need.

Proposed

Ciudad Juárez identifies major corridors of investment for BRT, bikes, and pedestrians via its Plan de Desarollo Urbano Sostenible (PDUS), 2016. The plan will help guide an active transportation system for residents and visitors to key activity centers and job sites, including those pedestrians who cross the binational border regularly.

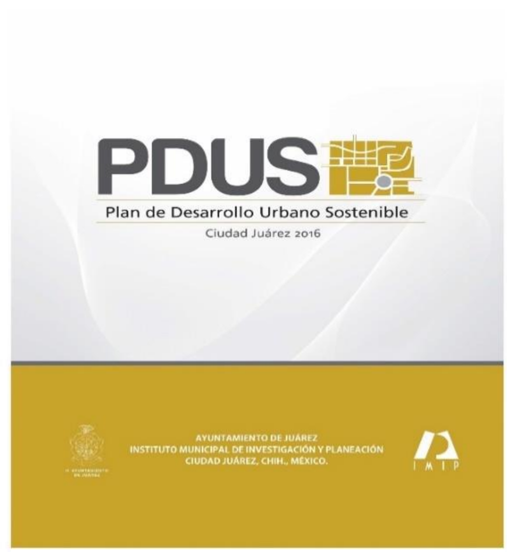


Figure 11: Cover of Plan de Desarrollo Urbano Sostenible

Summary of Connectivity and Gaps in Current System

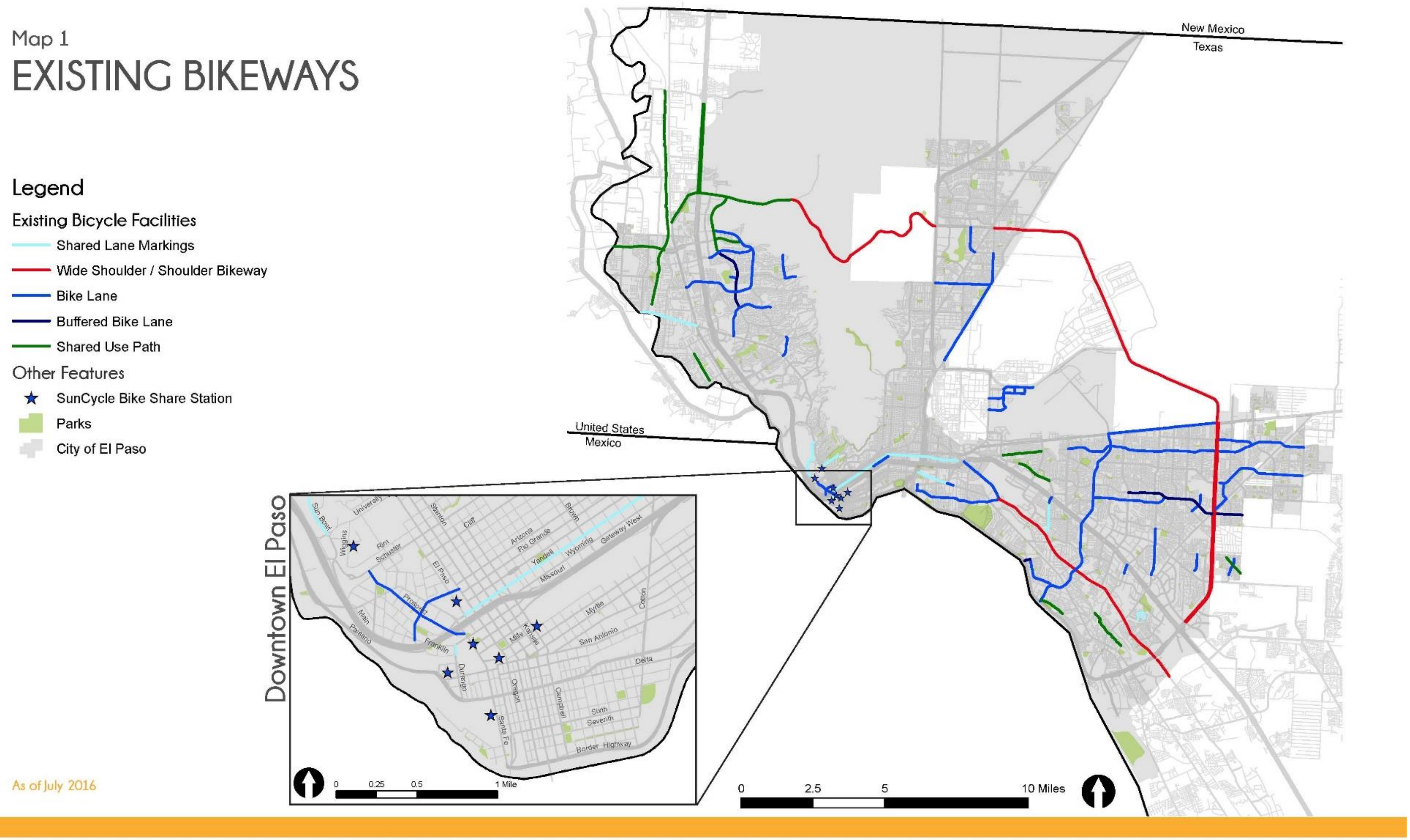
Bicycle and Pedestrian Network

In Summary, the local jurisdictions in the El Paso region are working to improve the ability of residents and visitors to access a robust bicycle and pedestrian network. This will be done by using local, State, and federal funding sources to upgrade and construct new facilities. Each jurisdiction has had to prioritize projects because there is not sufficient funding to meet the needs identified in local and State plans. For the most part, plans focus on improving safety and connectivity of sidewalk and bike path infrastructure.

Combined Facilities and General Access Considerations

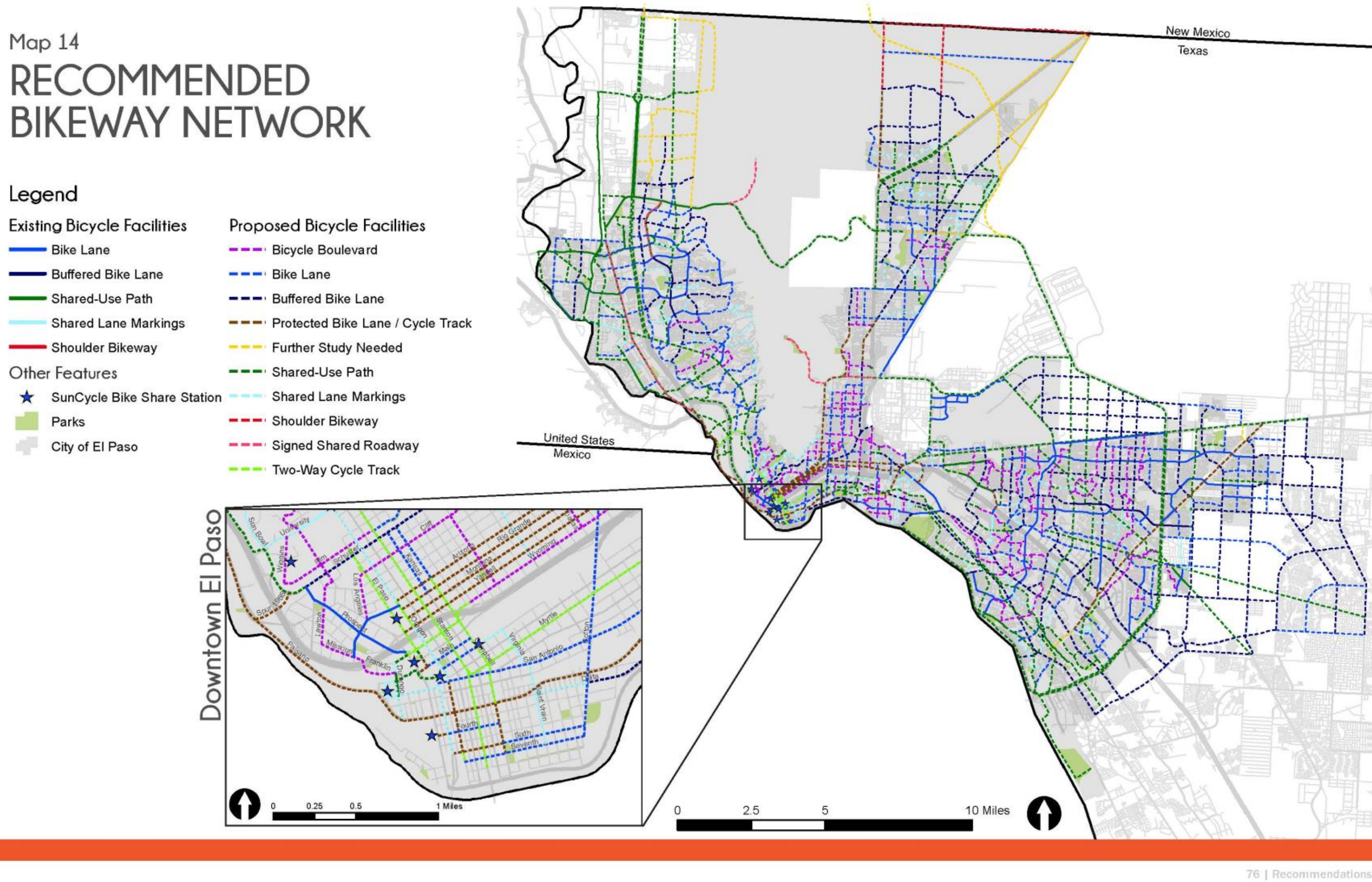
There are several examples of roadway projects that combine bike and pedestrian facility programming in the region. This can be an effective way to secure enough resources to construct a project and serve the needs of many types of transportation system users. Additionally, partnering with agencies, like the transit provider or developers, can reduce vehicle miles traveled and promote urban development that directs density to the approved sites in urban areas that typically attract more pedestrian and bike trips.

Appendix G-1: El Paso, Existing Bicycle Facilities



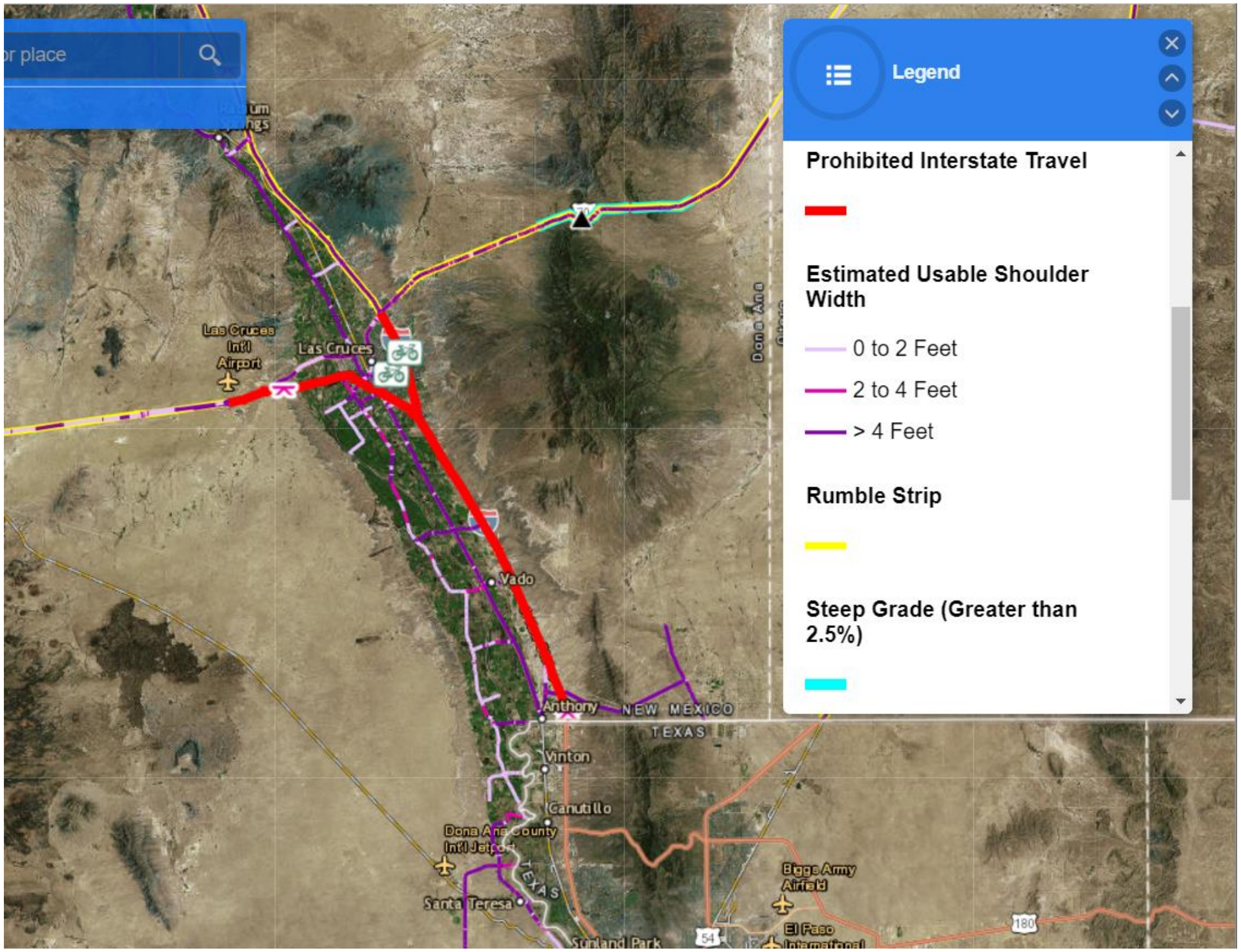
Accessed at: https://www.elpasotexas.gov/~/media/files/coep/capital-improvement/bike%20plan/081616%20epbp_plan_august%202016.ashx?la=en

Appendix G-2: El Paso, Recommended Bikeway Network



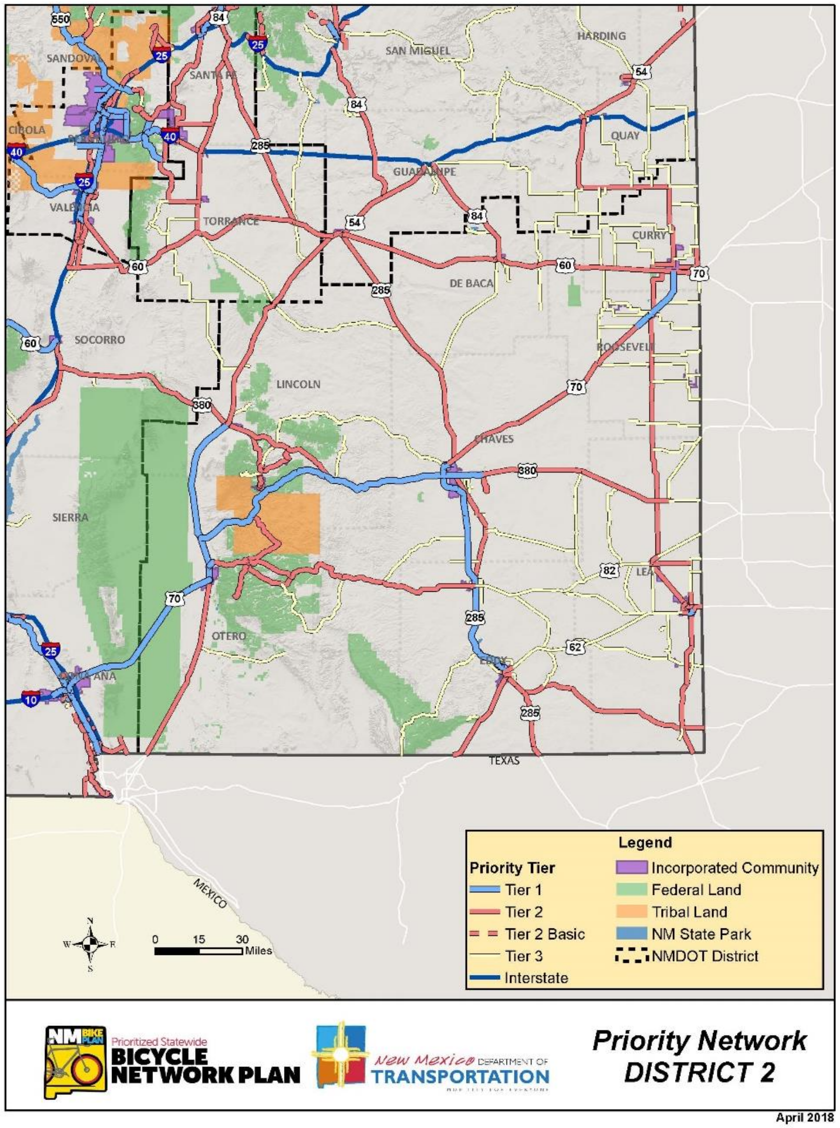
https://www.elpasotexas.gov/~/media/files/coep/capital-improvement/bike%20plan/081616%20epbp_plan_august%202016.ashx?la=en

Appendix G-3: New Mexico, Existing Bicycle Network



Accessed at: https://www.arcgis.com/apps/Viewer/index.html?appid=e41ec746a4ce4eb292e919779968a291

Appendix G-4: New Mexico, Proposed Priority Network



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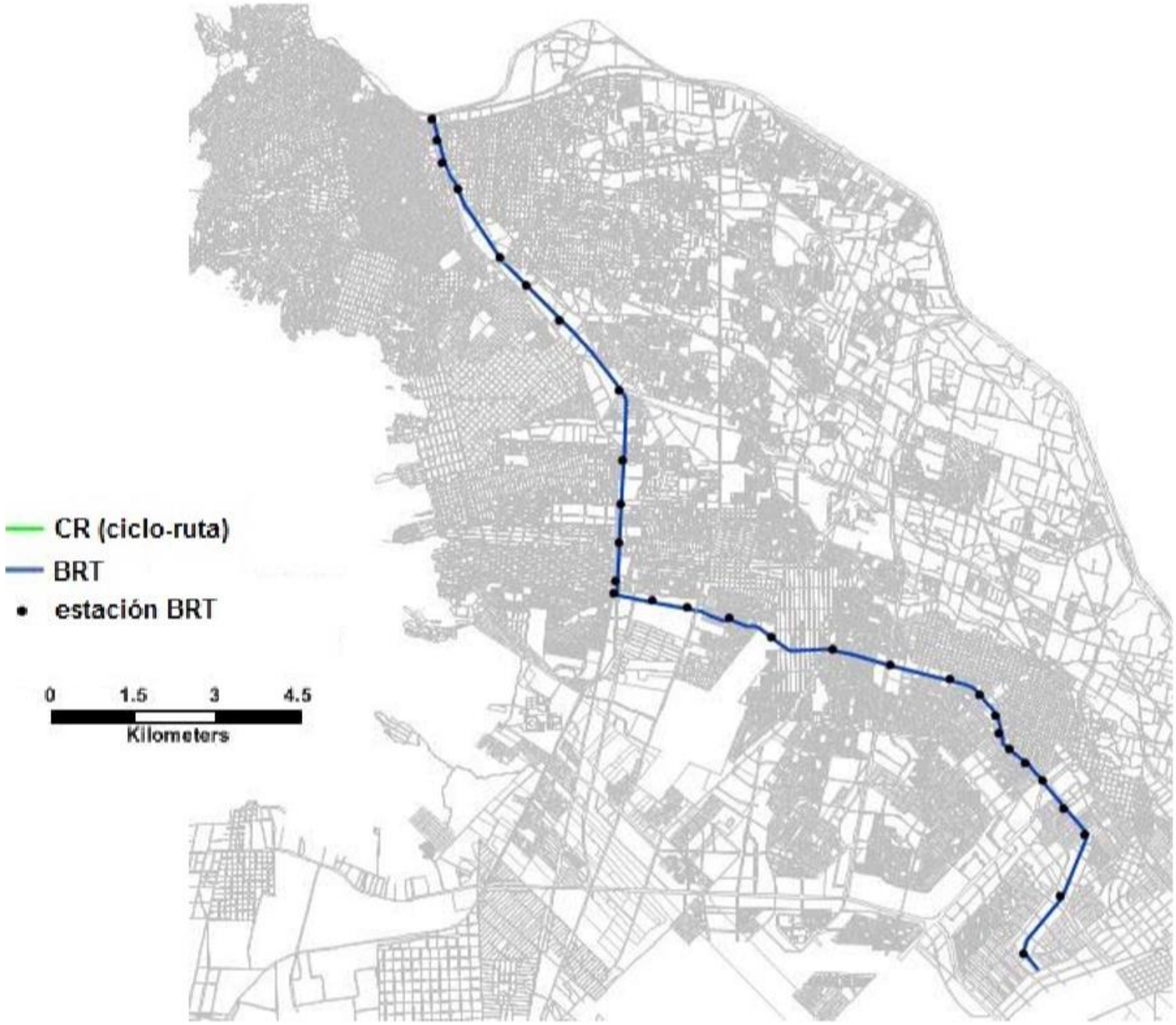
Appendix G-5: Ciudad Juárez, Existing BRT and Bike Network



Accessed at: http://www.imip.org.mx/Beta/pdu2016/Anexos/PlanMovilidadCiclistaeIntegracionalSistemadeTransportePublico/PLANMOVILIDADCICLISTJUAREZ.pdf, Figure 4.4

Appendix G-6: Ciudad Juárez, Bike Master Plan Implementation Phases

Accessed at: http://www.imip.org.mx/Beta/pdu2016/Anexos/PlanMovilidadCiclistaeIntegracionalSistemadeTransportePublico/PLANMOVILIDADCICLISTJUAREZ.pdf, Figure 4.35

Appendix G-7: Ciudad Juárez, Pedestrian and Bike Crossing Design at BRT Stations

Accessed at: http://www.imip.org.mx/Beta/pdu2016/Anexos/PlanMovilidadCiclistaeIntegracionalSistemadeTransportePublico/PLANMOVILIDADCICLISTJUAREZ.pdf, Figure 4.130

APPENDIX H

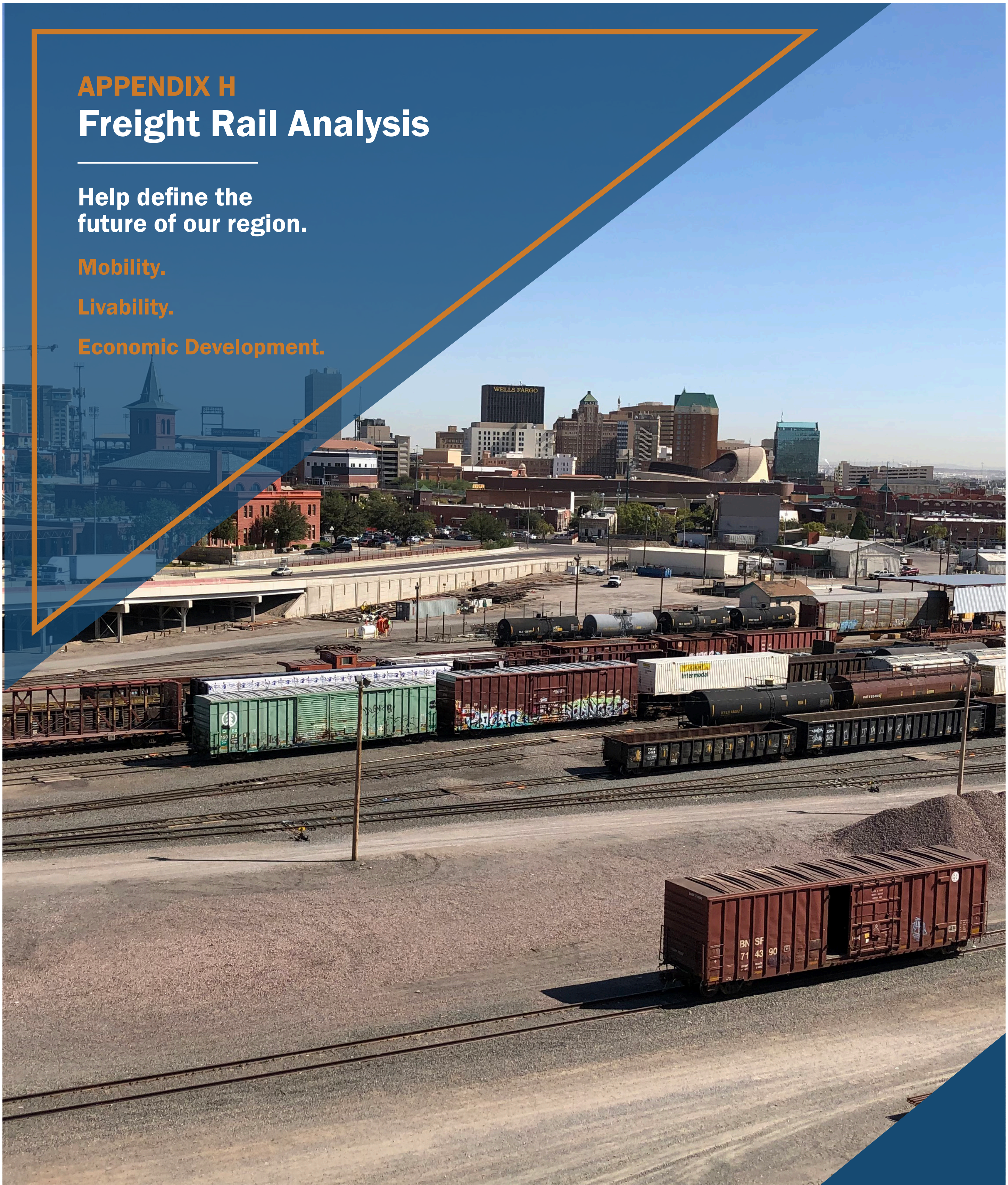
Freight Rail Analysis

Help define the future of our region.

Mobility.

Livability.

Economic Development.



El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS

REGIONAL MOBILITY STRATEGY

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1.0 Regional Mobility Strategy Background

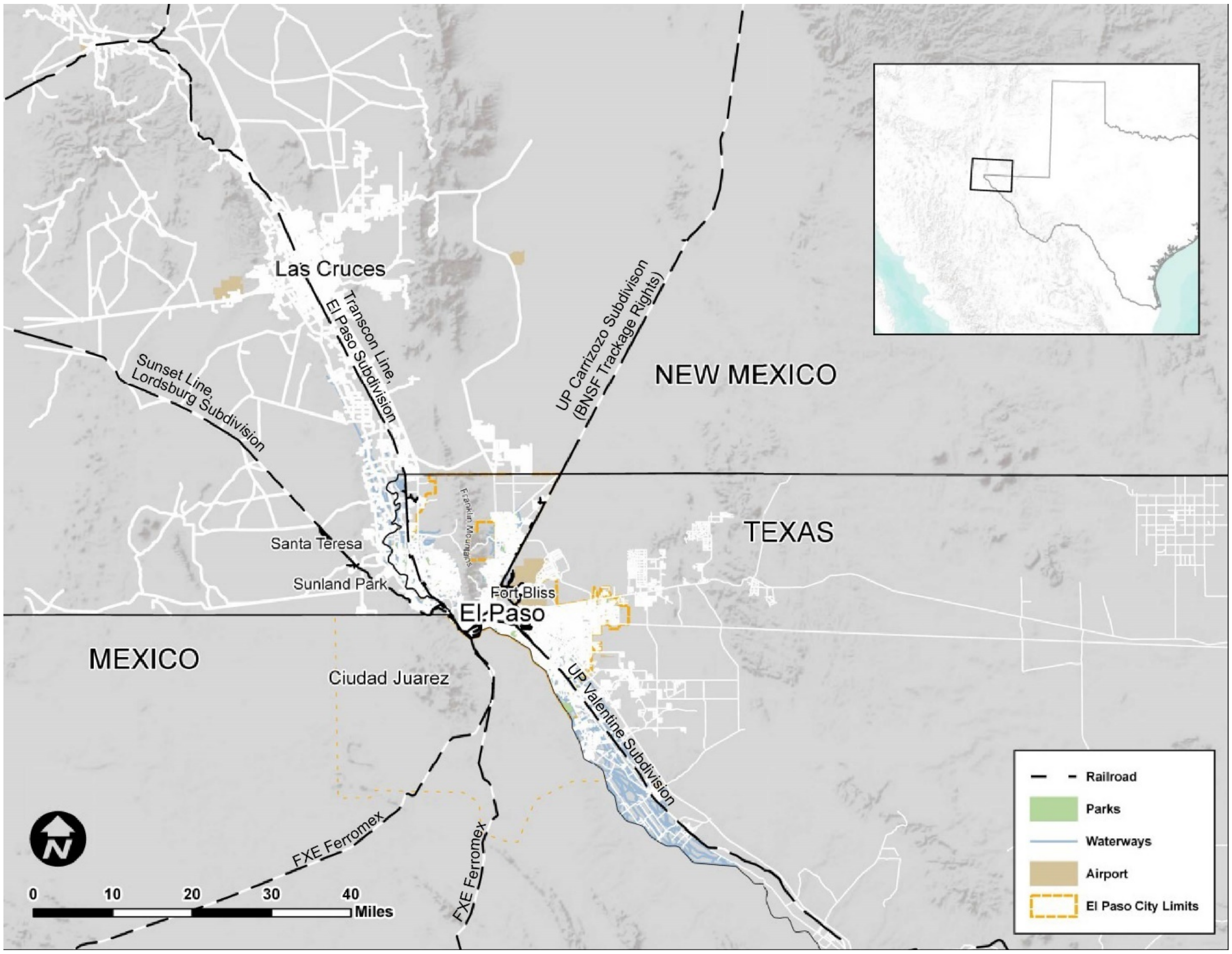
1.1 Regional Context

The Regional Mobility Strategy (RMS) evaluates large-scale, macroscopic mobility challenges in the El Paso region to identify opportunities for improvements where the need is greatest. The RMS encompasses the following geography:

1. El Paso, Texas
2. Southern Dona Ana County, New Mexico; and
3. Ciudad Juárez, Chihuahua (as it connects to the US)

According to 2045 Destino Metropolitan Transportation Plan forecasts, the regional population of El Paso is expected to grow to over 1.4 million people, which is about a 50% increase from 2012 to 2045. Much of this projected population growth is expected to occur in east and northeast El Paso and in areas in the neighboring state of New Mexico to the west, such as Sunland Park and Santa Teresa. **Figure 1** provides an overview of the study region.

Figure 1. Overview of Rail Lines for RMS



Located along the Rio Grande, El Paso is just across the border from Ciudad Juárez, Chihuahua, Mexico. The two cities, along with Las Cruces, New Mexico, form a binational metropolitan area, sometimes referred as El Paso–Juárez–Las Cruces Borderplex, with a regional population of over 2.7 million people making it the largest bilingual-binational work force in the Western Hemisphere. Solutions that address bottlenecks at the Ports Of Entry (POEs) need to be multimodal and adaptive to changing physical and political landscapes.

1.2 Context of Rail Study

Rail operations are an ongoing influence to mobility in the El Paso region. Since the 1880s, railroads have played a vital role in both the movement of freight and people in the El Paso region. Two Class I railroads, UP and BNSF, operate on the U.S. side of the border with international connectivity with Mexico's Ferromex (FXE) (the largest freight transporter in Mexico serving Mexican ports and major U.S. and Canadian markets) at a port of entry in El Paso[1]. UP's major east-west route (Sunset line) from the ports in Long Beach and Los Angeles

[1] Source: https://www.ferromex.com.mx/index-eng.jsp, October 21, 2019

travels through the region. A major transload facility for this route is strategically situated in Santa Teresa, New Mexico within the region. BNSF's service from the region connects to one of its main east-west routes (southern Transcon line), which is located further north. UP and BNSF rail also serve as major routes to the United States Midwest, increasing railroad activity.

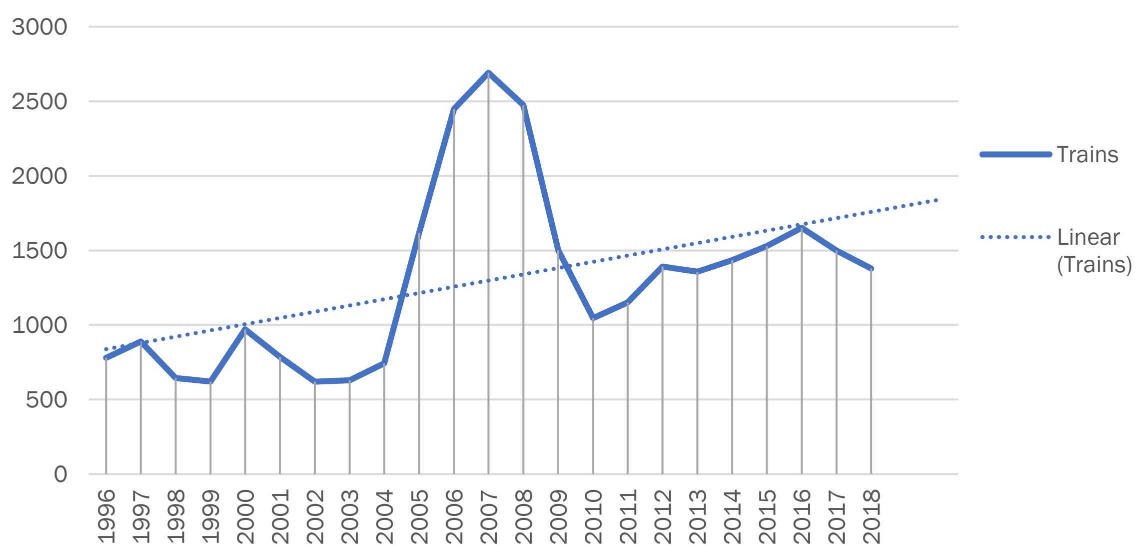
Both railroads operate within and through the center of Downtown El Paso, crossing major roadways, highways, and freeways. This combination of rail traffic presents operational challenges as vehicular traffic volumes continue to increase.

Both the frequency of trains and the volumes of vehicles at roadway/rail crossings are anticipated to increase over time.[2] **Figure 2** illustrates annual inbound international train crossings between 1996 and 2018 and shows a clear upward trend.

Within this context of population growth, vehicular traffic volumes and increasing train operations, it is evident that:

1. Traffic delay at at-grade crossings will increase; and
2. Crashes may increase at at-grade crossings due to increases in vehicular and train volumes.

Figure 2. Historic Annual International Train Crossings (Juarez to El Paso)



1.3 Study Purpose

Rail is critical to the region's future mobility. Strengthening the region's freight rail network has the potential to:

1. Improve the region's national market competitiveness;

[2] Source: 2011 El Paso Region Freight Rail Study, TxDOT

2. Help local residents to realize economic opportunity associated with movement of goods to/from local, regional, and national markets;
3. Shift truck cargo to rail, potentially providing congestion relief on local roadways and freeways; and
4. Improve safety on roadways with improvements at at-grade roadway-rail crossings.

For these reasons, this technical memo explores rail topics related to mobility within the region. A high-level assessment of the BNSF and UP railroad crossings is included. Relevant projects involving railroads are identified and summarized. Crash data is gathered and analyzed. Microsimulation (VISSIM) modeling of roadway intersections along the UP corridor to quantify and rank delays. Concepts are identified for further consideration and project development by the implementing agencies.

