SYSTEMS-LEVEL ANALYSIS

5

5. SYSTEMS-LEVEL ANALYSIS

Metropolitan transportation planning is not solely concerned with the best way to move people and goods. In addition to mobility concerns, the planning process also examines the interaction of proposed transportation improvements with the natural and human environment. For the purposes of the metropolitan transportation plan, potential impacts on environmental resources and quality of life in the region are evaluated at a system-wide level.

A more detailed analysis of the specific impacts associated with a project is typically performed later in the project development process to fulfill requirements under the National Environmental Protection Act (NEPA).

The primary goal of the systems-level analysis is to evaluate whether the proposed program of unconstrained potential transportation improvements may negatively impact the environment or result in disparate impacts to certain populations. It is intended to serve as a guide for implementing agencies and elected officials as projects progress through the development process.

While it is not always possible to avoid negative impacts to environmentally sensitive areas, the goal of the environmental mitigation analysis is to balance the need for transportation improvements with environmental protection and quality of life considerations and, where possible, to increase access to natural and cultural resources in the region. Mitigation activities should be considered during all phases of project planning, design, construction, and maintenance.

In addition to environmental and cultural resources, the systems-level analysis addresses Environmental Justice considerations to ensure both the benefits and the burdens of the transportation system are distributed equitably across the region. The term Environmental Justice first emerged in the metropolitan transportation planning discussion in 1994 with the issuance of *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The executive order was based upon Title VI of the Civil Rights Act and is meant to ensure that minority and low-income populations are not adversely affected by federal actions.

Identifying potential impacts on the environment, as well as low-income and minority populations, involves a three-step process that includes:

- Defining and developing an inventory of environmental resources/minority and low-income populations;
- Identifying and assessing the potential impacts of proposed transportation improvements on these resources; and
- Addressing possible mitigation activities system-wide.

ENVIRONMENTAL MITIGATION ANALYSIS

The El Paso Metropolitan Planning Area is located in the far western corner of Texas, and encompasses the entirety of El Paso County, Texas, as well as portions of Doña Ana and Otero Counties in New Mexico. The City of El Paso stands on the Rio Grande across the US-Mexico border from Ciudad Juárez.

The El Paso region has a transitional climate between cold and hot desert climates with low humidity and winters that are cool and dry. El Paso experiences an average of 9.7 inches of rain per year, which can occur during severe thunderstorms, sometimes strong enough to produce flash flooding. The City of El Paso is home to Franklin Mountains State Park. The El Paso region sits atop

the Hueco Bolson aquifer, which stretches north into New Mexico and southwest under the Rio Grande in to Mexico. The location of the region's environmental and cultural resources, including rivers and streams, wetlands, floodplains, parks, open space, recreational areas, and historic sites, originally inventoried as part of the environmental analysis for Destino 2045 MTP, were reviewed and updated as needed.

The data and information used to conduct the analysis included flood plain maps from the Federal Emergency Management Agency (FEMA), wetlands maps from the U.S. Fish and Wildlife Service, historic sites from the National Register of Historic Places, and state and federal wildlife and environmental protection resources. These inventoried resources are shown in **Figure 5-1** through **Figure 5-3**.

