TRANSPORTATION STRATEGIES

4

4. TRANSPORTATION STRATEGIES

Adding roadway capacity to the transportation system cannot address all mobility needs in the region. While funding is always the primary constraint, some needs are best met through the adoption of congestion mitigation strategies. Therefore, the MTP planning process included the consideration of strategies such as travel demand management (TDMg) and transportation system management and operations (TSM&O), in addition to facility construction (roadway capacity) projects. This chapter provides an overview of the wide range of congestion mitigation strategies available for the region and the consideration of the particular strategies that fit the character of our region, and best address unmet needs.

CONGESTION MITIGATION STRATEGIES TO ADDRESS UNMET NEEDS

Building new roads and adding capacity to existing roadways is not only expensive, but often takes years to go through the planning, environmental, design, and construction phases. Given the limited availability of funding for transportation projects and rising congestion levels, state, regional, and local agencies are increasingly TDMg, TSM&O, and "Complete Streets" strategies to improve the performance of existing roadways. These strategies do not require the construction of new roadways or additional lanes of capacity, and therefore are often referred to as non-capacity strategies.

The following sections provide recommendations for incorporating best practices in TDMg, TSM&O, complete streets, and other strategies into the transportation planning process.

While EPMPO is not directly responsible for implementing transportation projects, it works closely with local member jurisdictions to explore and evaluate the appropriateness of these strategies for reducing congestion and improving the performance of the existing transportation system.

TRAVEL DEMAND MANAGEMENT

Travel demand management (TDMg) strategies seek to reduce congestion on existing roadways by reducing the overall number of cars using roads or by redistributing cars away from congested areas and peak periods of travel. Encouraging the use of alternative modes of transportation (such as transit, biking, or walking) and increasing the number of travelers in each vehicle are the primary ways in which TDMg strategies reduce single-occupant vehicle (SOV) demand on existing roadways. Simply put, travel demand can be managed by providing travelers with a wide range of choices for reaching their destination.

With limited funding available to address congestion through new roadway capacity, TDMg is a cost-effective means to improve use of the transportation system. TDMg strategies are designed to accomplish the following:

- Improve mobility and accessibility by expanding and enhancing the range and quality of available travel choices;
- Reduce congestion and improve system reliability by decreasing the number of vehicles using the roadway system and by redistributing demand away from peak periods and existing bottlenecks;
- Increase safety by addressing congestion, which is generally related to higher occurrences of traffic incidents; and

- Improve air quality by reducing the number of vehicle miles traveled, thereby saving energy, and decreasing the number of short trips that are largely responsible for the proportion of emissions generated from cold starts.

EL PASO REGION TRAVEL DEMAND MANAGEMENT STRATEGIES

Through the federally mandated Congestion Management Process, the EPMPO has been helping coordinate the programing of federal funds through the RMS 2023-2026 TIP. This coordination includes several projects that are TDMg strategies or include TDMg strategies. These projects are:

- ITS infrastructure at Zaragoza and Bridge of the Americas POE
- City of El Paso Traffic Management Center Upgrade
- Border Highway West Shared Use Path
- Regional Transit Start-up assistance for FY23
- Montana RTS Operating Assistance
- SH 178 Operational Improvements
- Downtown Bicycle Improvements
- Dyer Pedestrian Sidewalk Improvements
- Horizon City Transit Plaza
- Park and Ride lot and Far East Express Service Bus (Far East Connector)

BEST PRACTICES

STRATEGIES TO INCREASE VEHICLE OCCUPANCY

Carpool, vanpool, and school-pool programs encourage travelers with common destinations, particularly employment and school destinations, to share vehicles. These can be based on informal arrangements between individuals or formally arranged through ride-matching services. Available research indicates that improving awareness, trust, and willingness to ride with strangers, as well as flexibility in scheduling, may help to increase carpool use. Incentives are another effective tool for encouraging ride-sharing.

RIDE-SHARING RESOURCES

Resources that may help to increase the use of carpooling, vanpooling, and school-pooling include "Frequently Asked Questions" (FAQs) that address the benefits of carpooling, tips for finding other carpoolers, advice on how to organize pick-ups and drop-offs, carpooling etiquette, and safety concerns, among others.

Additionally, some entities have used websites to facilitate the matching of individuals with other carpoolers by either hosting their own free ride-matching search tool, or publicizing ride-matching applications that are available to the public, such as the Carma carpooling smartphone app.

ENCOURAGE EMPLOYERS TO INCENTIVIZE RIDE-SHARING

The MPO can play a valuable role in working with area employers and schools to develop employer-based incentives to encourage ridesharing, such as tax incentives and preferential parking. A variety of employer-based incentives for carpooling are discussed in greater detail later in this section.

TRANSPORTATION MANAGEMENT ORGANIZATIONS (TMOS)

Transportation Management Organizations (TMOs) are non-profit organizations voluntarily created by a group of businesses – often with local government support – to coordinate transportation services in a defined area (typically a commercial district, medical center, or industrial park). Because they tend to serve a small geographic area and constituency, these groups can be very responsive to members' needs. TMOs provide a variety of TDMg services that encourage more efficient use of transportation and parking resources, particularly through commute trip reduction strategies and ridesharing.

EMPLOYER-BASED TOOLS AND INCENTIVES

The commute to and from work is a significant contributor to traffic congestion along area roadways, particularly during peak travel times. TDMg strategies that focus on employer-based tools and incentives can be an effective way to reduce travel by single occupant vehicles by coordinating ridesharing among employees, encouraging the use of alternative modes for work trips, shifting work trips from peak hours, and reducing work travel times and the number of overall trips.

Employer-based TDMg strategies fall into four separate categories:

- Encouraging employees to travel by alternative modes;
- Shifting trips from peak periods of travel and reducing the total number of trips;
- Providing route information to divert commuters from congested routes; and
- Using location-specific solutions - such as locating in developments with a mix of employment, residential, and service uses - to shorten the work commute and reduce the need for midday trips.

Regional transportation planning entities can actively work with area employers to reduce congestion by expanding the transportation options available to their employees. This type of information can be provided on a website or delivered through a "speaker series" for educating area employers regarding options available and their benefits to employers, employees, and the community as a whole.

PARKING MANAGEMENT AND INCENTIVES

Parking management strategies and incentives encourage the use of alternative modes and can be implemented by both local jurisdictions and employers. These strategies typically rely on dis-incentivizing travel by single occupant vehicles by passing along more of the cost of parking to employees and/or limiting the availability of parking. Improved management of parking facilities can result in potential savings to communities and reduce parking requirements by 20 to 40 percent compared with conventional planning requirements. Examples of parking management strategies available (Litman, 2016)[1] include the following:

- Provide shared parking that serves multiple users or destinations, which is most efficient when the destinations have varied peak periods of activity.
- Implement parking regulations that control who, when, and how long vehicles may park at a particular location.
- Develop more accurate and flexible standards that take into account factors such as residential density, employment density, land use mix, transit accessibility, and income, among other factors, to establish parking requirements for a particular development or area.

1) Litman. 2016. "Parking Management: Strategies, Evaluation and Planning". Victoria Transportation Policy Institute. Available: http://www.vtpi.org/park_man.pdf

- Reduce residential street width requirements to encourage the development of neighborhoods with narrower streets and less parking to encourage the use of alternative modes.
- Provide remote parking and shuttle service to encourage the use of off-site parking facilities that are often shared facilities, served by special shuttle buses or free transit service.
- Limit on-street parking of large vehicles (e.g., vehicles over 22 feet long or trailers) to ease traffic flow and discourage use of public parking for storage of commercial vehicles.
- Prohibit on-street parking on certain routes at certain times (such as on arterials during rush hour) to increase the number of traffic lanes and peak capacity.

STRATEGIES TO INCREASE TRAVEL BY TRANSIT, BICYCLE, OR WALKING

In order to reduce the number of trips by private automobile, strategies to increase travel by transit, bicycle, or walking generally focus on the following objectives:

- Expand the service area of the transit system and connect infrastructure, which can reach more people and connect them to a greater number of destinations within the region;
- Improve the quality of the service, which increases the convenience, comfort, ease of access, and affordability of the mode and makes people more willing to choose it; and
- Educate the public on the availability of the various non-auto transportation options and services and provide resources to help travelers navigate the region.

The following sections detail mode-specific strategies that could be considered for implementation in the El Paso Region.

TRANSIT STRATEGIES

While traveling by car offers the ease and convenience of being able to "come and go as one pleases," traveling by transit – particularly by bus – generally requires longer travel time and less flexibility in reaching one's destination. Improving the quality of transit services involves strategies that shorten the overall travel times, increase traveler's comfort both while waiting for the bus and when on-board, and provide added flexibility with travel time and destinations. While certain aspects of travel by bus will always be less convenient than travel by car, there are several improvements that can be made to significantly improve the quality of the experience.

Transit can also provide a less expensive means of travel compared to personal automobiles. National statistics have shown that commuters that switch from driving to transit for their daily commute can save more than $9,000 annually. However, providing new routes or increased levels of transit service must always be balanced against funding availability.

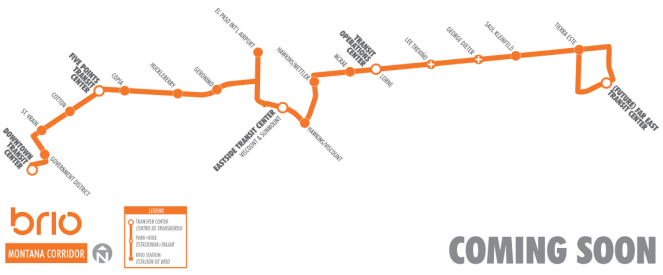
SUN METRO TRANSIT

In 2019 (pre-covid data), Sun Metro served more than 12 million passengers through a combination of 179 buses running on 60 fixed-routes, including the Brio Bus Rapid Transit (BRT) service. Sun Metro also operates 66 smaller vehicles for the LIFT service, which provides origin-to-destination transportation for ADA-eligible clients within the service area. Current planning efforts aim to implement a total of four additional Brio corridors and a streetcar system which will enhance downtown transportation connectivity.

The Brio Rapid Transit System (RTS) is a service that offers similar benefits to light rail transit, such as improved speed and reliability, but at a much lower implementation cost. This system's use of traffic signal prioritization lengthens green light durations for the bus, which allows for faster movement through the corridor, decreasing rider commute times.

Sun Metro has also expanded the Brio network and is now serving Alameda and Dyer corridors and will soon expand service to the Montana Corridor.