2.0 Background on Railroads

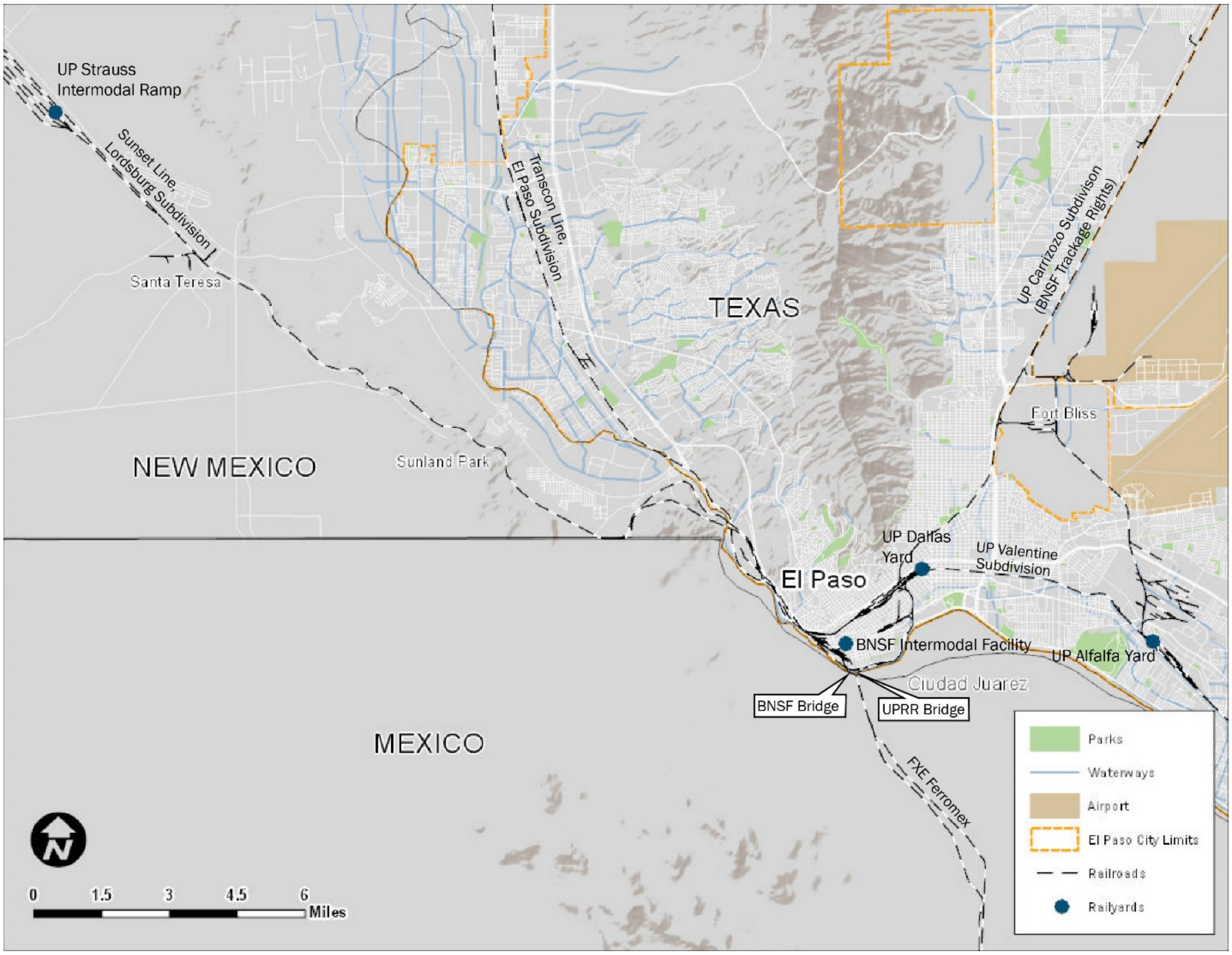
2.1 Existing Conditions

El Paso is home to two Class 1 railroads and multiple rail yards including the Santa Teresa Intermodal Ramp, which provides intermodal activity and is a major stop for through trains from the west coast.[3] **Figure 3** shows major rail facilities located in the area. Across the international border, Mexico's Ferromex provides international connectivity to most of the country. The export and import trade at the U.S/Mexico International Border Crossing generates considerable rail traffic passing through El Paso in addition to the UP rail traffic passing through El Paso from the west coast to eastern regions of the U.S.

The Sunset line, UP's major east-west route from the ports in Long Beach and Los Angeles, California, connects to the large Intermodal Ramp facility strategically situated in Santa Teresa, New Mexico. To the north, BNSF connects to one of its main east-west routes, known as the southern Transcon line. UP and BNSF rail traversing the region also service major routes to the United States Midwest.

[3] Source: 2016 Texas Rail Plan Update, TxDOT

Figure 3. Major Rail Facilities in RMS Area



2.1.1 BNSF Subdivision

The BNSF-owned El Paso Subdivision railroad corridor extends from the U.S.-Mexico border at the international bridge in El Paso, TX, north to Isleta, NM, near Albuquerque. This corridor is primarily a single track that ultimately connects to BNSF's Southern Transcon route. There are currently no other freight or passenger rail operators using the El Paso Subdivision. Based on Federal Railroad Administration (FRA) Grade Crossing Inventory forms, train volumes vary between six (6) and eight (8) trains per day on this line between El Paso and Las Cruces.

The El Paso Subdivision provides freight connectivity to Mexico via Ferromex via the El Paso port of entry and has trackage rights from El Paso to the U.S. Midwest region through UP's Carrizozo Subdivision. These rights provide flexibility for BNSF movements into and out of the El Paso region.

Existing right-of-way (ROW) within the corridor between El Paso and Las Cruces varies but is typically 100 feet in width. This ROW is constrained on one side for most of its length by roadway corridors such as US 85 (Paisano), SH 20/Doniphan Drive (El Paso to Anthony, NM) and NM 478 (Anthony to Las Cruces). The continuous proximity of these roadways with the railroad limit the potential for adding capacity to either the rail line or the roadways. In other areas, possible ROW expansion is limited by development along the corridor as well as the Rio Grande River.

2.1.2 UP Subdivision

The UP-owned Lordsburg and Valentine Subdivision railroad corridor (a portion of the Sunset line) extends from the West Coast, through El Paso to Alpine, TX and eventually to Houston, TX. This corridor is primarily configured with a double track with three- and four-track segments that are part of a major east-west route for UP's operations. Amtrak also operates on this line for intercity passenger rail service, and BNSF has trackage rights on a small segment of track between UP's Carrizozo Subdivision and Dallas Yard. Based on FRA Grade Crossing Inventory forms, train volumes vary between 22 and 42 trains per day on this line within El Paso.

The Sunset line provides freight connectivity from west coast ports in Long Beach and Los Angeles to the southern and midwestern United States. Locally, the large Santa Teresa Intermodal Ramp is strategically placed for transload operations and refueling, and the Dallas and Alfalfa Yards in El Paso connect to it as well. Further, the El Paso port of entry is very closely situated to the Sunset line.

The width of existing rail ROW within El Paso varies but is typically between 80 and 110 feet with a constrained 50-foot depressed section through downtown. Besides the depressed section, there are roadway and development constraints along either side of the existing right of way; these constraints limit the potential for expansion of both the rail line and the roadways.

2.1.3 International Rail Bridges

There are two rail border crossings located in El Paso, which consist of steel bridges on either side of the Paso Del Norte International Bridge. The eastern crossing is owned and operated by UP along the Valentine Subdivision, and the western crossing (also known as the Black Bridge) is owned and operated by BNSF and continues along the El Paso Subdivision.[4]

2.2 Studies to Date

Concerns identified during previous studies, existing evaluation through this analysis, and listening sessions have identified the following transportation challenges:

- Severe impacts in Juarez, Mexico when crossing trains to El Paso, TX
- Congestion and delay at several at-grade roadway-rail crossings along BNSF and UP corridors;
- Lack of funding and need for improved/alternative funding strategies for rail;
- Projects that ensure complementary land uses adjacent to rail lines, or plans to improve the ingress/egress to said project; and
- Large scale regional initiatives regarding rail yard to allow efficient trade and production.

The following studies are an inventory of the work to date completed which focus on rail-related projects within the El Paso region:

- **Destino 2019-2022 Transportation Improvement Program** (2018 – El Paso Metropolitan Planning Organization). The Transportation Improvement Program (TIP) is a short-range program of projects for the El Paso MPO's planning area and reflects a consensus of priority needs of citizens, officials, and local transportation and transit agency representatives. Transit-related improvements proposed in the TIP include construction of passenger shelters, rail storage/maintenance facilities, and bus transfer facilities.

- **Las Cruces – El Paso Commuter Rail Feasibility Study** (2017 – South Central Regional Transit District). The study reviews the feasibility of establishing passenger rail service between Las Cruces and El Paso. The recommendations from the study noted that the initial findings are that commuter rail service could operate successfully but identified key items as negotiating with BNSF on use of its track, establishing partnerships for the project with key stakeholders in El Paso, incorporating transit-oriented development into the corridor, and positioning the project for future federal and state funding.

- **Santa Teresa International Rail Study** (2016 – New Mexico Border Authority). This study focuses on the potential of a bi-national rail bypass west of El Paso and Ciudad Juárez involving three railroad owners (Ferromex, UP, and BNSF). Items that are noted in the study include the feasibility of potential alternatives, economic and financial feasibility, requirements for a Presidential Permit for bi-national projects, and next steps to move the project forward. The conclusions state that the project is feasible but faces major challenges for implementation, including funding and agreement from all three railroad owners on a path to move forward. See **Figure 4** for the proposed BNSF relocation identified in the study.

[4] Source: 2011 El Paso Region Freight Rail Study, TxDOT

2.3 Recent Projects and Planned Improvements

The following planned and recent projects illustrate the ongoing investment regional stakeholders are undertaking that impact rail operations.

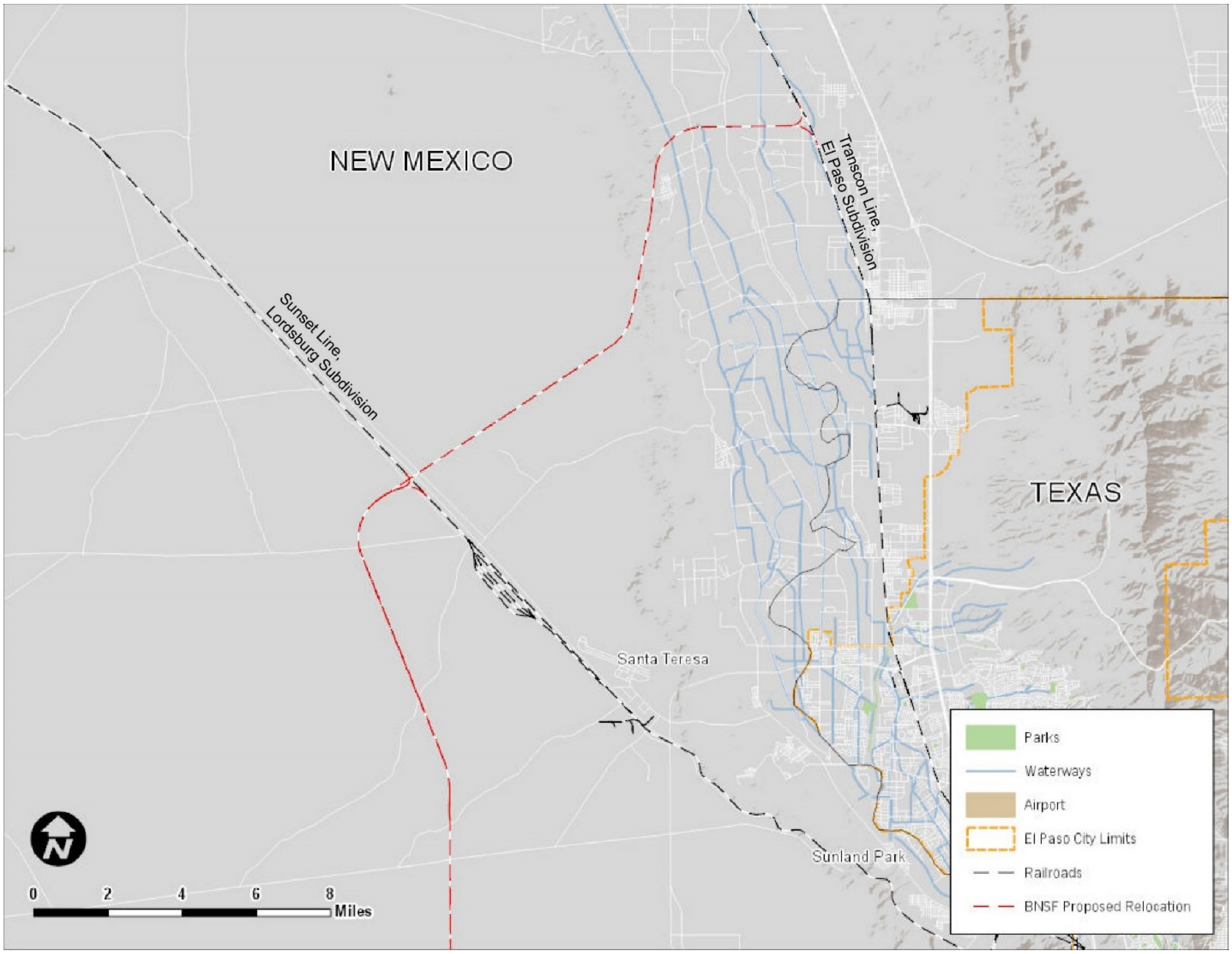
2.3.1 Recent Notable Projects

- **Border West Express Project,** which is a newly constructed freeway that required agreements between TxDOT, BNSF, and UP to relocate rail and utilize aerial space for toll lanes connecting US 85 Paisano Drive to Loop 375 Cesar Chavez. Project also included new grade separation of Delta Drive where it crosses UP.
- **Five Points Quiet Zones Project,** which was a joint effort between UP and the City of El Paso to close four crossings (Maple, Birch, Cedar and Elm) and improve two crossings (Piedras and Rosewood). The modifications satisfied federal rail operating requirements allowing trains to pass more quietly through this El Paso neighborhood.
- **Medical Center Quiet Zone Project,** similar in nature to the Five Points project, modified the at-grade crossings of San Marcial, Estrella, Cebada, Grama, Copia, Boone, Concepcion, Chelsea, Glenwood, Clark, and Cadwallader streets. Safety measures incorporated into the Medical Center project include the installation of medians, quad gates, and some closures.
- **Yarbrough Drive and Carolina Drive UP Bridge Replacement** included reconstruction of these important arterial bridges that connect to the Mission Valley region. The Yarbrough Drive Bridge and approaches were replaced, and the Carolina Drive Bridge was upgraded to a two-lane bridge with wider lanes, turn lanes, and pedestrian-friendly sidewalks.
- **El Paso Region Freight Study** (2013 – Texas Department of Transportation). TxDOT's review of possible freight improvements within the El Paso region includes review of existing freight rail movements through modeling, determination of rail improvements based on operational constraints, and identification of roadway-rail improvements to increase safety. The proposed roadway-rail improvements at 33 selected intersections (grade separations and crossing closures) across UP and BNSF corridors are estimated at a total cost of $314 million.

2.3.2 Planned Notable Projects

- **I-10 Eastbound Frontage Road near Downtown Dallas UP yard,** in early discussions as part of TxDOT's Reimagine 10 study, looks to acquire a strip of UP property to create an eastbound frontage road between Downtown and Piedras which does not presently exist. The concept includes grade separation of the existing westbound frontage road, Missouri Ave.

Figure 4. Proposed BNSF Rail Relocation



2.3.3 Conceptual or Conversational Notable Projects

- **UP's Downtown Dallas yard,** adjacent to I-10, is no longer utilized to its full extent as in prior years, and the 2018 announcement by UP of closing the locomotive repair facility is further evidence of this. The City's comprehensive plan and other conversations have floated the idea of a major downtown redevelopment site possibly including an events arena. Also related was a study that TxDOT performed to assess the feasibility of grade separating Montana Ave.
- **BNSF's El Paso Intermodal Facility,** adjacent to Loop 375 and Santa Fe Street in South El Paso, has also been discussed as a site for potential redevelopment. The yard and the nearby international rail bridge are still used by BNSF but is the subject of the Santa Teresa International Rail Study for a "bypass" of the downtown metros.
- **University Medical Center of El Paso/Paul L. Foster School of Medicine** – Currently a UP line traverses the northside of University Medical Center of El Paso, a Level 1 trauma center with over 850,000 outpatient visits annually. Connected on the eastside of the medical facility is the university. According to stakeholder interviews, these sites combined are considered a major activity center for the El Paso region. Egress and Ingress to/from this activity center is a concern for local stakeholders, and

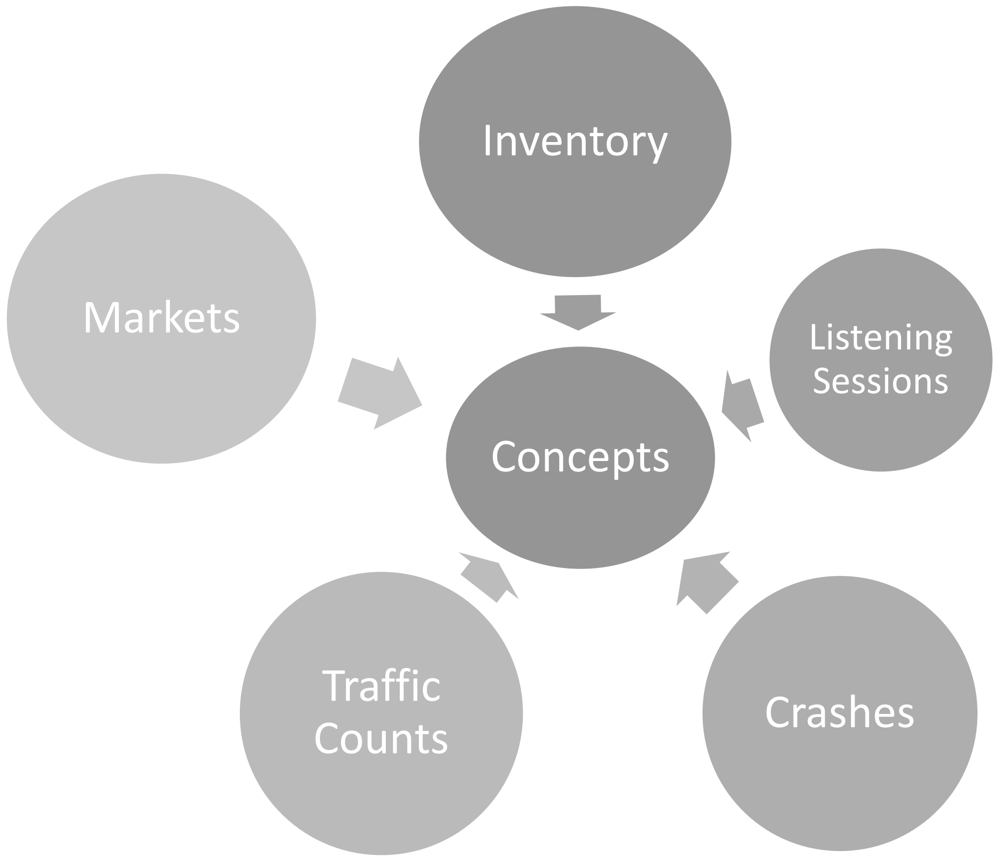
conversations are ongoing related to the rail line and improvements that could be made to ensure safe and efficient movements of goods and people.

- **TxDOT recent Corridor Studies,** including Doniphan Drive Corridor Plan, Horizon Blvd. (FM-1281) study, and Alameda Ave. (SH-20) study included assessments of needs, public input, and recommendations that may include rail associated improvements.
- **Grade separation concepts prepared by TxDOT or the City of El Paso in prior years –** A number of these looked at the UP corridor including Hawkins Blvd., Zaragoza Road, Lee Trevino Drive, Horizon Blvd., and Montana Ave. but were not advanced due to funding or other concerns.

3.0 Corridor Evaluation

RMS evaluated both the BNSF and UP Corridor Evaluation to identify where stakeholder input and available data coincide, and then to identify early concepts that could improve rail operations. RMS aims to foster cooperation among regional stakeholders to ensure viable projects can be developed and advanced. This methodology is illustrated in **Figure 5**.

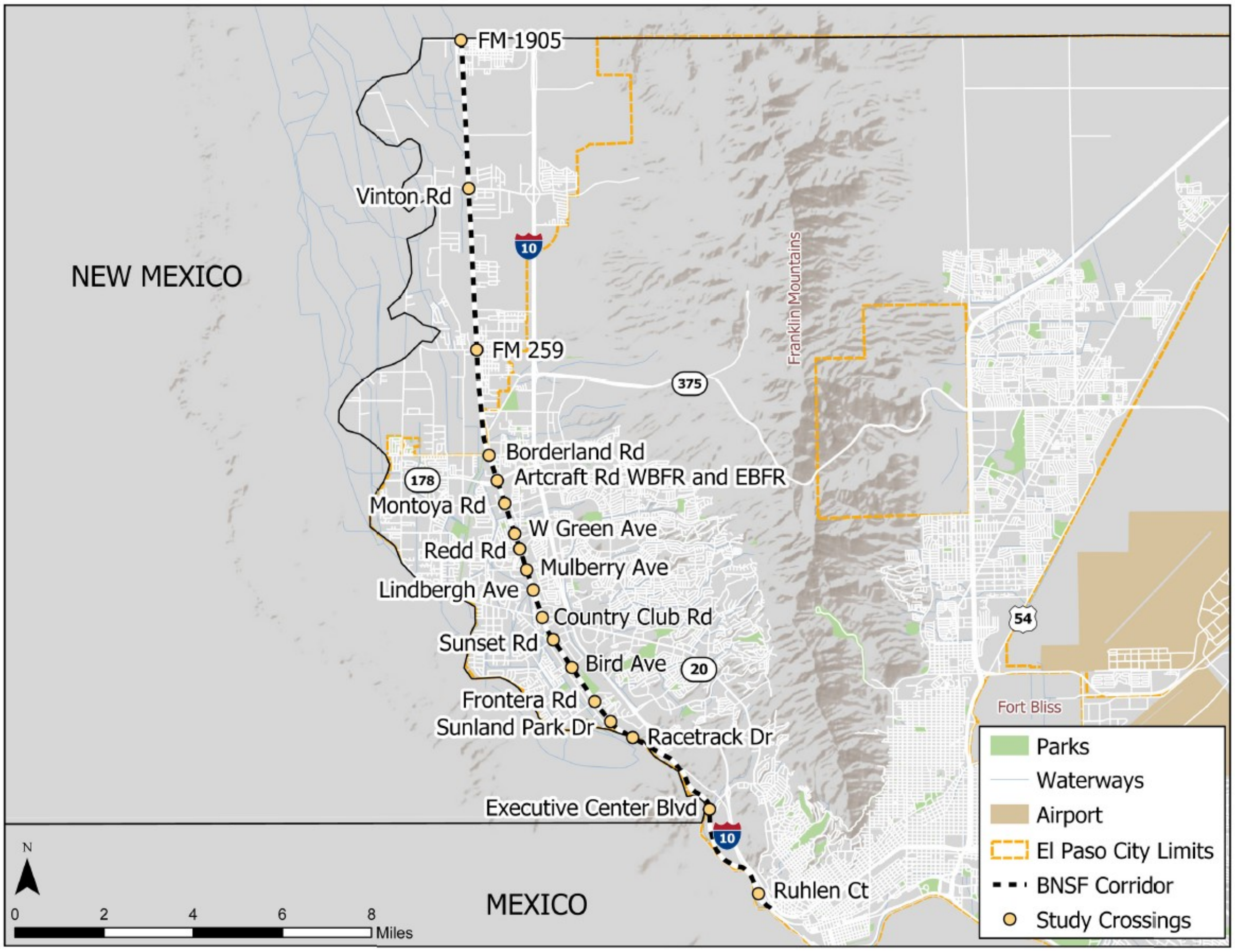
Figure 5. Methodology to Identify Concepts that Improve Freight Rail Operations



3.1 Inventory of the BNSF Corridor

The study area of the BNSF inventory is comprised of the BNSF El Paso Subdivision corridor within the state of Texas. The corridor begins at the Texas-New Mexico state line and ends at BNSF's El Paso Intermodal Facility at Santa Fe Street. The roads intersecting the rail crossings are classified as arterials, collectors, and local roads and provide connectivity to Doniphan Drive and US 85. **Figure 6** illustrates the project study area and the limits of the corridor, while **Appendix A-1**: contains the detailed inventory.

Figure 6. BNSF Project Study Area



An existing conditions inventory of key physical and operational features was completed for each of the nineteen (19) public rail crossings in the study area. The inventory includes rail crossing geometry, availability of gates, location and type of control (stop sign or gate), and relationship with adjacent intersections. The inventory presented in **Table 1** was completed using TxDOT's Doniphan Drive Corridor Study, aerial photography and available public datasets such as Google Earth.

Table 1. BNSF Inventory Summary

RAIL CROSSING NUMBER	INTERSECTING ROADWAY	GATES PRESENT (Y/N)	NUMBER OF LANES	ROADWAY WIDTH (FT)	POSTED SPEED LIMIT (MPH)	TRAFFIC CONTROL	ADDITIONAL INFORMATION
DONIPHAN CROSSINGS							
101	FM 1905	Y	2	30/45	35	SIGNALIZED	-
102	VINTON RD	Y	3	35	40	SIGNALIZED	-
103	FM 259	Y	2	20	40	SIGNALIZED	-
104	BORDERLAND RD	Y	2	25	30	SIGNALIZED	-
105	ARTCRAFT RD WB FRTG	Y	1	25	35	SIGNALIZED	ONE-WAY FACILITY
106	ARTCRAFT RD EB FRTG	Y	3	45	40	SIGNALIZED	ONE-WAY FACILITY
107	MONTOYA RD	Y	2	35	30	SIGNALIZED	PRIMA-FACIE SPEED*
108	W GREEN AVE	Y	2	35	30	SIGNALIZED	RAISED 12-FOOT MEDIAN
109	REDD RD	Y	6	75	30	SIGNALIZED	-
110	MULBERRY AVE	Y	3	35	30	SIGNALIZED	-
111	LINDBERGH AVE	Y	3	30/35	30	SIGNALIZED	-
112	COUNTRY CLUB RD	Y	5	60	35	SIGNALIZED	-
113	SUNSET RD	Y	3	35/40	30	SIGNALIZED	-
114	BIRD AVE	Y	2	25	30	SIGNALIZED	-
115	FRONTERA RD	Y	2	30	30	SIGNALIZED	-
116	SUNLAND PARK DR	Y	5	95	30	SIGNALIZED	RAISED 6-FOOT MEDIAN
117	RACETRACK DR	Y	3	65	40	SIGNALIZED	-
US 85 PAISANO CROSSINGS							
118	EXECUTIVE CENTER BLVD	Y	4	60	35	SIGNALIZED	RAISED 10-FOOT MEDIAN
119	RUHLEN CT	Y	2	25	30	SIGNALIZED	PRIMA-FACIE SPEED*

*Prima-facie speed limits are those limits which are reasonable and prudent under normal conditions.[5]

3.2 BNSF Crash Analysis

Crash data and accident prediction values for the nineteen (19) crossings along the BNSF study limits were collected from FRA and TxDOT. The data was analyzed to provide insight on potentially hazardous conditions along the corridor and place a spotlight on areas that could benefit most from safety improvements.

[5] Source: Texas Administrative Code. https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=43&pt=1&ch=25&rl=21, October 22, 2019

3.2.1 FRA Accident Prediction

The FRA Office of Safety Analysis releases an annual 'Accident Prediction Report for Public at-Grade Highway Rail Crossings.' This report can be filtered to a specific geographic area. The report generated for this study lists and ranks at-grade rail crossings within El Paso County according to predicted collisions per year. The Web Accident Prediction System (WBAPS) accident prediction formula is based on physical and operational characteristics in addition to five years of crash incident history at each crossing. The accident prediction value is the probability that a collision between a train and a highway vehicle will occur at the crossing within a year. The WBAPS report gives a county rank to each intersection per railroad with the highest rank representing the intersection with the highest accident prediction value. The study limits contain the top five (5) highest ranked crossings in El Paso County for the BNSF railroad:

- Crossing 112 at Country Club Road;
- Crossing 117 at Racetrack Drive;
- Crossing 109 at W Redd Road;
- Crossing 118 at Ruhlen Court; and
- Crossing 116 at Sunland Park Drive.

Accident prediction values for all public at-grade roadway-rail crossings within the study area are listed in **Table 2**.

Table 2. BNSF Corridor FRA Accident Prediction Values

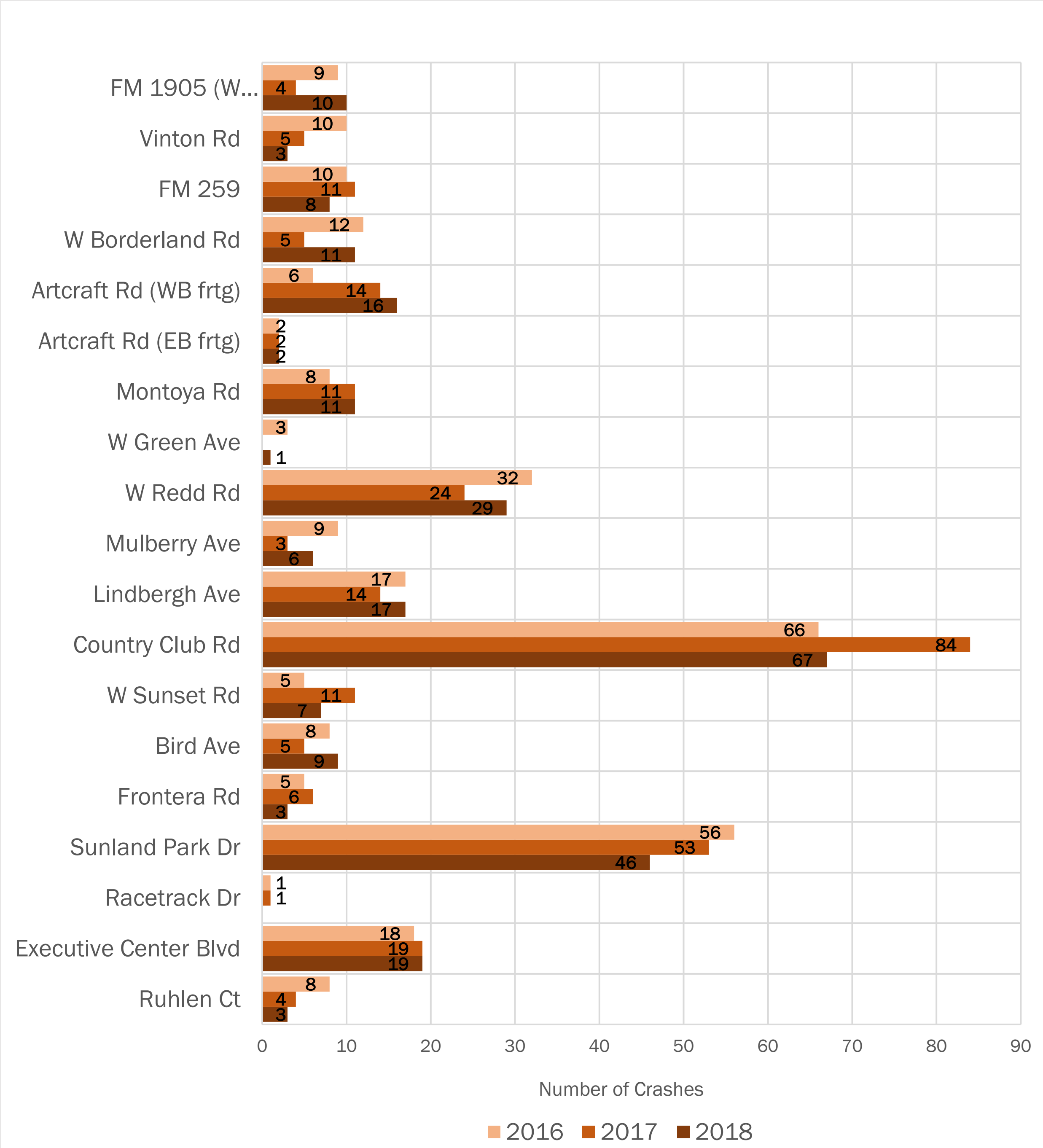
CROSSING NUMBER	INTERSECTING ROADWAY	FRA ID	ACCIDENT PREDICTION VALUE	COUNTY RANK
101	FM 1905	019753N	0.015975	16
102	VINTON RD	019763U	0.004579	28
103	FM 259	019769K	0.017627	11
104	BORDERLAND RD	019771L	0.013528	24
105	ARTCRAFT RD WB FRTG	019667S	0.013979	21
106	ARTCRAFT RD EB FRTG	019668Y	0.013979	22
107	MONTOYA RD	019774G	0.014277	20
108	W GREEN AVE	019620W	0.012405	25
109	REDD RD	019776V	0.030719	3
110	MULBERRY AVE	019778J	0.013625	23
111	LINDBERGH AVE	019779R	0.015112	18
112	COUNTRY CLUB RD	019780K	0.057737	1
113	SUNSET RD	019781S	0.017410	12
114	BIRD AVE	019784M	0.014459	19
115	FRONTERA RD	019785U	0.015412	17
116	SUNLAND PARK DR	019786B	0.022707	5
117	RACETRACK DR	019789W	0.042013	2
118	EXECUTIVE CENTER BLVD	019797N	0.019767	7
119	RUHLEN CT	019801B	0.024309	4

Red values denote locations ranked within the top 5 in El Paso Country based on its Accident Prediction Value

3.2.2 TxDOT Roadway Crash Records

Automobile crash records within two (2) blocks of all nineteen (19) crossings were evaluated to identify crash incident trends and highlight crossings that would benefit most from safety improvements. Crash records for the years 2016, 2017, and 2018 were obtained from TxDOT's Crash Record Information System (CRIS), which is derived from Texas Peace Officer's Crash Reports. The information includes publicly available data such as location, date and time, and severity, as well as various roadway, environmental, vehicular, and driver-behavior related factors. **Figure 7** shows the total number of crashes found within two (2) blocks of each crossing, each year. This spatial query retrieved a total of 829 vehicular crashes where Crossing 112 at Country Club Road, Crossing 109 at W Redd Road, Crossing 118 at Executive Center Boulevard, and Crossing 116 at Sunland Park Drive experienced the highest number of crashes. Crossings where the fewest crashes took place during the 3-year time period include Crossing 117 at Racetrack Drive and Crossing 108 at W Green Avenue.

Figure 7. Crash Count Within Two blocks of Each BNSF Crossing (2016 - 2018)



<u>3.2.3 Crashes Involving BNSF Railroad</u>

Of the 829 crash events identified within two (2) blocks of the crossings, sixteen (16) were flagged as being railroad-related in the CRIS dataset. Railroad-related crash incidents constitute approximately 2.0% of the crashes within the study area. These crash counts are listed by year in **Table 3**. The percentage of railroad related crashes within the study area has decreased by 0.9% from January 2016 to December 2018.

Table 3. BNSF Corridor Crashes by Year (2016- 2018)

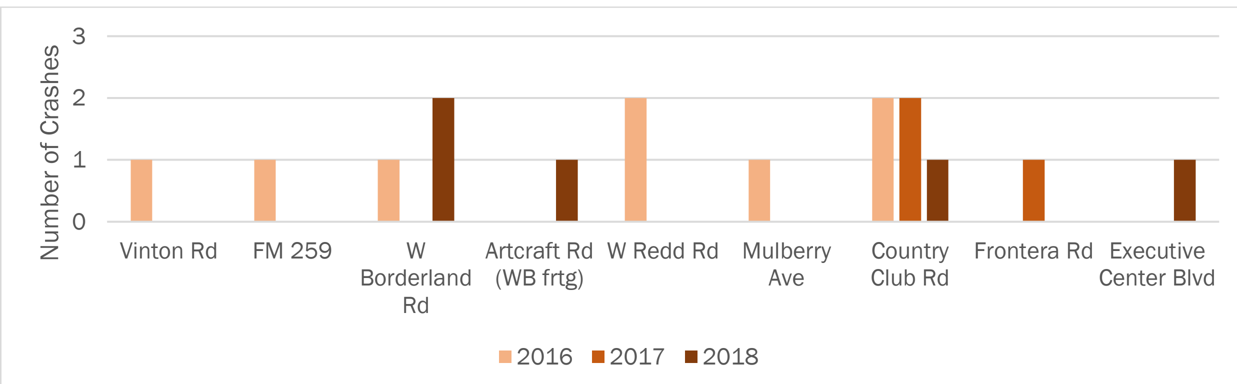
YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING TRAINS	PERCENT RAILROAD-RELATED
2016	285	8	2.8%
2017	276	3	1.1%
2018	268	5	1.9%

According to this dataset, three (3) BNSF crossings experienced the highest number of railroad related crash events within the study area:

- five (5) crashes at Country Club Road;
- three (3) crashes at West Borderland Road; and
- two (2) at W Redd Road.

BNSF crossings at Executive Center Boulevard, Frontera Road, Mulberry Avenue, Artcraft Road (westbound frontage), FM 259, and Vinton Road experienced one (1) railroad-related crash event from January 2016 to December 2018. **Figure 8** illustrates the distribution of railroad-related incidents for each public railroad crossing by year. Railroad crossings not associated with a crash incident involving the railroad are not included.

Figure 8. BNSF Corridor Crashes Involving Railroad Crossing

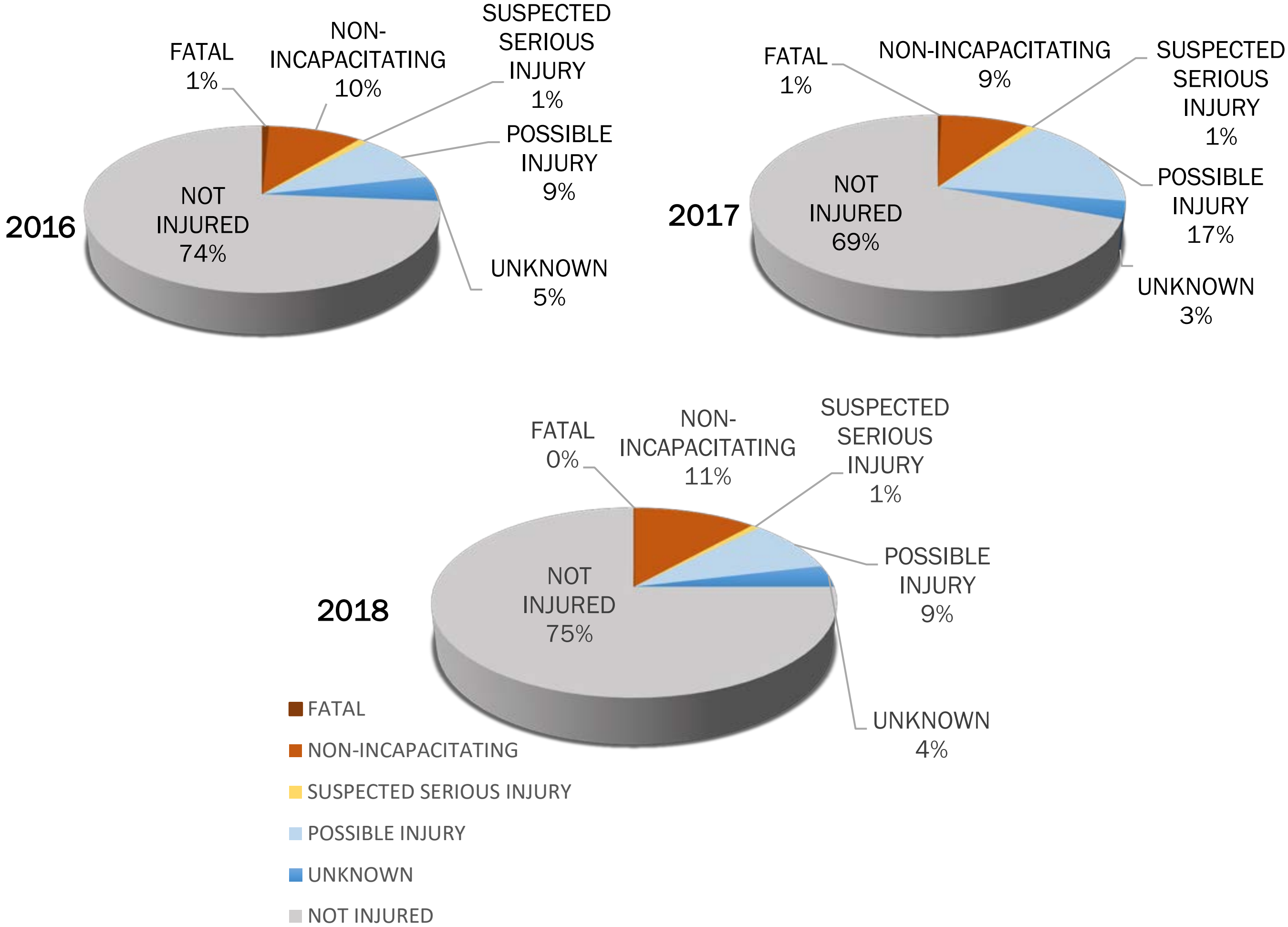


YEAR	VINTON RD	FM 259	W BORDERLAND RD	ARTCRAFT RD (WB FRTG)	W REDD RD	MULBERRY AVE	COUNTRY CLUB RD	FRONTERA RD	EXECUTIVE CENTER BLVD
2016	1	1	1	0	2	1	2	0	0
2017	0	0	0	0	0	0	2	1	0
2018	0	0	2	1	0	0	1	0	1

<u>3.2.4 Crash Severity of Railroad-Related Crashes</u>

Of the sixteen (16) railroad-related crash events, there were zero (0) fatal crashes and one (1) crash that resulted in a non-incapacitating injury at Crossing 112 Country Club Road. No injuries were reported for the other fourteen (14) incidents. ***Figure 9*** illustrates crash severity for all crashes found within two (2) blocks of the corridor. Like the subset of railroad-related crashes, the majority of crash events within two (2) blocks of each crossing did not result in an injury, and fatal crashes constitute the smallest percentage of severity categories.

Figure 9. Crash Severity for Crashes within Two Blocks of BNSF Corridor Crossings



<u>3.2.5 Manner of Collision for Railroad-Related Crashes</u>

The listing of crashes by type and year as defined by TxDOT's CRIS record specifications is in **Table 4**. Ten (10) incidents were initiated by a vehicle colliding with another motor vehicle, five (5) incidents were initiated by a vehicle colliding with a fixed object, and one (1) crash incident was initiated by a vehicle colliding with a moving train.

Table 4. Manner for Railroad-related Crashes within BNSF Corridor

CROSSING NUMBER	ROADWAY	FIRST OBJECT STRUCK	MANNER OF COLLISION	2016	2017	2018	3-YEAR TOTAL
102	VINTON RD	FIXED OBJECT - RAILROAD SIGNAL POLE OR POST	ONE MOTOR VEHICLE - TURNING RIGHT	1			1
103	FM 259	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH LEFT TURN	1			1
104	W BORDERLAND RD	FIXED OBJECT - FENCE	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
		FIXED OBJECT - OTHER	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE LEFT TURN-ONE STOPPED	1			1
105	ARTCRAFT RD (WB FRTG)	FIXED OBJECT - RAILROAD CROSSING GATES	ONE MOTOR VEHICLE - TURNING LEFT			1	1
109	W REDD RD	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED	2			2
110	MULBERRY AVE	FIXED OBJECT - TRAFFIC SIGNAL POLE OR POST	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
112	COUNTRY CLUB RD	FIXED OBJECT - OTHER	ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH GOING STRAIGHT-REAR END			1	1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED	2			2
		RR TRAIN - MOVING FORWARD	ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
115	FRONTERA RD	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE LEFT TURN		1		1
118	EXECUTIVE CENTER BLVD	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH GOING STRAIGHT-REAR END			1	1
TOTALS				8	3	5	16

3.2.6 Environmental Conditions of Railroad-Related Crashes

Weather, lighting, and pavement surface conditions can also shed light on the nature and cause of crash incidents. **Table 5** details those conditions during railroad-related crashes. Of the sixteen (16) railroad-related crashes, ten (10) crashes took place in clear weather conditions during daylight hours or in a lighted environment. One (1) crash event occurred at Crossing 104 Borderland Road in July 2018 in dark and unlighted conditions. This was a single-vehicle incident where the vehicle struck a fixed object. Weather does not appear to be a factor along the corridor but lighting conditions at Crossing 104 Borderland Road should be further evaluated.

Table 5. Environmental Conditions During Railroad-related Crashes within BNSF Corridor

WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DARK, LIGHTED	DRY	6.25%	0.00%	6.25%	2
	DARK, LIGHTED	OTHER	0.00%	6.25%	0.00%	1
	DARK, UNKNOWN LIGHTING	DRY	6.25%	0.00%	0.00%	1
	DAYLIGHT	DRY	25.00%	6.25%	18.75%	8
CLOUDY	DARK, NOT LIGHTED	DRY	0.00%	0.00%	6.25%	1
	DAYLIGHT	DRY	12.50%	0.00%	0.00%	2
RAIN	DAYLIGHT	WET	0.00%	6.25%	0.00%	1
TOTAL			**50.00%**	**18.75%**	**31.25%**	**16**

3.2.7 Driver Behavior in Railroad-Related Crashes

In addition to the manner of collision, CRIS records capture contributing factors. Contributing factors analyzed in this study include the first factor for the vehicle which the reporting officer felt contributed to the crash. Driver inattention and failure to control speed were the most commonly reported contributing factors. Driver failure to stop for train, fatigue, and alcohol consumption constitute the remainder of reported factors. The distribution of reported contributing factors over time for the railroad-related crashes in this study are listed in **Table 6**.

Table 6. Contributing Factors for Railroad-related Crashes within BNSF Corridor

CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
DRIVER INATTENTION	18.75%	0.00%	0.00%	18.75%
FAILED TO CONTROL SPEED	6.25%	0.00%	6.25%	12.50%
FAILED TO STOP FOR TRAIN	0.00%	6.25%	0.00%	6.25%
FATIGUED OR ASLEEP	0.00%	6.25%	0.00%	6.25%
HAD BEEN DRINKING	6.25%	0.00%	0.00%	6.25%
NONE REPORTED	18.75%	6.25%	18.75%	43.75%
UNDER INFLUENCE – ALCOHOL	0.00%	0.00%	6.25%	6.25%
TOTAL	50.00%	18.75%	31.25%	100%

3.2.8 BNSF Crashes Involving Pedestrians/Cyclists

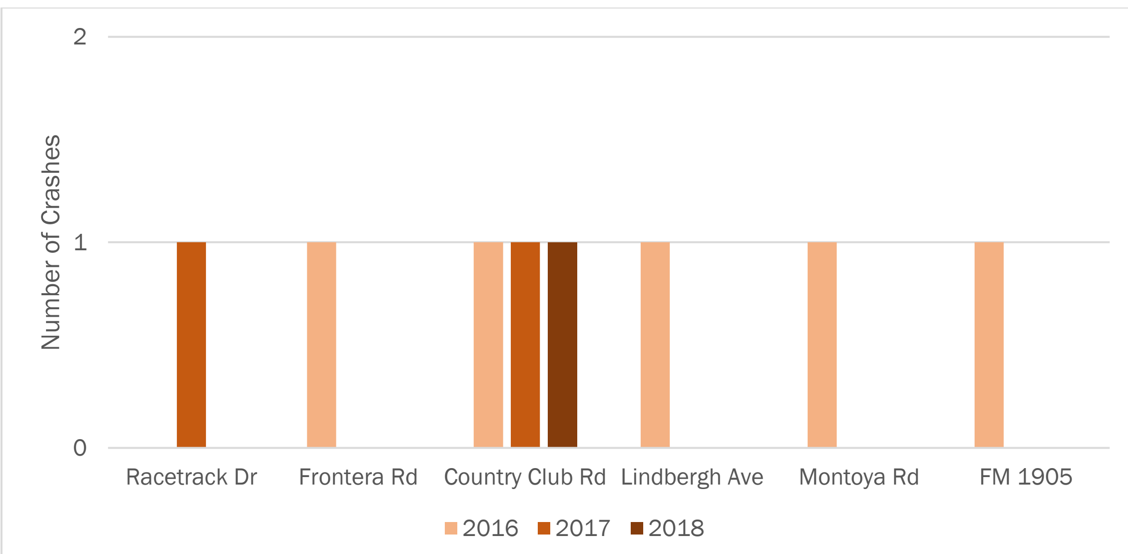
CRIS dataset indicates whether crashes involve a pedestrian or cyclist. Of the 829 vehicular crashes on the BNSF corridor, nine (9) crashes involved pedestrians or cyclists. Crashes involving pedestrians or cyclists constitute approximately 1% of the crashes within the BNSF study area. **Table 7** lists these crash counts by year.

Table 7. Pedestrian/Cyclist-Involved Crashes by Year (2016 - 2018) within BNSF Corridor

YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING PEDESTRIANS/CYCLISTS	PERCENT PEDESTRIAN/CYCLIST -RELATED
2016	277	6	2.2%
2017	273	2	0.7%
2018	263	1	0.4%

The BNSF crossing at Country Club Road, with three (3) pedestrian/cyclist-involved crashes, was the only intersection to experience multiple such crashes. The crossing should be assessed for pedestrian/ cyclist safety. FM 1905, Montoya Road, Lindbergh Avenue, Frontera Road, Racetrack Drive, and Ruhlen Court each experienced a single pedestrian/cyclist-involved crash. **Figure 10** illustrates the distribution of pedestrian/cyclist-involved crashes for each intersection. Crossings not associated with a crash incident involving a pedestrian or cyclist are omitted.

Figure 10. Crashes within BNSF Corridor Involving Pedestrians or Cyclists

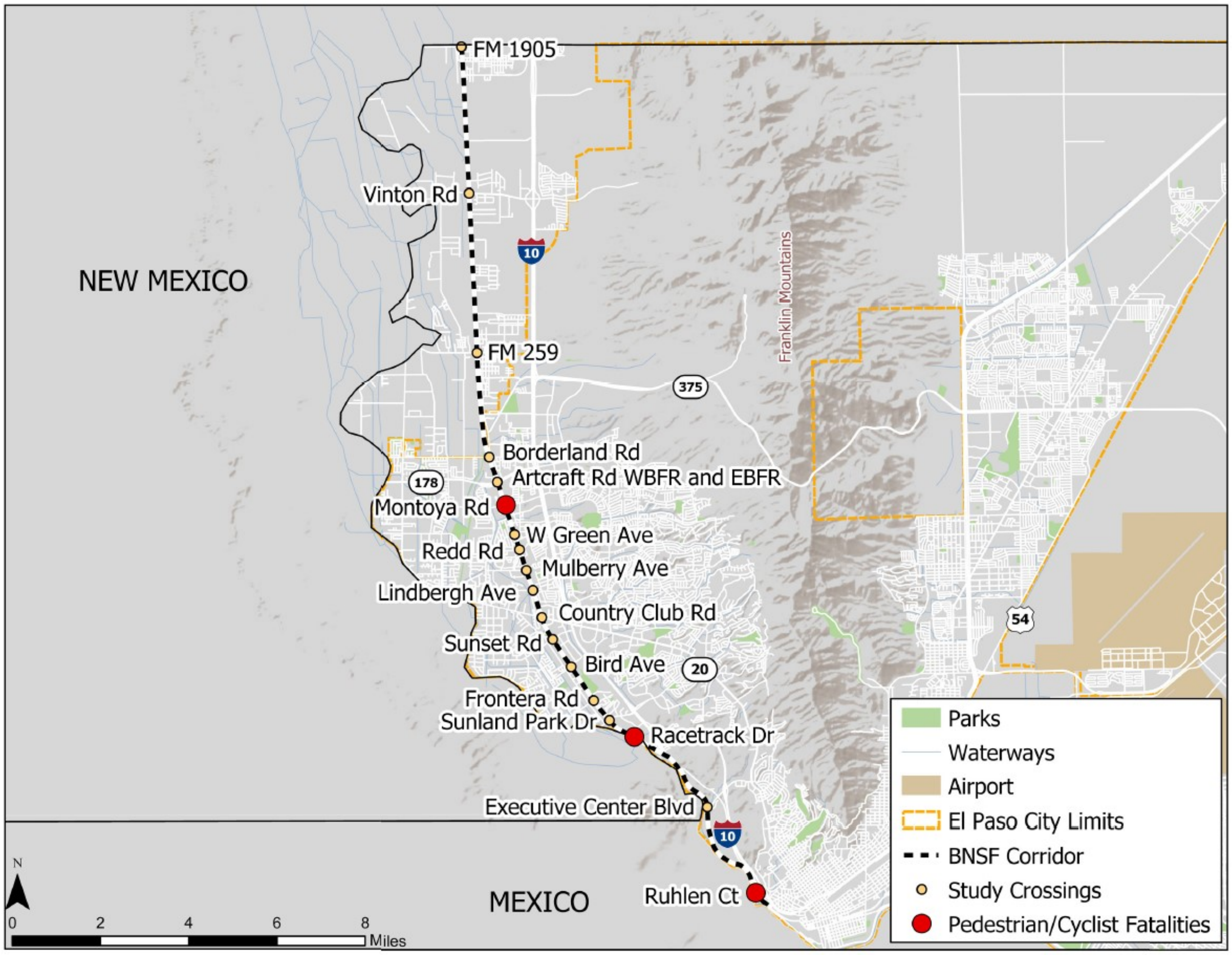


YEAR	RACETRACK DR	FRONTERA RD	COUNTRY CLUB RD	LINDBERGH AVE	MONTOYA RD	FM 1905
2016	0	1	1	1	1	1
2017	1	0	1	0	0	0
2018	0	0	1	0	0	0

3.2.9 Crash Severity of Crashes Involving Pedestrians/Cyclists

Of the nine (9) crashes involving a pedestrian or cyclist, there were three (3) fatal crashes: a pedestrian was killed near the Montoya Road crossing, another pedestrian was killed near Ruhlen Court, and a cyclist was killed near Racetrack Drive. This is illustrated in **Figure 11**.

Figure 11. Pedestrian/Cyclist Fatalities, BNSF Corridor



<u>3.2.10 Manner of Collision of Crashes Involving Pedestrians/Cyclists</u>

Table 8 lists crashes involving a pedestrian or cyclist by type and year. Six (6) of the crashes involved a pedestrian, and the remaining three (3) involved a cyclist. Three (3) crashes involved turning vehicles, one involved a vehicle backing up, and the remaining five (5) involved a vehicle going straight.

Table 8. Manner of Pedestrian/Cyclist-Involved Crashes within BNSF Corridor

CROSSING NUMBER	ROADWAY	PEDESTRIAN/CYCLIST	MANNER OF COLLISION	2016	2017	2018	3-YEAR TOTAL
101	FM 1905	CYCLIST	ONE MOTOR VEHICLE - TURNING RIGHT	1			1
107	MONTOYA RD	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
111	LINDBERGH AVE	PEDESTRIAN	ONE MOTOR VEHICLE - TURNING LEFT	1			1
112	COUNTRY CLUB RD	PEDESTRIAN	ONE MOTOR VEHICLE - BACKING	1			1
			ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
			ONE MOTOR VEHICLE - TURNING LEFT			1	1
115	FRONTERA RD	CYCLIST	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
117	RACETRACK DR	CYCLIST	ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
119	RUHLEN CT	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
TOTALS				**6**	**2**	**1**	**9**

3.2.11 Environmental Conditions of Crashes Involving Pedestrians/Cyclists

Weather, lighting, and pavement surface conditions may affect crash risk. **Table 9** details those conditions during pedestrian- and cyclist-related crashes. Of the nine (9) crashes in which a pedestrian or cyclist was involved, seven (7) crashes took place in clear weather conditions during daylight hours or in a lighted environment. Crossing 117, the Racetrack Drive Crossing, may merit consideration for lighting improvements. The fatal crash there occurred in unlit conditions, in the dark and in the rain.

Table 9. Environmental Conditions During Pedestrian/Cyclist-Related Crashes within BNSF Corridor

WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DAYLIGHT	DRY	44.4%	0.0%	11.1%	5
	DARK, LIGHTED	DRY	11.1%	11.1%	0.0%	2
	DARK, NOT LIGHTED	DRY	11%	0%	0%	1
RAIN	DARK, NOT LIGHTED	WET	0.0%	11.1%	0.0%	1
TOTAL			**66.7%**	**22.2%**	**11.1%**	**9**

3.2.12 Driver Behavior in Crashes Involving Pedestrians/Cyclists

In addition to the manner of collision, CRIS records capture contributing factors. Contributing factors analyzed in this study include the first factor for the vehicle which the reporting officer felt contributed to the crash. Seven (7) of pedestrian/cyclist-involved crashes have no contributing factor reported. The contributing factors for the remaining two (2) crashes were, respectively, driver inattention and backing without safety. The distribution by year of reported contributing factors for the railroad-related crashes in this study are listed in **Table 10**.

Table 10. Contributing Factors for Pedestrian/Cyclist-Related Crashes within BNSF Corridor

CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
DRIVER INATTENTION	11.1%	0.0%	0.0%	11.1%
BACKED WITHOUT SAFETY	11.1%	0.0%	0.0%	11.1%
NONE REPORTED	44.4%	22.2%	11.1%	77.8%
TOTAL	**66.7%**	**22.2%**	**11.1%**	**100%**

3.2.13 Monetary Cost of Crashes

The National Safety Council estimates the monetary cost of a crash by considering wage and productivity losses, medical expenses, administrative expenses, motor-vehicle damage, and employers' uninsured costs. Note that, with the exception of motor-vehicle damage, these dollar values are per fatality or injury, not per crash. Motor-vehicle damages are tabulated as cost per damaged vehicle. Those costs are presented in **Table 11**.

Table 11. Monetary Cost of Crashes within BNSF Corridor

EVENT	COST
DEATH	$1,615,000
DISABLING	$93,800
EVIDENT	$27,100
POSSIBLE	$22,300
NO INJURY OBSERVED	$11,900
PROPERTY DAMAGE ONLY	$4,400

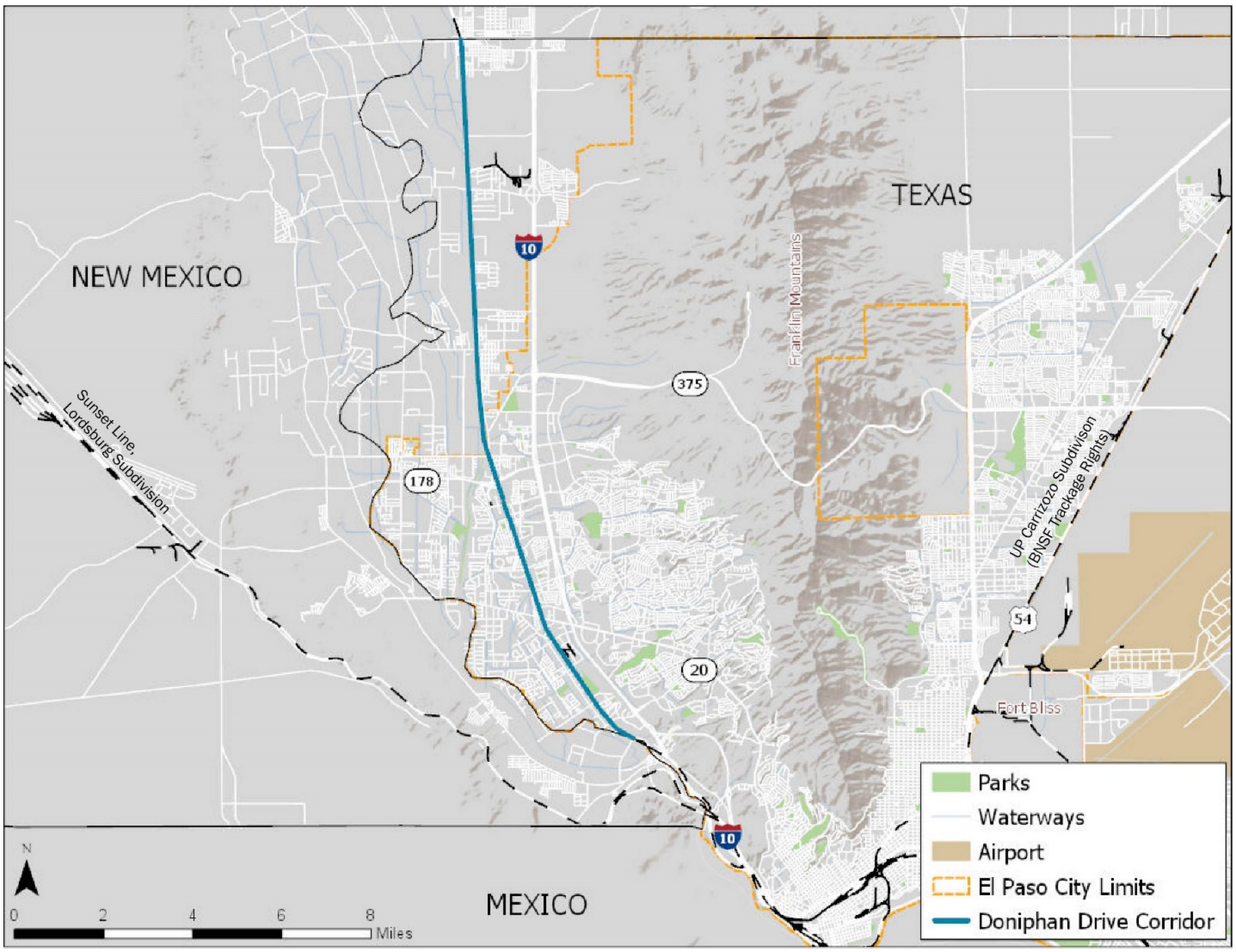
3.2.14 Summary of Crash Analysis

RMS used historic crash records to identify characteristics of rail-related crashes including severity, manner of collision, environmental conditions, driver behavior, and pedestrian/cyclist involvement. The intersection at Country Club Road has experienced the highest number of total crashes, the highest number of rail-related crashes, and the highest number of pedestrian/cyclist related crashes. Vehicular, pedestrian and cyclist safety should be reviewed and improvements should be considered. Additionally, the crossings at Racetrack Drive and Borderland Road should be reviewed for lighting improvements.

3.3 Analysis of Impacts at BNSF Intersections

The BNSF corridor is closely aligned with US 85 (Paisano) and Doniphan Drive. A 15-mile section of Doniphan Drive extends from Texas/New Mexico state line to Racetrack Drive, parallel to I-10, as illustrated in **Figure 12**. This segment of Doniphan is specifically addressed in this RMS report because of its importance as a corridor connecting two states and its location parallel to the BNSF corridor which creates mobility challenges that will require a focused effort to resolve.

Figure 12. Doniphan Study Map



In 2018 TxDOT completed the Doniphan Drive Corridor Plan documenting a comprehensive effort to capture the community's future vision and to serve as the basis for future preliminary design and engineering. The plan identifies costs and opportunities for various improvements and identifies those for short-, medium- and long-term implementation. The plan addresses roadway improvements for safety and reduced congestion at key intersections (refer to **Table 12**), as well as the community's desire to modify the corridor to include installation of pedestrian/bicycle infrastructure, and appropriate aesthetic improvements. The Doniphan plan developed concepts for the intersections including new geometric configurations and other enhancements (**Figure 13**).

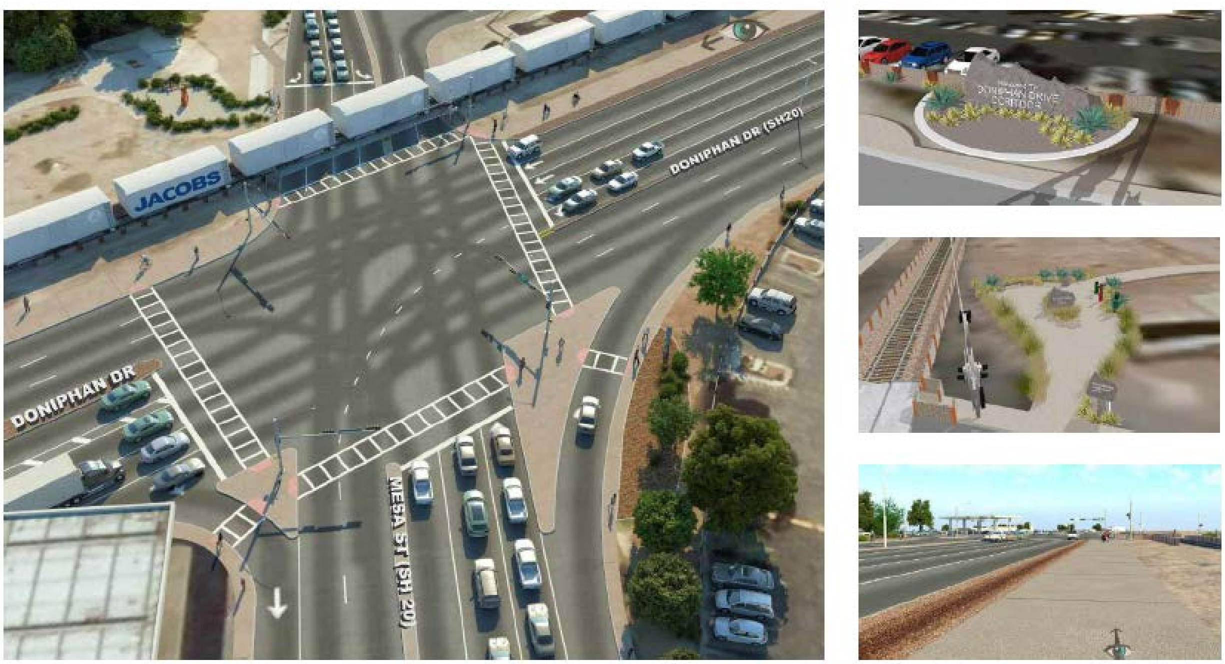
Table 12. Inventory of Crossings in Doniphan Study

INTERSECTION
FM 1905 /WASHINGTON ST.
VINTON RD./SS 37 (VINTON RD.)
FM 529 (CANUTILLO LA UNION AVE.)/LA MESA AVE
BORDERLAND RD.
(SH 178) ARTCRAFT RD.
MONTOYA LN.
REDD ST.
SH 20 (MESA ST.)/COUNTRY CLUB RD.
SUNSET RD.
BIRD AVE.
FRONTERA RD.
SUNLAND PARK DR.
RACETRACK DR.

Source: TxDOT Doniphan Drive Corridor Plan, 2018

The concepts varied by intersections and would relieve delay at each at-grade crossing of the BNSF line. **Figure 13** below illustrates the concepts developed for each intersection where the BNSF line crosses Doniphan Drive. Multiple rounds of stakeholder input were held to identify the priorities for each intersection, whether that be placemaking, safety, or cost. This input was used to develop concepts. Further development of these concepts would require funding to be identified, as well as Preliminary Engineering and Design.

Figure 13. Example of Concepts from Doniphan Study



3.3.1 Analysis of Vehicular Delay at BNSF Crossings

The RMS team initially set out to obtain working VISSIM traffic simulation files from the Doniphan study team for review and determination of for rail-related traffic delays. The delays were to be used for estimating vehicle emissions resulting vehicles waiting for trains to pass. Such an analysis was performed for the UP crossings and can be found in subsequent sections of this report. However, the RMS team learned that the Doniphan study did not isolate or determine rail delays in its modeling. Instead the Doniphan study yielded traditional traffic analysis measures such as signalized intersection LOS for 2016 and 2040. These results are included in **Table 13**. The intersections are all currently (2016) operating at LOS "C" or better during the AM and PM Peak Hour except the Doniphan Drive & Mesa Street intersection and the Doniphan Drive & Sunland Park intersection, which operate at LOS "D."

Table 13. 2016 AM & PM Peak Hour Intersection Delay & LOS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS
DONIPHAN DRIVE & WASHINGTON STREET	31	C	10	B
DONIPHAN DRIVE & FRANKLIN STREET	7	A	8	A
DONIPHAN DRIVE & WILDCAT DRIVE	2	A	2	A
DONIPHAN DRIVE & VINTON ROAD	18	B	18	B
DONIPHAN DRIVE & LA MESA AVENUE	19	B	14	B
DONIPHAN DRIVE & TALBOT AVENUE	6	A	10	A
DONIPHAN DRIVE & SPUR 16	5	A	7	A
DONIPHAN DRIVE & BORDERLAND ROAD	21	C	16	B
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD WB	13	B	14	B
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD EB	10	B	12	B
DONIPHAN DRIVE & MONTOYA ROAD	15	B	8	A
DONIPHAN DRIVE & MONTOYA LANE	12	B	11	B
DONIPHAN DRIVE & REDD ROAD	27	C	28	C

DONIPHAN DRIVE & MULBERRY AVENUE	6	A	4	A
DONIPHAN DRIVE & THORN AVENUE	8	A	10	A
DONIPHAN DRIVE & LINDBERGH AVENUE	10	A	9	A
DONIPHAN DRIVE & MESA STREET	47	D	41	D
DONIPHAN DRIVE & SUNSET ROAD	26.90	C	25	C
DONIPHAN DRIVE & BIRD AVENUE	-	-	-	-
DONIPHAN DRIVE & FRONTERA ROAD	17.36	B	13	B
DONIPHAN DRIVE & SUNLAND PARK	35.52	D	39	D
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	6.87	A	8	A
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	-	-	-	-

Source: TxDOT Doniphan Drive Corridor Plan, 2018

The Doniphan study went on to calculate projected 2040 no-build and build intersection delays and LOS. Under the build conditions, all intersections and approaches would operate at LOS "D" or better during the AM and PM Peak Hour periods, except for the eastbound approach at Doniphan Drive and Washington Street, which would operate at LOS "F" during the AM Peak Hour (see **Table 14** and **Table 15**).

Table 14. 2040 No-Build AM & PM Peak Hour Intersection Delay & LOS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS
DONIPHAN DRIVE & WASHINGTON STREET	51	D	30	C
DONIPHAN DRIVE & FRANKLIN STREET	12	B	32	C
DONIPHAN DRIVE & WILDCAT DRIVE	3	A	5	A
DONIPHAN DRIVE & VINTON ROAD	34	C	35	C
DONIPHAN DRIVE & LA MESA AVENUE	83	F	94	F
DONIPHAN DRIVE & TALBOT AVENUE	20	C	74	E
DONIPHAN DRIVE & SPUR 16	8	A	11	B
DONIPHAN DRIVE & BORDERLAND ROAD	73	E	53	D
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD WB	37	D	38	D
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD EB	14	B	21	C
DONIPHAN DRIVE & MONTOYA ROAD	68	E	47	D
DONIPHAN DRIVE & MONTOYA LANE	32	C	31	C
DONIPHAN DRIVE & REDD ROAD	55	E	62	E
DONIPHAN DRIVE & MULBERRY AVENUE	8	A	5	A
DONIPHAN DRIVE & THORN AVENUE	11	B	13	A
DONIPHAN DRIVE & LINDBERGH AVENUE	17	B	18	B
DONIPHAN DRIVE & MESA STREET	128	F	113	F
DONIPHAN DRIVE & SUNSET ROAD	61	E	38	D
DONIPHAN DRIVE & BIRD AVENUE	83	F	16	B

DONIPHAN DRIVE & FRONTERA ROAD	32	C	23	C
DONIPHAN DRIVE & SUNLAND PARK	85	F	111	F
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	9	A	10	A
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	5	A	7	A

Source: TxDOT Doniphan Drive Corridor Plan, 2018

Table 15. 2040 Build AM & PM Peak Hour Intersection Delay & LOS

INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS	INTERSECTION DELAY (SEC/VEH)	INTERSECTION LOS
DONIPHAN DRIVE & WASHINGTON STREET	42	D	27	C
DONIPHAN DRIVE & FRANKLIN STREET	8	A	19	B
DONIPHAN DRIVE & WILDCAT DRIVE	3	A	3	A
DONIPHAN DRIVE & VINTON ROAD	11	B	15	B
DONIPHAN DRIVE & LA MESA AVENUE	27	C	25	C
DONIPHAN DRIVE & TALBOT AVENUE	21	C	21	C
DONIPHAN DRIVE & SPUR 16	8	A	12	B
DONIPHAN DRIVE & BORDERLAND ROAD	27	C	32	C
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD WB	23	C	27	C
DONIPHAN DRIVE & ARTCRAFT FRONTAGE ROAD EB	13	B	21	C
DONIPHAN DRIVE & MONTOYA ROAD	31	C	32	C
DONIPHAN DRIVE & MONTOYA LANE	32	C	21	C
DONIPHAN DRIVE & REDD ROAD	10	A	6	A

DONIPHAN DRIVE & MULBERRY AVENUE	8	A	13	B
DONIPHAN DRIVE & THORN AVENUE	13	B	13	B
DONIPHAN DRIVE & LINDBERGH AVENUE	39	D	48	D
DONIPHAN DRIVE & MESA STREET	28	C	22	C
DONIPHAN DRIVE & SUNSET ROAD	17	B	15	B
DONIPHAN DRIVE & BIRD AVENUE	13	B	13	B
DONIPHAN DRIVE & FRONTERA ROAD	38	D	30	C
DONIPHAN DRIVE & SUNLAND PARK	9	A	9	A
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	3	A	5	A
DONIPHAN DRIVE & NORTH RACE TRACK DRIVE	7	A	7	A

Source: TxDOT Doniphan Drive Corridor Plan, 2018

3.3.2 Doniphan Study Improvement Concepts

These intersection improvement concepts proposed in the build scenario are of interest to goals of RMS. By improving vehicular LOS, the emissions associated with rail crossings are also anticipated to be reduced. The Doniphan Drive Corridor Plan was included in the MPO's current CMP. TxDOT is taking steps to allow Doniphan improvements to be prioritized and advanced for programming and funding. Such activities should be given a high importance considering the growth that is occurring in Northwest El Paso.

As funding is identified and Preliminary Engineering begins, it will be important to discuss such improvements with BNSF and reaching agreements. Other key steps may need to include: identifying constraints; developing horizontal and vertical alignments in accordance with the TxDOT Roadway Design Manual; identifying the type of environmental clearances required; and developing preliminary order-of-magnitude costs.

The concepts also provide multimodal opportunities – and should be developed in conjunction with Sun Metro and with the City of El Paso's Bike Plan. For bicycles, the concepts envision a shared bike facility for the length of Doniphan Drive, with adjoining east/west bike facilities on corridors like Mesa Street/Country Club Road. By improving connectivity for pedestrians, bikes, transit, vehicles, and truck freight trips, this will improve community connectivity to activity centers, health care facilities, and regional travel.

3.3.3 Envisioning the Future

Based on the changing conditions of the Doniphan corridor and the separate 2016 Santa Teresa International Rail Study, RMS further evaluated long term potential future opportunities if the obvious constraint of BNSF's existing rail line was ever to be removed. In that scenario, potential opportunities could include widening of roadways, adding bypass lanes, improving intersections, and adding transit, bicycle and pedestrian amenities. To explore these opportunities, RMS developed concepts for:

- US 85 (Paisano Drive) at Spur 1966;
- US 85 (Paisano Drive) at Executive Center Boulevard
- Doniphan Drive at Sunland Park Drive

For Doniphan Drive at Sunland Park Drive, which is performing poorly in LOS by 2040 in the no-build, by using some of the BNSF railroad ROW for additional turn lanes, the traffic conditions could be improved. For the intersections of US 85 with Spur 1966 and Executive Center Boulevard, the concept expanded Paisano Drive with new intersection bypass lanes to improve mobility between downtown and West El Paso.

Appendix B-1 contains the conceptual drawings.

The BNSF El Paso Intermodal Facility could also become available for redevelopment if the bypass is ultimately implemented. If this large tract of land eventually becomes available in a built-out part of El Paso, this could yield significant opportunities for redevelopment and economic benefits.