FIGURE 4-1: MONTANA-BRIO BRT



System-wide bus network redesign and integrating rapid transit service routes with existing routes by adjusting route transfers to accommodate, or feed into, the BRT corridors can have a tremendous impact on the service provided by the overall transit system. A similar system-wide redesign was recently developed for the Houston Metro area. This redesign increased the number of high frequency rapid bus routes with extended service hours to complement an expanded light rail and less-frequent local bus network. This initiative stemmed from Houston Metro's 2011 Metropolitan Long-Range Plan and resulted in a complete reimagining of the entire system. The change resulted in a 4% increase in bus ridership between 2015 and 2016.

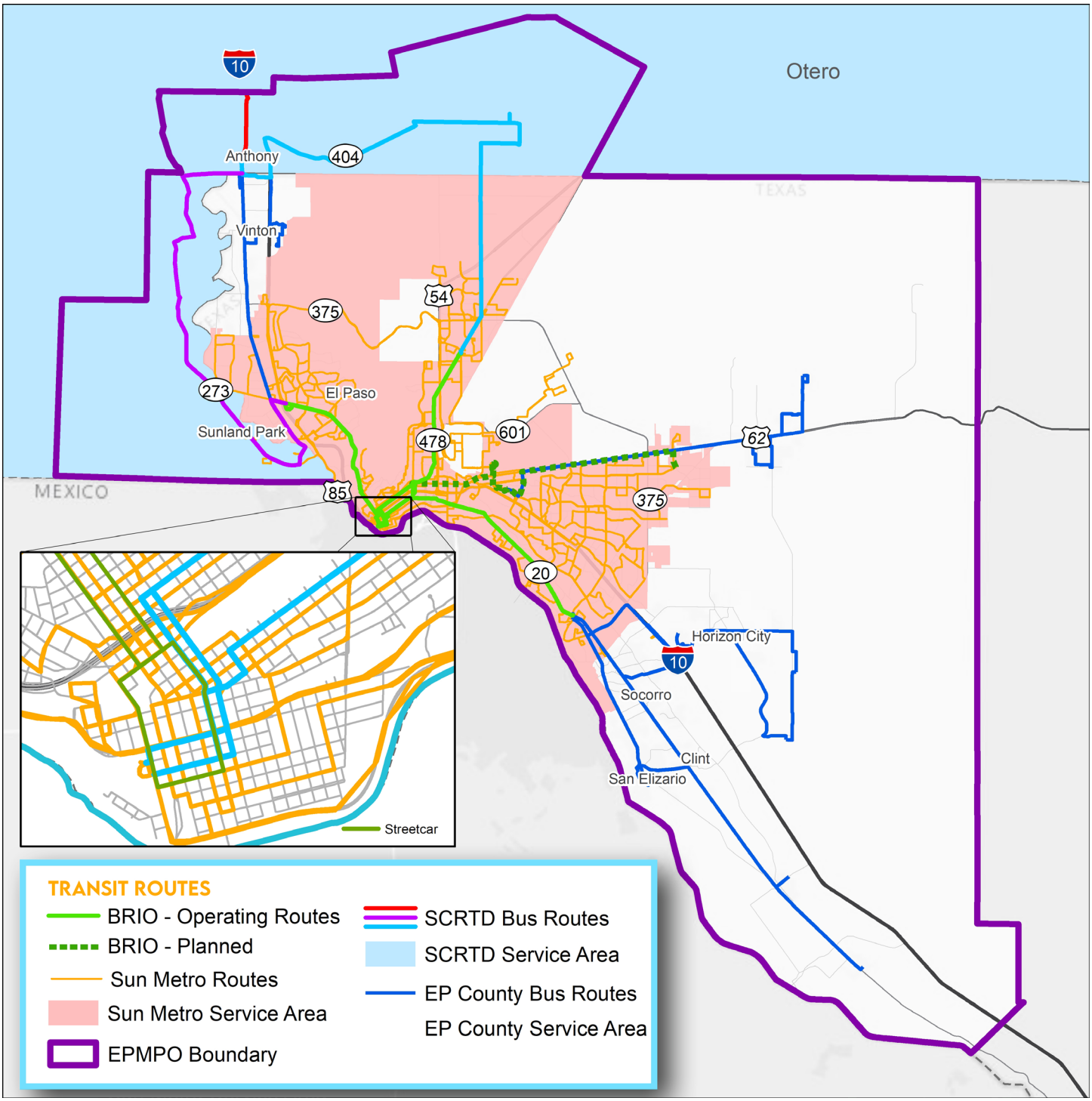
EL PASO COUNTY TRANSIT

Regional interconnectivity can also be supplemented by transit strategies. El Paso County Transit operates six rural transit routes that have listed stop locations but can also be boarded at any safe location along the route by flagging the bus. The County of El Paso recently completed a comprehensive study for regional transit outside of the City of El Paso that recommended several improvements to enhancing transit service outside of Sun Metro's service area.

SOUTH CENTRAL REGIONAL TRANSIT

The South Central Regional Transit District (SCRTD) provides transportation between rural areas, small unincorporated communities, and municipalities throughout its service area in southern New Mexico. The SCRTD primarily operates in Doña Ana County, with limited service in Sierra County and connections to Otero and El Paso Counties. Service connects with Sun Metro service via the Purple Line at the Westside Transfer Center.

FIGURE 4-2: EXISTING AND PROPOSED TRANSIT ROUTES (AS OF JUNE 2019)



REGIONAL INTEGRATION

Fare system integration and consolidation of fare collection methods across platforms at the regional level could improve service and accessibility, as well as reduce some operating costs for providers through central services. Real time travel information, integrating traffic API's and developing GTFS on consolidated app platforms could also provide users with information on travel time and supplement user routing choices.

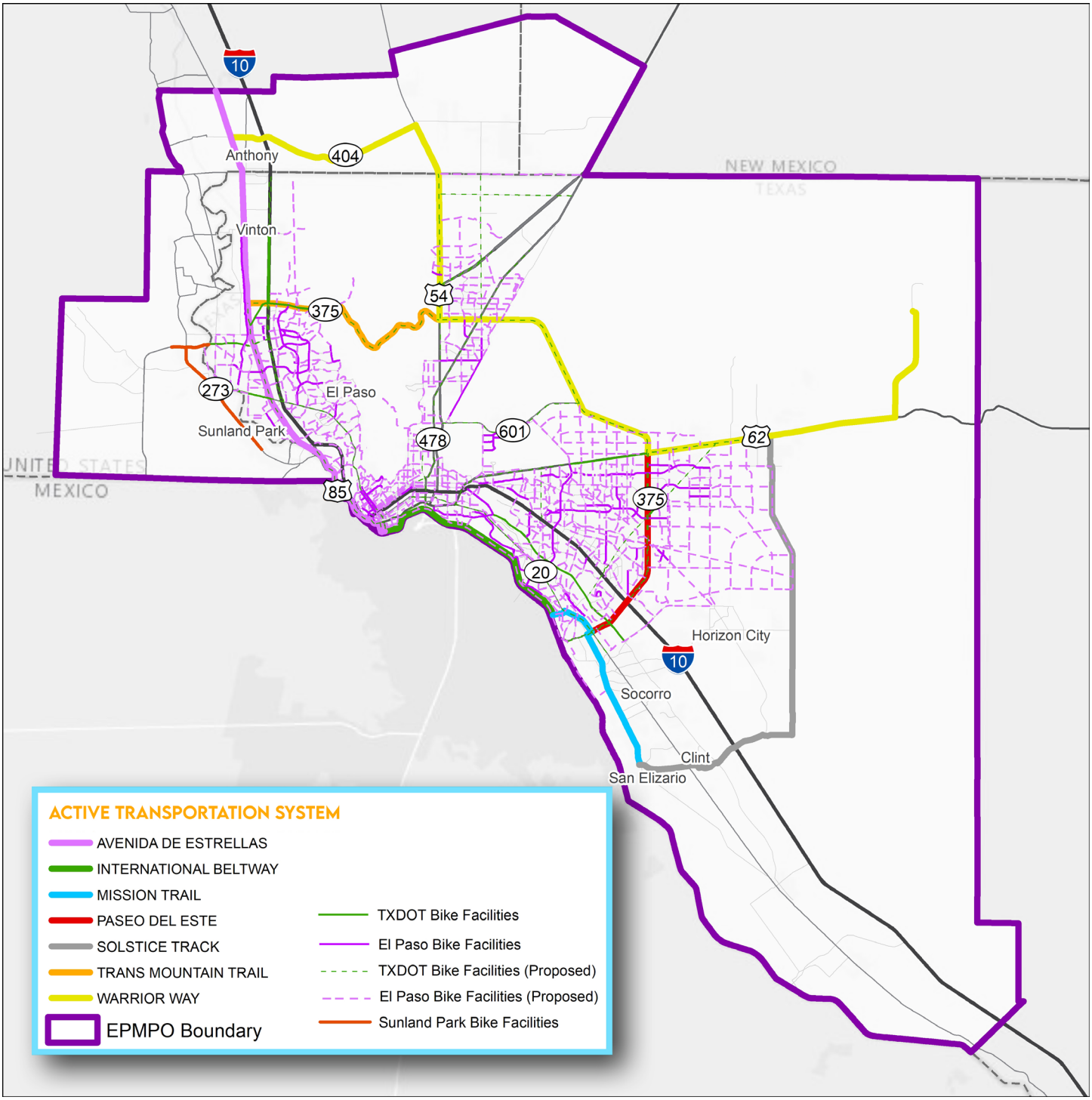
ACTIVE TRANSPORTATION STRATEGIES

A large portion of visioning workshop contributors voiced their concerns for revamping the region's active transportation infrastructure, beginning with improved bicycling and pedestrian facilities. Active transportation investments also benefit transit ridership by enhancing accessibility of existing or future transit stops.

The EPMPO Transportation Policy Board (TPB) passed a resolution on July 22, 2016 formally adopting the Active Transportation System. The Active Transportation System identifies regionally significant biking and walking infrastructure, both existing and planned. The identified segments are shown in **Figure 4-3**. The system also encompasses the El Paso Bike Share Program and any future expansion including a potential International Bike Share Project.

The Active Transportation System was formally adopted by the TPB with the recognition that the system will promote greater accessibility, mobility, tourism, access to historical and cultural assets, bicycle and pedestrian friendly retail development, greater economic opportunities, land use development and redevelopment, human health and greater quality of life within the region, including the Mesilla Valley MPO as well as the Instituto Municipal de Investigacion y Planeacion ("IMIP") in Ciudad Juarez.