3.4 Inventory of the UP Corridors

The study area for the UP inventory is comprised of two UP corridors that begin at the Dallas Yard in Downtown El Paso. The first corridor (Corridor 1) follows a northeast direction towards the Texas-New Mexico state line. The second corridor (Corridor 2) follows an eastbound direction to the El Paso/Hudspeth County line. The roads intersecting the rail crossings are classified as local roads. These local roads provide connectivity to major arterials such as Alameda Avenue, freeways such as I-10, and I-10 Frontage Roads. **Figure 14** and **Figure 15** illustrate the project study area and the limits of the two corridors, while **Appendix C-1** contains the detailed inventory.

Figure 14. UP Project Study Area (1 of 2)

Figure 15. UP Project Study Area (2 of 2)

An existing conditions inventory of key physical and operational features was completed for each of the twenty-six (26) rail crossings in the study area. The inventory includes rail crossing geometry, availability of gates, location and type of control (stop sign or gate), and relationship with adjacent intersections. The inventory was completed using aerial photography and available public datasets such as Google Earth. Corridor 1 has six (6) at-grade crossings labeled as Rail Crossings 201 to 206, and Corridor 2 consists of twenty (20) at-grade crossings labeled as Rail Crossings 301 to 320. **Table 16** and **Table 17** summarize the Existing Conditions inventory for Corridors 1 and 2.

Table 16. UP Inventory Summary – Corridor 1

RAIL CROSSING NUMBER	INTERSECTING ROADWAY	GATES PRESENT (Y/N)	NUMBER OF LANES	ROADWAY WIDTH (FT)	POSTED SPEED LIMIT	TRAFFIC CONTROL	ADDITIONAL INFORMATION
201	PIEDRAS ST.	Y	4	50	30	SIGNALIZED	3' RAISED MEDIAN
202	ELM ST.	Y	2	30 / 45	30	SIGNALIZED	ON-STREET PARKING TO THE SOUTH
203	ROSEWOOD ST.	Y	2	25	30	SIGNALIZED	5' RAISED MEDIAN
204	MONTANA AVE.	Y	4	45	30	SIGNALIZED	-
205	YANDELL DR.	Y	3	32	35	SIGNALIZED	ONE-WAY, ON-STREET PARKING
206	MISSOURI AVE.	Y	3	47	45	SIGNALIZED	ONE-WAY

Table 17. UP Inventory Summary – Corridor 2

RAIL CROSSING NUMBER	INTERSECTING ROADWAY	GATES PRESENT (Y/N)	NUMBER OF LANES	ROADWAY WIDTH (FT)	POSTED SPEED LIMIT	TRAFFIC CONTROL	ADDITIONAL INFORMATION
301	SAN MARCIAL ST.	Y	2	40	30	SIGNALIZED	-
302	ESTRELLA ST.	Y	2	40	20	SIGNALIZED	-
303	CEBADA ST.	Y	2	35	30	SIGNALIZED	PRIMA-FACIE SPEED LIMIT
304	GRAMA ST.	Y	2	40	30	SIGNALIZED	ON-STREET PARKING
305	COPIA ST.	Y	4	55	30	SIGNALIZED	-
306	BOONE ST.	Y	2	40	30	SIGNALIZED	-
307	CHELSEA ST.	Y	2	45	30	SIGNALIZED	-
308	GLENWOOD ST.	Y	2	50	30	SIGNALIZED	-
309	CADWALLADER DR.	Y	2	30	30	SIGNALIZED	-
310	ROSEDALE ST.	Y	2	40	30	SIGNALIZED	-
311	LAFAYETTE DR.	Y	2	40	30	SIGNALIZED	ON-STREET PARKING TO THE SOUTHWEST
312	SMITH RD.	Y	2	40 / 20	30	SIGNALIZED	-
313	NEW HAVEN DR.	Y	2	50	30	SIGNALIZED	-
314	PENDALE RD.	Y	2	30	30	SIGNALIZED	-
315	ZARAGOZA RD.	Y	4	50	35	SIGNALIZED	-
316	INGLEWOOD DR.	Y	2	30	30	SIGNALIZED	-
317	MOON RD.	Y	2	25	30	SIGNALIZED	-
318	RIO VISTA RD.	Y	2	20	25	SIGNALIZED	PRIMA-FACIE SPEED LIMIT
319	HORIZON BLVD.	Y	4	65	35	SIGNALIZED	RAISED 17-FOOT MEDIAN
320	BAUMAN RD.	Y	2	20	30	SIGNALIZED	-

*Prima-facie speed limits are those limits which are reasonable and prudent under normal conditions.

3.5 UP Crash Analysis

Crash information for twenty-six (26) rail crossings along the UP is included. Data from TxDOT crash records for the three most recent years (2016 to 2018) was obtained from CRIS for the roadways intersecting at-grade rail crossings. Available data for crashes within the vicinity of rail crossings were examined to determine if their respective causes could be attributed to queuing at the crossings. However, the available information did not yield results allowing crashes to be attributed to the at-grade rail crossings; therefore, the crashes within a distance of two blocks from the at-grade crossings in each direction were compiled to ensure all crashes that may attribute the rail crossings as a secondary cause would be captured.

3.5.1 FRA Accident Prediction

The FRA Office of Safety Analysis releases an annual 'Accident Prediction Report for Public at-Grade Highway Rail Crossings.' This report can be filtered to a specific geographic area. The report generated for this study lists and ranks at-grade rail crossings within El Paso County according to predicted collisions per year. The Web Accident Prediction System (WBAPS) accident prediction formula is based on physical and operational characteristics in addition to five years of crash incident history at each crossing. The accident prediction value is the probability that a collision between a train and a highway vehicle will occur at the crossing within a year. The WBAPS report gives a county rank to each intersection per railroad with the highest rank representing the intersection with the highest accident prediction value. The study area contains two (2) of the top five (5) highest ranked crossings in El Paso County for the UP railroad:

- Crossing 201 at North Piedras Street, and
- Crossing 314 at Pendale Road.

Accident prediction values for all public at-grade roadway-rail crossings within the study area are for Corridor 1 and Corridor 2 are listed in **Table 18** and **Table 19**, respectively.

Table 18. UP Corridor 1 FRA Accident Prediction Values

CROSSING NUMBER	INTERSECTING ROADWAY	FRA ID	ACCIDENT PREDICTION VALUE	COUNTY RANK
201	PIEDRAS ST.	741165T	0.116515	2
202	ELM ST.	- - -	- - -	- - -
203	ROSEWOOD ST.	741160J	0.018006	41
204	MONTANA AVE.	741264R	0.023963	31
205	YANDELL DR.	741158H	0.019035	38
206	MISSOURI AVE.	741614F	0.049240	11

Red values denote locations ranked within the top 5 in the country based on its Accident Prediction Value

Table 19. UP Corridor 2 FRA Accident Prediction Values

CROSSING NUMBER	INTERSECTING ROADWAY	FRA ID	ACCIDENT PREDICTION VALUE	COUNTY RANK
301	SAN MARCIAL ST.	741200E	0.013999	47
302	ESTRELLA ST.	741201L	0.044583	13
303	CEBADA ST.	741202T	0.044583	14
304	GRAMA ST.	741203A	0.013999	48
305	COPIA ST.	741204G	0.036572	17
306	BOONE ST.	741207C	0.017421	43
307	CHELSEA ST.	741212Y	0.027033	23
308	GLENWOOD ST.	741214M	0.013696	49
309	CADWALLADER DR.	---	---	---
310	ROSEDALE ST.	741223L	0.024190	30
311	LAFAYETTE DR.	741224T	0.022939	34
312	SMITH RD.	741227N	0.043448	15
313	NEW HAVEN DR.	741228V	0.053109	10
314	PENDALE RD.	741229C	0.068428	4
315	ZARAGOZA RD.	741231D	0.042295	16
316	INGLEWOOD DR.	764223B	0.013696	50
317	MOON RD.	764225P	0.035636	18
318	RIO VISTA RD.	764226W	0.021000	36
319	INTERSECTING ROADWAY	764227D	0.032524	19
320	SAN MARCIAL ST.	764229S	0.021225	35

Red values denote locations ranked within the top 5 in the country based on its Accident Prediction Value

3.5.2 TxDOT Roadway Crash Records

Automobile crash records within two (2) blocks of all twenty-six (26) crossings were evaluated to identify crash incident trends and highlight crossings that would benefit most from safety improvements. **Figure 16** shows the total number of crashes found within two (2) blocks of each crossing by year. A total of 644 vehicular crashes were identified between 2016 to 2018. The highest number of crashes occurred near Piedras Street and Chelsea Street. Crossings where the fewest crashes took place include Elm Street and Rio Vista Road.

Figure 16. Crash Count Within 2 Blocks of Each UP Crossing (2016 - 2018)

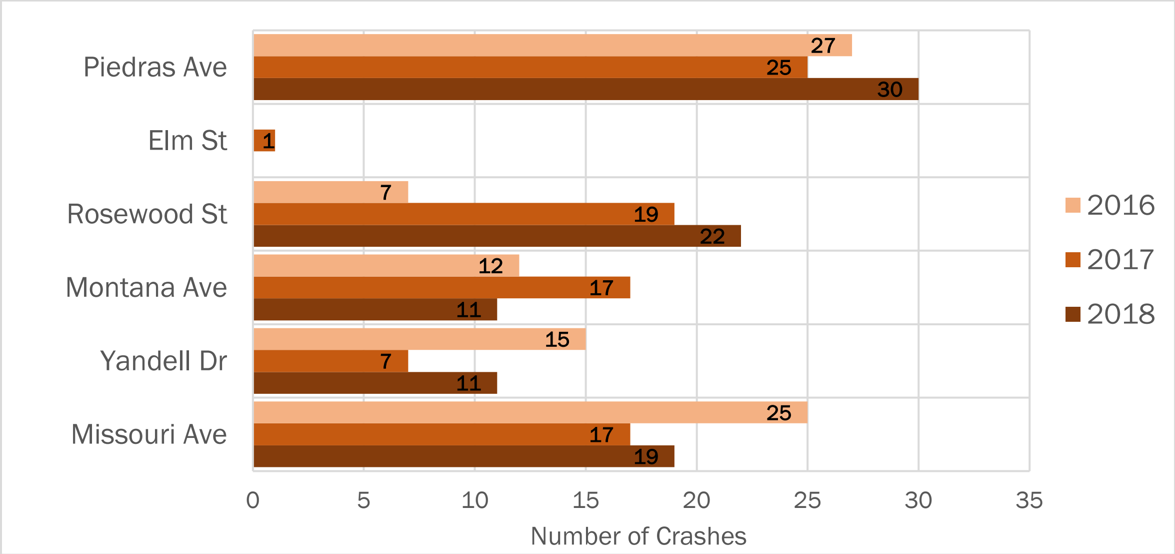


Figure 16 (Continued). Crash Count Within 2 Blocks of Each UP Crossing (2016 - 2018)

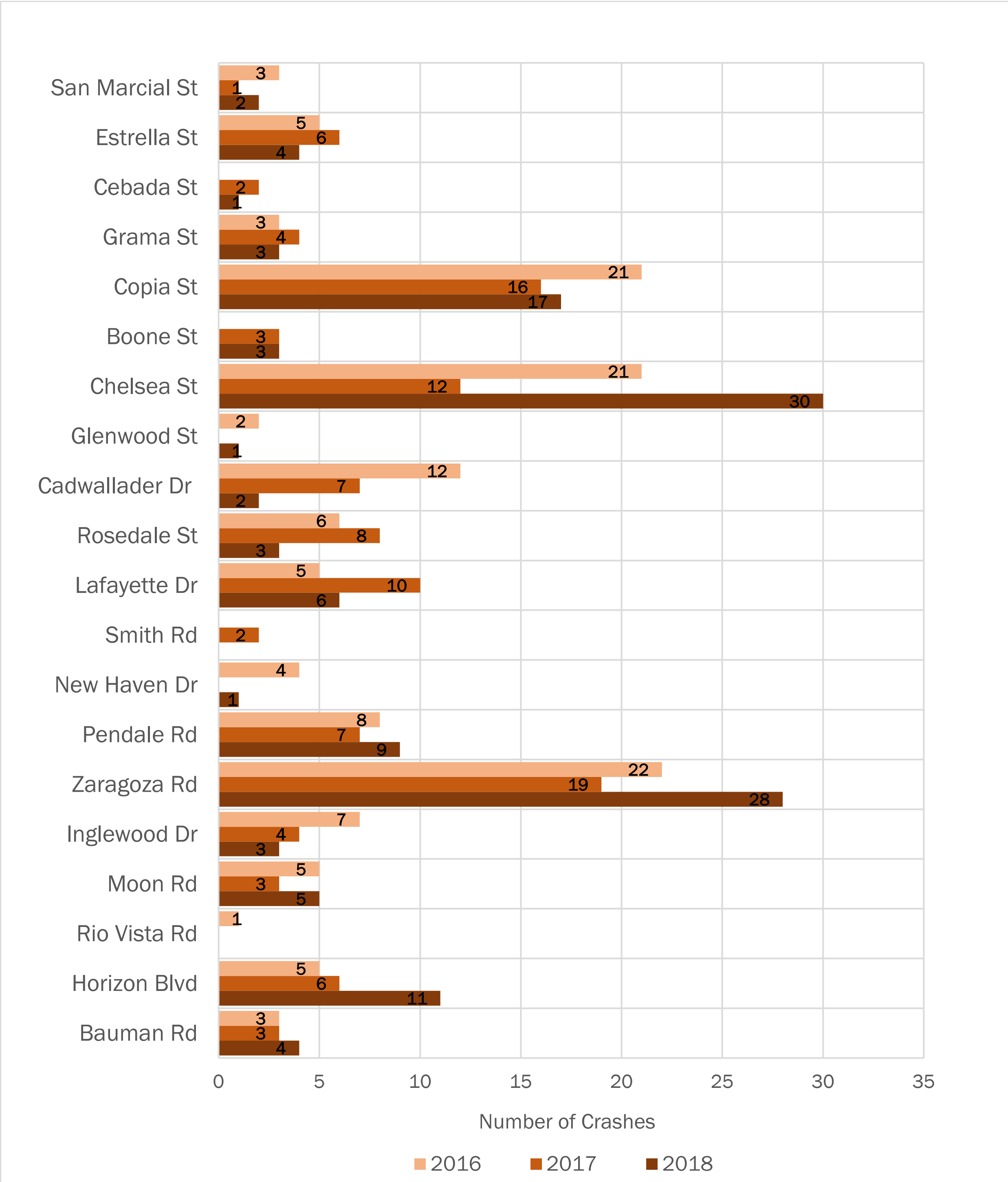


Table 20. UP Corridor Crashes by Year (2016- 2018)

CORRIDOR 1			
YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING TRAINS	PERCENT RAILROAD-RELATED
2016	86	2	2.3%
2017	86	0	0%
2018	93	6	6.5%

CORRIDOR 2			
YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING TRAINS	PERCENT RAILROAD-RELATED
2016	133	4	3.0%
2017	113	4	3.5%
2018	133	6	4.5%

According to this dataset, three (3) UP crossings experienced the highest number of railroad-related crash events within the study area between 2016 to 2018:

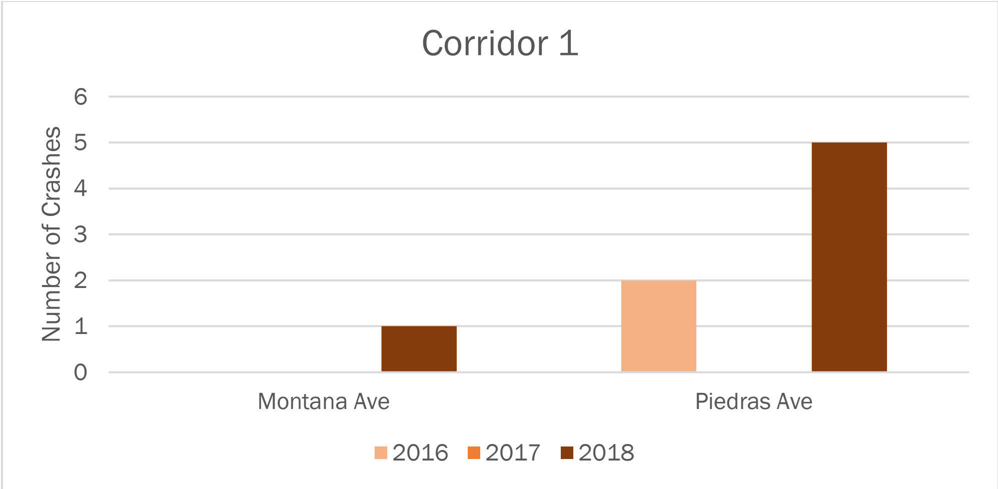
- seven (7) crashes at Piedras Street;
- four (4) crashes at Horizon Boulevard; and
- four (4) crashes at Copia Street.

UP crossings at Montana Avenue, Cebada Street, Cadwallader Drive, Pendale Road, and Moon Road each experienced one (1) railroad-related crash event from January 2016 to December 2018. Zaragoza Road experienced two (2) railroad-related crash events between 2016 to 2018. **Figure 17** illustrates the distribution of railroad-related crashes for each public railroad crossing by year. Railroad crossings not associated with railroads are not included.

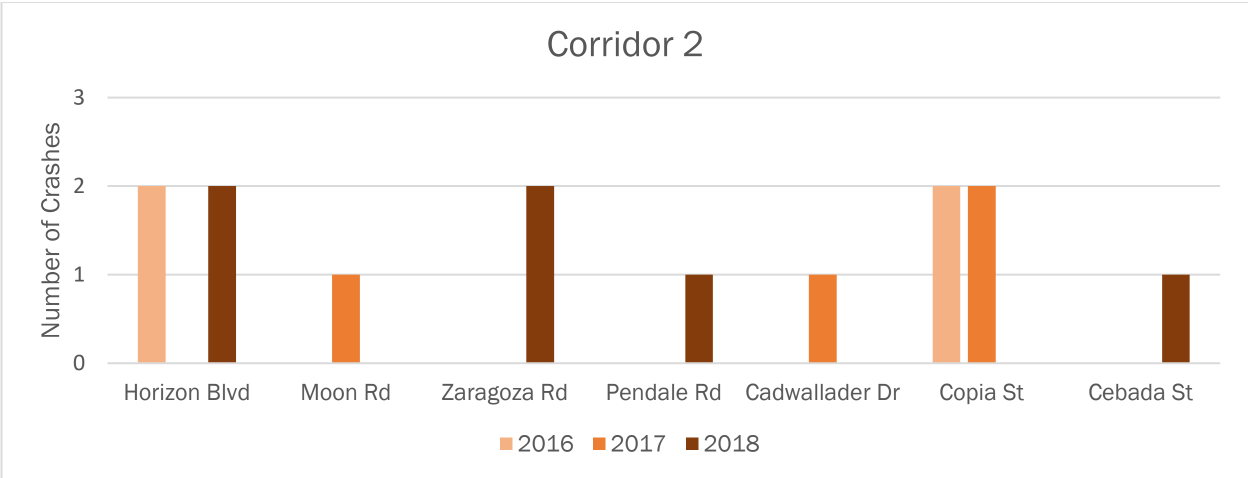
3.5.3 Crashes Involving UP Railroad

Of the 644 crash events identified within two (2) blocks of the crossings, 22 were flagged as being railroad-related in the CRIS dataset. Railroad-related crash incidents constitute approximately 3.4% of the crashes within the study area. These crash counts are listed by year and by corridor in **Table 20**. The percentage of railroad related crashes for Corridor 1 and Corridor 2 has increased by 4.2% and 1.5%, respectively.

Figure 17. UP Corridor Crashes Involving a Railroad Crossing



	MONTANA AVE	PIEDRAS AVE
2016	0	2
2017	0	0
2018	1	5

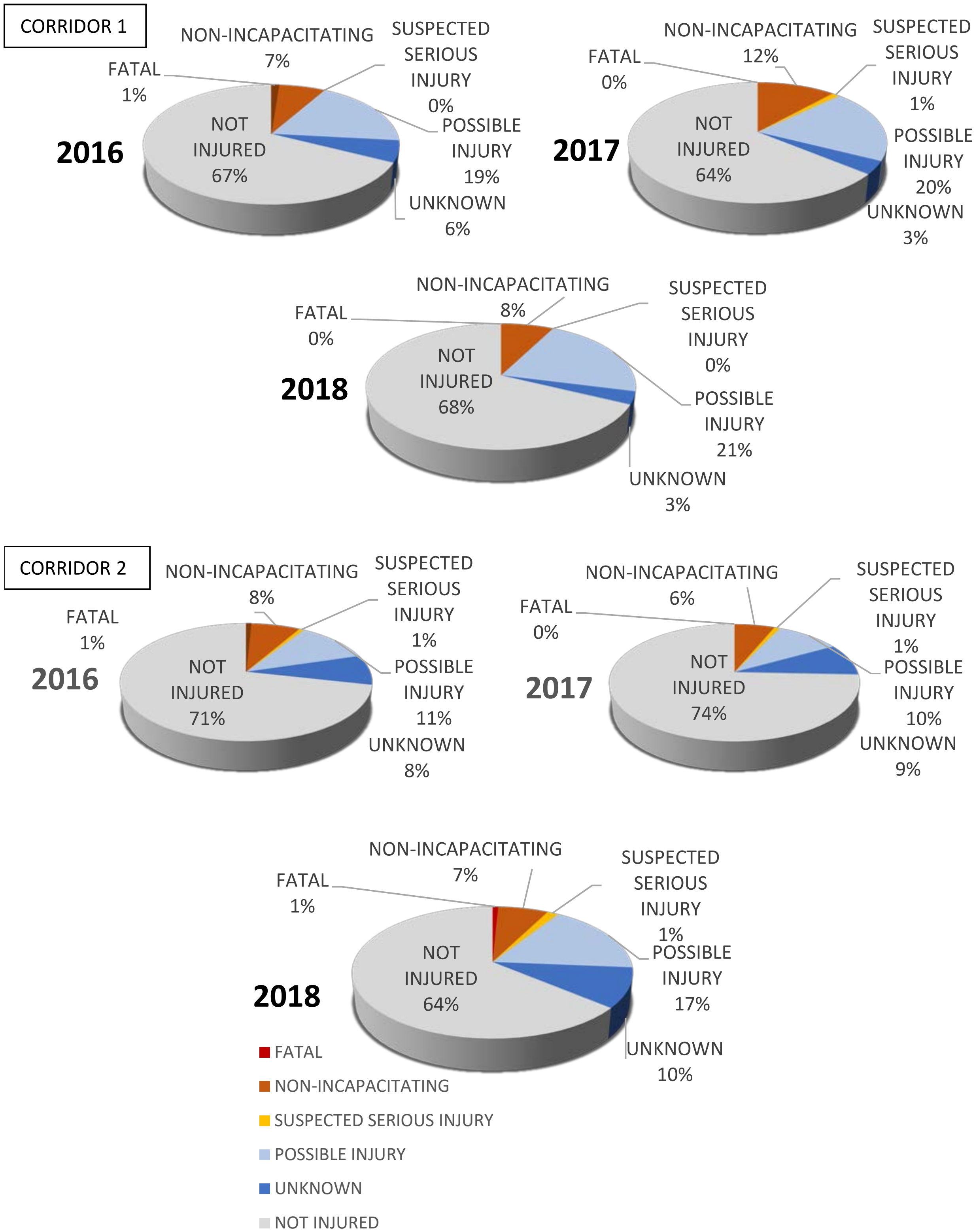


	HORIZON BLVD	MOON RD	ZARAGOZA RD	PENDALE RD	CADWALLADER DR	COPIA ST	CEBADA ST
2016	2	0	0	0	0	2	0
2017	0	1	0	0	1	2	0
2018	2	0	2	1	0	0	1

3.5.4 Crash Severity of Railroad-Related Crashes

Of the twenty-two (22) railroad-related crash events, there were zero (0) fatal crashes, four (4) crashes resulting in possible injury (Montana, Horizon, Copia, and Moon streets), one (1) crash that resulted in a non-incapacitating injury (Zaragoza), and one (1) crash for which the severity is unknown (Horizon Street). **Figure 18** illustrates crash severity for all crashes found within two (2) blocks of the corridor. Like the subset of railroad-related crashes, the majority of crash events within two (2) blocks of each crossing did not result in an injury, and fatal crashes constitute the smallest percentage of severity categories.

Figure 18. Crash Severity Within 2 Blocks of UP Corridor Crossings



3.5.5 Manner of Collision for Railroad-Related Crashes

The listing of crashes by type and year is defined by TxDOT's CRIS record specifications in **Table 21** and **Table 22**. Ten (10) crashes were initiated by a vehicle colliding with another motor vehicle, two (2) other incidents were initiated by a vehicle colliding with a fixed object, and two (2) crash incidents were initiated by a vehicle colliding with a moving train.

Table 21. Manner of Railroad-Related Crashes within UP Corridors

CORRIDOR 1							
CROSSING NUMBER	**ROADWAY**	**FIRST OBJECT STRUCK**	**MANNER OF COLLISON**	**2016**	**2017**	**2018**	**3-YEAR TOTAL**
201	**PIEDRAS AVE**	RR TRAIN	ONE MOTOR VEHICLE - GOING STRAIGHT	1	0	2	3
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED	1	0	1	2
			SAME DIRECTION - BOTH GOING STRAIGHT-REAR END	0	0	1	1
		FIXED OBJECT	ONE MOTOR VEHICLE - GOING STRAIGHT	0	0	1	1
204	**MONTANA AVE**	MOTOR VEHICLE IN TRANSPORT	OPPOSITE DIRECTION - BOTH GOING STRAIGHT	0	0	1	1
TOTALS				**2**	**0**	**6**	**8**

Table 22. Manner of Railroad-related Crashes within UP Corridors

CORRIDOR 2							
CROSSING NUMBER	**ROADWAY**	**FIRST OBJECT STRUCK**	**MANNER OF COLLISON**	**2016**	**2017**	**2018**	**3-YEAR TOTAL**
303	**CEBADA ST**	FIXED OBJECT - FENCE	ONE MOTOR VEHICLE - TURNING LEFT			1	1
305	**COPIA ST**	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH GOING STRAIGHT-REAR END	1			1
		MOTOR VEHICLE IN TRANSPORT	OPPOSITE DIRECTION - ONE BACKING-ONE STOPPED	1			1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED		2		2
309	**CADWALLADER DR**	MOTOR VEHICLE IN TRANSPORT	OPPOSITE DIRECTION - ONE STRAIGHT-ONE BACKING		1		1
314	**PENDALE DR**	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED			1	1
315	**ZARAGOZA RD**	MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED			1	1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH GOING STRAIGHT-SIDESWIPE			1	1
317	**MOON RD**	RR TRAIN	ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
319	**HORIZON BLVD**	FIXED OBJECT - RAILROAD CROSSING GATES	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
		FIXED OBJECT - OTHER	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - BOTH GOING STRAIGHT-REAR END	1			1
		MOTOR VEHICLE IN TRANSPORT	SAME DIRECTION - ONE STRAIGHT-ONE STOPPED			1	1
TOTALS				**4**	**4**	**6**	**14**

3.5.6 Environmental Conditions of Railroad-Related Crashes

Weather, lighting, and pavement surface conditions can also shed light on the nature and cause of crash incidents. **Table 23** details those conditions during railroad-related crashes. Of the twenty-two (22) railroad-related crashes, sixteen (16) crashes took place in clear weather conditions during daylight hours or in a lighted environment. Weather does not appear to be a factor along the corridor.

Table 23. Environmental Conditions During Railroad-related Crashes within UP Corridors

CORRIDOR 1						
WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DAYLIGHT	DRY	12.5%	0.0%	25.0%	3
	DARK, LIGHTED	DRY	12.5%	0.0%	25.0%	3
	DARK, UNKNOWN LIGHTING	DRY	0.0%	0.0%	12.5%	1
CLOUDY	DAYLIGHT	WET	0.0%	0.0%	12.5%	1
TOTAL			**25%**	**0%**	**75%**	**8**

CORRIDOR 2						
WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DAYLIGHT	DRY	14.3%	28.6%	21.4%	9
		OTHER	7.1%	0.0%	0.0%	1
	DARK, LIGHTED	DRY	7.1%	0.0%	0.0%	1
	DARK, UNKNOWN LIGHTING	DRY	0.0%	0.0%	7.1%	1
CLOUDY	DAYLIGHT	DRY	0.0%	0.0%	7.1%	1
RAIN	DAYLIGHT	WET	0.0%	0.0%	7.1%	1
TOTAL			**28.6%**	**28.6%**	**42.9%**	**14**

3.5.7 Driver Behavior in Railroad-Related Crashes

Contributing factors analyzed in this study include the first factor for the vehicle which the reporting officer felt contributed to the crash. Failure to control speed and driver inattention were the most commonly reported contributing factors. Disregard for construction warning signs, disregard for intersection controls, failure to yield right of way, and backing without safety are the remaining specified factors; four (4) crash factors are given as "other," and another six (6) crashes have no factor reported. The distribution of reported contributing factors over time for the railroad-related crashes in this study are listed in **Table 24**.

Table 24. Contributing Factors for Railroad-related Crashes within UP Corridors

CORRIDOR 1				
CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
DISREGARD STOP SIGN OR LIGHT	0%	0%	12.5%	12.5%
DRIVER INATTENTION	0%	0%	12.5%	12.5%
FAILED TO CONTROL SPEED	0%	0%	25.0%	25.0%
FAILED TO YIELD RIGHT OF WAY	0%	0%	12.5%	12.5%
NONE REPORTED	25%	0%	12.5%	37.5%
TOTAL	**25%**	**0%**	**75%**	**100%**

CORRIDOR 2				
CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
DISREGARD WARNING SIGN AT CONSTRUCTION	7.1%	0.0%	0.0%	7.1%
DRIVER INATTENTION	7.1%	0.0%	0.0%	7.1%
FAILED TO CONTROL SPEED	7.1%	7.1%	21.4%	35.7%
BACKED WITHOUT SAFETY	0.0%	7.1%	0.0%	7.1%
OTHER	0.0%	7.1%	7.1%	14.3%
NONE REPORTED	7.1%	7.1%	14.3%	28.6%
TOTAL	**28.6%**	**28.6%**	**42.9%**	**100.0%**

3.5.8 UP Crashes Involving Pedestrians/Cyclists

The CRIS dataset indicates whether crashes involve a pedestrian or cyclist. Of the six-hundred-and-forty-four (644) vehicular crashes on the UP corridor, twelve (12) crashes involved pedestrians or cyclists: five (5) crashes on Corridor 1 and seven (7) crashes on Corridor 2. Crashes involving pedestrians or cyclists constitute approximately 2.0% of the crashes within the UP study area. **Table 25** lists these crash counts by corridor and year.

Table 25. Pedestrian/Cyclist-Involved Crashes by Year (2016-2018) within UP Corridors

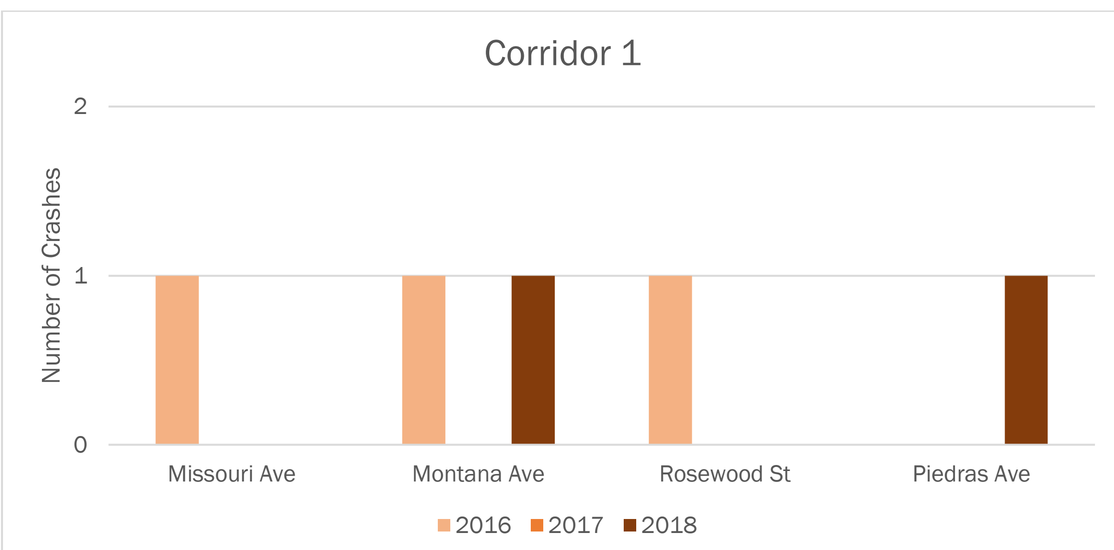
CORRIDOR 1			
YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING PEDESTRIANS/CYCLISTS	PERCENT PEDESTRIAN/CYCLIST -RELATED
2016	86	3	3.5%
2017	86	0	0%
2018	93	2	2.2%

CORRIDOR 2			
YEAR	TOTAL CRASHES WITHIN 2 BLOCKS	CRASHES INVOLVING PEDESTRIANS/CYCLISTS	PERCENT PEDESTRIAN/CYCLIST -RELATED
2016	133	2	1.5%
2017	113	1	0.9%
2018	133	4	3.0%

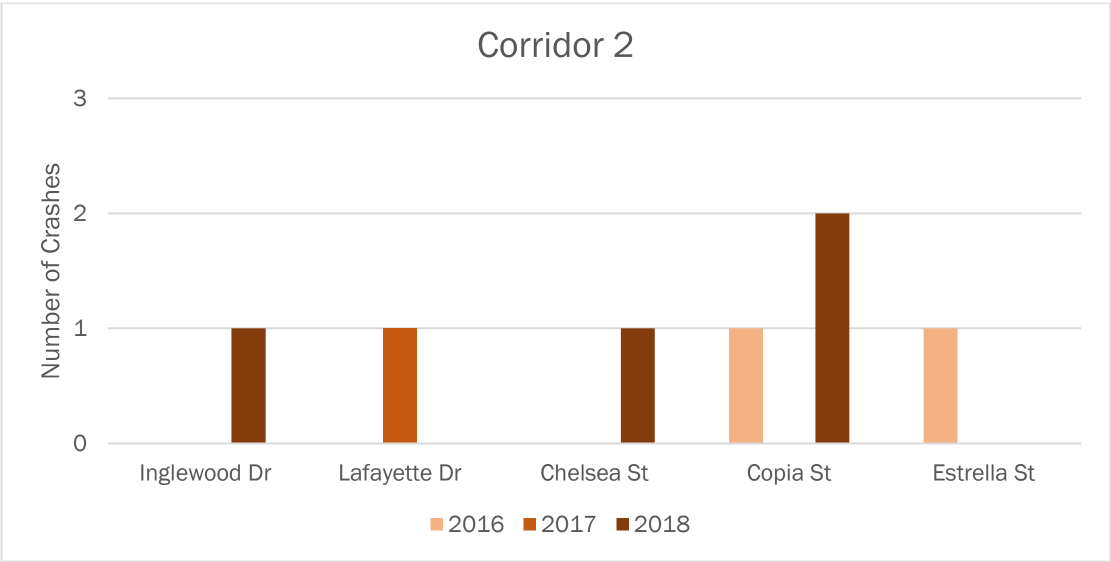
UP crossings at Missouri Avenue, Montana Avenue, and Rosewood Street in Corridor 1 experienced one (1) pedestrian-involved or cyclist-involved crash from 2016 to 2018.

Copia Street in Corridor 2, with two (2) pedestrian-involved or cyclist-involved crashes, was the only intersection to experience multiple such crashes. All other crossings in Corridor 2 experienced one (1) crash involving a pedestrian or cyclist in the study period. **Figure 19** illustrates the distribution of pedestrian- or cyclist-involved crashes for each intersection in Corridors 1 and 2, respectively. Crossings not associated with a crash incident involving a pedestrian or cyclist are omitted.

Figure 19. Crashes within UP Corridors Involving Pedestrians or Cyclists



	MISSOURI AVE	MONTANA AVE	ROSEWOOD ST	PIEDRAS AVE
2016	1	1	1	0
2017	0	0	0	0
2018	0	1	0	1



	INGLEWOOD DR	LAFAYETTE DR	CHELSEA ST	COPIA ST	ESTRELLA ST
2016	0	0	0	1	1
2017	0	1	0	0	0
2018	1	0	1	2	0

<u>3.5.9 Crash Severity of Crashes Involving Pedestrians/Cyclists</u>

Of the twelve (12) crashes involving a pedestrian or cyclist, there were two (2) fatal crashes: one at Montana Avenue and another near Chelsea Street (shown in **Figure 20** and **Figure 21**).

Figure 20. Pedestrian/Cyclist Fatalities, UP Corridor 1 & Corridor 2 North

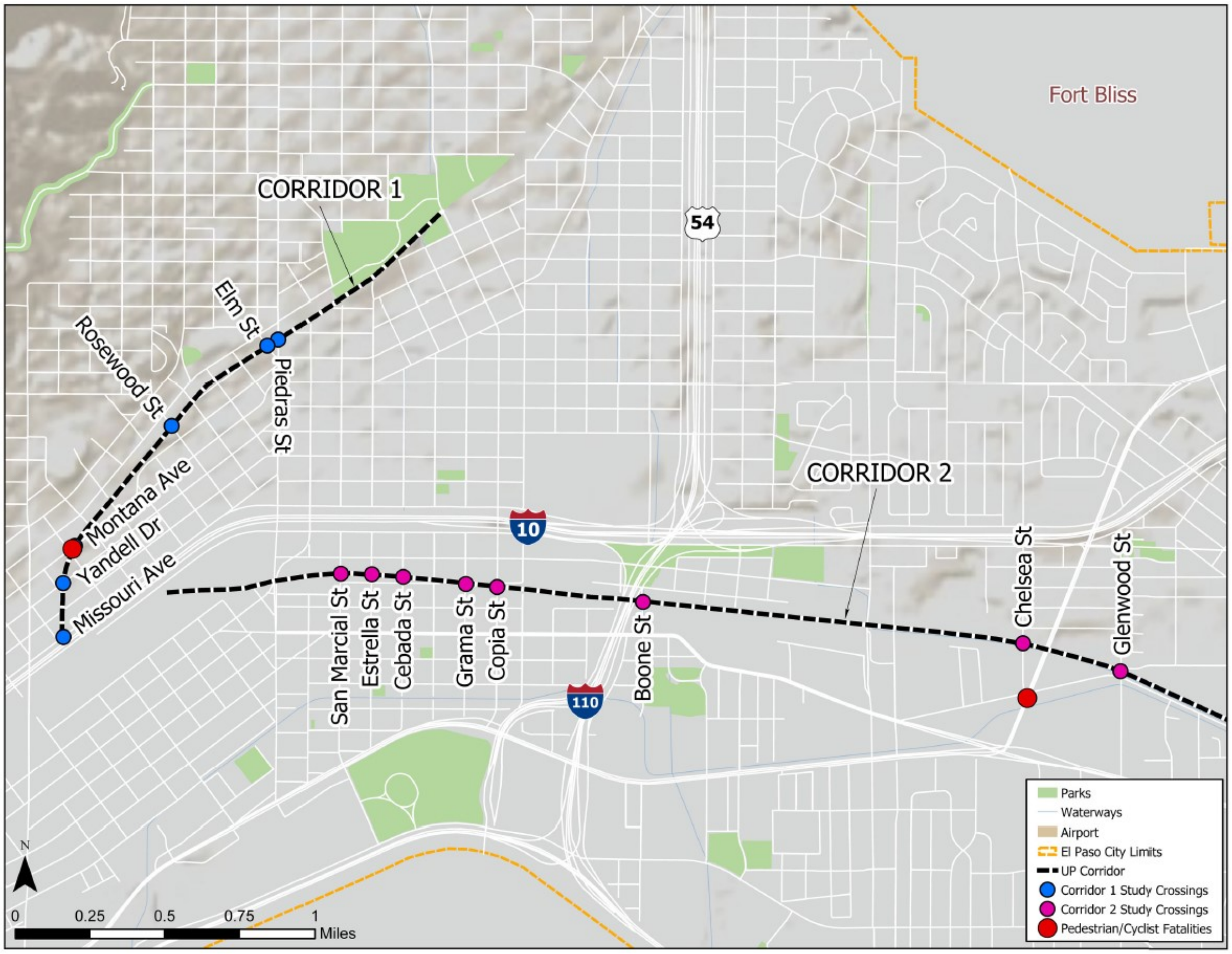


Figure 21. Pedestrian/Cyclist Fatalities, UP Corridor 2 South

<u>3.5.10 Manner of Collision for Crashes Involving Pedestrians/Cyclists</u>

Table 26 lists crashes involving a pedestrian or cyclist by type and year. Of the twelve (12) crashes, nine (9) involved pedestrians and the three (3) remaining involved cyclists.

Table 26. Manner of Pedestrian/Cyclist-Related Crashes within UP Corridors

CROSSING NUMBER	ROADWAY	PEDESTRIAN/CYCLIST	MANNER OF COLLISION	2016	2017	2018	3-YEAR TOTAL
102	PIEDRAS ST	CYCLIST	ONE MOTOR VEHICLE - TURNING RIGHT			1	1
103	ROSEWOOD ST	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
104	MONTANA AVE	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
		CYCLIST	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
105	MISSOURI AVE	CYCLIST	ONE MOTOR VEHICLE - TURNING RIGHT	1			1
TOTALS				3	0	2	5

CORRIDOR 2							
CROSSING NUMBER	ROADWAY	PEDESTRIAN/CYCLIST	MANNER OF COLLISION	2016	2017	2018	3-YEAR TOTAL
302	ESTRELLA ST	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1			1
305	COPIA ST	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT	1		1	2
		PEDESTRIAN	ONE MOTOR VEHICLE - TURNING LEFT			1	1
307	CHELSEA ST	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
311	LAFAYETTE DR	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT		1		1
316	INGLEWOOD DR	PEDESTRIAN	ONE MOTOR VEHICLE - GOING STRAIGHT			1	1
TOTALS				2	1	4	7

3.5.11 Environmental Conditions of Crashes Involving Pedestrians/Cyclists

Weather, lighting, and pavement surface conditions may affect crash risk. **Table 27** details those conditions during pedestrian- and cyclist-related crashes. Of the twelve (12) crashes in which a pedestrian or cyclist was involved, nine (9) crashes took place in clear weather conditions during daylight hours or in a lighted environment.

Table 27. Environmental Conditions During the Pedestrian/Cyclist-Related Crashes within UP Corridors

CORRIDOR 1						
WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DAYLIGHT	DRY	20.0%	0.0%	40.0%	3
	DARK, NOT LIGHTED	DRY	20.0%	0.0%	0.0%	1
CLOUDY	DARK, NOT LIGHTED	DRY	20.0%	0.0%	0.0%	1
TOTAL			**60%**	**0%**	**40%**	**5**

CORRIDOR 2						
WEATHER CONDITION	LIGHTING CONDITION	SURFACE CONDITION	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	TOTAL COUNT
CLEAR	DAYLIGHT	DRY	14.3%	0.0%	42.9%	4
	DARK, NOT LIGHTED	DRY	0.0%	14.3%	0.0%	1
	DARK, LIGHTED	DRY	14.3%	0.0%	14.3%	2
TOTAL			**28.6%**	**14.3%**	**57.1%**	**7**

3.5.12 Driver Behavior in Crashes Involving Pedestrians/Cyclists

In addition to the manner of collision, CRIS records capture contributing factors. This study analyzed the first contributing factor, the primary factor which the reporting officer felt led to the crash. **Table 28** illustrates that eight (8) of the crashes involving a pedestrian or cyclist listed no factor. Two (2) of the remaining crashes listed Other. The only specified factor was failure to yield right of way to a pedestrian, accounting for two (2) of the twelve (12) crashes.

Table 28. Contributing Factors for Pedestrian/Cyclist-Related Crashes within UP Corridors

CORRIDOR 1				
CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
FAILED TO YIELD RIGHT OF WAY	60%	0%	20.0%	80.0%
NONE	0%	0%	20.0%	20.0%
TOTAL	**60%**	**0%**	**40%**	**100%**

CORRIDOR 2				
CONTRIBUTING FACTOR	PERCENT IN 2016	PERCENT IN 2017	PERCENT IN 2018	3YR TOTAL
FAILED TO YIELD RIGHT OF WAY	14.3%	0.0%	0.0%	14.3%
OTHER	0%	0%	28.6%	28.6%
NONE REPORTED	14.3%	14.3%	28.6%	57.1%
TOTAL	**28.6%**	**14.3%**	**57.1%**	**100.0%**

3.5.13 Monetary Cost of Crashes

The National Safety Council estimates the monetary cost of a crash by considering wage and productivity losses, medical expenses, administrative expenses, motor-vehicle damage, and employers' uninsured costs. Note that, with the exception of motor-vehicle damage, these dollar values are per fatality or injury, not per crash. Motor-vehicle damages are tabulated as cost per damaged vehicle. Those costs are presented in **Table 29**.

Table 29. Monetary Cost of Crashes within UP Corridors

EVENT	COST
DEATH	$1,615,000
DISABLING	$93,800
EVIDENT	$27,100
POSSIBLE	$22,300
NO INJURY OBSERVED	$11,900
PROPERTY DAMAGE ONLY	$4,400

3.5.14 Summary of Crash Analysis

RMS used historic crash records to identify characteristics of rail-related crashes including severity, manner of collision, environmental conditions, driver behavior, and pedestrian/cyclist involvement. The crossings at Piedras Street and Pendale Drive had the highest FRA accident prediction values. As predicted, Piedras Avenue experienced the highest number of total crashes and highest number of rail-related crashes. However, Pendale Drive experienced a relatively low number of total crashes and rail-related crashes compared to other intersections. Copia Street also experienced a high number of total crashes and railroad-related crashes and had the highest number of pedestrian/cyclist-related crashes. Other intersections with a relatively high number of total crashes included Missouri Avenue, Chelsea Street, and Zaragoza Road. Horizon Boulevard also experienced a relatively high number of railroad-related crash events. Vehicular, pedestrian and cyclist safety should be reviewed and improvements should be considered at these intersections.

3.6 Analysis of Emissions at UP Intersections

3.6.1 Methodology

To evaluate the existing (2018) and future (2045) emissions caused by delays at rail crossings, existing directional hourly volumes for all study cross streets were developed using a segmentation by volume methodology to estimate peak hour volumes for the area. The segmentation was also used to assign hourly factors and directional splits to daily volumes along the corridor.

Table 30 below shows the assumptions for the segmentation by volume, peak hour factors, and directional distribution.

Table 30. Crossing Segmentation Hourly and Directional Assumptions

CROSSING SEGMENTATION			
VOLUME	**VOLUME TYPE**	**ANALYSIS HOURS %**	**DIRDIST**
<5,000 VPD	1	0.20	65/35
5,000 TO 10,000	2	0.15	60/40
10,000 TO 15,000	3	0.12	55/45
15,000 TO 20,000	4	0.10	50/50
>20,000	5	0.08	50/50

Once volumes were developed, they were forecasted to 2045 future traffic conditions. Growth rates for the study cross streets were determined using an average annual growth rate (AAGR) based on available growth rate data for similar facility types in the study area.

Using Vissim Version 10, microsimulation models were run for existing and future conditions to estimate emissions associated with delays at rail crossings. These microsimulation models were developed using the approved Methodology and Assumptions memo, submitted in October 2018 and provided in **Appendix D-1**. Previously approved assumptions used to develop the models include:

- The average length of a freight train is 8,000 feet (1.5 miles).
- The minimum length of a freight train is 3,000 feet (0.6 miles).
- A 1.5-mile-long train traveling 30 mph would take approximately three (3) minutes to cross over a roadway. Coupled with the opening and closing times of the rail gates, a

total of four (4) minutes was assumed for the delay attributed to a train crossing. Similarly, a 0.6-mile-long train would cause approximately 2.25 minutes of delay.

- A heavy vehicle factor of 4% for the study area was determined from available vehicle classification data along the corridor.
- The Vissim standard vehicle type, comprised of typical North American vehicle fleets, was assumed.
- Vehicles were assumed to reduce their speed to twenty (20) mph approximately one hundred (100) feet upstream of the rail crossings.

Existing and future traffic volumes and rail crossing delays for the peak hours were modeled in Vissim. Results for each at-grade crossing were annualized (by the recommended annualization factor of 260 days) to determine annual corridor delay. These methodologies are detailed in **Appendix D-1**.

3.6.2 Analysis of Emissions along UP Corridor

Utilizing the methodology and assumptions stated above, the hourly and annual emissions data for CO, NOx, and Volatile Organic Compounds (VOC) emissions were determined for both an average train length and a minimum train length. Once actual train volumes were known, values were increased linearly by multiplying the number of trains per day by the vehicular delay outputs.

3.6.3 Average Train Length Emissions along UP Corridor

The resulting emissions data for an average train length for existing (2018) conditions are shown in **Table 31**, and emissions data for future (2045) conditions are shown in **Table 32**. It should be noted that the data provided in Tables 28 and 29 are for one train per day; there are approximately 49 trains per day in 2019 at the Zaragoza crossing alone. Given the direct correlation between trains and emissions, as train traffic increase so will emissions.

Table 31. Existing 2018 Vehicle Emissions, UP Corridor - Average Train Length

ID	CROSS STREET	HOURLY			ANNUAL (ASSUMING ONE TRAIN PER DAY)		
		CO (GRAMS)	NO_X (GRAMS)	VOC (GRAMS)	CO (GRAMS)	NO_X (GRAMS)	VOC (GRAMS)
CORRIDOR 1							
201	PIEDRAS ST.	4,205	818	975	1,093,379	212,732	253,401
202	ELM ST.	421	82	97	109,349	21,275	25,343
203	ROSEWOOD ST.	1,455	283	337	378,290	73,601	87,672
204	MONTANA AVE.	3,755	731	870	976,192	189,931	226,242
205	YANDELL DR.	220	43	51	57,313	11,151	13,283
206	MISSOURI AVE.	894	174	207	232,525	45,241	53,890
CORRIDOR 2							
301	SAN MARCIAL ST.	420	82	97	109,170	21,241	25,301
302	ESTRELLA ST.	488	95	113	126,767	24,664	29,380
303	CEBADA ST.	1,924	374	446	500,123	97,306	115,908
304	GRAMA ST.	1,898	369	440	493,427	96,003	114,357
305	COPIA ST.	3,057	595	709	794,889	154,657	184,223
306	BOONE ST.	289	56	67	75,069	14,606	17,398
307	CHELSEA ST.	1,305	254	302	339,299	66,015	78,636
308	GLENWOOD ST.	278	54	64	72,260	14,059	16,747
309	CADWALLADER DR.	270	53	63	70,227	13,664	16,276
310	ROSEDALE ST.	1,554	302	360	404,135	78,630	93,662
311	LAFAYETTE DR.	781	152	181	203,150	39,526	47,082
312	SMITH RD.	463	90	107	120,334	23,413	27,889
313	NEW HAVEN DR.	2,017	393	468	524,533	102,055	121,566
314	PENDALE RD.	1,641	319	380	426,715	83,023	98,895
315	ZARAGOZA RD.	6,546	1,274	1,517	1,702,060	331,159	394,469
316	INGLEWOOD DR.	434	84	100	112,730	21,933	26,126
317	MOON RD.	4,421	860	1,025	1,149,459	223,643	266,398
318	RIO VISTA RD.	4,722	919	1,094	1,227,694	238,865	284,530
319	HORIZON BLVD.	6,956	1,353	1,612	1,808,544	351,877	419,148
320	BAUMAN RD.	1,266	246	294	329,109	64,084	76,335

Emissions results are based on node data averaged over 10 Vissim simulations for each year. Intersections with the greatest potential for emissions impacts due to delays from railroad traffic are Horizon Boulevard, Zaragoza Road, Rio Vista Road, Piedras Street, and Montana Avenue.

Table 32. Projected 2045 Vehicle Emissions, UP Corridor - Average Train Length

ID	CROSS STREET	HOURLY			ANNUAL (ASSUMING ONE TRAIN PER DAY)		
		CO (GRAMS)	NOx (GRAMS)	VOC (GRAMS)	CO (GRAMS)	NOx (GRAMS)	VOC (GRAMS)
CORRIDOR 1							
201	PIEDRAS ST.	4,587	892	1,063	1,192,496	232,016	276,372
202	ELM ST.	615	120	143	159,874	31,106	37,052
203	ROSEWOOD ST.	2,141	417	496	556,656	108,305	129,010
204	MONTANA AVE.	5,005	974	1,160	1,301,316	253,189	301,593
205	YANDELL DR.	388	76	90	100,962	19,644	23,399
206	MISSOURI AVE.	1,086	211	252	282,236	54,913	65,411
CORRIDOR 2							
301	SAN MARCIAL ST.	833	162	193	216,666	42,155	50,214
302	ESTRELLA ST.	1,110	216	257	288,676	56,166	66,903
303	CEBADA ST.	2,999	583	695	779,639	151,689	180,689
304	GRAMA ST.	2,694	524	624	700,371	136,267	162,318
305	COPIA ST.	4,441	864	1,029	1,154,771	224,677	267,629
306	BOONE ST.	681	133	158	177,140	34,465	41,054
307	CHELSEA ST.	2,017	392	467	524,407	102,030	121,536
308	GLENWOOD ST.	638	124	148	165,850	32,268	38,437
309	CADWALLADER DR.	565	110	131	146,816	28,565	34,026
310	ROSEDALE ST.	2,442	475	566	634,985	123,545	147,164
311	LAFAYETTE DR.	1,275	248	295	331,428	64,484	76,812
312	SMITH RD.	933	182	216	242,700	47,221	56,248
313	NEW HAVEN DR.	2,898	564	672	753,608	146,625	174,656
314	PENDALE RD.	2,070	403	480	538,206	104,715	124,734
315	ZARAGOZA RD.	10,491	2,041	2,431	2,727,568	530,686	632,140
316	INGLEWOOD DR.	879	171	204	228,547	44,467	52,968
317	MOON RD.	5,914	1,151	1,371	1,537,562	299,154	356,345
318	RIO VISTA RD.	6,813	1,326	1,579	1,771,465	344,663	410,554
319	HORIZON BLVD.	7,252	1,411	1,681	1,885,646	366,878	437,017
320	BAUMAN RD.	1,893	368	439	492,301	95,784	114,095

Based on this analysis, emissions are expected to increase from approximately 5% (on cross streets with higher estimated volumes) to 55% (on cross streets with lower estimated volumes) from 2018 to 2045. The increase in emissions for each cross street is shown in **Figure 22** and **Figure 23**. Boone Street, Glenwood Street, and Estrella Avenue intersections are expected to experience the greatest increases in annual and hourly emissions.

Figure 22. Annual Increase in Emissions (Grams), UP Corridor

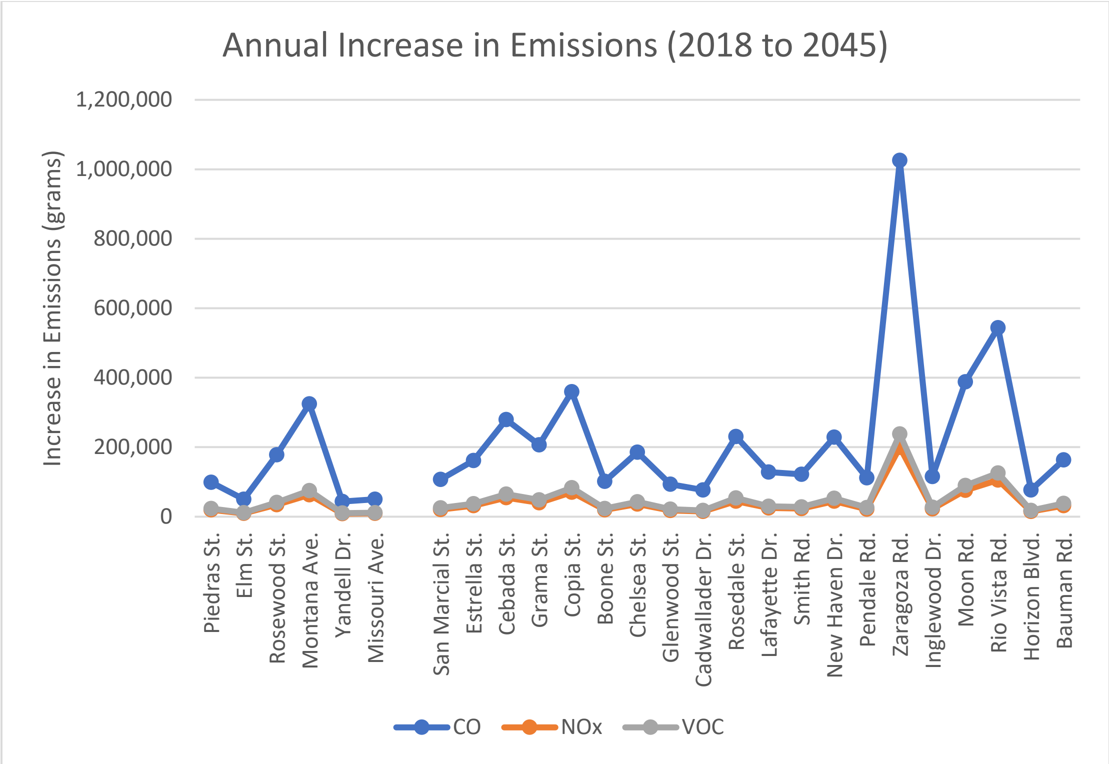
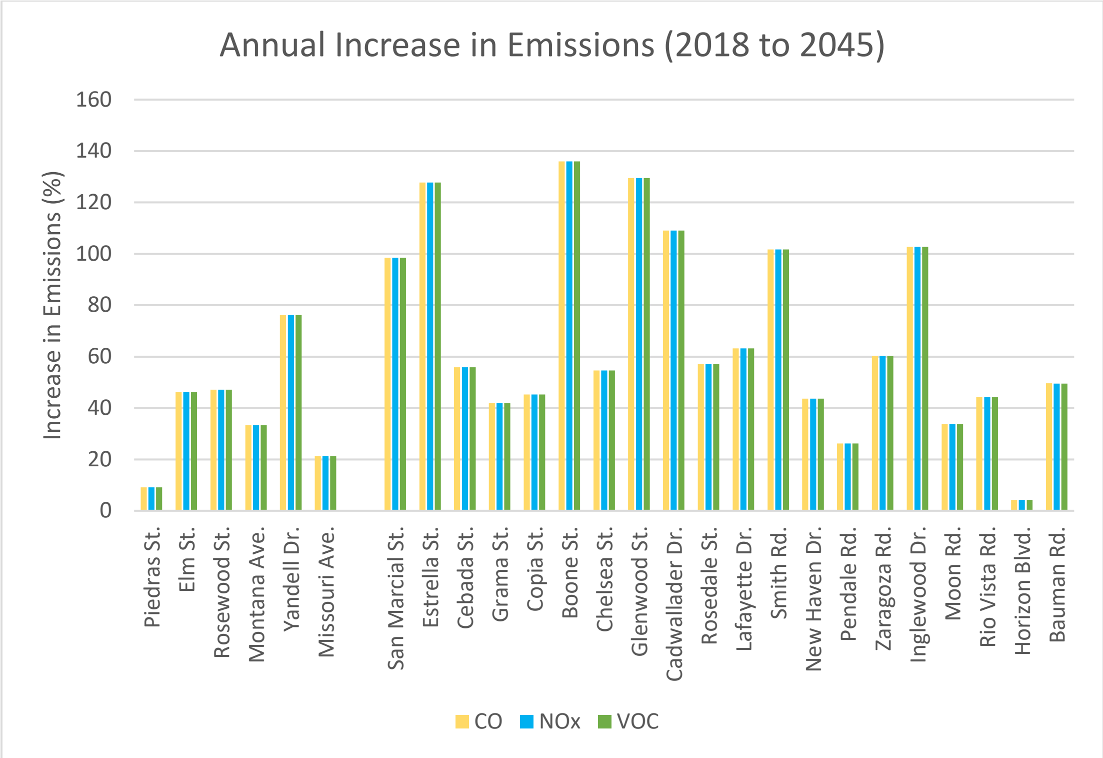


Figure 23. Annual Increase in Emissions (Percentage), UP Corridor



3.6.4 Minimum Train Length Emissions

Results for a minimum train length for existing (2018) emissions conditions are listed in **Table 33**, and results for future (2045) emissions conditions are listed in **Table 34**. These emissions results are based on node data averaged over 10 Vissim simulations for each year. According to this analysis, the UP intersections at Zaragoza Road and Horizon Boulevard are experiencing the greatest emissions impacts from rail operations. Emissions at the Zaragoza Boulevard and Horizon Boulevard intersections are expected to increase by nearly 40% and 9%, respectively, from 2018 to 2045.

Table 33. Existing 2018 Vehicle Emissions, UP Corridor - Minimum Train Length

ID	CROSS STREET	HOURLY			ANNUAL (ASSUMING ONE TRAIN PER DAY)		
		CO (GRAMS)	NO_x (GRAMS)	VOC (GRAMS)	CO (GRAMS)	NO_x (GRAMS)	VOC (GRAMS)
CORRIDOR 1							
201	PIEDRAS ST.	3,702	720	858	962,439	187,256	223,055
202	ELM ST.	387	75	90	100,493	19,552	23,290
203	ROSEWOOD ST.	1,389	270	322	361,057	70,249	83,678
204	MONTANA AVE.	3,434	668	796	892,727	173,692	206,898
205	YANDELL DR.	220	43	51	57,308	11,150	13,282
206	MISSOURI AVE.	744	145	172	193,356	37,620	44,812
CORRIDOR 2							
301	SAN MARCIAL ST.	384	75	89	99,882	19,433	23,149
302	ESTRELLA ST.	458	89	106	119,149	23,182	27,614
303	CEBADA ST.	1,731	337	401	449,978	87,549	104,287
304	GRAMA ST.	1,666	324	386	433,268	84,298	100,414
305	COPIA ST.	2,935	571	680	763,202	148,491	176,879
306	BOONE ST.	296	58	69	77,032	14,988	17,853
307	CHELSEA ST.	1,165	227	270	303,012	58,955	70,226
308	GLENWOOD ST.	288	56	67	74,931	14,579	17,366
309	CADWALLADER DR.	267	52	62	69,368	13,496	16,077
310	ROSEDALE ST.	1,437	280	333	373,548	72,679	86,573
311	LAFAYETTE DR.	752	146	174	195,504	38,038	45,310
312	SMITH RD.	401	78	93	104,344	20,302	24,183
313	NEW HAVEN DR.	1,803	351	418	468,890	91,229	108,670
314	PENDALE RD.	1,535	299	356	399,150	77,660	92,507
315	ZARAGOZA RD.	6,318	1,229	1,464	1,642,794	319,628	380,733
316	INGLEWOOD DR.	399	78	93	103,780	20,192	24,052
317	MOON RD.	4,212	819	976	1,095,057	213,058	253,790
318	RIO VISTA RD.	4,639	903	1,075	1,206,134	234,670	279,533
319	HORIZON BLVD.	6,191	1,205	1,435	1,609,660	313,181	373,054
320	BAUMAN RD.	1,070	208	248	278,328	54,173	64,530

Table 34. Projected 2045 Vehicle Emissions, UP Corridor - Minimum Train Length

ID	CROSS STREET	HOURLY			ANNUAL (ASSUMING ONE TRAIN PER DAY)		
		CO (GRAMS)	NO_x (GRAMS)	VOC (GRAMS)	CO (GRAMS)	NO_x (GRAMS)	VOC (GRAMS)
				CORRIDOR 1			
201	PIEDRAS ST.	4,264	830	988	1,108,716	215,716	256,956
202	ELM ST.	554	108	128	144,062	28,029	33,388
203	ROSEWOOD ST.	2,007	390	465	521,794	101,522	120,931
204	MONTANA AVE.	4,653	905	1,078	1,209,689	235,362	280,357
205	YANDELL DR.	344	67	80	89,492	17,412	20,741
206	MISSOURI AVE.	913	178	212	237,439	46,197	55,029
				CORRIDOR 2			
301	SAN MARCIAL ST.	793	154	184	206,111	40,102	47,768
302	ESTRELLA ST.	917	178	213	238,458	46,395	55,265
303	CEBADA ST.	2,679	521	621	696,667	135,546	161,459
304	GRAMA ST.	2,590	504	600	673,292	130,998	156,042
305	COPIA ST.	3,815	742	884	991,886	192,985	229,879
306	BOONE ST.	538	105	125	139,762	27,193	32,391
307	CHELSEA ST.	1,813	353	420	471,263	91,691	109,220
308	GLENWOOD ST.	503	98	117	130,709	25,431	30,293
309	CADWALLADER DR.	490	95	113	127,318	24,771	29,507
310	ROSEDALE ST.	2,174	423	504	565,114	109,951	130,971
311	LAFAYETTE DR.	1,066	207	247	277,086	53,911	64,217
312	SMITH RD.	838	163	194	217,798	42,376	50,477
313	NEW HAVEN DR.	2,846	554	660	740,048	143,986	171,513
314	PENDALE RD.	1,867	363	433	485,474	94,456	112,513
315	ZARAGOZA RD.	8,828	1,718	2,046	2,295,306	446,583	531,959
316	INGLEWOOD DR.	765	149	177	198,985	38,715	46,117
317	MOON RD.	5,127	998	1,188	1,333,037	259,361	308,944
318	RIO VISTA RD.	6,035	1,174	1,399	1,569,122	305,294	363,659
319	HORIZON BLVD.	6,730	1,309	1,560	1,749,723	340,433	405,515
320	BAUMAN RD.	1,738	338	403	451,949	87,983	104,804

Emissions from the minimum train length were compared to results produced from an average train length. This comparison found a reduction in emissions when the minimum train length was employed versus the average train length. The results of this comparison are consistent between existing (2018) and future (2045) conditions. The average reduction in emissions across all cross streets is approximately 10% (ranging from 1% to 20%).

3.6.5 Analysis of Vehicular Delay along UP

In addition to determining the emissions from both an average train length and a minimum train length, RMS determined the vehicle delays at each of the at-grade crossings for both scenarios. Similar to the emissions outputs, these annual values assume one train per day. Once actual train per day values are known, the values can be increased linearly by multiplying the number of trains per day by the vehicular delay outputs.

3.6.6 Train Length on UP

The resulting delay data for an average and minimum train length for existing (2018) and future (2045) conditions are shown in **Table 35**. These delay results are based on node data averaged over 10 Vissim simulations for each year.

Table 35. UP Corridor Vehicle Delays, Average

ID	CROSS STREET	AVERAGE		MINIMUM	
		2018 VEHICLE DELAY (S)	2045 VEHICLE DELAY (S)	2018 VEHICLE DELAY (S)	2045 VEHICLE DELAY (S)
CORRIDOR 1					
201	PIEDRAS ST.	19.7	20.8	8.4	8.5
202	ELM ST.	8.0	8.5	2.9	3.2
203	ROSEWOOD ST.	11.6	13.8	4.3	5.2
204	MONTANA AVE.	18.5	21.8	7.6	9.6
205	YANDELL DR.	9.0	10.4	2.7	3.0
206	MISSOURI AVE.	15.5	16.5	4.9	5.5
CORRIDOR 2					
301	SAN MARCIAL ST.	13.1	14.6	5.4	6.2
302	ESTRELLA ST.	14.8	17.0	6.4	8.2
303	CEBADA ST.	17.4	22.2	7.7	10.4
304	GRAMA ST.	16.9	18.6	7.1	9.1
305	COPIA ST.	20.8	23.0	9.3	11.8
306	BOONE ST.	10.5	11.5	3.7	4.4
307	CHELSEA ST.	18.6	20.4	8.3	10.4
308	GLENWOOD ST.	14.3	15.1	5.5	5.9
309	CADWALLADER DR.	10.9	12.5	3.8	4.6
310	ROSEDALE ST.	14.5	17.6	5.7	7.5
311	LAFAYETTE DR.	12.6	14.5	5.1	6.1
312	SMITH RD.	11.7	14.3	4.0	5.4
313	NEW HAVEN DR.	20.5	24.3	9.9	14.0
314	PENDALE RD.	9.7	12.4	4.6	5.9
315	ZARAGOZA RD.	25.6	34.1	11.9	17.5
316	INGLEWOOD DR.	11.9	13.3	4.3	5.4
317	MOON RD.	20.3	24.6	9.8	12.0
318	RIO VISTA RD.	22.9	29.4	12.5	16.0
319	HORIZON BLVD.	32.5	34.8	11.0	12.0
320	BAUMAN RD.	19.1	18.2	6.3	11.1

3.6.7 Analysis of Results Along UP

In order to establish a system for comparing the severity of impact of the railway on each crossing, the relative severity of vehicle emissions, vehicle delay, number of collisions, and vehicular volume at each of the rail crossings were ranked. These rankings were combined to create an overall ranking from least impacted by railway traffic to most severely impacted by the railway for existing (2018) and future (2045) conditions for both average and minimum train lengths. Results of this ranking process are listed in **Table 36**. Rankings are color-coded, with green representing least impacted intersections and red representing the most severely impacted intersections.

Table 36. UP Corridor Rail Crossing Severity Ranking

		AVERAGE TRAIN LENGTH		MINIMUM TRAIN LENGTH	
ID	CROSS STREET	2018 RANK	2045 RANK	2018 RANK	2045 RANK
201	Piedras St.	7	7	6	8
202	Elm St.	23	23	23	23
203	Rosewood St.	13	12	13	14
204	Montana Ave.	4	3	3	3
205	Yandell Dr.	24	24	24	24
206	Missouri Ave.	16	20	20	21
301	San Marcial St.	22	22	21	19
302	Estrella St.	19	17	17	17
303	Cebada St.	11	10	10	11
304	Grama St.	9	9	9	9
305	Copia St.	3	4	3	5
306	Boone St.	26	26	26	26
307	Chelsea St.	15	15	14	15
308	Glenwood St.	20	19	19	20
309	Cadwallader Dr.	25	25	25	25
310	Rosedale St.	10	10	10	10
311	Lafayette Dr.	17	16	16	16
312	Smith Rd.	21	21	22	22
313	New Haven Dr.	5	5	5	4
314	Pendale Rd.	14	14	12	12
315	Zaragoza Rd.	1	1	1	1
316	Inglewood Dr.	17	18	18	18
317	Moon Rd.	2	2	2	2
318	Rio Vista Rd.	8	7	8	7
319	Horizon Blvd.	6	6	7	6
320	Bauman Rd.	12	13	15	12

Figure 24 through **Figure 31** illustrate the results of the impact assessment for each of the four scenarios, 2018 average and minimum train length, and 2045 average and minimum train length. As shown in **Figure 24**, Missouri Avenue, Montana Avenue, and Piedras Street are ranked highest along UP Corridor 1; Copia Street and Chelsea Street are ranked highest in UP Corridor 2. As shown in **Figure 25**, New Haven Drive, Zaragoza Road, Moon Road, Rio Vista Road, and Horizon Boulevard are highest ranked along UP Corridor 2.

Figure 24. 2018 UP Rail Crossing Severity, Northern Limits, Average Train Length

Figure 25. 2018 UP Rail Crossing Severity, Southern Limits, Average Train Length

Figure 26. 2045 UP Rail Crossing Severity, Northern Limits, Average Train Length

Figure 27. 2045 UP Rail Crossing Severity, Southern Limits, Average Train Length

Figure 28. 2018 UP Rail Crossing Severity, Northern Limits, Minimum Train Length

Figure 29. 2018 UP Rail Crossing Severity, Southern Limits, Minimum Train Length

Figure 30. 2045 UP Rail Crossing Severity, Northern Limits, Minimum Train Length

Figure 31. 2045 UP Rail Crossing Severity, Southern Limits, Minimum Train Length

3.6.8 Summary of Microsimulation (VISSIM)

Utilizing previously approved methodologies as referenced in Appendix D, the UPRR Corridor Evaluation[6], existing (2018) and future (2045) year traffic volumes were identified and used as input to Vissim models. The models were developed to assess emissions, delays, and severity of intersection impact for both an average train length and a minimum train length. Results can be used by TxDOT and other regional agencies for initiatives to address grade crossing challenges.

The CO_2, NO_x, and VOC emissions for average train length is expected to increase from 2018 to 2045 by between 5% (on cross streets with higher estimated volumes) and 55% (on cross streets with lower estimated volumes), A comparison of existing and future emissions produced between average and minimum train lengths suggests that the minimum train length is expected to produce approximately 10% fewer CO_2, NO_x, and VOC emissions on average as compared to the average train length.

Additionally, total vehicle delays at each rail crossing for average and minimum train lengths, and historical collisions at each intersection were compared. The relative severity of these three variables, considering the vehicular volume at the intersection, were ranked for average and minimum train length in **Table 36**. Each ranking represents the impact to the rail crossing, with 1 being the most severely impacted and 26 being the least impacted.

The results of the analysis were compared across all four scenarios. Using the existing and expected emissions, vehicular delays, and number of collisions, the top ten most affected intersections were determined. **Table 37** below presents the resulting ranking. The rankings provide an opportunity to prioritize improvements to these intersections.

Table 37. Top Ten Most Impacted Intersections along UP Corridor

RANK	ID	CROSS STREET
1	**221**	**ZARAGOZA RD.**
2	223	MOON RD.
3	104	MONTANA AVE.
4	211	COPIA ST.
5	219	NEW HAVEN DR.
6	225	HORIZON BLVD.
7	101	PIEDRAS ST.
8	224	RIO VISTA RD.
9	210	GRAMA ST.
10	216	ROSEDALE ST.

TxDOT and other regional agencies are working on the following initiatives that directly reference these grade crossing challenges:

[6] UPRR Corridor Evaluation, Regional Mobility Strategy, Alliance Transportation Group. April 19, 2019.

- MPO and City of El Paso are reviving a previous feasibility study of grade separating the Zaragoza Road crossing
- TxDOT is developing concepts for grade separating Horizon Boulevard crossing as part of the ongoing corridor study
- TxDOT prepared a feasibility study for grade separating Montana Avenue
- TxDOT prepared a PEL study which included recommendations for grade separations of several arterial streets in the Mission Valley area.
- City of Socorro and MPO are developing the New Hueco Tanks Extension and Arterial 1 Extension to address needs of Moon Road and Rio Vista Road.

4.0 Passenger Rail Opportunities

Opportunities and challenges associated with the possibility of implementing commuter rail service on select existing freight railroad corridors within the El Paso region were evaluated on both the UP and BNSF ROW within the study area.