FIGURE 4-3: EXISTING AND PROPOSED ACTIVE TRANSPORTATION SYSTEM FACILTIES (AS OF JUNE 2019)



BICYCLE STRATEGIES

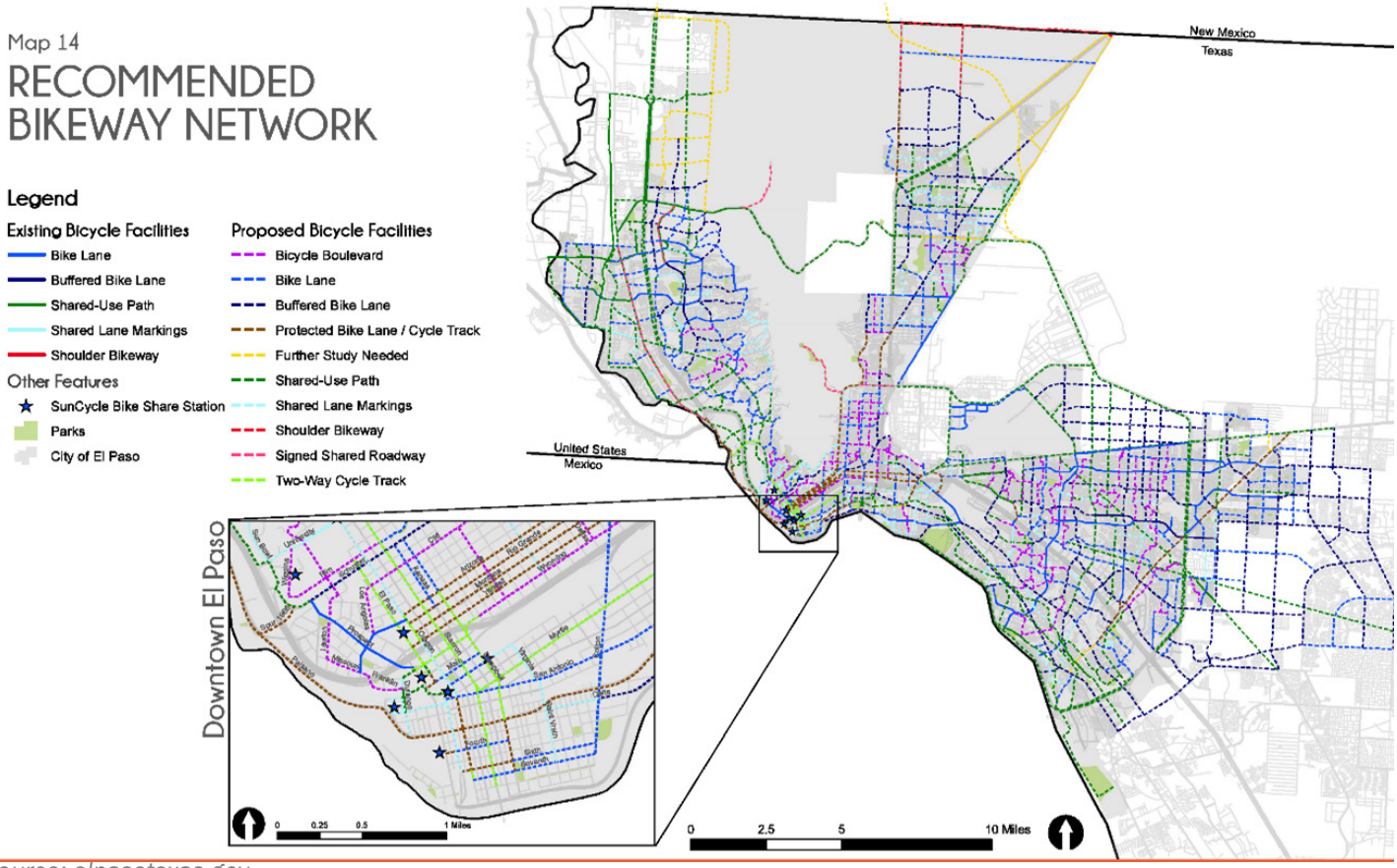
One of the primary concerns for cyclists (and those who may be considering biking as a form of basic, every-day transportation) is safety. Additional considerations include integration with other modes, continuity of the bicycle facility network, availability of bicycle parking or storage, and availability of other amenities such as on-site showers.

The 2016 El Paso Bike Plan seeks to implement many of these strategies within the City of El Paso. The plan's recommended bikeway network is shown in **Figure 4-4**.

Many of these trails are incorporated into the region-wide Active Transportation Network and are augmented by facilities extending beyond El Paso County throughout the greater El Paso region.

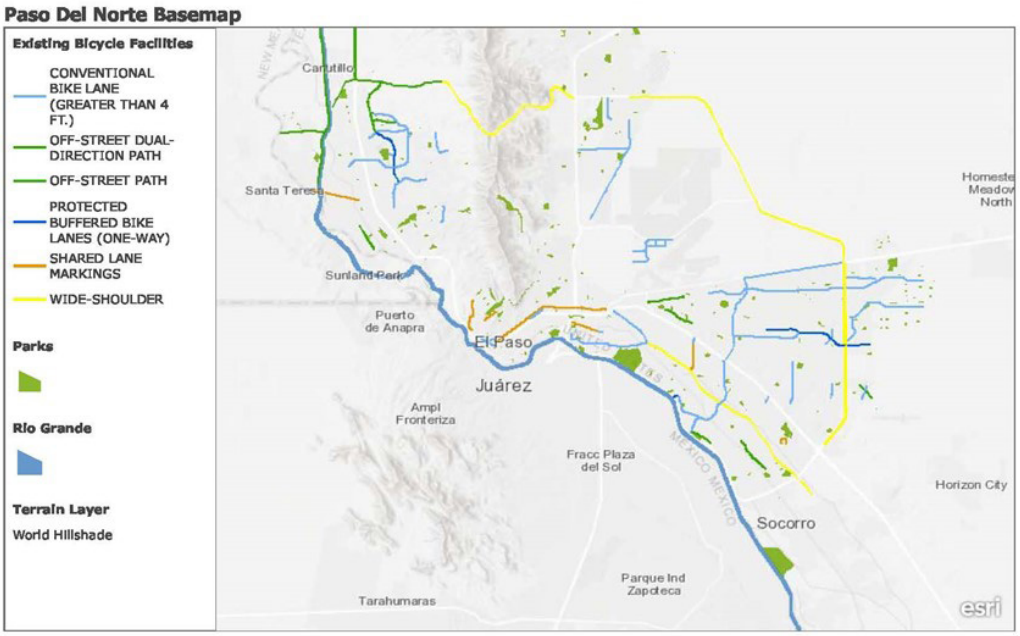
The Paso del Norte (PDN) Health Foundation is currently promoting an initiative to connect more trails across the region. The heart of the Paso del Norte Trail initiative relies on mapping potential trail routes, as well as addressing health indicators using data from the Healthy Paso del Norte website and the CDC's 500 Cities Project. Some of the work PDN Health Foundation's work can be seen in **Figure 4-5** and **Figure 4-6**.