Some of the most challenging steps to implementing a passenger rail system involve the following:

A. Determination of project owner;
B. Compliance with local, state, and federal laws;
C. Significant upgrades to existing rail and potential ROW acquisition;
D. Determination of ownership of operations and maintenance;
E. Agreement with the host railroad (if service is within its ROW); and
F. Determination of sources of funding for the initial investment and continual operation and maintenance of the service.

These items are crucial to initial success for design efforts and ongoing growth in passenger rail frequency.

4.1 Requirements for Implementing Passenger Rail

4.1.1 Infrastructure Requirements

Infrastructure requirements for a passenger rail system are listed in **Table 38** and highlight the six (6) basic elements. These requirements apply to both the UP and BNSF rail lines. Additional evaluation or feasibility studies should include public or stakeholder input, grant funding requirements, or changes in applicable rail policies or laws.

Table 38. Requirements to Operate Passenger Rail Service

REQUIREMENT	SUMMARY
INSTALLATION OF TRACK AND OTHER RAILWAY INFRASTRUCTURE	The construction of tracks and other railway infrastructure such as bridges, wayside signal system, roadway-rail crossing protection, and positive train control (PTC) may need to be installed if the owning railroad does not allow the passenger rail service on its freight lines. If the owning railroad allows passenger service on its line, other improvements to maintain adequate headways (sidings, additional wayside signals, additional PTC infrastructure, etc.) may be required.
STATIONS AND ASSOCIATED AMENITIES	Strategically placed rail stations for passengers boarding and alighting the trains allow for successful service, and station amenities such as facility parking, canopies, lighting, safety and security features, and others as determined by the agency may be included as well.
RAIL CARS AND ASSOCIATED LOCOMOTIVES	A fleet of passenger rail vehicles that can sufficiently provide the appropriate level and reliability of service while supporting requirements for ongoing maintenance would be required for any passenger rail service. Depending on the situation, these vehicles will need to meet FRA and/or Federal Transit Administration (FTA) requirements.
MAINTENANCE FACILITY	A dedicated area to store and maintain the passenger rail vehicles is needed. This facility should be situated close to the track if possible and may be strategically placed near one of the passenger rail termini.
OPERATIONS FACILITY/DISPATCHING	Like the maintenance facility, an operations facility for dispatching the trains (if required) and for all other operations-related activities may be needed to keep the passenger service on schedule. This facility does not have to be along the track but may be in concert with a maintenance facility. If the service is on an existing freight track, the owning railroad may provide the dispatching for the passenger rail service.
CONNECTIVITY TO OTHER TRANSIT SERVICES	Typically, passenger rail service provides connections to and from final destinations or stations with access other transportation modes. These other modes can be more traditional transit services (buses), park-and-ride facilities, taxis/transportation network companies, or other first- or last-mile services. This connectivity provides ridership opportunities within the community and expands the potential service area.

4.1.2 Procedural Requirements and Approvals

FTA, DOT, FRA

During design, development and implementation of the six (6) requirements, several State and Federal regulating agencies would require coordination including, but not limited to: Texas Department of Transportation, Federal Highway Administration, Federal Transit Administration, and Federal Railroad Administration. Each agency has set processes and approval mechanisms granting them authority over rail operations within Texas and the United States. Throughout the design, development and implementation process the project sponsor(s) would need to closely coordinate with regulatory agencies to ensure compliance with all applicable policies and laws, while efficiently obtaining approvals to maintain the projects' timeline and budget.

Surface Transportation Board (STB) Involvement

STB involvement, as noted in the previous section and referenced in 49 U.S. Code § 11101, states that "a rail carrier providing transportation or service subject to the jurisdiction of the Board under this part shall provide the transportation or service on reasonable request." Commonly called the Common Carrier Obligation of Railroads, this can limit the sale or abandonment of existing freight rail lines and can be challenged by customers utilizing the line for their transportation needs. Agreements can be made where this freight service continues while passenger rail service is also in operation, but such terms would need to be negotiated as part of a formalized agreement and approved by the STB.

4.1.3 Governance Model

One of the most important decisions early in the process is to determine the responsible party for the design, construction, management, and operation of the passenger rail system. Some of the challenges in this decision include:

- **Jurisdiction –** A passenger rail line extending from El Paso to Las Cruces would travel through two states, two transit agency boundaries, and many municipalities. Coordination between all these political entities is necessary for successful passenger rail service as well as determination of costs to be borne by each entity where applicable.
- **Funding –** Initial and continued funding is key to construction and ongoing operation of a passenger rail line. The governance structure must account for collection of funding streams. Funding of a potential passenger rail line is discussed in further detail in a subsequent section.
- **Technical Capacity –** The entity governing the actions of the passenger rail line must have the staff and functions to be able to construct, maintain, and operate the line.

4.1.4 Railroad Ownership/Agreements

Because UP and BNSF own and operate the existing line's track and ROW, an agreement for passenger rail operations on the lines would be necessary. If an agency intends to operate within railroad ROW, there are two options for this type of agreement.

- **Capacity rights agreement –** With a capacity rights agreement, the agency would be purchasing a specified number of trains and not the track or other infrastructure itself. Dispatching and other operational needs (maintenance) would be handled by the railroad, and any infrastructure improvements would likely be constructed and owned by the railroad but paid for by the agency.

- **Sale agreement –** As part of a sale agreement, a railroad would sell its rights and interest to the ROW to the agency. There are challenges with this option, especially for an active railroad line, including:

    - Existing freight rail customers on the corridor;
    - Surface Transportation Board and common carrier obligations; and

- Removal of international border crossings.

Potential governance model options are outlined below:

- **Regional Rail Authority –** A regional rail authority could be a single provider of construction, operations, and maintenance and can be formed by legislative statute or via direct popular vote. It is typically run by a board comprised of representatives from each jurisdiction within the rail system. Ideally, the rail authority would receive funding from each jurisdiction to supplement the fare box revenue.
- **Joint Powers Authority/Board –** This is a common model for commuter rail operations throughout the nation and allows two or more public agencies to operate together through a board of directors with powers inherent to those agencies. A joint powers authority relies on member funding through agreements with local and regional entities. This approach brings together existing entities with the knowledge and expertise to operate cooperatively and facilitates the provision of other supportive transit services.
- **Division of State DOT –** Using a state to run a passenger rail system typically works more reasonably in states with one predominant metropolitan area. In this case, this may not be a viable option since this is not the predominant city in the state of Texas.

Ultimately, UP and BNSF must agree to allow for passenger rail operations before discussion of any agreement for those operations are to take place.

4.3 High-Level Opportunities and Challenges

There are many factors to investigate when considering the possibility of starting a new passenger rail service, especially in an area where local or commuter passenger rail service does not currently exist. These factors include existing infrastructure, market conditions, co-locating freight and passengers on the same line, connecting those passengers to Amtrak, transit-oriented development, first mile/ last mile connectivity, and international connectivity, and funding. A high-level review of these factors is described in this section.

4.3.1. Infrastructure Opportunities/Challenges

Implementation of passenger rail infrastructure that supports ridership opportunities and complies with FRA and/or FTA requirements within a freight rail corridor can be met with challenges. Some of the common opportunities and challenges for infrastructure involved with new passenger rail service within or adjacent to existing freight corridors or major utility lines.

4.3.2 Market Conditions

An overarching determinant of feasibility for any passenger rail service is the potential for ridership, or demand. Many things can drive demand for a transit service, including the locations served by that service and the convenience and reliability of the service in satisfying that market demand. While revenue generated from the fares collected on most passenger rail service do not cover all expenditures associated with it, the revenue from ridership should be able to cover a considerable percentage of operations.

Potential ridership and possible revenue was not evaluated in this report. If passenger rail service along the BNSF or UP corridors is to be considered further, a ridership analysis should be undertaken to determine if the viability of proposed transit services.

4.3.3 Operations of Freight and Passenger Rail Traffic on the same Line

At its most basic level, shared freight and passenger operations on the existing BNSF and UP corridors may be accomplished by coordinated dispatching to create windows for a set schedule to provide consistent arrival and departure times for riders. This has the possibility to be accomplished through temporal separation (separate times for freight-only and passenger-only service) or mixed-use service, which may require additional rail infrastructure to provide shared operations.

BNSF and UP currently own the ROW and rail infrastructure along the El Paso Subdivision, so an agreement with BNSF and UP would be necessary to move forward with any passenger rail service within that corridor. Pending any agreement with BNSF and UP, three general options for use of the corridor for passenger service are:

- **Shared service –** Freight and passenger service would reside on the same tracks. This could be implemented either through temporal separation (separate operating windows in which passenger and freight trains do not interact) or mixed-use operations under a single dispatcher with strategically placed sidings and signals.

- **Removal of freight service (passenger only) –** Freight service would be removed from this line. This would require engagement with the Surface Transportation Board (STB), existing customers on the line, and coordination and agreement with BNSF.

- **Passenger service outside of BNSF ROW –** Additional separate, but adjacent ROW outside of the existing BNSF ROW is used for passenger rail service. This would be a separate service without any connections to the existing freight line; thus, there would not be interaction between freight and passenger service.

Further discussion of railroad agreements and associated high-level requirements for passenger rail on freight corridors is in subsequent sections of this technical memo.

4.3.4 Impacts to Roadway Users

BNSF

I-10 and Doniphan Drive/NM 478 are parallel roadways to the BNSF El Paso Subdivision, providing roadway connectivity between Las Cruces and El Paso, and cities in between. While a traffic study and modeling have not been performed for passenger rail service, it would appear that including such service on the BNSF corridor would decrease the number of vehicles on I-10 and Doniphan Drive/NM 478 and provide some congestion relief during peak traffic periods.

On the current BNSF El Paso Subdivision corridor, there are over 50 at-grade crossings identified between the downtown El Paso Intermodal Facility and downtown Las Cruces, and

6 to 8 trains currently use this corridor per day based on FRA Grade Crossing Inventory data. When a train travels through an at-grade crossing, there is delay created for roadway users while those users wait for the train to clear. In addition to these delays, other potential impacts such as those to emissions, safety, and reliability also occur.

Including passenger rail service will cause additional delays and potential impacts at these at-grade crossings. The magnitude of these delays and potential impacts are dependent on the length and frequency of the passenger rail trains. While roadway-rail grade separations could possibly mitigate and eliminate some of these delays, these grade separations may be challenging due to the proximity of intersecting streets and development density in some of the areas adjacent to the corridor.

UP

I-10, SH 20, and segments of Loop 375 are parallel roadways to the UP Sunset line, providing roadway connectivity between downtown and southern El Paso, and cities in between. While a traffic study and modeling have not been performed for passenger rail service, it would appear that including such service on the UP corridor could potentially decrease the number of vehicles on these roadway corridors and provide some congestion relief during peak traffic periods.

There are many at-grade crossings identified along the current UP Sunset corridor, and 22 to 42 trains currently use this corridor per day based on FRA Grade Crossing Inventory data. When a train travels through an at-grade crossing, there is delay created for roadway users while they wait for the train to clear. In addition to these delays, other potential impacts such as those to emissions associated with idling, safety, and limiting travel time reliability may also occur.

Including passenger rail service would cause additional delays and potential impacts at these crossings if they were to remain at-grade. The magnitude of these delays and potential impacts are dependent on the length and frequency of the passenger rail trains. While roadway-rail grade separations could possibly mitigate and eliminate some of these delays, these grade separations could be challenging due to the proximity of intersecting streets and development density in some of the areas adjacent to the corridor.

4.3.5 Possible Transit-Oriented Development (TOD)

In areas that provide transit options, there is the possibility of providing livable residential and business spaces that utilize those transit services. The success of TOD depends on connectivity with transit services as well as market conditions and other factors, such as density. This technical memo does not investigate the factors of implementation of TOD along this corridor; however, the increased density, mix of land use and walkability typically associated with TODs may increase demand for trips between stations and provide additional benefits to quality of life

4.3.6 First-mile/Last-mile Connectivity

While passenger rail service can provide travel to areas along its corridor, other transportation options may need to be investigated and implemented to provide successful first-/last-mile connectivity to the riders' origin and destination points. This connectivity to those origin and destination points has the potential to increase ridership by creating travel opportunities to get to and from passenger rail stations.

Some first-mile and last-mile options require additional public infrastructure and cost, while others are private and can be operated within existing constraints. Similarly, some options may already be in place depending on ultimate station locations. These options may include:

- Traditional transit services (bus/streetcar) – El Paso's Sun Metro and Las Cruces' Roadrunner bus services provide a transit-based network throughout those cities, and El Paso recently began streetcar service within the area.

- Park-and-Ride facilities – Strategically placed park-and-ride facilities provide ridership opportunities for passengers or families that need to make part of their trip with a vehicle. Challenges may arise in this corridor related to locating Park-and-Ride facilities due to existing constraints and development near most of the existing rail corridor.

- Taxis/transportation network companies (TNCs) – In more downtown areas, the use of taxis or TNCs (such as Uber and Lyft) can be beneficial for access to a final destination beyond walking distance of the station.

- Bicycles/dockless scooters – The locations of bicycle infrastructure (including the B-cycle program) or possible future dockless scooter placement should be verified prior to implementation, but these may be available at or near a station for short-distance opportunities.

Potential areas for first- and last-mile solutions may be the major termini in downtown for traditional transit options as well as ridesharing and dockless scooter implementation and park-and-ride facilities near the intermediate stations where possible.

4.3.7 International Connectivity

The international rail bypass is one possible future project that may influence multiple transportation modes. This bypass has potential to eliminate the need for a segment of BNSF's track into El Paso and crossing the U.S.-Mexico border.

According to this study, recent and ongoing major investments alongside bi-national planning efforts present a greater need for freight to circumnavigate congestion in downtown El Paso. Additionally, capacity limitations at the Port of Los Angeles/ Long Beach will push a greater portion of intermodal containers to Santa Teresa for blocking and shipment. Influential efforts noted in the study include the following:

- In August 2013, Governor Susana Martinez announced the creation of a master plan for the Bi-National Community, sited on both sides of the Santa Teresa-San Jerónimo border crossing.

- In 2014, UPRR completed the construction of the Strauss Intermodal Ramp in Santa Teresa, a twelve mile-long, $400 million railroad service and intermodal facility. The

Intermodal Ramp is strategically sited approximately eleven miles from a connection to I-10 via NM 136 (Pete V Domenici Hwy) and SH 178 (Artcraft Rd). Additionally, Foxconn manufacturing campus in San Jerónimo is sited 13 miles south, just across the Mexico border.

A possible opportunity in this case may be to create international streetcar or other dedicated transit service between El Paso and Ciudad Juárez. This would provide an extra level of connectivity to a passenger rail line in the region. However, this would require the appropriate permits for operations from both the U.S. and Mexico, acquisition of rights for the tracks and international bridge from BNSF and Ferromex, and other interagency factors at a minimum.

4.3.8 Project Funding

The implementation of passenger rail requires funding for initial design and construction costs of railway infrastructure, stations, rolling stock, facilities, and connectivity infrastructure as well as ongoing staff, operations, and maintenance costs for continued revenue service. The initial cost burden is typically substantial. Some funding sources may include:

- Existing agency funds
- Bond referendum
- Grant programs
- Tax revenue
- Fare box revenue (once revenue service is initiated)

The amount of funding required would be determined during an initial review of corridor feasibility and is driven by many of the infrastructure items mentioned in this technical memo.

4.3.9 Coordination with Amtrak

The Rail Passenger Service Act of 1970 and subsequent amendments (49 U.S. Code § 24101) require the National Railroad Passenger Corporation (Amtrak) to provide passenger rail service between points and creating a basic system of routes to transfer passenger rail responsibilities from the freight railroads to Amtrak. This also allows for the use of existing freight rail lines as host facilities for the passenger rail system with dispatching preference over other freight trains on that line.

Amtrak currently provides intercity passenger rail service through El Paso with a stop west of downtown on Union Pacific Railroad's Sunset line. However, this service is restricted to the Texas Eagle and Sunset Limited routes (three weekly stops both eastbound and westbound) and provides service to limited nationwide – and not regional – destinations. In some area's agencies have attempted to engage Amtrak to run regional service on freight lines, and some have been successful in Amtrak running service; these include the Maryland Area Regional Commuter Rail, Shore Line East (through the Connecticut Department of Transportation), and some services in California.

4.4 Mode and Case Studies

Many types of transit modes can be considered for implementation of service between areas. In some cases, certain modes are not viable options due to infrastructure requirements, distances between anticipated stops, or other factors. This technical memo reviews two potential passenger rail systems: commuter rail and light rail transit. Other passenger rail systems, such as high-speed rail, were not considered since the distance between anticipated stations would not fully utilize the benefits of the higher speeds.

4.4.1 Commuter Rail

Commuter Rail systems typically provide passenger rail service for large numbers of riders traveling longer distances between destinations and commuter centers during peak commute hours (rush hour). Commuter Rail systems can use either smaller Diesel Multiple Units (DMU) for lighter passenger volumes, or a train of passenger coaches pushed and pulled by a diesel locomotive (Push-Pull) for heavier passenger volumes. Commuter Rail service can operate in a dedicated ROW, or along existing freight railroads when kept separate physically or by schedule. Typical route distances for commuter rail services range from 20 to 80 miles in length, and the distance between Las Cruces and El Paso is approximately 50 miles.

The profile grade for typical commuter rail equipment is generally around 1.5 percent maximum vertical grade with absolute maximum for short distances up to 2.5 percent. These limitations are generally due to freight track and vehicle requirements since many commuter rail systems are within freight rail corridors. Due to the limitations in allowable grades, it is assumed that a commuter rail system would be generally at grade with rail-roadway crossings protected with active warning devices (gates, bells, flashers, and possible cantilevered flashers as warranted). Grades on the El Paso Subdivision meet these requirements.

Commuter rail stations are assumed to be in-line, or along the track, and located adjacent to a park-and-ride or other type of passenger facility with connecting transit services. Typical shelter designs are anticipated to be simple with a canopy and passenger seating, while end-of-line stations may include additional amenities. Spacing between each station for commuter rail operations is typically from two to ten miles. Minimum peak headways for this type of system are usually around 30 minutes but may be dependent on ridership, available vehicles, and (if a constraint) available operational windows.

4.4.2 Light Rail Transit

Light Rail Transit (LRT) systems typically provide passenger rail service for large numbers of riders traveling shorter distances between neighborhoods and commercial centers within a region throughout the day. LRT systems generally use lighter volume electric rail vehicles on an urban, fixed-guideway within a dedicated ROW, or within existing city streets. Typical route distances for LRT range from 5 to 20 miles in length and are largely dependent on the types of commuter trips using the corridor.

A typical section for an LRT system is a double-track system with an overhead contact system (OCS) and electrification to provide power to the vehicles. The typical maximum operating vertical grade for LRT vehicles is around 5 percent and can maneuver a minimum vertical clearance of 15.5 feet for short distances. Thus, in many cases it is possible for the LRT profile to limit the potential for at-grade intersections with cross streets. However, some of the infrastructure preferences for LRT may be challenging if freight rail service is to remain on the corridor.

Stations for an LRT system are always located along the track, provide level boarding access for passengers, and are generally assumed to include a simple design with a canopy and passenger seating; end-of-line stations may include additional amenities. LRT station spacing ideally varies between ¾ to one mile with maximum spacing up to two miles. Minimum peak headways are typically between 5 and 10 minutes but may be dependent on ridership, available vehicles, and (if a constraint) available operational windows.

4.4.3 Case Studies

The following Case Studies highlight the challenges and opportunities to get a fully operational line. These Case Studies highlight some of the strategic process to ensure a passenger line is not only feasible but can remain operational after construction.

Table 39. Case Study Review of Freight Rail and Commuter Rail

CASE STUDY
LONE STAR RAIL DISTRICT (LSRD) The LSRD was formed with the intent of developing and operating passenger rail service (LSTAR) between the Austin and San Antonio metropolitan regions along an existing Union Pacific Railroad corridor. LSRD decisions were made through a board of elected officials and private sector leaders representing cities, counties, regional transportation agencies, and the general public. LSRD intended to broker a deal with Union Pacific to use the freight corridor for passenger rail service while constructing a new freight-only line east of the existing line. Two of the major challenges were funding the construction of the new freight line as well as providing freight service to existing customers along the proposed passenger rail corridor. Ultimately, LSRD and Union Pacific could not reach an agreement on use of the existing corridor, removing it from possible implementation.
NEW MEXICO RAIL RUNNER EXPRESS (NMRX) NMRX is a stand-alone commuter service that extends from Santa Fe via Albuquerque to Belen. The NMRX effort was initially led by the New Mexico Department of Transportation (NMDOT) and the Mid-Region Council of Governments (MRCOG) and is now managed by the Rio Metro Regional Transit District (Rio Metro) on behalf of NMDOT. Rio Metro is governed by a board of directors of officials from the commuter rail's counties. Initial funding for the construction of the infrastructure was covered by state and local monies, and federal participation through Congestion Mitigation and Air Quality Improvement (CMAQ) funds helped pay for the first few years of operations and maintenance of the corridor. In addition to fare box revenue, continued funding is provided through regional taxes and other methods.
TRINITY RAILWAY EXPRESS (TRE) The TRE commuter rail service is a cooperative service provided through an interlocal agreement between Trinity Metro in Fort Worth and Dallas Area Rapid Transit (DART) in Dallas and has termini in downtown Fort Worth and Dallas with other intermittent stops. The line was jointly purchased by the cities of Dallas and Fort Worth in 1983 for commuter rail use, but BNSF and UP both operate freight on the line as well. In addition, Amtrak also operates passenger rail service on this line. Funding for ongoing service comes from fare box revenue as well as sales taxes collected through Trinity Metro and DART.
CAPITAL METRO TRANSPORTATION AUTHORITY (CAPITAL METRO) Capital Metro was initiated through a referendum in 1985 to provide mass transportation service to the greater Austin area and as part of that referendum received a percentage of its funding through a sales tax. It provides public transit services in Austin, Texas; these services include a commuter rail line (MetroRail Red Line) from suburbs in Leander into the downtown area. Capital Metro is run by a board of directors that includes members from the local and regional political entities such as the City of Austin, the Capital Area Metropolitan Planning Organization (MPO), Travis and Williamson Counties, and municipality representation. Both commuter and freight rail services are active along the Red Line corridor. Freight operations are handled by the Austin Waster Railroad through a contract with Capital Metro and are temporally separated from commuter rail operations; all freight service occurs during nighttime hours after the commuter rail schedule is complete and before revenue service begins in the morning.
DENTON COUNTY TRANSPORTATION 35 **AUTHORITY (DCTA)** DCTA was approved by the voters in 2002 and absorbed the City of Denton's transit services in 2006. The A-train, DCTA's commuter rail service, opened in 2011 and has six stations over its 21-mile line; it connects to Dallas Area Rapid Transit's (DART) service on the south A-train terminus. Both passenger and freight trains operate within the Dallas, Garland & Northeastern Railroad's ROW for a portion of the corridor, and the shared operation without temporal separation required a compliance waiver from the FRA. DCTA is governed by a 14-member board that includes representation from small cities, large cities, and unincorporated areas within the region as well as an at-large position.

To realize the operation of Passenger Rail Service on BNSF and UP Corridor, critical items would need to be addressed as indicated in **Table 39**. Coordination with existing railroads, state and federal agencies will be critical to successful implementation of passenger rail service within the area. Physical constraints from existing infrastructure, natural features, and political boundaries compound the complexity of efforts. Identification of a project owner(s), funding sources, and a maintenance and operations plan will be the critical first steps.

5.0 Summary

5.1 Key Regional Findings

RMS conducted a high-level assessment of BNSF and UP railroad corridors in the El Paso region, including the potential opportunities related to improving mobility within the region. Existing conditions of railroad crossing with major roadways, highways, and freeway were evaluated and future conditions were forecasted. Corridor inventories, crash analyses and intersection analyses were employed to rank intersections by potential impacts. Rail shipment volume data was reviewed and an increasing trend was identified for inbound rail shipments in the region proving that the El Paso-Las Cruces-Juárez region will continue to be an important hub for freight rail. Current operational issues resulting from inefficient international vehicular crossings in downtown El Paso and Juárez have created bottlenecks in the area. Solutions that address bottlenecks at these crossings need to be multimodal to serve both current and future mobility needs.

Rail was also a recurring topic in the RMS Stakeholder listening sessions, in particular, the Santa Teresa POE, which is at maximum vehicular capacity and is in need of expansion to support existing and future commercial traffic. Targeted listening sessions with New Mexico Border Authority (NMBA), NMDOT, and the State of Chihuahua were held to gauge stakeholder interests. Feedback from the meetings highlights that a bi-national rail bypass involving three railroad owners (Ferromex, UP, and BNSF), that would result in El Paso freight traffic being diverted to the Santa Teresa POE, continues to be a high priority for the states of New Mexico and Chihuahua. The rail bypass would divert freight rail traffic out of downtown El Paso-Juarez to Santa Teresa. If the vision for a rail bypass became a reality, Stakeholders believed this would unlock existing land currently utilized for downtown railyards for redevelopment for emerging priorities. The rail bypass project faces major challenges for implementation, including funding, a required presidential permit, and agreements with all three railroad owners. Similarly, the City of El Paso and Sun Metro continue to be interested in a future potential cross-border streetcar project near the international bridges. Such cross-border service existed in previous years.

Stakeholders repeatedly emphasized the importance of international trade to the regional economy and thought additional international rail crossings are needed, or at a minimum, rail-served industrial properties. However, public safety associated with rail crossings was also a stakeholder concern. The potential to increase public safety as a result of moving trains away from densely populated areas, such as the Doniphan Drive corridor on El Paso's westside and the Chihuahuaita neighborhood on El Paso's southside, ranked high among the issues raised by stakeholders even in light of the regional economic importance. An evaluation of Class 1 rail operators in the El Paso region, Union Pacific Railroad (UP) and BNSF Railway Company (BNSF) was performed as part of the RMS. Existing conditions of railroad crossings with major roadways, highways, and freeways were evaluated and future conditions were forecasted. Corridor inventories, crash analyses, and intersection analyses were employed to rank intersection by potential impacts. Crossings with immediate needs should be prioritized. Viable projects should be identified, pursued for funding, developed and advanced.

5.2 BNSF Findings

Within the BNSF study area, crash data shows that the intersections of Country Club Road, Racetrack Drive, W Redd Road, Ruhlen Court, and Sunland Park Drive should be reviewed for vehicular, pedestrian and cyclist safety. The intersections of Doniphan Drive at Mesa Street / Country Club Road and Sunland Park Drive should be reviewed for poor levels of service. Safety and capacity improvements should be considered at these intersections. TxDOT's Doniphan Drive Corridor Plan recommends improvements and enhancements, while the RMS effort identified a possible long term repurposing of the BNSF corridor.

5.3 UP Findings

Within the UP corridors, crash data shows that the intersections of Missouri Avenue, Piedras Street, Copia Street, Chelsea Street, Zaragoza Road and Horizon Boulevard should be reviewed for vehicular, pedestrian and cyclist safety. The intersections of Montana Avenue, Piedras Street, Copia Street, New Haven Drive, Zaragoza Road, Moon Road, Rio Vista Road, and Horizon Boulevard should be reviewed for train delays and vehicular emissions caused by trains. Safety and capacity improvements should be considered at these crossings.

5.4 Passenger Rail Opportunities

Opportunities and challenges associated with the possibility of implementing commuter rail service on select existing freight railroad corridors within the El Paso region were evaluated on both the UP and BNSF ROW. The evaluation did not include any discussions with UP and BNSF, nor did it include a ridership analysis to determine the viability of any such service. Additional evaluation or feasibility studies should include public or stakeholder input, grant funding requirements, or changes in applicable rail policies or laws.

The information contained in this technical memo will be used to identify needs and prioritize proposed solutions to rail-roadway crossings and improved transit services in the region.

Appendix A-1: Inventory of BNSF

Rail Crossing 101: This rail crossing at FM 1905 (W Washington Street) is a signalized, at-grade crossing located between SH 20 (S Main Street) and Omar Street, approximately 120 and 575 feet from the adjacent intersections, respectively. At this crossing, FM 1905 is a two-lane roadway with a 30/45-foot cross section and a posted speed limit of 35 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 101 is shown in ***Figure A1***.

Figure A1. Rail Crossing 101 - FM 1905

Rail Crossing 102: This rail crossing at Vinton Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Levee Road, approximately 50 and 745 feet from the adjacent intersections, respectively. At this crossing, Vinton Road is a three-lane roadway with a 35-foot cross section and a posted speed limit of 40 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 102 is shown in ***Figure A2.***

Figure A2. Rail Crossing 102 – Vinton Road

Rail Crossing 103: This rail crossing at FM 259 is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Levee Road, approximately 220 and 425 feet from the adjacent intersections, respectively. At this crossing, FM 259 is a two-lane roadway with a 20-foot cross section and a posted speed limit of 40 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 103 is shown in ***Figure A3*.**

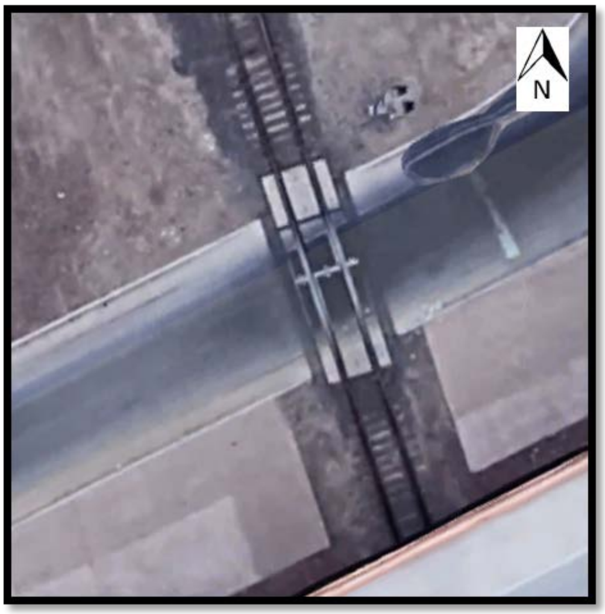
Figure A3. Rail Crossing 103 – FM 259

Rail Crossing 104: This rail crossing at W Borderland Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Viale Del Sol Avenue, approximately 90 and 1570 feet from the adjacent intersections, respectively. At this crossing, W Borderland road is a two-lane roadway with a 25-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 104 is shown in ***Figure A4***.

Figure A4. Rail Crossing 104 – W Borderland Road

Rail Crossing 105: This rail crossing at Artcraft Road (westbound frontage road) is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Rio West Drive, approximately 75 and 450 feet from the adjacent intersections, respectively. At this crossing, the Artcraft Road westbound frontage road is a one-lane roadway with a 25-foot cross section and a posted speed limit of 35 mph. This crossing has a grade crossing crossbuck (R15-1) sign and an automatic gate in one direction (one-way street). An aerial view of Rail Crossing 105 is shown in ***Figure A5*.**

Figure A5. Rail Crossing 105 – Artcraft Road (westbound frontage road)



Rail Crossing 106: This rail crossing at Artcraft Road (eastbound frontage road) is a signalized, at-grade crossing located near SH 20 (Doniphan Drive), approximately 75 feet from the adjacent intersection. At this crossing, the Artcraft Road eastbound frontage road is a three-lane roadway with a 45-foot cross section and a posted speed limit of 40 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in one direction (one-way street). An aerial view of Rail Crossing 106 is shown in ***Figure A6*.**

Figure A6. Rail Crossing 106 – Artcraft Road (eastbound frontage road)

Rail Crossing 107: This rail crossing at Montoya Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Luckett Court, approximately 95 and 620 feet from the adjacent intersections, respectively. At this crossing, Montoya Road is a two-lane roadway with a 35-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 107 is shown in ***Figure A7*.**

Figure A7. Rail Crossing 107 – Montoya Road

Rail Crossing 108: This rail crossing at W Green Avenue is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and W Valley Circle, approximately 50 and 200 feet from the adjacent intersections, respectively. At this crossing, W Green Avenue is a two-lane roadway with a 35-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 308 is shown in ***Figure A8.***

Figure A8. Rail Crossing 108 – W Green Avenue

Rail Crossing 109: This rail crossing at W Redd Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Equestre Drive, approximately 50 and 390 feet from the adjacent intersections, respectively. At this crossing, W Redd Road is a six-lane roadway with a 75-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions with a median in the center of the roadway. An aerial view of Rail Crossing 109 is shown in ***Figure A9***.

Figure A9. Rail Crossing 109 – W Redd Road

Rail Crossing 110: This rail crossing at Mulberry Avenue is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Charl Ann Street, approximately 50 feet from each adjacent intersection. At this crossing, Mulberry Avenue is a three-lane roadway with a 35-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 110 is shown in ***Figure A10*.**

Figure A10. Rail Crossing 110 – Mulberry Avenue

Rail Crossing 111: This rail crossing at Lindbergh Avenue is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Charl Ann Street, approximately 50 and 60 feet from the adjacent intersections, respectively. At this crossing, Lindbergh Avenue is a three-lane roadway with a 30/35-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 111 is shown in ***Figure A11***.

Figure A11. Rail Crossing 111 – Lindbergh Avenue

Rail Crossing 112: This rail crossing at Country Club Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Charl Ann Street, approximately 65 and 75 feet from the adjacent intersections, respectively. At this crossing, Country Club Road is a five-lane roadway with a 60-foot cross section and a posted speed limit of 35 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 112 is shown in ***Figure A12*.**

Figure A12. Rail Crossing 112 – Country Club Road

Rail Crossing 113: This rail crossing at W Sunset Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Charl Ann Street, approximately 50 and 70 feet from the adjacent intersections, respectively. At this crossing, W Sunset Road is a three-lane roadway with a 35/40-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 113 is shown in ***Figure A13*.**

Figure A13. Rail Crossing 113 – W Sunset Road

Rail Crossing 114: This rail crossing at Bird Avenue is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Emory Road, approximately 60 and 590 feet from the adjacent intersections, respectively. At this crossing, Bird Avenue is a two-lane roadway with a 25-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 114 is shown in ***Figure A14*.**

Figure A14. Rail Crossing 114 – Bird Avenue

Rail Crossing 115: This rail crossing at Frontera Road is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Emory Road, approximately 60 and 580 feet from the adjacent intersections, respectively. At this crossing, Frontera is a two-lane roadway with a 30-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 115 is shown in ***Figure A15*.**

Figure A15. Rail Crossing 115 – Frontera Road

Rail Crossing 116: This rail crossing at Sunland Park Drive is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Emory Road, approximately 55 and 560 feet from the adjacent intersections, respectively. At this crossing, Sunland Park Drive is a five-lane roadway with a 95-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions with medians at the crossing. An aerial view of Rail Crossing 116 is shown in ***Figure A16.***

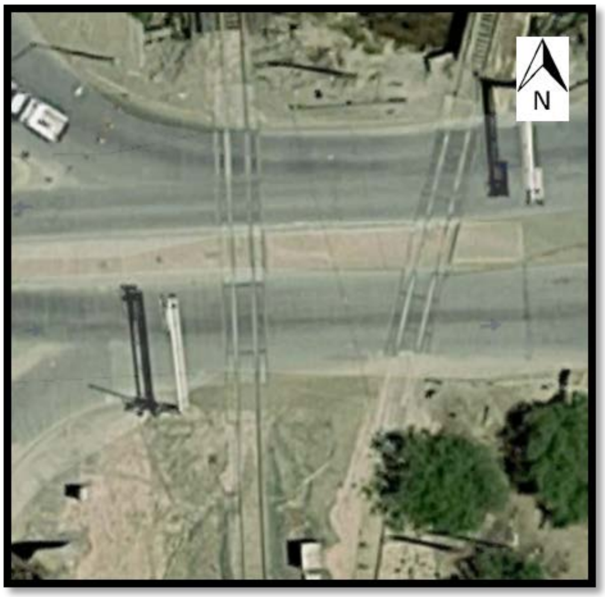
Figure A16. Rail Crossing 116 – Sunland Park Drive

Rail Crossing 117: This rail crossing at Racetrack Drive is a signalized, at-grade crossing located between SH 20 (Doniphan Drive) and Futurity Drive, approximately 55 and 2100 feet from the adjacent intersections, respectively. At this crossing, Racetrack Drive is a three-lane roadway with a 65-foot cross section and a posted speed limit of 40 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates with cantilevers in both directions with medians. An aerial view of Rail Crossing 117 is shown in ***Figure A17*.**

Figure A17. Rail Crossing 117 – Racetrack Drive

Rail Crossing 118: This rail crossing at Executive Center Boulevard is a signalized, at-grade crossing located between US 85 (CanAm Highway) and San Marcos Drive, approximately 120 and 100 feet from the adjacent intersections, respectively. At this crossing, Executive Center Boulevard is a four-lane roadway with a 60-foot cross section and a posted speed limit of 35 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates with cantilevers in both directions. An aerial view of Rail Crossing 118 is shown in ***Figure A18*.**

Figure A18. Rail Crossing 118 – Executive Center Boulevard



Rail Crossing 119: This rail crossing at Ruhlen Court is a signalized, at-grade crossing located between US 85 (Paisano Highway) and a private drive, approximately 30 feet from each adjacent intersection. At this crossing, Ruhlen Court is a two-lane roadway with a 25-foot cross section and a posted speed limit of 30 mph. This crossing has grade crossing crossbuck (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 119 is shown in ***Figure A19***.

Figure A19: Rail Crossing 119 – Ruhlen Court

Appendix B-1: Conceptual Drawings for BNSF Segments 1 and 2

HNTB

HNTB Corporation
The HNTB Companies
Infrastructure Solutions
Firm Registration Number 420

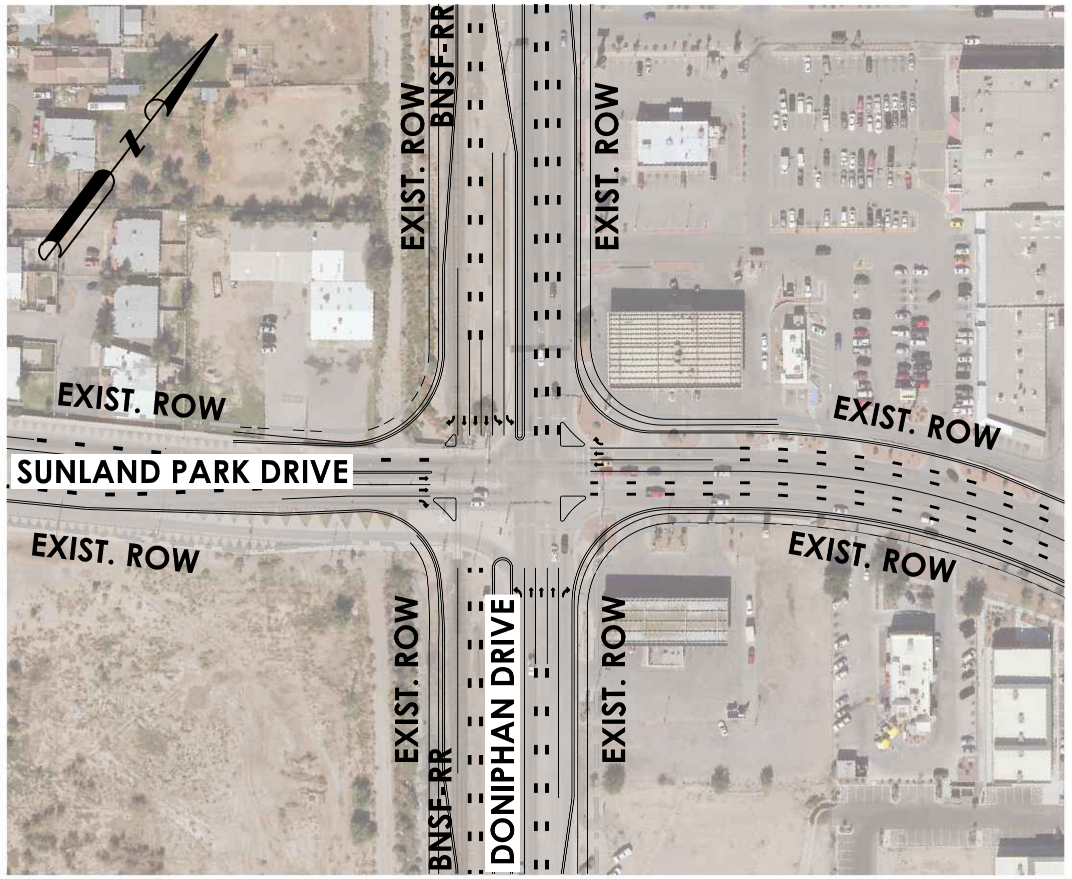
Texas Department of Transportation

US 85 (PAISANO DR)
CONCEPTUAL IMPROVEMENTS

SHEET 1 OF 1

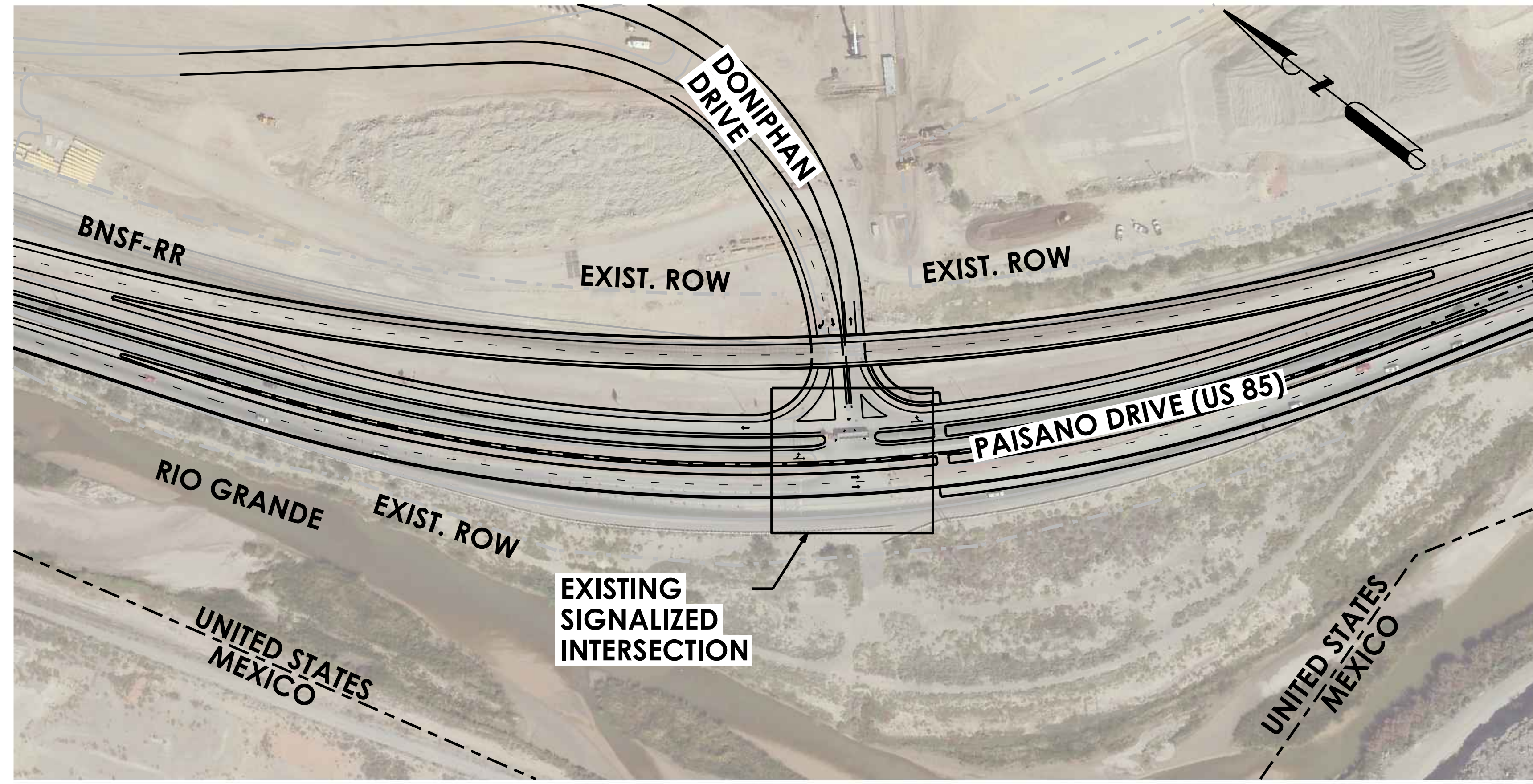
DESIGNED:	FED. RD. DIV. No.	STATE	FEDERAL AID PROJECT No.		HIGHWAY No.
CHECKED:	6	TEXAS			CS
DRAWN:	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	EL PASO	ELP	2151	10	424	

SEGMENT 2

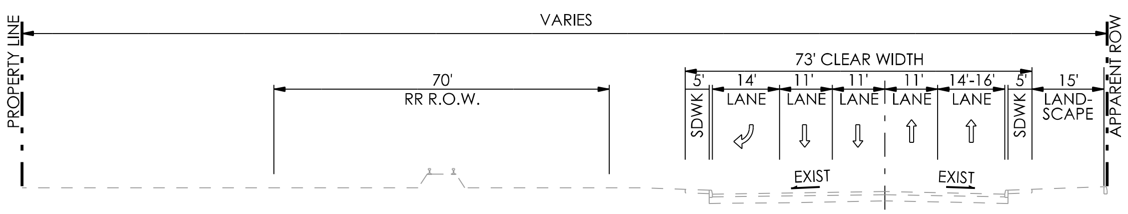


TYPICAL MAJOR INTERSECTION ON DONIPHAN DRIVE
(FROM NEW MEXICO STATE LINE TO RACETRACK DRIVE)

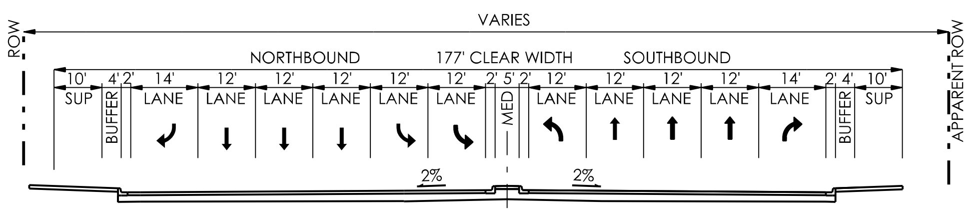
SEGMENT 1



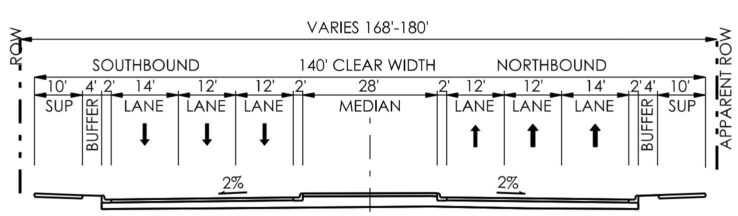
BYPASS CONCEPT - WB LANES GRADE SEPARATED
(FROM RACETRACK DRIVE TO DOWNTOWN EL PASO)



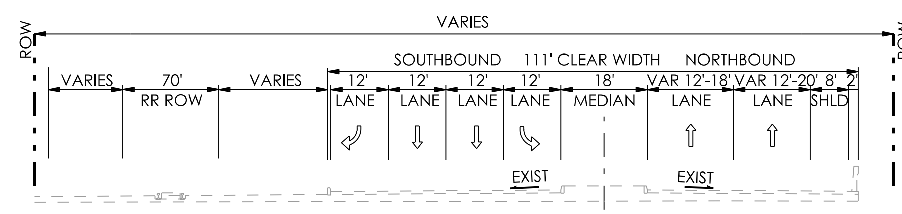
DONIPHAN DRIVE
EXISTING
NTS



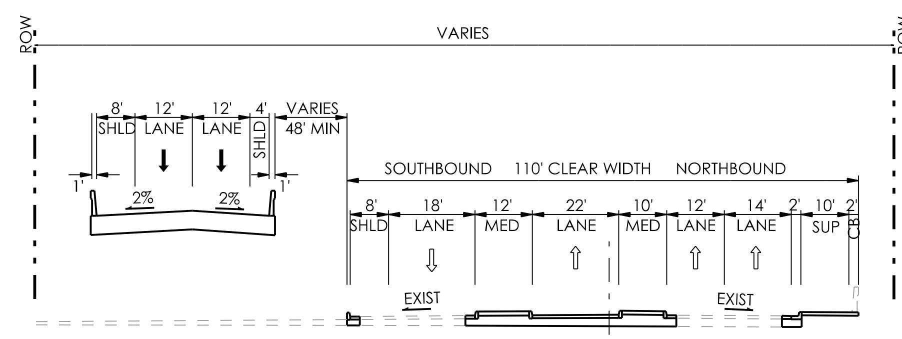
DONIPHAN DRIVE
TYPICAL INTERSECTION LAYOUT
PROPOSED
NTS



DONIPHAN DRIVE
TYPICAL LAYOUT
PROPOSED
NTS



PAISANO DRIVE AT
DONIPHAN DRIVE
EXISTING
NTS



PAISANO DRIVE AT
DONIPHAN DRIVE
PROPOSED
NTS

0 100 200
HORIZONTAL SCALE

SHEET 1 OF 2

HNTB
HNTB Corporation
The HNTB Companies
Infrastructure Solutions
Firm Registration Number 420

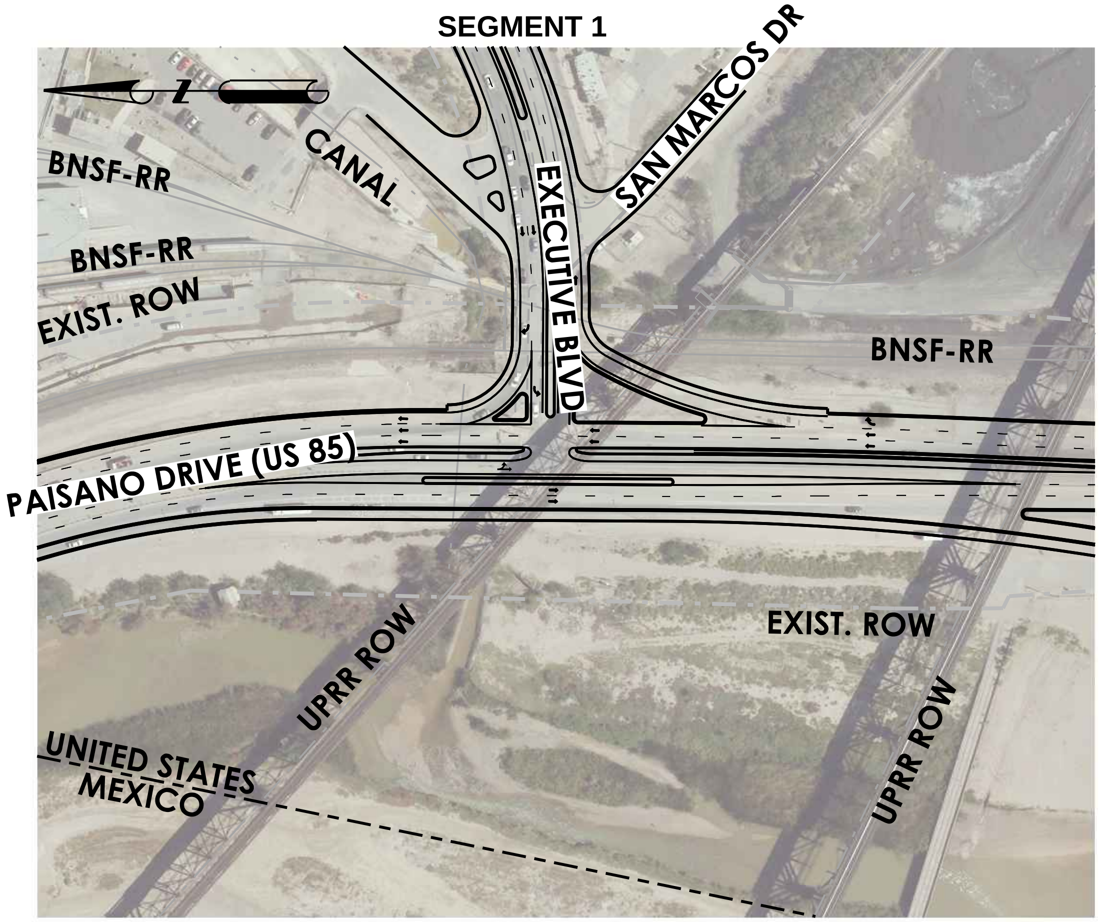
Texas Department of Transportation

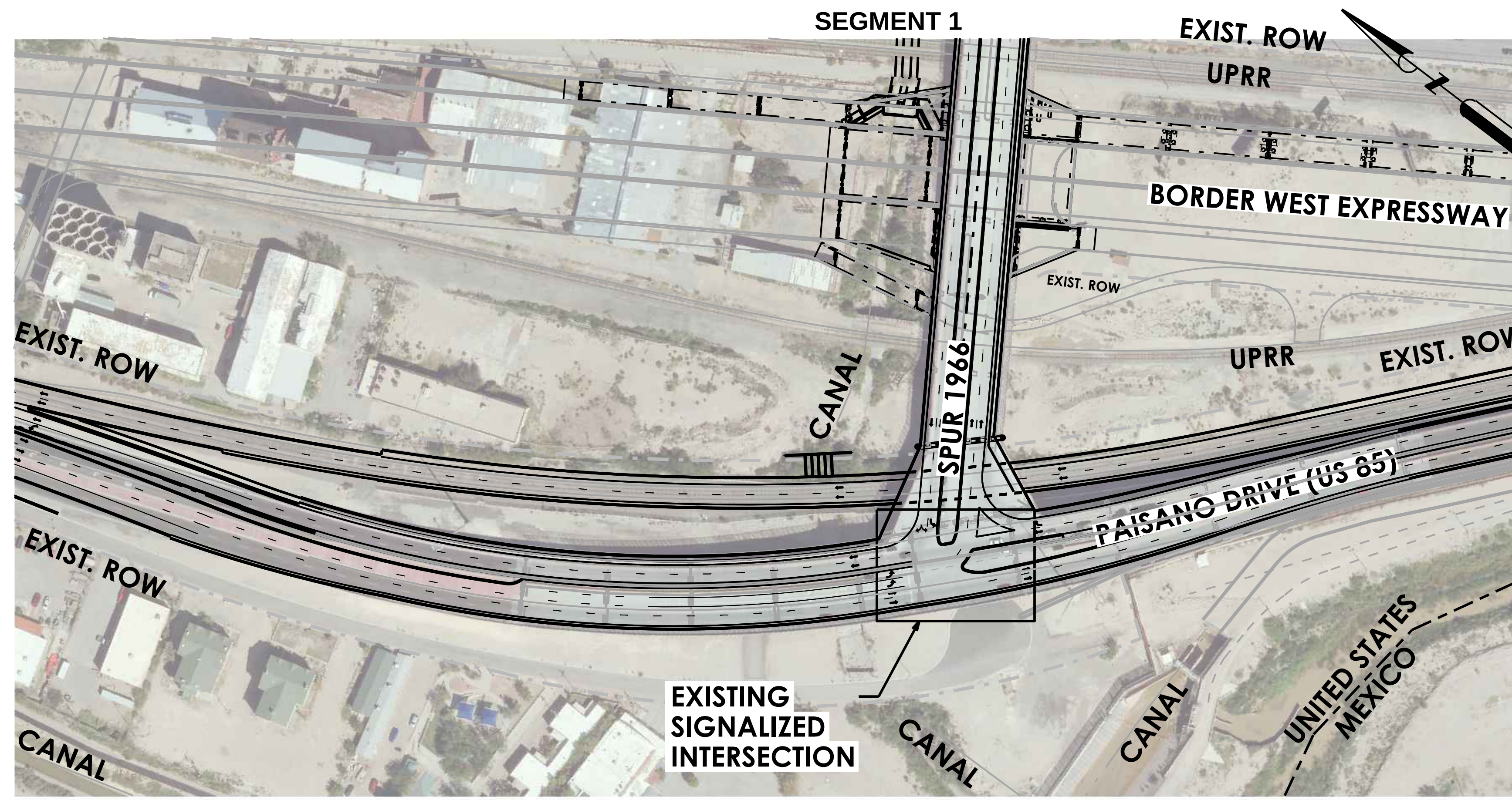
INTERSECTION CONCEPT

DONIPHAN DRIVE AT
SUNLAND PARK DRIVE
AND
PAISANO DRIVE AT
DONIPHAN DRIVE

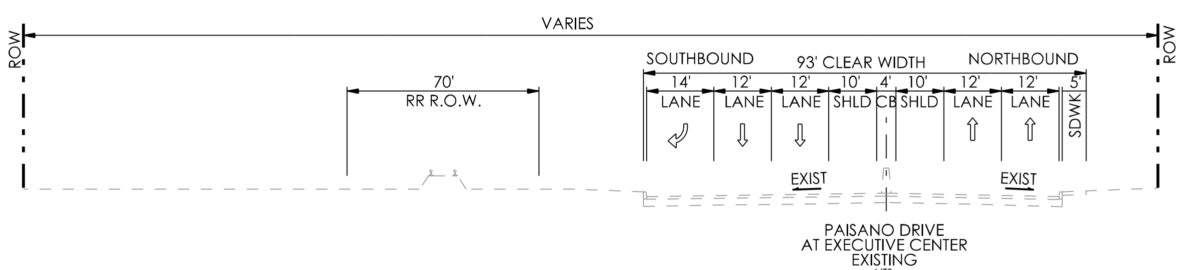
DESIGNED:	KR	FED. RD. DIV. No.	STATE	FEDERAL AID PROJECT No.				HIGHWAY No.	
CHECKED:	FO	6	TEXAS					CS	
DRAWN:	KR	STATE DISTRICT		COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED:	FO	EL PASO		ELP	2151	10	424		

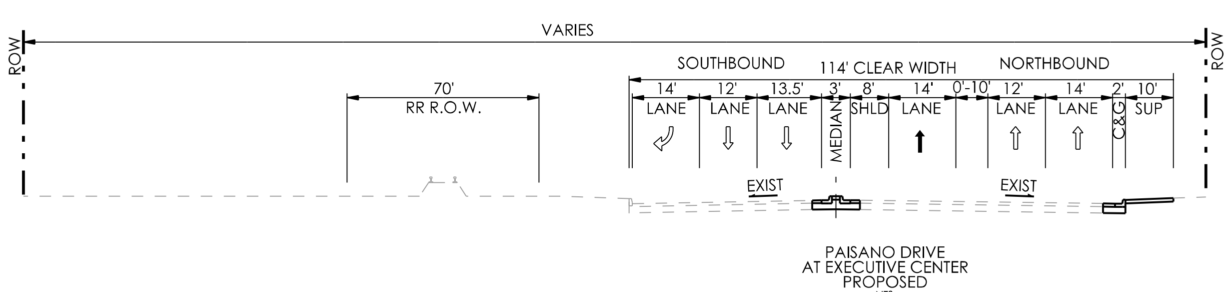
$TIME$
$DATE$
$FILE$



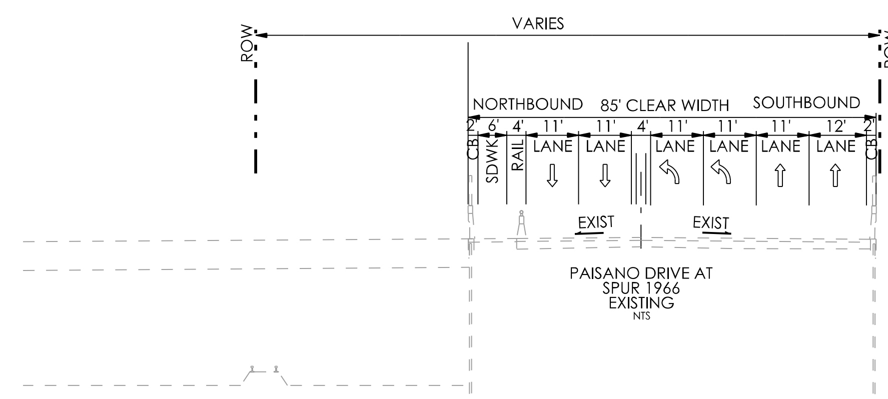


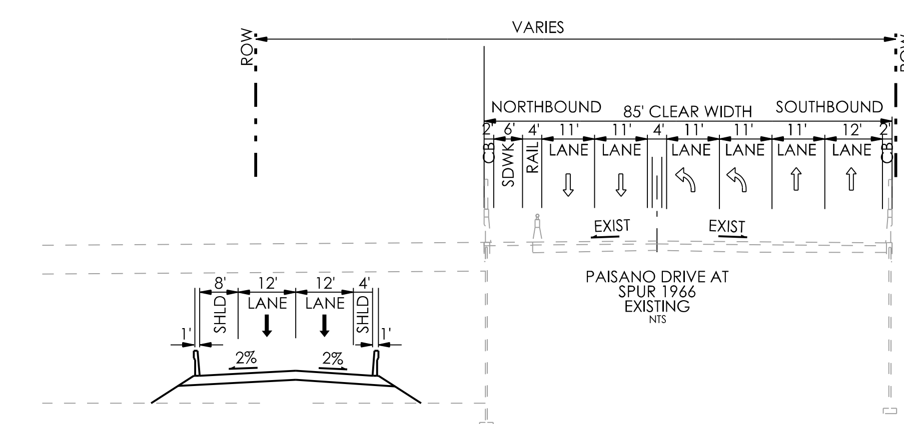
BYPASS CONCEPT AT-GRADE
(FROM RACETRACK DRIVE TO DOWNTOWN EL PASO)





BYPASS CONCEPT - WB LANES GRADE SEPARATED
(FROM RACETRACK DRIVE TO DOWNTOWN EL PASO)





0 100 200
HORIZONTAL SCALE

SHEET 2 OF 2

HNTB
HNTB Corporation
The HNTB Companies
Infrastructure Solutions
Firm Registration Number 420

Texas Department of Transportation

INTERSECTION CONCEPT

PAISANO DRIVE (US 85) AT
EXECUTIVE BLVD
AND
PAISANO DRIVE (US 85) AT
SPUR 1966

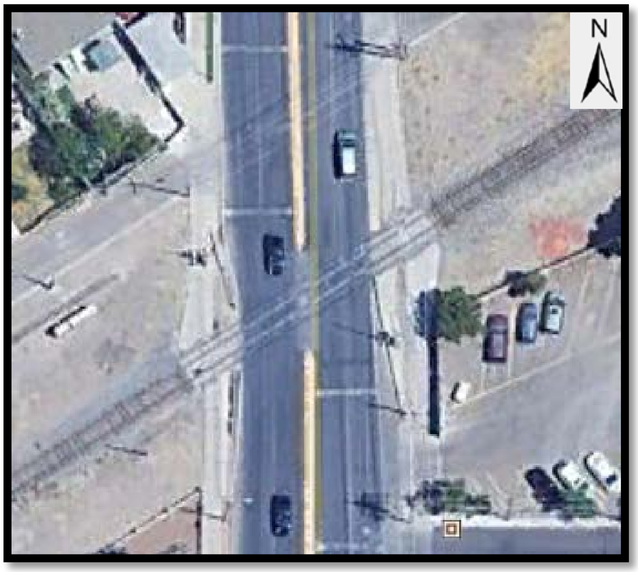
DESIGNED:	KR	FED. RD. DIV. No.	STATE	FEDERAL AID PROJECT No.			HIGHWAY No.
CHECKED:	FO	6	TEXAS				CS
DRAWN:	KR	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED:	FO	EL PASO	ELP	2151	10	424	

$TIME$
$DATE$
$FILE$

Appendix C-1: Inventory of UP

Rail Crossing 201: This rail crossing at Piedras Street is a signalized, at-grade crossing located between Grant Avenue and Pershing Drive, approximately 255 feet and 255 feet from the adjacent intersections, respectively. At this crossing, Piedras Street is a four-lane roadway with a three-foot raised median, a 50-foot cross section, and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions, as well as longitudinal bollards along the raised median to prevent left-turns near the crossing. An aerial view of Rail Crossing 201 is shown in ***Figure C1.***

Figure C1. Rail Crossing 201 – Piedras Street



Rail Crossing 202: This rail crossing located at Elm Street is a signalized, at-grade crossing located between Grant Avenue and Piedras Street, approximately 215 feet and 240 feet from the adjacent intersections, respectively. At this crossing, Elm Street is a two-lane roadway with a 30-foot cross section on the north side of the rail crossing, a 45-foot cross section with on-street parking on the south side of the crossing, and a prima facie speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 202 is shown in ***Figure C2***.

Figure C2. Rail Crossing 202 – Elm Street

Rail Crossing 203: This rail crossing at Rosewood Street is a signalized, at-grade crossing located between Grant Avenue and Pershing Drive, approximately 215 feet and 220 feet from the adjacent intersections, respectively. At this crossing, Rosewood Street is a two-lane roadway with a five-foot raised median, a 25-foot cross section, and a prima facie speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions, as well as longitudinal bollards along the raised median to prevent left-turns near the crossing. An aerial view of Rail Crossing 203 is shown in **Figure *C3*.**

Figure C3. Rail Crossing 203 – Rosewood Street

Rail Crossing 204: This rail crossing at Montana Avenue is a signalized, at-grade crossing located between Willow Street and Walnut Street, approximately 100 feet and 365 feet from the adjacent intersections, respectively. Montana Avenue is a four-lane roadway with a 45-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs, automatic gates, and mast-arms with crossing signals in both directions. An aerial view of Rail Crossing 204 is shown in **Figure *C4*.**

Figure C4. Rail Crossing 204 – Montana Avenue

Rail Crossing 205: This rail crossing at Yandell Drive is a signalized, at-grade crossing located between Eucalyptus Street and Willow Street, approximately 105 feet and 360 feet from the adjacent intersections, respectively. At this crossing, Yandell Drive is one-way southbound facility with three lanes, a 32-foot cross section, and a posted speed limit of 35 mph. Pavement designated for on-street parking is provided on either side of the crossing; however, curb bulb-outs prohibit parking within 25-60 feet of the crossing. This crossing has a Grade Crossing (Crossbuck) (R15-1) sign, automatic gates, and a mast arm with crossing signals on the north side of the crossing. An aerial view of Rail Crossing 205 is shown in **Figure *C5***.

Figure C5. Rail Crossing 205 – Yandell Road

Rail Crossing 206: This rail crossing at the I-10 Westbound Frontage Road, called Missouri Avenue at this location is a signalized, at-grade crossing located between N Laurel Street and Eucalyptus Street, approximately 100 feet and 380 feet from the adjacent intersections, respectively. At this crossing, Missouri Avenue is one-way southbound facility with three lanes, a 47-foot cross section, and a posted speed limit of 45 mph. The crossing has two Grade Crossing (Crossbuck) (R15-1) signs and automatic gates on the north side of the crossing. An aerial view of Rail Crossing 206 is shown in **Figure *C6*.**

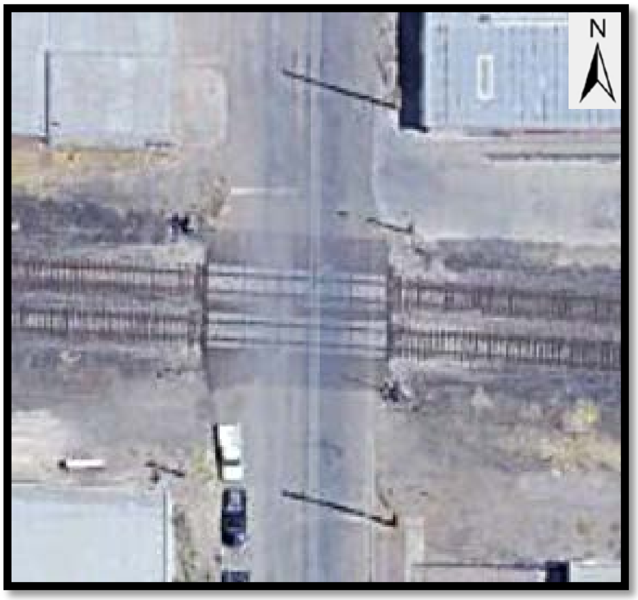
Figure C6. Rail Crossing 206 – Missouri Avenue

Rail Crossing 301: This rail crossing at San Marcial Street is a signalized, at-grade crossing located between Durazno Avenue and Rosa Avenue, approximately 240 feet and 150 feet from the adjacent intersections, respectively. At this crossing, San Marcial Street is a two-lane roadway with a 40-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 301 is shown in **Figure *C7***.

Figure C7. Rail Crossing 301 – San Marcial Street

Rail Crossing 302: This rail crossing at Estrella Street is a signalized, at-grade crossing located between Durazno Avenue and Rosa Avenue, approximately 245 feet and 135 feet from the adjacent intersections, respectively. At this crossing, Estrella Street is a two-lane roadway with a 40-foot cross section and a posted speed limit of 20 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 302 is shown in **Figure C8.**

Figure C8. Rail Crossing 302 – Estrella Street



Rail Crossing 303: This rail crossing at Cebada Street is a signalized, at-grade crossing located between Durazno Avenue and Rosa Avenue, approximately 190 feet and 100 feet from the adjacent intersections, respectively. At this crossing, Cebada Street is a two-lane roadway with a 35-foot cross section and a prima facie speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 303 is shown in **Figure C9.**

Figure C9. Rail Crossing 303 – Cebada Street

Rail Crossing 304: This rail crossing at Grama Street is a signalized, at-grade crossing located between Durazno Avenue and Frutas Avenue, approximately 370 feet and 370 feet from the adjacent intersections, respectively. At this crossing, Grama Street is a two-lane roadway with street parking on either side of the road, a 40-foot cross section, and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 304 is shown in ***Figure C10.***

Figure C10. Rail Crossing 304 – Grama Street

Rail Crossing 305: This rail crossing at Copia Street is a signalized, at-grade crossing located between Durazno Avenue and Frutas Avenue, approximately 410 feet and 330 feet from the adjacent intersections, respectively. At this crossing, Copia Street is a four-lane roadway with a 55-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs, automatic gates, and mast-arms with crossing signals in both directions. An aerial view of Rail Crossing 305 is shown in ***Figure C11***.

Figure C11. Rail Crossing 305 – Copia Street

Rail Crossing 306: This rail crossing at Boone Street is a signalized, at-grade crossing located between Rosa Avenue and Alameda Avenue, approximately 220 feet and 485 feet from the adjacent intersections, respectively. At this crossing, Boone Street is a two-lane roadway with a 40-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 306 is shown in **Figure *C12*.**

Figure C12. Rail Crossing 306 – Boone Street

Rail Crossing 307: This rail crossing at Chelsea Street is a signalized, at-grade crossing located between Beacon Avenue and El Paso Drive, approximately 225 feet and 760 feet from the adjacent intersections, respectively. At this crossing, Chelsea Street is a two-lane roadway with a 45-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 307 is shown in **Figure *C13***.