FIGURE 4-4: EL PASO BIKE PLAN RECOMMENDED BIKEWAY NETWORK



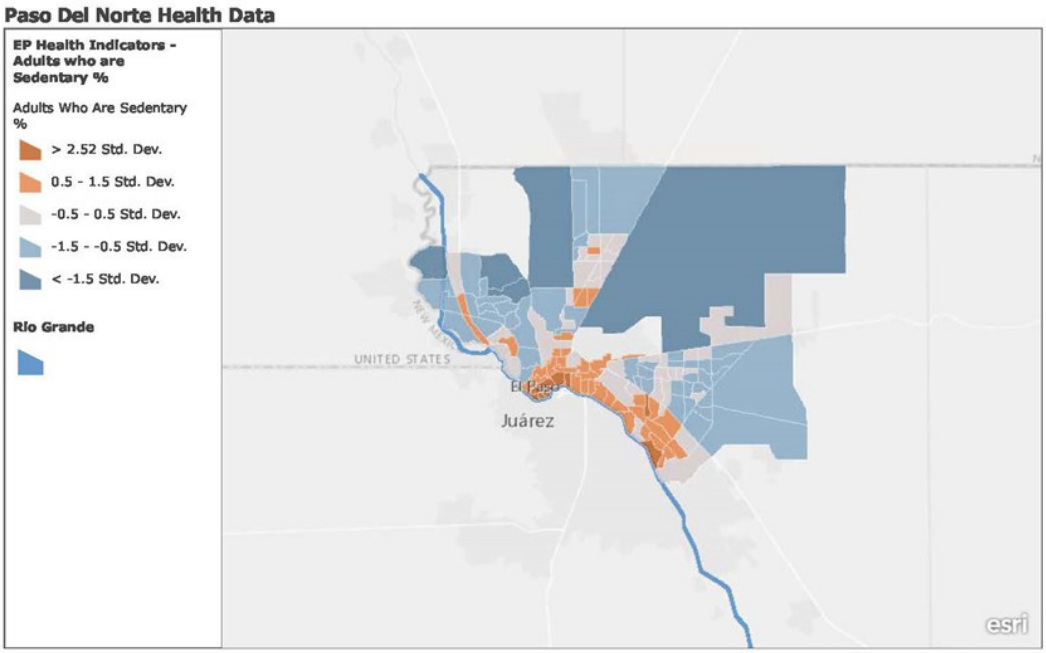
Source: elpasotexas.gov

FIGURE 4-5: PASO DEL NORTE ONLINE GIS MAPPING INITIATIVE



Source: pdnhf.org

FIGURE 4-6: PASO DEL NORTE HEALTH DATA



Source: pdnhf.org

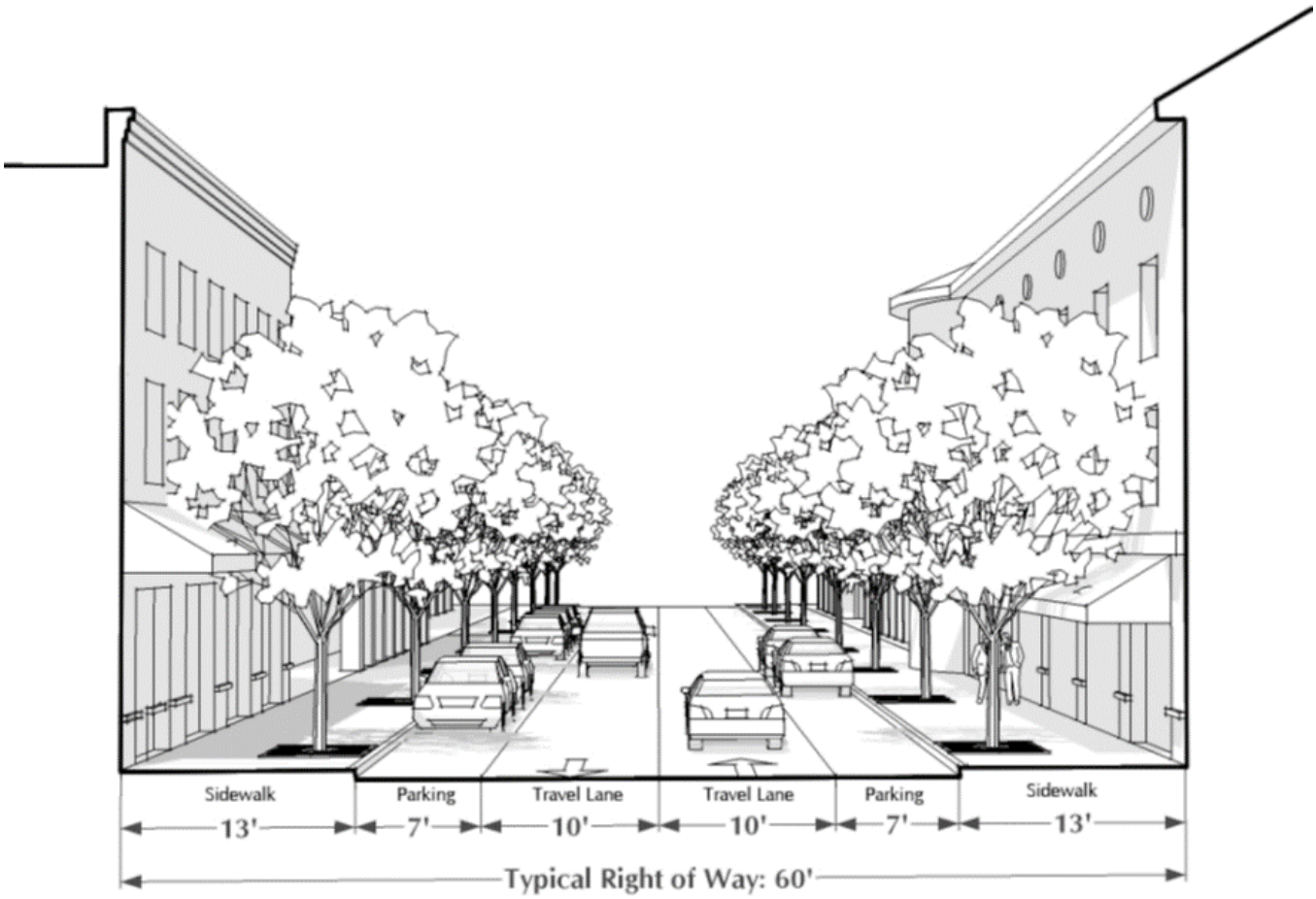
PEDESTRIAN STRATEGIES

Improving the quality of the pedestrian experience involves addressing both real and perceived safety concerns and upgrading pedestrian facilities to make sure they are contiguous and comfortable. Additionally, promoting development at a more "human scale" encourages pedestrian activity by improving perceptions of safety and creating a visually interesting environment at street level. Examples of enhanced pedestrian strategies include:

- Provide buffers between sidewalks and automobile traffic;
- Enhance the visibility of crosswalks;
- Provide midblock pedestrian crossings; and
- Improve comfort of the walking public through street level amenities.

Plan El Paso, the comprehensive plan for the City of El Paso, which was adopted in 2012, provides design guidelines on a wide number of topics, including context appropriate pedestrian strategies for street and neighborhood development. **Figure 4-7** below shows a typical suggested cross section for a primary street in an urban setting with 60-foot right of way.

FIGURE 4-7: PLAN EL PASO TYPICAL ROAD CROSS SECTION FOR PRIMARY ROAD, 60FT ROW



Source: City of El Paso via elpasotexas.gov

LAND USE CONSIDERATIONS

Typical development patterns have generally encouraged a separation of land uses. Additionally, there has been an overall trend toward less dense development, particularly in the planning and design of suburban neighborhoods. These land use factors significantly impact travel, requiring more trips to be made by automobile due to the increased distances between origins and destinations. The EPMPO can work with local planning partners to encourage land use policies that facilitate the use of alternative modes of transportation and reduce the number of automobile trips.

SMART GROWTH

Smart growth generally refers to the protection and preservation of valuable natural and cultural resources through encouragement of more compact development patterns that optimize use of existing transportation infrastructure. Smart growth development is characterized by higher population and employment densities and a mix of land uses, which increases the viability of public transportation, walking, and biking as transportation modes. Since smart growth principles encourage redevelopment and infill development of existing areas, investment in the transportation system is focused on the maintenance and operation of existing roadway infrastructure and providing safe opportunities to travel by bike or foot, rather than on building costly new roadways in previously undeveloped areas.

It is important to note that smart growth does not mean building dense high-rise structures or pitting transit or any other modes against highways. Instead, smart growth is about tailoring choices for individual settings. For example, in a suburban or rural community, smart growth may mean building smaller detached homes on smaller lots within walking distance of schools and other amenities. Smart growth encourages the development of a balanced intermodal transportation system that allows for the efficient and economical movement of people and goods. In some areas that may mean more transit, in other areas it may entail roadway improvements.

Source: Wikimedia Commons

TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS

Transportation System Management and Operations (TSM&O) strategies seek to improve the performance of existing roadways through increased efficiency and throughput of people on current infrastructure. TSM&O strategies not only rely on traffic engineering solutions (such as signal synchronization and access management) to optimize the existing system but also rely on resource utilization, infrastructure, personnel, and data management strategies to extend the useful life of the existing transportation system and improve its reliability.

The following section provides a brief outline of the TSM&O strategies implemented in the El Paso region and lists additional strategies for consideration that can improve the performance of the existing transportation system.

EL PASO REGION TSM&O

TxDOT manages and operates the El Paso Intelligent Transportation System (ITS) website, which is a part of the ITS implemented by TxDOT in the El Paso area. The website provides up to date information on lane closures, incidents, congestion, and travel times. This portion of the El Paso ITS also allows access to area wide traffic cameras and information from US Customs and Border Protection on border wait times for freight, passenger, and pedestrian traffic. The City of El Paso Streets and Maintenance department also operates a Transportation Management Division that provides traffic engineering, traffic control and signal management services, and includes the oversight of the Traffic Management Center for the city. The City's Transportation Management Center Computerized Signal System includes the signal timing and coordination for approximately 650 traffic signals, and includes remote operations from the Management Center for 600 of these signals with the ability to expand the system for all signals within the city

The El Paso ITS also helps augment TSM&O coordination efforts between:

- Texas Department of Transportation
- Texas Department of Public Safety
- City of El Paso
- El Paso Police Department
- El Paso Fire Department
- El Paso Electric
- Sun Metro
- Border Crossing Information System

TSM&O activities in the El Paso area also include programmed maintenance and maintained traffic operations through local, state, and federal funds, as well as Traffic Incident Management and Traffic Data Collection. Many of the best practices highlighted below can be seen implemented through EPMPO-programmed projects as well as ongoing efforts from TxDOT, and the local municipalities and authorities.

EL PASO REGIONAL ITS ARCHITECTURE-2020

The El Paso Regional ITS Architecture is a roadmap for transportation system integration in the El Paso Region. The architecture has been updated in 2020 to provide stakeholders within the region with a plan for ITS implementation over the next 20 years. The architecture was developed through a cooperative effort by the region's transportation agencies, covering all modes and all roads in the region. It represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region.

The architecture provides an overarching framework that spans all of the region's transportation organizations and individual transportation projects. Using the architecture, each transportation project can be viewed as an element of the overall transportation system, providing visibility into the relationship between individual transportation projects and ways to cost–effectively build an integrated transportation system over time.

An ITS architecture web site was developed as part of the 2020 update and is available via the EPMPO web site (https://www.elpasompo.org/ElPasoRegionalITSArchitecture-2020). The purpose of this regional ITS architecture web site is to encourage use of the regional ITS architecture and gather feedback so that the architecture is used and continues to reflect the ITS vision for the region.

BEST PRACTICES

In addition to the TSM&O strategies implemented in the region, other strategies employed successfully in other cities serve as best practices for optimizing the performance of the existing transportation systems to reduce congestion and improve safety.

MAINTENANCE

Infrastructure maintenance is a critical aspect of transportation system management and operations. Most infrastructure management agencies prefer to schedule routine repairs and inspections instead of embarking on ad-hoc patching and repairing. Schedule management for inspection and street repairs will enable city and county personnel to efficiently use limited resources. A calendar for repairs and reviews will also provide valuable information to concerned citizens. Regularly scheduled roadway resurfacing is necessary to provide uniform improvements to the existing roadways and to extend their useful life. Older roads, especially those built according to discontinued standards, should be reviewed with an eye towards upgrading deficient sections to modern criteria.

ELECTRONIC INFRASTRUCTURE

Transportation infrastructure is no longer limited to concrete pavement and asphalt. Recent improvements in operations and data collection methods have led to digital controls and integrated computer networks that require maintenance and management. Older technologies are being systematically replaced with newer options.

For example, in-pavement magnetic loops are being phased out, while video detection and automatic detection devices for pedestrians and bicycles are gaining popularity. Advances in camera technology such as Gridsmart allow traffic engineers to monitor intersection conditions more efficiently than ever before. Traditional incandescent bulbs for signal heads have been replaced with more efficient light emitting diodes (LEDs). These new technologies offer increased durability and lower overall maintenance costs.

TRAFFIC SIGNAL AND INTERSECTION IMPROVEMENTS

Roadway users encounter traffic control signage and intersection signals on nearly every route they travel. While the primary function of intersection traffic control is to improve safety at intersections, it is also often a significant source of delay. Improper signage and poor signal timing results in unnecessarily long queues and impacts the reliability of the transportation system. Improving signage, signal timing, and equipment is a cost-effective way to facilitate traffic flow along a corridor. The MPO can work with its planning partners to identify corridors which would benefit from traffic signal improvements and to prioritize projects.

TRAFFIC SIGNAL OPTIMIZATION

The timing and phasing of signalized intersections should be reviewed periodically, especially in areas of rapid development or increased commercial activity. Most intersections should be reviewed for appropriate timing and phasing every six months, while more heavily traveled intersections could be reviewed more frequently. Whenever possible, the signal heads and controls should be uniform to facilitate ease of coordination and servicing of hardware. In locations of due east or due west travel, back plates and directional signal heads may be advantageous. In locations with significant wind and severe weather concerns, mast arm and pole dimensions should be designed appropriately. Traffic signals can also be coordinated along a corridor or throughout an entire system. As traffic volumes increase, signal coordination can be used to optimize high priority traffic corridors and increase the throughput of critical thoroughfares.

Adaptive signal control, which adjusts the timing of traffic lights based on real-time travel conditions, can also provide significant relief to congested corridors and cut costs associated with traffic signal timing data collection and computation.

SIGNAL PRE-EMPTION

On busy roads with highly used transit routes, transit signal priority or pre-emption can improve the operations of the transit system. Transit signal priority refers to technology that reduces dwell time for transit vehicles at signalized intersections, typically by holding green lights longer or shortening the duration of the red-light cycle. The same kinds of technology can also be employed for emergency vehicles. Equipping all intersections

to accommodate signal prioritization can facilitate the deployment of such systems commensurate with demand.

ACCESS MANAGEMENT

Access management refers to the regulation of the number of access points between a development and the adjacent roadway network. Most discussions of access management involve the placement and number of driveway curb cuts, although the application can also include the location, size, and function of interior service roads. Many access management solutions involve installation of roadway medians where feasible to limit turning movements and improve traffic flow and safety.

TARGETED TRAFFIC ENFORCEMENT

Consistent and reliable enforcement of traffic laws helps address public concerns about traffic issues. In areas with complaints about speeding and reckless or inconsiderate driving, responsive law enforcement staff can do much towards gaining the public's trust and compliance. Focused speed studies (using radar trailers and traffic counters) can be employed to discourage speeding on residential streets.

TRAFFIC CALMING

Because there are many instances where the number of aggressive drivers is greater than human resources can address, many cities and counties have implemented various "self-enforcing" speed and volume control devices. Most of these measures are referred to as "traffic calming." These physical devices can assist law enforcement in influencing driver behavior. Traffic calming is often controversial and can be challenging to discuss.

Most traffic calming measures are applied to residential streets, though certain measures can be applied to higher volume roadways as well. Broadly defined, the goals of traffic calming measures are:

- To slow down the average vehicle speeds for a particular roadway;
- To address excessive volumes for a particular roadway; and
- To remind drivers of or reinforce the residential nature of specific roadways.

Traffic calming measures are designed to slow down or impact all vehicles. In practice, this can lead to reduced access and response times for emergency and law enforcement personnel. Careful consideration must be given to any proposed traffic calming device, especially if the roadway under review provides critical access for emergency personnel. Representatives of fire, police, and emergency services departments should be involved in the review of proposed traffic calming devices. The EPMPO can work with its planning partners and emergency response agencies to identify locations suitable for traffic calming implementation.

HIGH OCCUPANCY VEHICLE LANES

High Occupancy Vehicle (HOV) lanes are dedicated for use by vehicles with more than one occupant and thereby serve to increase the total number of people that move through a congested corridor. HOV lanes offer substantial travel time savings and reliable, predictable travel times. HOV lanes move significantly more people during congested periods, even if the number of vehicles that use the lane is lower than on adjoining general-purpose lanes. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes. In coordination with its planning partners, EPMPO can identify corridors that would benefit from the implementation of HOV lanes.

TRAFFIC INCIDENT MANAGEMENT

Traffic Incident Management (TIM) consists of a planned and coordinated process to detect, respond to, and quickly clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM strategies reduce the duration and impacts of traffic incidents and improve the safety of motorists, crash victims, and emergency responders. Traffic incident management involves coordination among a number of public and private sector partners, including:

- Law enforcement
- Emergency Management and preparedness
- Fire and rescue
- EMS
- Towing and recovery
- Transportation departments
- Hazardous materials contractors
- Public safety communications
- Traffic information media

TRAFFIC DATA COLLECTION

As transportation technology grows increasingly sophisticated, obtaining the amount of data required by new traffic optimization interfaces presents significant challenges to cash-strapped public agencies. Automated traffic data collection creates an opportunity for transportation management agencies to receive a continuous supply of traffic data at a low cost. Because automated traffic data collection gathers data in real-time, it facilitates many of the demand-responsive TSM&O strategies discussed earlier in this chapter (such as traffic signal optimization). New types of traffic data collection, such as Bluetooth and Wi-Fi detectors, are particularly appealing due to their lower operational and maintenance costs compared to in-road loop detectors. These types of detectors have the added benefit of being able to gather traveler information beyond the traditional scope of the private vehicle to include bicycle and pedestrian roadway users.

LEVERAGING EMERGING TECHNOLOGIES

In addition to the implementation of some the Intelligent Transportation Systems (ITS) mentioned above, the emergence of new technologies and the adoption of policies and legislation will provide future decision makers with a whole new tool kit of strategies to implement.

CONNECTED & AUTONOMOUS VEHICLES

Connected and autonomous vehicles (AV) can be integrated into existing ITS architecture, and while autonomous technology holds many promises for mobility, improved traffic operations, and safety, it should be noted that there are potential unknown and known drawbacks to this technology as well. While higher capacity automated public transportation could drastically reduce both emissions and congestion on the roads, as well as reduce the required right of way to accommodate current trends in single occupant vehicles, advances in this field can also require drastic shifts in land use and policy development. And through making these major shifts in land use and policy development might require greater upfront costs, the benefits for environmental justice and social equity could far outweigh the implementation costs. Other tremendous benefits to the implementation of AV could be drastic reductions in fatalities and severe injury due to less flawed drivers on the road. Questions of liability and vehicle ownership in this new paradigm are yet to be resolved, though vehicle manufacturers, software developers, insurance companies, and entrepreneurial companies are all vying for dominance in this emerging field.

This technology also holds benefits to freight and economic growth. Where freight drivers are currently limited by exhaustion as well as congestion in urban areas, improved travel distances and improved traffic operations could have very real and positive impacts on the economic vitality of rural and urbanized area, as well as the integration of these regions into commercial megaregions.

Source: Gnangarra via Wikimedia commons

Real time data collection could have immediate and long-term benefits for growth and operations planning, while third party data collection companies might face new challenges in securing and utilizing the influx of data.

The National Association of City Transportation Officials (NACTO) provides some advice and guidance in their "Blueprint for Autonomous Urbanism," found at nacto.org/blueprint, and the Society of Automotive Engineers (SAE) and the National Highway Traffic Safety Administration (NHTSA) are working to provide guidance for safety and programming levels of automation.

The EPMPO staff can help the development and deployment of these technologies throughout the region by beginning discussions on policy and land use, as well as staying abreast of developments in autonomous vehicle technology.

SMART PHONE APPLICATIONS

Rideshare applications for smart phones are already influencing how people are choosing to commute. Uber recently unveiled (Feb 2018) their new "Express Pool" service in the Washington D.C. Metro Area. This new service utilizes traffic analytics and routing software to reduce backtracking and rerouting to pick up multiple passengers, as is the case with their "UberPool" service. In exchange for significant discounts and more direct routing, riders are picked up within two blocks of their origins, and dropped off within two blocks of their destinations, which means more walking.

Smart phones are also already being used to improve transit service and user experience with route information apps, as well as instant payment and rider subscription services. The EPMPO can continue to work with its planning partners to enhance the functionality of smartphone transit applications to further encourage travelers to use transit.

Source: Santeri Viinamäki via Wikimedia commons

COMPLETE STREETS

The concept of "Complete Streets" is rooted in the idea that roads should be built with all users in mind, not just the private automobile. While Complete Streets principles include many TDMg and TSM&O strategies, the concept focuses less on improving traffic conditions and more on the livability of places. Complete Streets strategies address the needs of all users of the transportation system, including the young and the old, the disabled, and users of transit or non-motorized forms of transportation. They yield a wide range of benefits such as improved safety, equity and access, economic development, air quality, health, and livability. While policies adopted by local governments represent most Complete Streets policies adopted nationwide, MPOs can be integral partners in promoting and implementing Complete Streets strategies.

PRELIMINARY EVALUATION OF TRAVEL DEMAND MANAGEMENT STRATEGIES

As presented in the previous section, there is a wide range of strategies that the region can consider for implementation to manage roadway congestion and improve air quality. From the previous MTP, only a limited number of projects with such strategies were implemented and thus, their contribution to VMT or emissions reductions is debatable. Notable examples of such projects are the BRIO RTS and various road diets with bicycle lanes. The BRIO concept is a transit improvement for the City of El Paso in terms of direct route alignments, headways, and coverage, with four RTS routes operating or planned. However, the BRIO service still lacks the benefits of a true BRT system, with dedicated/exclusive bus lanes that could improve transit travel times on congested roads and in peak periods. Furthermore, the City of El Paso has completed a number of road diets

that include bicycle lanes, as well as implementing the SunCycle bike-sharing program, but these design and service improvements have been implemented on a limited number of streets, mostly in downtown El Paso and near-downtown neighborhoods; as a result, their benefits to the regional travel network are limited. While these projects might have a small impact today, they could serve as the initial building block for a more comprehensive and robust system.

One TDMg strategy that can be explored to improve transit, bicycle and pedestrian infrastructure and could have a significant impact on VMT and emissions reductions is the encouragement of more compact and infill development, thereby increasing population and employment densities. While land use policies are controlled by municipal governments, as a result, the EPMPO can only promote discussion on land use policies; nevertheless, using its travel modeling tools the EPMPO can attempt to quantify their impact on regional transportation needs. No review of current municipal land use policies were conducted as part of the needs assessment evaluation for RMS 2050 MTP.

To explore the significance of Travel Demand Management (TDMg) strategies, in particular the significance of land use and density in travel patterns, two scenarios were conceptualized and evaluated using the RMS Travel Demand Model (TDM). These hypothetical scenarios were developed to test the sensitivity of the MPO's travel models to a set of border conditions, without a thorough review of the practicality or feasibility (economic, technical, cost, etc.) of achieving either scenario. The analyses of these two scenarios are provided in the section below. While these test scenarios are preliminary and thus simplified, the modeling exercise will help the EPMPO in the development of more realistic scenarios that can be used to help inform the needs assessment evaluation for the next MTP.