Figure C13. Rail Crossing 307 – Chelsea Street

Rail Crossing 308: This rail crossing at Glenwood Street is a signalized, at-grade crossing located between Welch Avenue and El Paso Drive, approximately 50 feet and 105 feet from the adjacent intersections, respectively. At this crossing, Glenwood Street is a two-lane roadway with a 50-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 308 is shown in **Figure C14.**

Figure C14. Rail Crossing 308 – Glenwood Street

Rail Crossing 309: This rail crossing at Cadwallader Drive is a signalized, at-grade crossing located between Franklin Drive and Alameda Avenue, approximately 145 feet and 460 feet from the adjacent intersections, respectively. At this crossing, Cadwallader Drive is a two-lane roadway with a 30-foot cross section and a prima facie speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 309 is shown in **Figure *C15*.**

Figure C15. Rail Crossing 309 – Cadwaller Drive

Rail Crossing 310: This rail crossing at Rosedale Street is a signalized, at-grade crossing located between Wenda Drive and Alameda Avenue, approximately 135 feet and 360 feet from the adjacent intersections, respectively. At this crossing, Rosedale Street is a two-lane roadway with a 40-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 310 is shown in **Figure *C16*.**

Figure C16. Rail Crossing 310 – Rosedale Street

Rail Crossing 311: The rail crossing at Lafayette Drive is a signalized, at-grade crossing located between Carpenter Drive and Alameda Avenue, approximately 230 feet and 320 feet from the adjacent intersections, respectively. At this crossing, Lafayette Drive is a two-lane roadway with a 40-foot cross section, on-street parking on the southwest side of the crossing, and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 311 is shown in **Figure C17.**

Figure C17. Rail Crossing 311 – Lafayette Drive

Rail Crossing 312: This rail crossing at Smith Road is a signalized, at-grade crossing located between Wells Road and Warner Place, approximately 90 feet and 725 feet from the adjacent intersections, respectively. At this crossing, Smith Road is a two-lane roadway with a 40-foot cross section on the northeast side of the crossing, a 20-foot cross section on the southwest side of the crossing, and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 312 is shown in **Figure *C18*.**

Figure C18. Rail Crossing 312 – Smith Road

Rail Crossing 313: This rail crossing at New Haven Drive is a signalized, at-grade crossing located between Wells Drive and Roseway Drive, approximately 85 feet and 85 feet from the adjacent intersections, respectively. At this crossing, New Haven Drive is a two-lane roadway with a 50-foot cross section and a posted speed limit of 20 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 313 is shown in **Figure *C19*.**

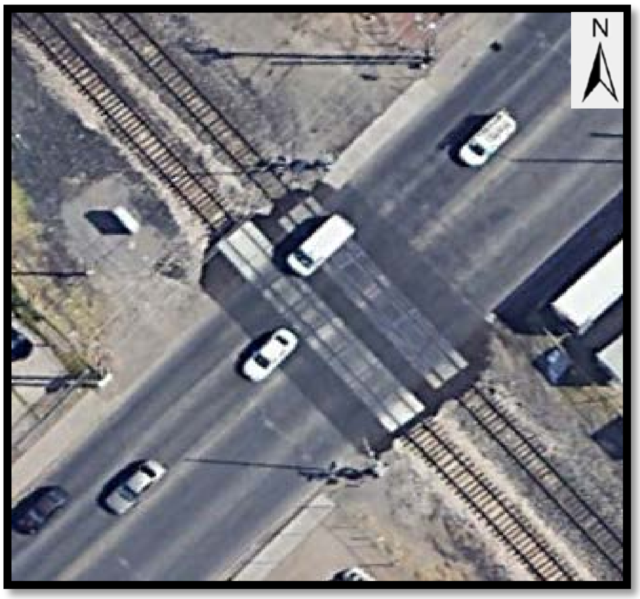
Figure C19. Rail Crossing 313 – New Haven Drive

Rail Crossing 314: This rail crossing at Pendale Road is a signalized, at-grade crossing located between Wells Road and Roseway Drive, approximately 120 feet and 70 feet from the adjacent intersections, respectively. At this crossing, Pendale Road is a two-lane roadway with a 30-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 314 is shown in **Figure *C20*.**

Figure C20. Rail Crossing 314 – Pendale Road

Rail Crossing 315: This rail crossing at Zaragoza Road is a signalized, at-grade crossing located between Billy The Kid Road and Roseway Drive, approximately 245 feet and 215 feet from the adjacent intersections, respectively. At this crossing, Zaragoza is four-lane roadway with a 50-foot cross section and a posted speed limit of 35 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 315 is shown in **Figure *C21*.**

Figure C21. Rail Crossing 315 – Zaragoza Road



Rail Crossing 316: This rail crossing at Inglewood Drive is a signalized, at-grade crossing located between Landgren Drive and Alameda Drive, approximately 490 feet and 1,685 feet from the adjacent intersections, respectively. At this crossing, Inglewood Drive is a two-lane roadway with a 30-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 316 is shown in **Figure *C22*.**

Figure C22. Rail Crossing 316 – Inglewood Drive

Rail Crossing 317: This rail crossing at Moon Road is a signalized, at-grade crossing located between Gideon Circle and Morocco Circle, approximately 225 feet and 345 feet from the adjacent intersections, respectively. At this crossing, Moon Road is a two-lane roadway with a 25-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 317 is shown in **Figure *C23*.**

Figure C23. Rail Crossing 317 – Mood Road

Rail Crossing 318: This rail crossing at Rio Vista Road is a signalized, at-grade crossing located between Valle Fertil Drive and Alameda Avenue, approximately 2,035 feet and 1,855 feet from the adjacent intersections, respectively. At this crossing, Rio Vista Road is a two-lane roadway with a 20-foot cross section and a prima facie speed limit of 25 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 318 is shown in **Figure *C24*.**

Figure C24. Rail Crossing 318 – Rio Vista Road

Rail Crossing 319: This rail crossing at Horizon Boulevard is a signalized, at-grade crossing located between Brown Road and Middle Drain Road, approximately 145 feet and 285 feet from the adjacent intersections, respectively. At this crossing, Horizon Boulevard is a four-lane roadway with a 17-foot raised median, a 65-foot cross section, and a posted speed limit of 35 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 319 is shown in **Figure *C25*.**

Figure C25. Rail Crossing 319 – Horizon Boulevard

Rail Crossing 320: This rail crossing at Bauman Road is a signalized, at-grade crossing located between Sheffield Drive and Middle Drain Road, approximately 345 feet and 180 feet from the adjacent intersections, respectively. At this crossing, Bauman Road is an unmarked two-lane roadway with a 20-foot cross section and a posted speed limit of 30 mph. This crossing has Grade Crossing (Crossbuck) (R15-1) signs and automatic gates in both directions. An aerial view of Rail Crossing 320 is shown in **Figure *C26*.**

Figure C26. Rail Crossing 320 – Bauman Road

Appendix D-1: Methodology and Assumptions Memo

TECHNICAL MEMORANDUM

To: Hugo Hernandez, TxDOT

From: Eduardo Calvo, HNTB

Date: August 31, 2018

Subject: Task 3.2, Methodology Proposal on Traffic Count Data for UPRR Microsimulation

1.0 Introduction

A subtask of the Regional Mobility Assessment Strategy (RMAS) is to identify the impacts to delay and emissions due to at-grade roadway and rail crossings along the UPRR corridors in El Paso. Twenty-six at-grade rail crossings have been identified for this analysis.

The data required to complete the analysis includes the following:

- Daily traffic count data at the rail crossing approaches
- Length of train
- Speed of train
- Number of trains per day

Currently, much of this data is unavailable or not recent enough to estimate impacts to delay and emissions. This memorandum outlines a methodology to achieve a reasonable estimation of corridor-level delay and emissions for each corridor for the existing year (2018) and forecast year of 2045.

2.0 Methodology

2.1 Existing Traffic Counts

Currently, traffic count data exists for 7 of the 26 at-grade rail crossings shown in **Table 1.**

Table 1: Available Traffic Count Data

Available Traffic Count Data	
At-Grade Crossing Street	**2012 Traffic Count**
Piedra St	14,256
N Laurel St	9,700
N Copia St	9,850
N Zaragoza Rd	30,360
Moon Rd	9,160
Horizon Blvd	15,460
Bauman Rd	4,650

These traffic count data were taken from the 2012 urban saturation counts performed by TPP for the Destino model calibration and validation purposes. The approach to estimate delay and emissions for the UPRR corridors is to conduct the microsimulation for the seven at-grade crossings where sufficient information exists. Once completed, the delay and emissions results will serve as proxies for the remaining at-grade crossings.

The latest available traffic count data for the seven above mentioned at-grade crossings is from 2012. To account for the last six years of potential traffic growth, the recommendation is to increase the 2012 traffic by 1% per year compounded for six years as shown in **Table 2**.

Table 2: Factored 2018 Traffic Count Data

Factored 2018 Traffic Count Data		
At-Grade Crossing Street	**2012 Traffic Count**	**2018 Factored Traffic Count**
Piedra St	14,256	15,200
N Laurel St	9,700	10,300
N Copia St	9,850	10,500
N Zaragoza Rd	30,360	32,300
Moon Rd	9,160	9,800
Horizon Blvd	15,460	16,500
Bauman Rd	4,650	5,000

The next step of the approach is to segment the at-grade rail crossings by volume type shown in **Table 3**. This segmentation will be used to assign delay and emissions results to the remaining at-grade rail crossings which lack data.

Table 3: Crossing Segmentation by Volume

Crossing Segmentation	
Volume	**Volume Type**
<5,000 vpd	1
5,000 to 10,000	2
10,000 to 15,000	3
15,000 to 20,000	4
>20,000	5

In addition to traffic volumes, simulation requires an hourly factor and a directional distribution percentage to convert the daily traffic volume to an hourly volume for both directions of travel. Since this data is not available, these metrics were taken from typical counts from similar volume facilities. The assumption of these metrics is shown below in **Table 4**.

Table 4: Crossing Segmentation Simulation Input Data

Crossing Segmentation Simulation Input Data			
Volume	Volume Type	Analysis Hour %	Directional Distribution
<5,000 vpd	1	0.20	65/35
5,000 to 10,000	2	0.15	60/40
10,000 to 15,000	3	0.12	55/45
15,000 to 20,000	4	0.10	50/50
>20,000	5	0.08	50/50

3.0 Conduct Microsimulation

3.1 Existing Traffic Data

The next step in the proposed methodology is to conduct the microsimulation for the seven at-grade rail crossings. First a volume type must be assigned to the seven at-grade rail crossings based on the traffic volume class shown in Table 3. Based on the estimated 2018 volume, each at-grade rail crossing was assigned its volume type as shown below in **Table 5**.

Table 5: Existing At-grade Rail Crossing Volume Type Assignment

Existing At-grade Rail Crossing Volume Type Assignment			
At-Grade Crossing Street	2012 Traffic Count	2018 Factored Traffic Count	Volume Type
Bauman Rd	4,650	5,000	1
Moon Rd	9,160	9,800	2
N Laurel St	9,700	10,300	3
N Copia St	9,850	10,500	3
Piedra St	14,256	15,200	4
Horizon Blvd	15,460	16,500	4
N Zaragoza Rd	30,360	32,300	5

The traffic data needed for the microsimulation is now complete. The analyst simply applies the appropriate traffic metrics based on the volume type assignment shown in Table 4.

3.2 Rail Data

Rail information required for microsimulation is the train delay and its frequency. Based on discussions with HNTB Freight Rail experts, the recommended train speed is 30 mph. This is based on Union Pacific's Max Timetable which was obtained for the larger study. HNTB rail experts also provided the average length of a freight train of 8,000 feet (1.5 miles). A 1.5 mile long train traveling 30 mph would take approximately 3 minutes to cross over a roadway.

Coupled with the opening and closing times of the rail gates, a total of 4 minutes is recommended for the associated delay attributed to a train crossing.

The final piece needed is the frequency of the trains. This particular piece of information is not vital at this point. The result of the simulation can be multiplied by the frequency once that has been determined.

3.3 Apply Microsimulation Results

Upon completion of the seven microsimulation runs. The delay and emissions results from each at-grade crossing will be assigned to the remaining at-grade crossings based on their volume types as shown below in **Table 6**.

Table 6: At-grade Crossing Volume Type Assignment

Location Without Traffic Data	Volume Type Assignment
Elm St @ Grant St	1
Pershing Dr @ Rosewood St	1
N Eucalyptus St @ Yandell Dr	1
N San Marcial St @ Durazno Ave	1
N Estrella St @ Rosa Ave	1
Cebada St @ Duranzo Ave	1
Grama St @ Duranzo Ave	1
N Boone St @ Alameda Ave	1
Glenwood Street @ El Paso Dr	1
Cadwallader Dr @ Franklin Dr	1
Smith Dr @ Warner Pl	1
Pendale Rd @ Roseway Dr	1
Inglewood Dr @ Landgren Dr	1
Chelsea St @ E Paisano Dr U-Turn	2
Rosedale St @ Wenda Dr	2
Layfayette Dr @ Carpenter Dr	2
New Haven Dr @ Roseway Dr	2
N Rio Vista Rd @ Valle Fertil Dr	2
Montana Ave @ N Walnut St	3

The results for each at-grade crossing would then be summed for each corridor and annualized to arrive at an estimated annual corridor delay caused by at-grade rail crossings. A recommended annualization factor is 260 days – assuming traffic is very light on weekends and accounting for holidays.

3.4 Forecast Traffic

The final step is to determine what the future impacts could likely be as both automobile and rail traffic volumes grow over time.

The planning horizon for RMAS is 2045. The estimated 2018 traffic volumes have been increased using an average annual growth rate as shown below in **Table 7**. The growth rates shown below are for illustrative purposes only and are based on professional judgement. TxDOT will make the final decision as to the appropriate rate of growth to apply to each location.

Table 7: Forecasted Traffic Volumes for Existing At-grade Rail Crossings

Forecasted Traffic Volumes for Existing At-grade Rail Crossings				
At-Grade Crossing Street	2012 Traffic Count	2018 Factored Traffic Count	AAGR*	2045 Factored Traffic Count
Bauman Rd	4,650	5,000	1.0%	6,541
Moon Rd	9,160	9,800	1.5%	14,649
N Laurel St	9,700	10,300	2.0%	17,581
N Copia St	9,850	10,500	2.0%	17,922
Piedra St	14,256	15,200	2.5%	29,607
Horizon Blvd	15,460	16,500	2.5%	32,139
N Zaragoza Rd	30,360	32,300	2.0%	55,132
*AAGR - Average Annual Growth Rate				

Each at-grade rail crossing volume type would be reclassified based on the new 2045 traffic volume shown in **Table 3**. Microsimulation would be reran based on the traffic inputs for the associated volume type shown in **Table 4**. The results from each of the seven 2045 microsimulation runs would be assigned to the remaining at-grade crossings based on their 2045 volume type assignment shown below in **Table 8**.

Table 8: 2045 At-grade Crossing Volume Type Assignment

Location Without Traffic Data	2045 Volume Type Assignment
Elm St @ Grant St	2
Pershing Dr @ Rosewood St	2
N Eucalyptus St @ Yandell Dr	2
N San Marcial St @ Durazno Ave	2
N Estrella St @ Rosa Ave	2
Cebada St @ Duranzo Ave	2
Grama St @ Duranzo Ave	2
N Boone St @ Alameda Ave	2
Glenwood St @ El Paso Dr	2
Cadwallader Dr @ Franklin Dr	2
Smith Dr @ Warner Pl	2
Pendale Rd @ Roseway Dr	2
Inglewood Dr @ Landgren Dr	2
Chelsea St @ E Paisano Dr U-Turn	3
Rosedale St @ Wenda Dr	3

Location Without Traffic Data	2045 Volume Type Assignment
Layfayette Dr @ Carpenter Dr	3
New Haven Dr @ Roseway Dr	3
N Rio Vista Rd @ Valle Fertil Dr	3
Montana Ave @ N Walnut St	4

The results for each at-grade crossing would then be summed for each corridor and annualized to arrive at an estimated 2045 annual corridor delay caused by at-grade rail crossings. A recommended annualization factor is 260 days – assuming traffic is very light on weekends and accounting for holidays.

4. Conclusion

Key assumptions are needed to appropriately develop an estimate of annual corridor delay and emissions due to the lack of data. These assumptions have been made in this report for discussion purposes and are based on professional judgement and desktop survey using Google Maps and other internet sources. The key assumptions that need agreement upon are shown below in **Table 9**.

Table 9: Key Assumptions

Microsimulation Assumptions Required
2012 to 2018 average annual growth rate
2018 to 2045 average annual growth rate
At-grade crossing volume type
Traffic factors (hourly factor and directional distribution)
Train speed
Train frequency
Train length

APPENDIX I

Keystone Projects

Help define the future of our region.

Mobility.

Livability.

Economic Development.

El Paso Metropolitan Planning Organization

Texas Department of Transportation

RMS
REGIONAL MOBILITY STRATEGY

NORTHEAST PARKWAY (TEXAS SECTION OF THE BORDERLAND EXPRESSWAY)

Top 100 Congested Ranking: N/A

"Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods."

PURPOSE AND NEED

The purpose of the proposed, Northeast Parkway project is to address regional system linkage and redundant capacity. Northeast Parkway would complete a circumferential route around suitable for truck and other through traffic, utilizing in part existing transportation facilities in New Mexico (NM 404 and NM 213) and Texas (Loop 375). Northeast Parkway could significantly improve connectivity between the transportation networks of Texas and New Mexico, benefiting communities in both states. Additionally, Northeast Parkway will increase the reliability for military vehicles and freight movements.

PROJECT DESCRIPTION

Northeast Parkway is planned as a new location four-lane facility, and initial designs include grade separations, interchanges, and bicycle and pedestrian facilities. The project is critical for accommodating vehicle traffic during the re-construction of I-10, a Top 100 congested roadway in the State of Texas. Northeast Parkway could be complemented by roadway improvements happening in New Mexico at NM 213 and NM 404.

PROJECT BENEFITS

Support Economic Growth

- Improves facilities used for bi-state travel.
- Roadway provides foreign trade zones, national Ports-of-Entry, and rail facilities.

Provides Transportation Network Redundancy

- Creates a loop around the congested areas of Downtown in the Borderplex Region (El Paso, Las Cruces, Cd. Juárez).
- Reduces bottlenecks in the freight supply chain by providing an alternate route to the I-10 corridor by constructing a regional New Mexico-Texas-Chihuahua roadway loop.
- Provides an alternate route to I-10 for those that live in the area, particularly important in the event of an I-10 closure or lane reduction incident.

Reduces Barriers to Employment Centers

- Facilitates access to major employers, such as Santa Teresa Industrial Park and Fort Bliss, to minority and low-income city (El Paso is 80% Hispanic, with 20% in poverty).
- Potential to attract investment and create jobs investment and create jobs.

Increases Safety

- Reduces the incidence of traffic accidents and fatalities by grade separation of opposing traffic lanes.
- Provides access to hospitals.

Supports the Military

- Hardened infrastructure supports military operations between installations.

PRELIMINARY PROJECT COST

$296M

PROJECT STATUS

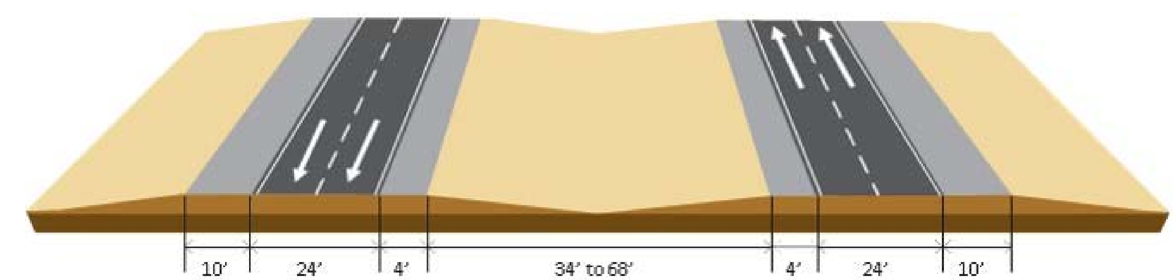
Environmental Clearance: Fall/Winter 2019.

Status: The project has advanced through the preparation of environmental documents and schematic design, which were presented to the public in July 2018. A public hearing is expected to take place in Summer 2019.

Construction: Anticipate construction to begin in FY 2026 and complete in FY 2028.

Planning Documents	Project Included
2020 RMS (Region)	Yes
2045 TDM (MPO)	Yes
2045 Destino (MTP)	Yes
2020 UTP (TxDOT)	No
2019-2022 TIP/STIP (MPO/TxDOT)	No
TX-MX BTMP (TxDOT)	Yes

PROPOSED CONSTRUCTION



PROJECT DETAILS

CSJ: 0924-06-136

Limits:	Loop 375 to FM 3255 in TX
Length:	Approx. 10.8 miles
Counties:	El Paso

Top 100 Ranking (2018)	
Direct	N/A
Indirect	69
Average Daily Traffic (ADT)	
Current	Facility does not exist presently
2030	22,600

TIMELINE (subject to change)

- FALL 2019 — ANTICIPATED ENVIRONMENTAL CLEARANCE
- FY 2020 — DESIGN
- FY 2021 — LETTING
- FY 2021 — CONSTRUCTION
- FY 2022 — CONSTRUCTION COMPLETED

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Timeline, design, and financing subject to change.

I-10 DOWNTOWN SEGMENT 2

REIMAGINE El Paso 10

Top 100 Congested Ranking: **69**

Top 100 Truck Ranking: **64**

EL PASO DISTRICT

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NOTE: Efforts are underway to potentially divide this into segments 2A and 2B

PROJECT DETAILS

CSJ: 2121-02-166

From:	Executive Center Blvd
To:	Loop 478 (Copia St)
Length:	Approx. 5.6 miles
Counties:	El Paso

Top 100 Ranking (2018)	
Direct	69 / 64 (Truck-Rank)
Indirect	71
Average Daily Traffic (ADT)	
2017	201,445
2045*	298,076

*Corridor study projected traffic based on El Paso MPO 2045 TDM

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PROJECT DESCRIPTION

The proposed I-10 Downtown Segment 2 project limits extend from Executive Center Boulevard to Loop 478 (Copia Street), traveling through downtown El Paso area. Efforts are underway to divide the proposed project into two segments, 2A and 2B, for funding and constructability purposes. The proposed improvements include reconstruction of the mainlanes, retaining walls, bridges, ramps and cross streets with the purpose to overcome deterioration of pavement and bridges.

CORRIDOR NEEDS

MAINTENANCE: I-10 Downtown Segment 2 is over 50 years in age and has been carrying truck loads and traffic volumes beyond its originally intended design. Because of this, I-10 is experiencing significant deterioration of pavement and bridge conditions.

SAFETY: The project is anticipated to enhance safety throughout the corridor. Ramp modifications and auxiliary lanes have the potential to reduce crashes. In the downtown area, the proposed "circuit" design may minimize conflict points between bikes, pedestrians, and vehicles, through the construction of bike lanes and a shared use path. New grade separation is also proposed at the railroad crossing near Cotton Street along the westbound frontage road (Missouri Street) modifying conflict points between vehicles, pedestrians, and trains to modernized standards with the purpose to improve safety. Proposed improvements are anticipated to reduce crashes by 15% on the mainlanes over a twenty year period.

MOBILITY: In the no build scenario, I-10 traffic is anticipated to travel at an average speed of 16 MPH in the eastbound direction and 27 MPH in the westbound direction, resulting in a failing level-of-service in the PM peak hour by 2045.

PROJECT BENEFITS

- Improves mobility and circulation by facilitating east-west movement.
- Increases capacity and intersection efficiency.
- Incorporates innovative uses of adaptive/ special purpose lanes.
- Accommodates transit service in Downtown.
- Adds bicycle and pedestrian facilities as well as ADA treatments.
- Facilitates intermodal connectivity for freight with adaptive lanes and platooning technologies.

UPCOMING OUTREACH

Agency Work Group Sessions¹: *Summer 2019*
Public Meetings:

- *Public Meeting #1: Fall 2020*
- *Public Meeting #2: Summer 2021*
- *Public Meeting #3: Spring 2022*
- *Public Hearing: Spring 2023*

Workshops: *TBD.*

¹ Outreach not part of the NEPA Process
² Outreach per the NEPA Process

PRELIMINARY PROJECT COST

$1.2 Billion (Divided into two segments).

PROJECT STATUS

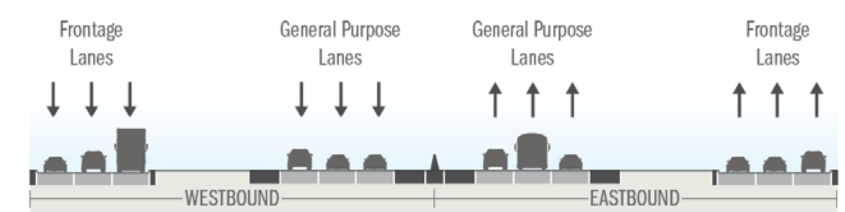
Environmental Clearance: Anticipated Summer 2023

Status: Schematic and Environmental under procurement

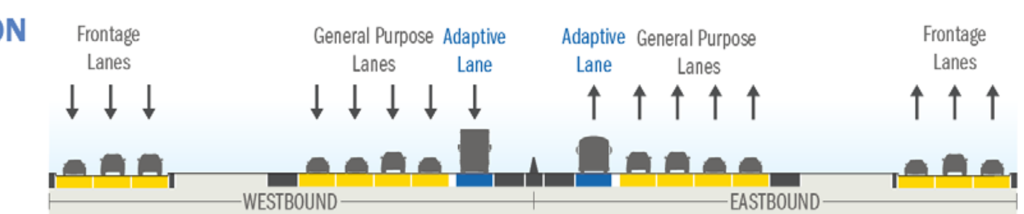
Construction: Anticipate construction to begin in 2024 and complete in 2028

Planning Documents	Project Included
2020 RMS (Region)	Yes
2045 TDM (MPO)	Yes
2045 Destino (MTP)	Yes
2020 UTP (TxDOT)	No
2019-2022 TIP/STIP (MPO/TxDOT)	No
TX-MX BTMP (TxDOT)	No

PRESENT CONDITION



PROPOSED CONSTRUCTION



TIMELINE (subject to change)

FALL 2016 — REIMAGINE I-10 STUDY

FY 2019 — SCHEMATIC AND ENVIRONMENTAL DESIGN

FY 2025 — CONSTRUCTION

FY 2019
REIMAGINE I-10 STUDY
RECOMMENDED IMPROVEMENTS

FY 2022
APPROVED SCHEMATIC

FY 2023
ENV CLEARANCE

FY 2027 - CONSTRUCTION COMPLETED

I-10 SEGMENT 3 - US 54 to STATE LOOP 375

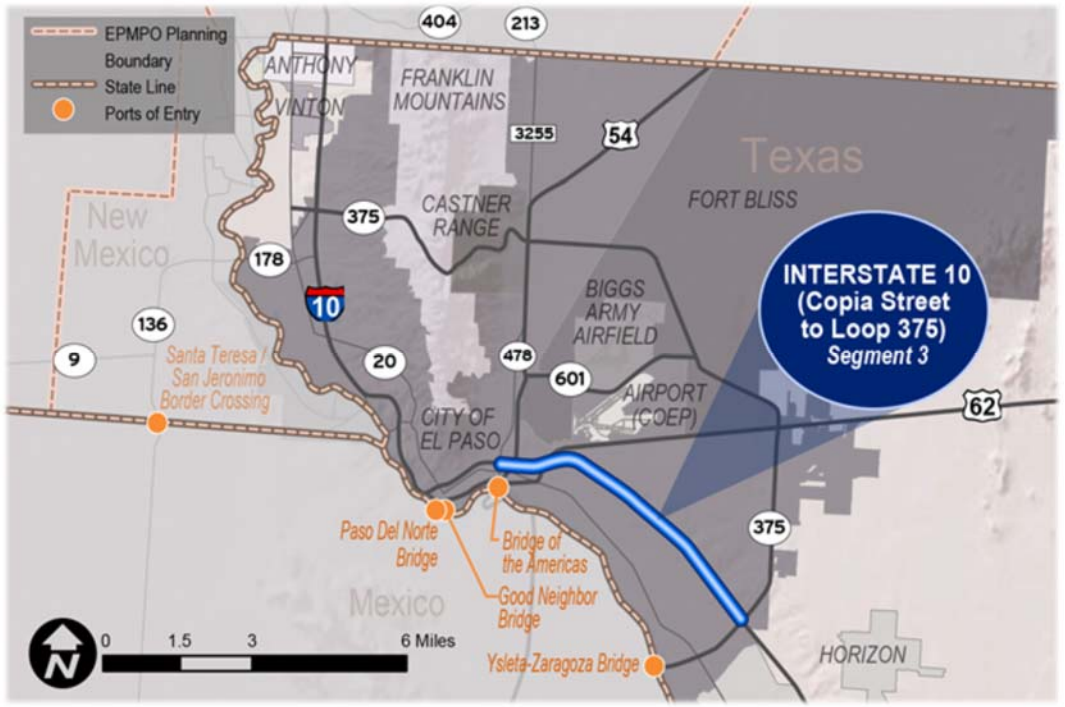
REIMAGINE El Paso 10

Top 100 Congested Ranking: **114**

Top 100 Truck Ranking: **114**

EL PASO DISTRICT

"Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods."



PROJECT DETAILS

CSJ:

From:	Loop 478 (Copia Street)
To:	Loop 375
Length:	Approx. 12.8 miles
Counties:	El Paso

Top 100 Ranking (2018)	
Direct	114 Truck-Rank
Indirect	
Average Daily Traffic (ADT)	
2017	166,197
2045	247,553

POTENTIAL SEGMENTS

Segment 3 is being considered for further definition into subsegments 3A, 3B, and 3C plus the surface street intersections at major arterial roadways. Smaller subsegments may improve funding opportunities and constructability.

POTENTIAL PROJECT PHASING

Due to the estimated $2 Billion cost , the project may proceed in phases, as listed below

- Prioritize intersection reconstruction at Airway Boulevard, Yarbrough Drive, Pendale Road, and Zaragoza Road.
- Construct ultimate configuration by phase:
  - > Segment 3A — US 54 to Airway Blvd.
  - > Segment 3B — Airway Blvd. to Yarbrough Dr.
  - > Segment 3C —Yarbrough Dr. to Loop 375

El Paso District Office
13301 Gateway West

CONTACT INFORMATION
Hugo Hernandez

PROJECT DESCRIPTION

The approximately 13-mile proposed project, I-10 Segment 3, extends from Loop 478 (Copia Street) to Loop 375, and includes US 54 and Loop 375 interchanges. I-10 Segment 3 Project is projected to carry over 247, 000 vehicles daily in the year 2045. The proposed improvements for I-10 Segment 3 will consist of reconstruction of the mainlanes, retaining walls, bridges, ramps and cross streets. Innovative designs are planned at various interchange locations along I-10 Segment 3, for example, a continuous flow interchange is planned at Airway Boulevard. A single point urban interchange is planned at both Hawkins Boulevard and Zaragoza Road. Additionally, a three-level interchanged is planned at Yarbrough Drive. Adaptive lanes are currently proposed along the majority of I-10 Segment 3. Adaptive Lanes could respond to on-demand traffic needs while accommodating transit and/or truck traffic. Connections to Adaptive Lanes would be provided at strategic locations. Lastly, planned ramp consolidation and elimination of weaving segments should reduce bottlenecks and congestion.

CORRIDOR NEEDS

MAINTENANCE: Repairs and ongoing maintenance will be more costly if I-10 is not reconstructed, pavement and bridge conditions along this segment of I-10 have deteriorated significantly and are near the end of their design life.

SAFETY: The project is anticipated to enhance safety throughout the corridor. Ramp modifications as well as auxiliary lanes are proposed to reduce crashes. In the US 54 area, collector distributor lanes aim to minimize conflicts by separating traffic movements. These proposed improvements are anticipated to reduce crashes on the mainlanes over a twenty year period by 39%.

MOBILITY: In the no build scenario, I-10 traffic is anticipated to experience speeds of 37 MPH in the eastbound direction and 27 MPH in the westbound direction, resulting in a failing level-of-service in the PM peak hour by 2042. The build scenario increases these travel speeds to 60 MPH and 60 MPH which results in an acceptable level-of-service in the PM peak hour by 2042.

PROJECT BENEFITS

- Improves mobility and circulation by facilitating east-west movement through and within the corridor.
- Increases capacity and intersection efficiency.
- Incorporates innovative uses of transportation alternatives via adaptive/special purpose lanes.
- Provides transit service with bus access at Robert E. Lee Road.
- Adds bicycle and pedestrian facilities as well as ADA treatments.
- Implementation of freight truck parking systems, adaptive lanes and platooning technologies would improve goods movement

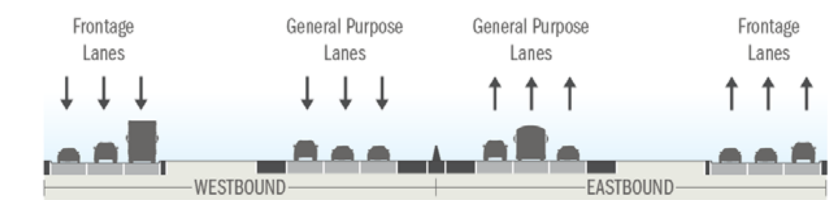
PRELIMINARY PROJECT COST

$2 Billion

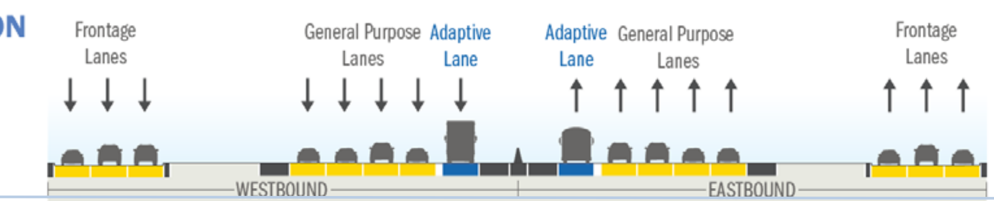
PROJECT STATUS

Planning Documents	Project Included
2020 RMS (Region)	Yes
2045 TDM (MPO)	Yes
2045 Destino (MTP)	Yes
2020 UTP (TxDOT)	No
2019-2022 TIP/STIP (MPO/TxDOT)	No
TX-MX BTMP (TxDOT)	No

PRESENT CONDITION



PROPOSED CONSTRUCTION



TIMELINE (subject to change)

- FALL 2016 — REIMAGINE I-10 STUDY
- FY 2019 REIMAGINE I-10 STUDY RECOMMENDED IMPROVEMENTS
- FY 2022 — SCHEMATIC AND ENVIRONMEN-
- FY 2022 APPROVED SCHEMATIC
- FY 2023 ENV CLEARANCE
- FY 2026 — CONSTRUCTION
- FY 2029 - CONSTRUCTION COMPLETED

SH 178 (Artcraft Road) (Schematic/Environmental)

Top 100 Congested Rank- **N/A**

"Through collaboration and leadership, we deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods."

PROJECT DETAILS

CSJ: 3592-01-009

From:	NM/TX State Line
To:	Interstate 10
Length:	Approx. 3 Miles
Counties:	El Paso

Average Daily Traffic (ADT)	
2017	22,020
2045	*33,350

*From MPO Travel Demand Model

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PURPOSE AND NEED

The purpose of the project, SH 178 (Artcraft Road) is to improve safety and reliability of travel time. SH178 (Artcraft Road) proposes to upgrade SH 178 (Artcraft Road) between the New Mexico State line and I-10. Local and long-distance freight users, would benefit from this proposed project, including those making trips to/from a UPRR Union Pacific Intermodal Facility and Santa Teresa Port of Entry.

PROJECT DESCRIPTION

Proposed improvements include four direct connectors with two lanes to accommodate projected traffic at I-10 and SH 178. Roadways would be modernized to accommodate oversized truck loads and planned improvements include Texas turnaround bridges at key intersections such as South Desert Boulevard.

Between I-10 and SH 20 (Doniphan Drive) improvements are planned to include access control measures, reconstruction and widening, and extending frontage roads in both directions. Upper Valley Road and Westside Drive planned improvements include grade separated interchanges, ramps to SH 178, and frontage roads.

Currently, NM 136 and SH 178 (east-west corridor) is the only roadway connecting the Santa Teresa-San Border Crossing to the United States National Freight Network of I-10.

PROJECT STATUS

SH 178 (Artcraft Road) Project is currently in the planning stages. TxDOT is the lead agency for the project.

PRELIMINARY PROJECT COST

$193M

PROJECT BENEFITS

Provides Transportation Efficiencies

- Enhances east-west connectivity to NM 136 and Santa Teresa Border Crossing by providing modernized roadway infrastructure.
- Provides additional capacity and decreases intersection delay by allowing eastbound and westbound traffic to by-pass the signalized intersection(s).
- Facilitates movement by providing facilities that can accommodate trucking.

Reduces Barriers to Employment Centers

- Provides access to activity centers, such as Dona Ana County International Jetport and Artcraft Business Center.

Addresses Safety

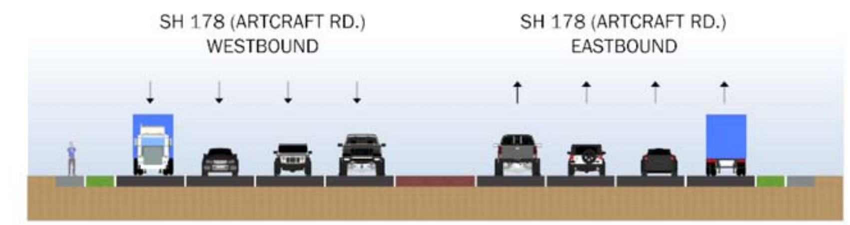
- Adds access control at key intersections within the corridor to reduce conflict points and speeding.
- Constructs grade separated interchange, which could reduce conflict

Planning Documents	Project Included
2020 RMS (Region)	Yes
2045 TDM (MPO)	No
2045 Destino (MTP)	No
2020 UTP (TxDOT)	No
2019-2022 TIP/STIP (MPO/TxDOT)	No
TX-MX BTMP (TxDOT)	No

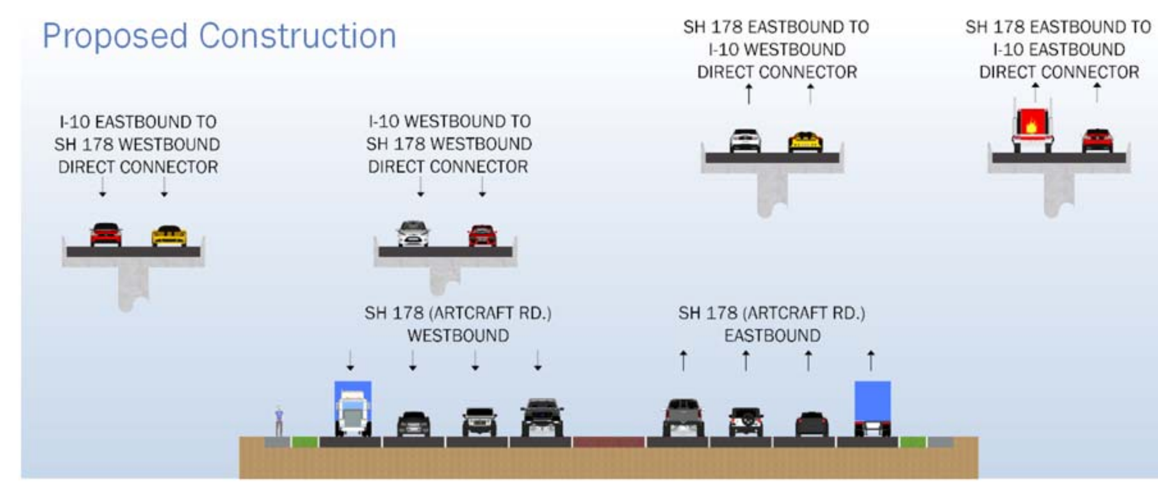
TYPICAL SECTIONS

Illustrative Purposes

Present Condition



Proposed Construction



TIMELINE (subject to Change)

- FALL 2022 — ANTICIPATED ENVIRONMENTAL CLEARANCE STUDY
- FY 2023 — DESIGN
- FY 2024 — LETTING
- FY 2024 — CONSTRUCTION
- FY 2026 — CONSTRUCTION COMPLETED

Timeline, design, and financing subject to change.