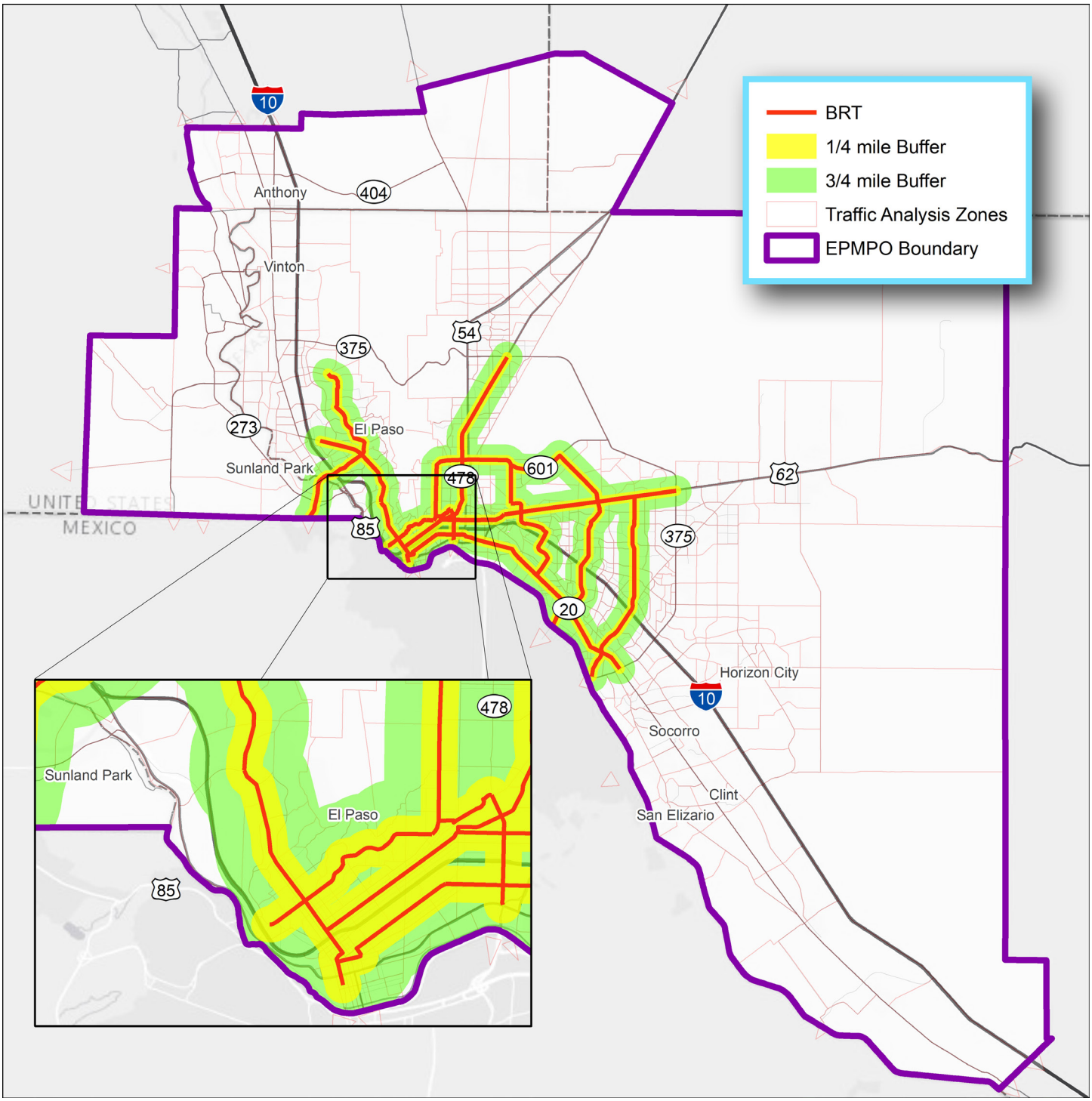
CONCEPTUALIZED DENSIFIED SCENARIO

A set of transportation network and demographic conditions were coded on the RMS TDM and labeled as the "densified scenario". In these scenarios the anticipated population and employment growth between 2022 and 2050 has been concentrated in 1.5-mile wide corridors corresponding to major roadways throughout the urban area. **Figure 4-8** shows the nine corridors, and the areas where the growth was concentrated.

DEMOGRAPHICS

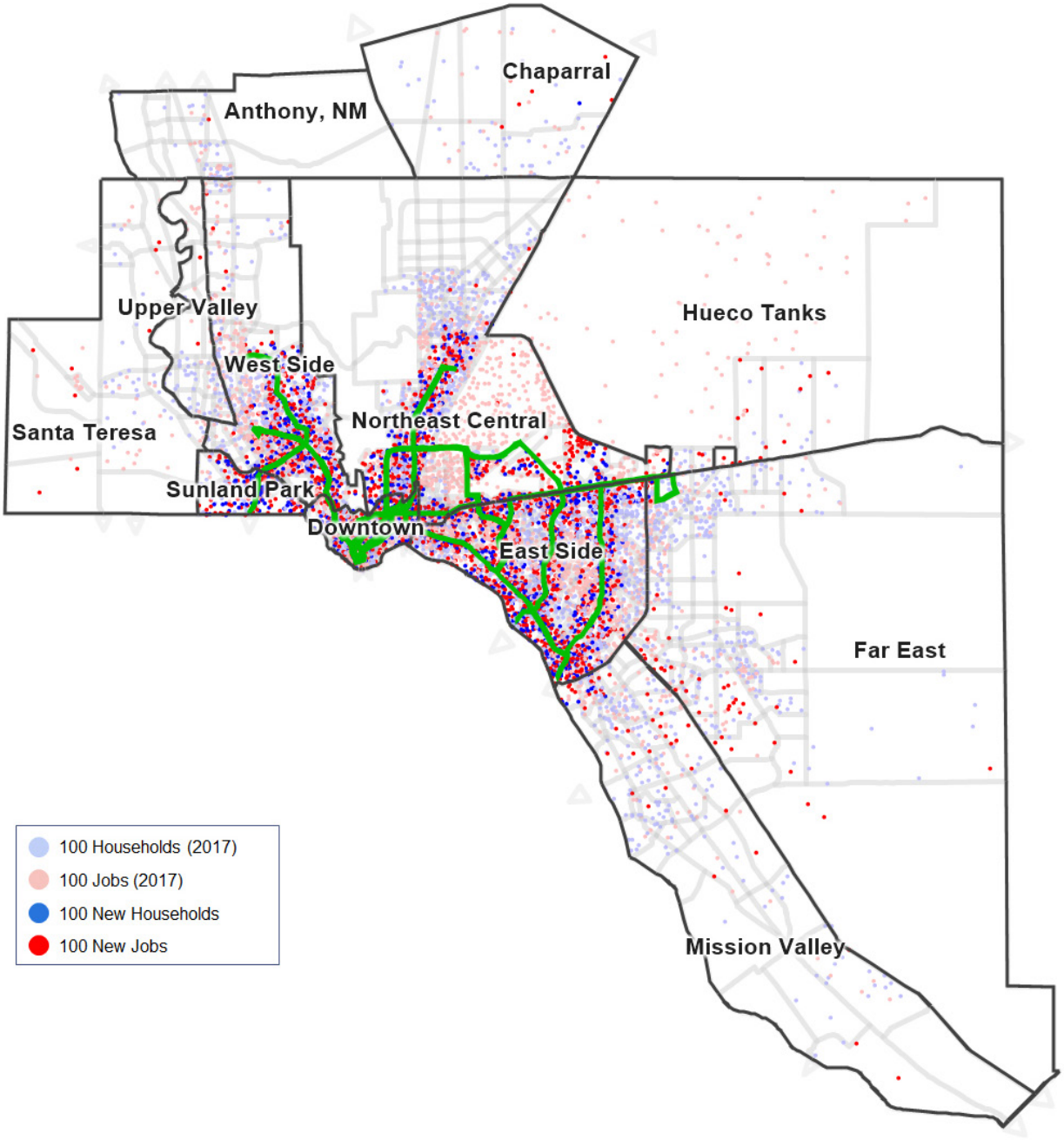
Based on data from the Texas State Demographer along with New Mexico demographic trends, the total population and employment growth between 2022 and 2050 will be 150,000 and 180,000 respectively. Through a preliminary exercise of satellite image review of existing land uses along the nine corridors (including available land, brownfield areas and surface parking lots), the new population growth was distributed, as well as retail and services employment.

FIGURE 4-8: DEMOGRAPHIC GROWTH CONCENTRATION CORRIDORS UNDER THE DENSIFIED SCENARIO



About 80% of the population and employment growth was placed within a half-mile of each of the nine corridors, with the remaining 20% placed in the next mile. **Figure 4-9** shows schematically how this concentration of employment and population compares to the 2017 demographics.

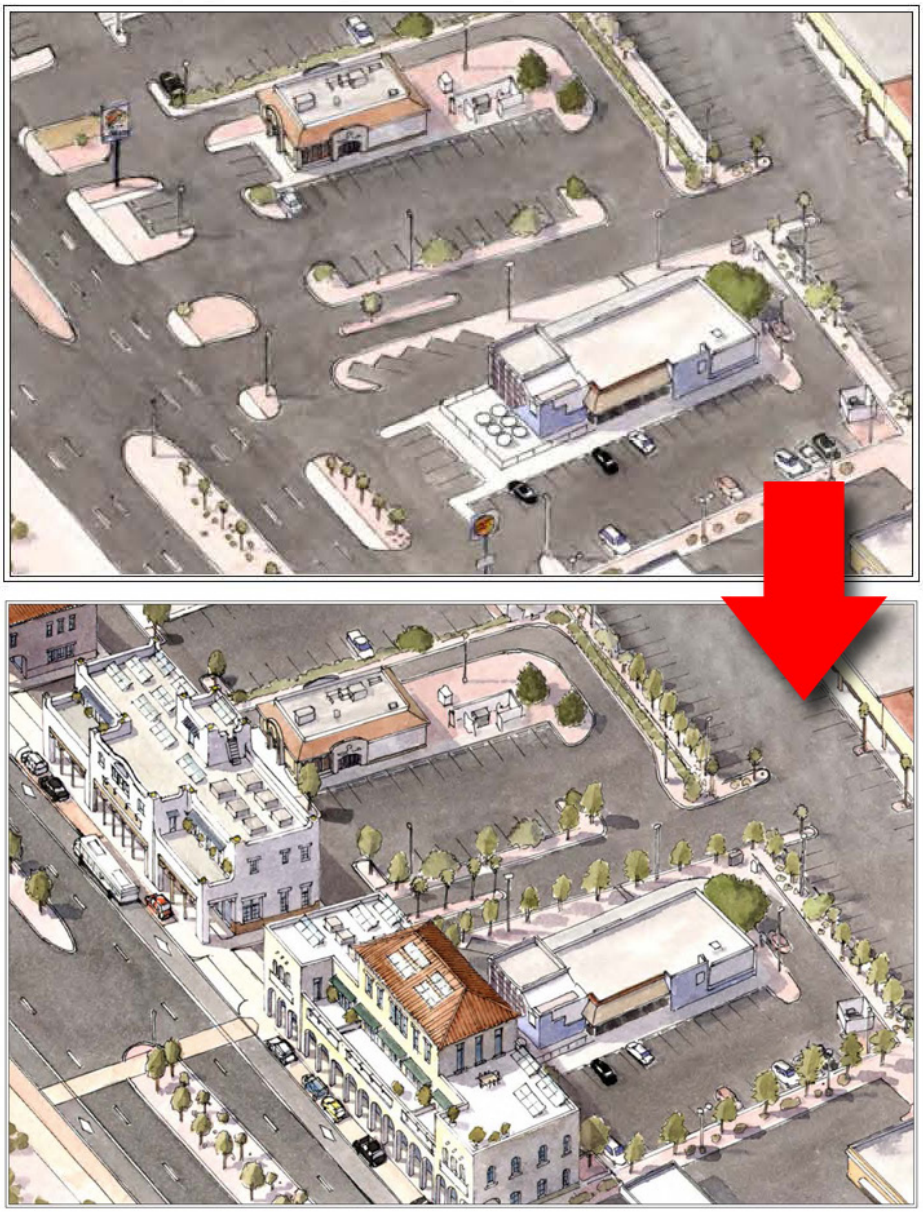
FIGURE 4-9: DISTRIBUTION OF YEAR 2050 EMPLOYMENT AND POPULATION UNDER THE DENSIFIED SCENARIO



On average the concentration of future growth amounts to an increase of 2 to 3 times the current densities in the half-mile area. Currently the population density in these corridors averages around 3,000 people per square mile. **Figure 4-10** illustrates an example of what this increase in density might look like on the ground.

Such population and employment concentration would considerably improve the pedestrian access to transit operating on the densified corridors, as well as increasing the share of trips that can be completed entirely on foot.

FIGURE 4-10: INFILL REDEVELOPMENT EXAMPLES FROM PLAN EL PASO



Source: City of El Paso via elpasotexas.gov

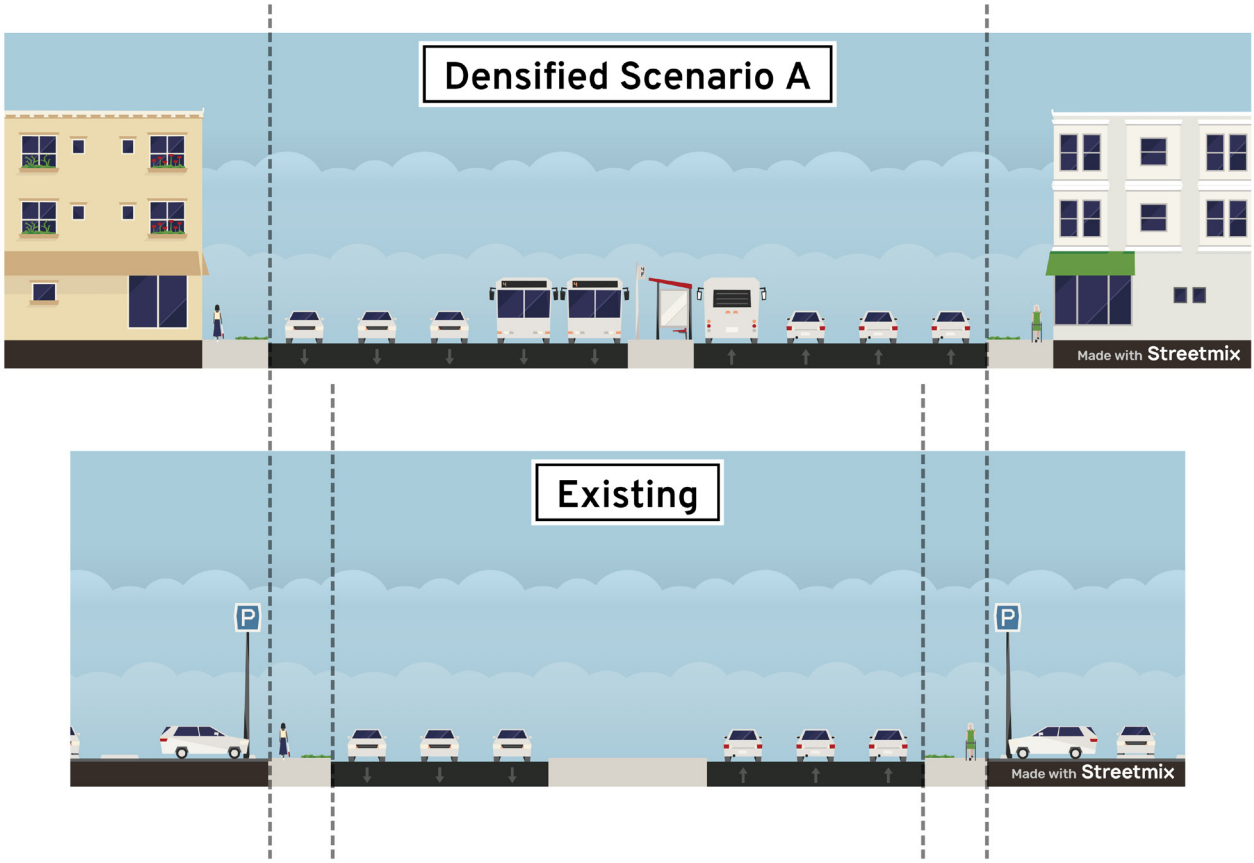
BRT INFRASTRUCTURE

To improve travel time, the transit service was coded along the densified corridors as Bus Rapid Transit (BRT), including the four routes of the BRIO RTS: Mesa, Dyer, Montana, Alameda. Five additional BRT routes were transversely located to explore the impact of an interconnecting network:

- Zaragoza-George Dieter
- Copia-Schuster
- Yarbrough-Global Reach
- Sunland Park- Westwind
- Airway-Hawkins

One of the major advantages of converting the BRIO system from RTS to BRT service is the use of dedicated bus lanes, allowing buses to avoid congestion occurring in regular travel lanes. Two approaches to creating dedicated bus lanes were analyzed; in Scenario A, an extra lane is added to the typical cross section on each major arterial with a BRT route, as shown in **Figure 4-11**, in order to compensate for the traffic lane taken for the BRT. This would maintain the existing roadway capacity for all other vehicles, but in some locations requires a wider right-of-way that currently exists.

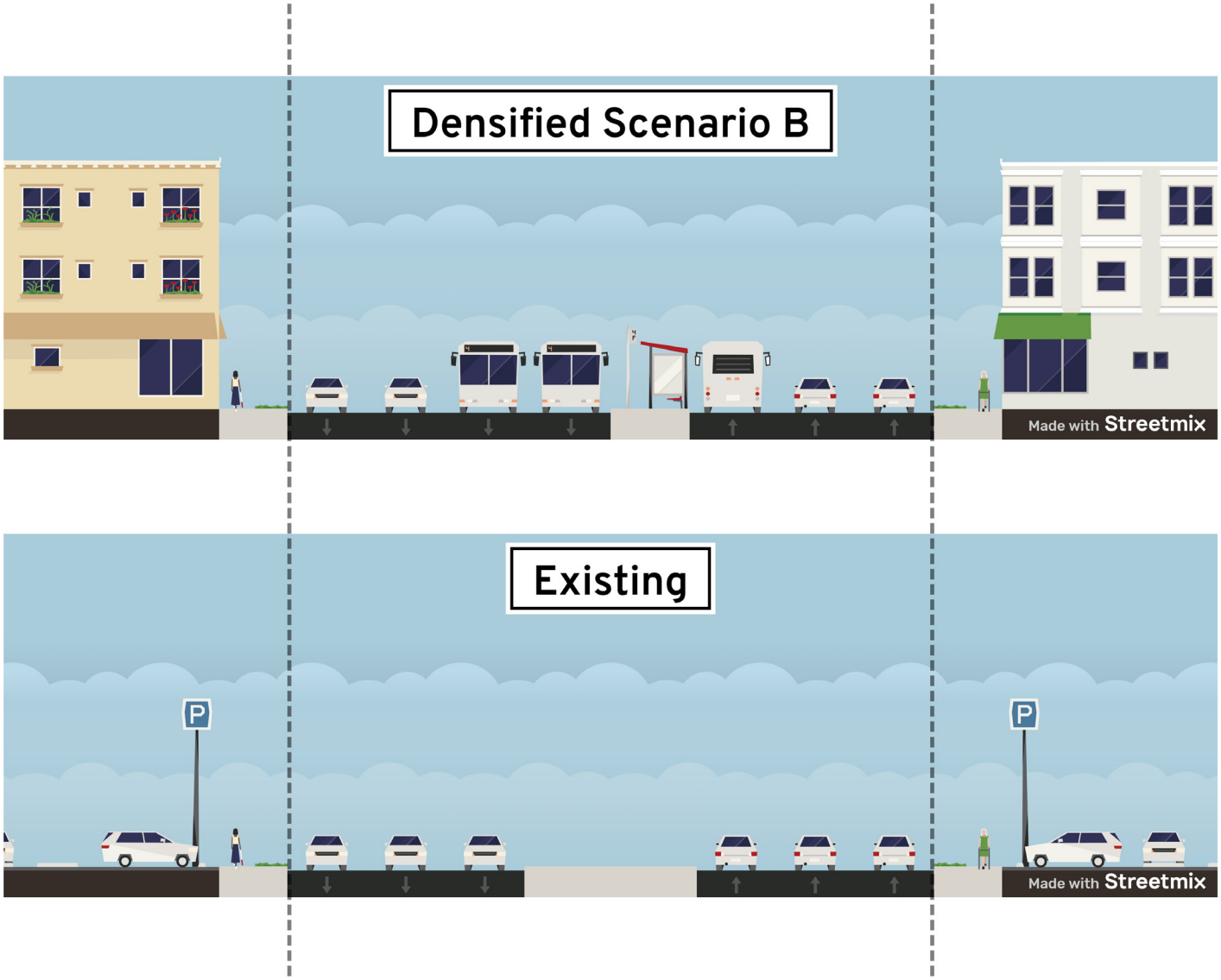
FIGURE 4-11: PROTOTYPE CROSS-SECTION OF ARTERIALS WITH BRT LANES UNDER DENSIFIED SCENARIO A



Top: Modified cross-section (BRT with added lanes)
Bottom: Reference existing cross-section

In Scenario B, an existing travel lane is converted for exclusive use by transit , as shown in **Figure 4-12**. This would reduce the roadway capacity for all other vehicles, but could be achieved using existing right-of-way. Additionally, Scenario B applies a fee for private vehicle parking along the BRT corridors.

FIGURE 4-12: PROTOTYPE CROSS-SECTION OF ARTERIALS WITH BRT LANES UNDER DENSIFIED SCENARIO B

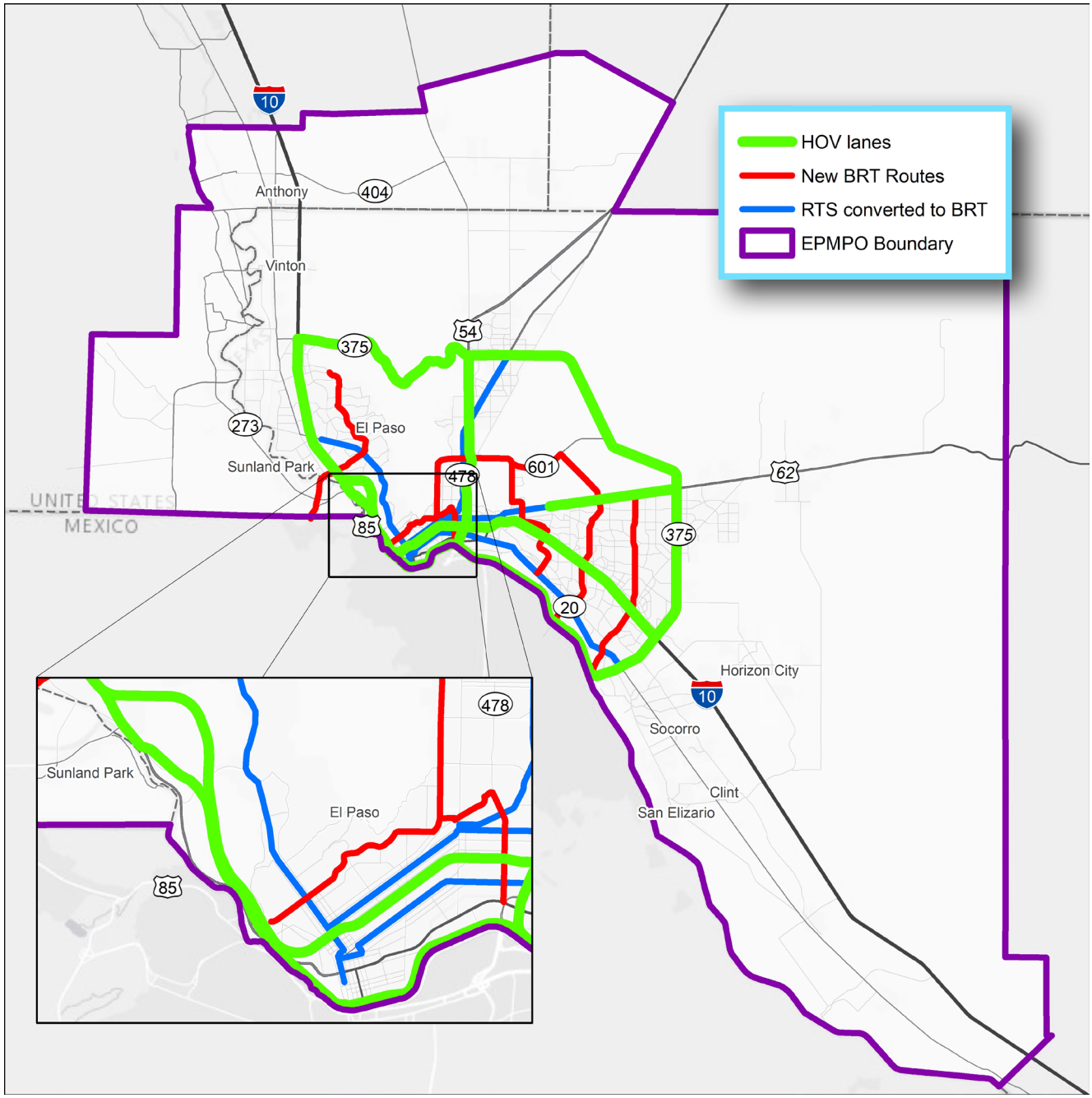


Top: Modified cross-section (BRT with no added lanes)
Bottom: Reference existing cross-section

HOV INFRASTRUCTURE

Both densified scenarios also applied HOV2+ lanes along the major freeways in the region (IH-10, US54, Loop 375, Border Highway and US180). The HOV infrastructure is shown in **Figure 4-13** along with the BRT routes.

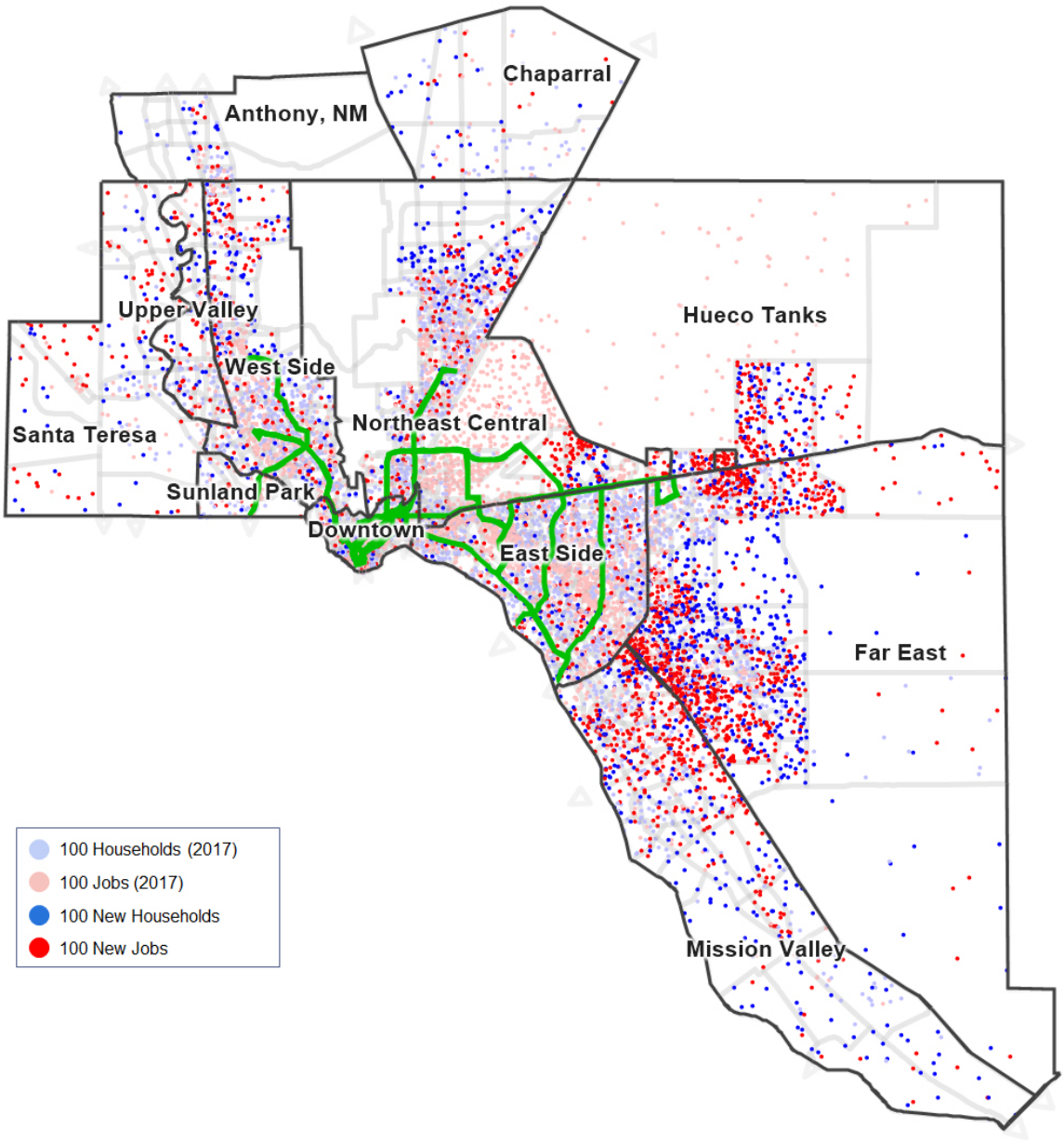
FIGURE 4-13: ALTERNATIVE TRANSPORTATION INFRASTRUCTURE CONSIDERED FOR THE DENSIFIED SCENARIOS



2050 DENSIFIED SCENARIOS VS. NO-BUILD SCENARIO

As an initial reference the densified scenarios were evaluated using the TDM and compared to the TDM results of a 2050 No-Build scenario. The 2050 No-Build considered the socio-demographic (SED) distribution of employment and population (established in part through a Delphi process) on the existing (2022) transportation infrastructure. **Figure 4-14** shows the 2050 SED distribution from the Delphi.

FIGURE 4-14: YEAR 2050 EMPLOYMENT AND POPULATION DISTRIBUTION ESTABLISHED FROM THE DELPHI PROCESS



Summary congestion maps from the TDM runs for the 2050 No-Build and Densified scenarios are shown on **Figure 4-15**. The red links indicate heavy congestion at peak periods, defined by values of volume/capacity (v/c) greater than 0.95, equivalent to a congestion index rank of 5. The No-Build map shows most red links beyond the Loop 375 outer ring, while the Densified map shows most red links inside the Loop 375 ring. In general, this correlates with the location of the employment and population growth.

FIGURE 4-15: PEAK ROADWAY CONGESTION COMPARISON (RED LINKS INDICATE HEAVY CONGESTION)

(a) 2050 No Build Scenario

(b) 2050 Densified Scenario B

Table 4-1 provides a summary of other performance measures at the regional level for all scenarios. Among these, it is worthwhile to highlight that the regional Congestion Index in all cases is less than 3.5, falling within the range considered "light congestion". Perhaps more significant is that Densified Scenario VMTs are lower than those observed in the No-Build Scenario , while transit mode share jumps from 0.8% in the No-Build to 4.9% and almost 8.8% in the Densified Scenarios A and B, respectively. More importantly for air quality conformity purposes, all emissions are lower for the Densified scenarios compared to the No-Build.

These preliminary results show great potential for TDMg strategies, such as the densification of the urban corridors together with a robust network of alternative transportation modes.

TABLE 4-1: COMPARISON OF REGIONAL PERFORMANCE MEASURES

TRANSPORTATION AND DEMOGRAPHIC SCENARIO	TRANSIT SHARE	DRIVE ALONE SHARE	CONGESTION INDEX	VMT (MILLION)	CO (TM/DAY)	PM10 (TM/DAY)	VOC (TM/DAY)	NOX (TM/DAY)
2050 No-build	0.8%	43.5%	3.36	22.8	27.8	6.9	7.7	7.9
2050 Densified A	4.9%	41.3%	3.48	21.4	25.3	5.8	7.1	7.3
2050 Densified B	8.8%	39.5%	3.46	20.9	25.9	5.9	7.3	7.5

FINAL RECOMMENDATIONS

The following recommendations are listed in no particular order:

- Encourage continued coordination of the metropolitan transportation planning process with the development of local transportation and comprehensive plans to promote the inclusion of facilities and systems related to transit, biking, and walking.
- Encourage transportation planning partners to consider cost-effective, congestion mitigation strategies, such as TDMg, TSM&O, and Complete Streets design prior to investing in roadway capacity improvements.
- Work with large area employers to explore and implement employer-based TDMg tools and incentives.
- Consider giving funding preference to projects that incorporate TDMg and TSM&O strategies, reflect Complete Streets design principles, or set regional multi-modal transportation goals and objectives through a robust public involvement process.