FIGURE 5-1: PARKS, HISTORIC DISTRICTS, AND CEMETERIES

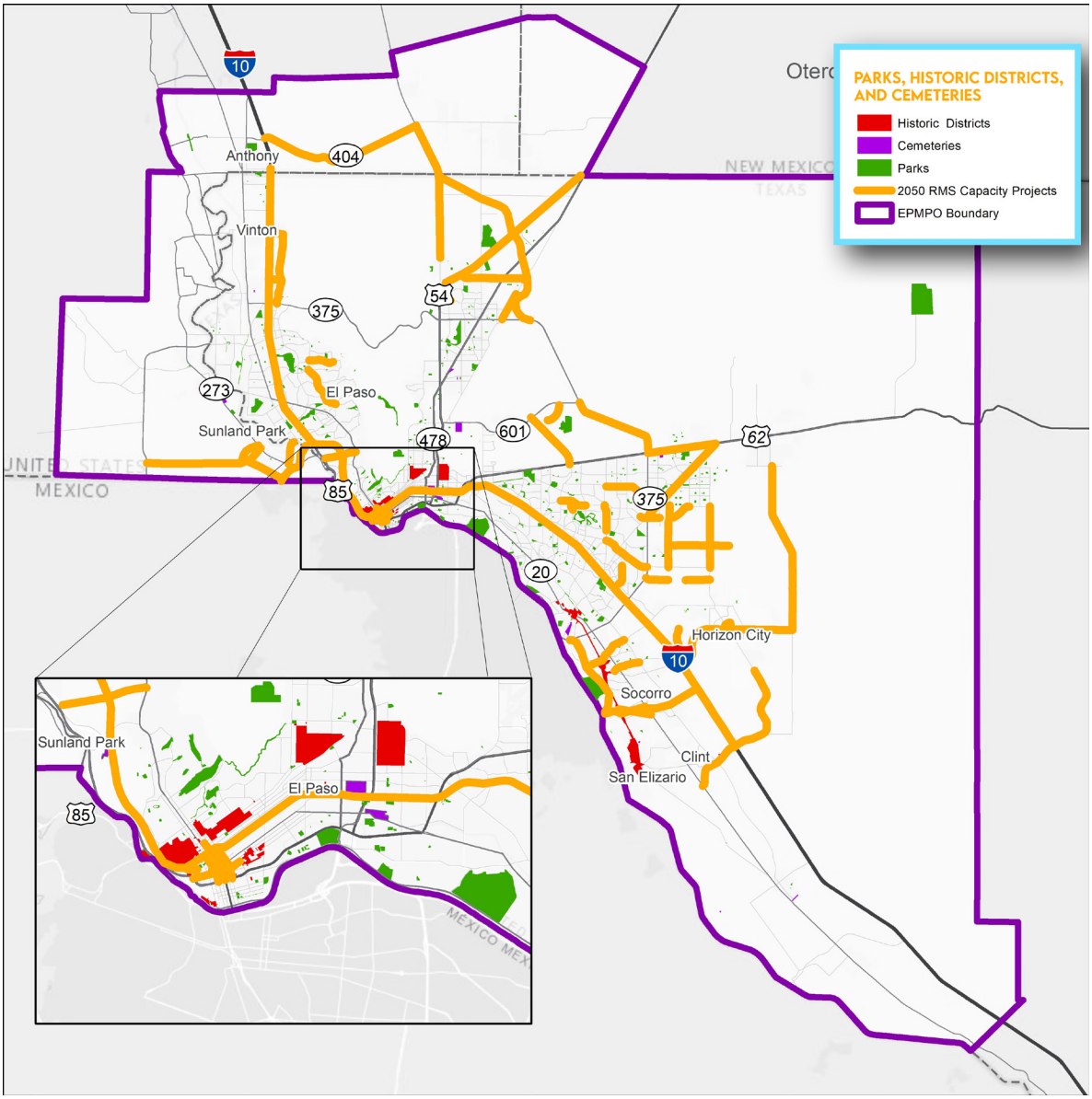


FIGURE 5-2: SCHOOLS AND CULTURAL RESOURCES

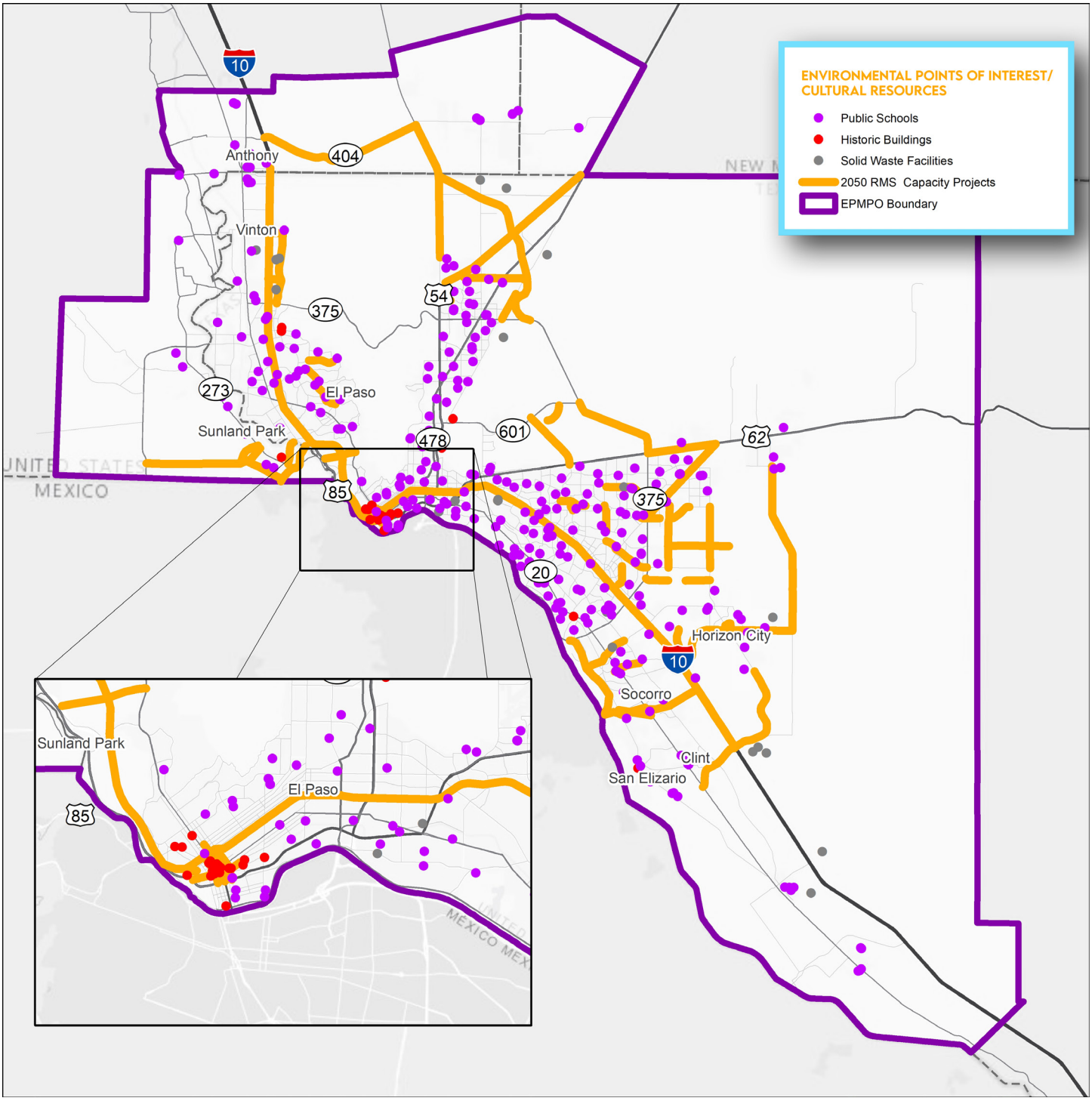
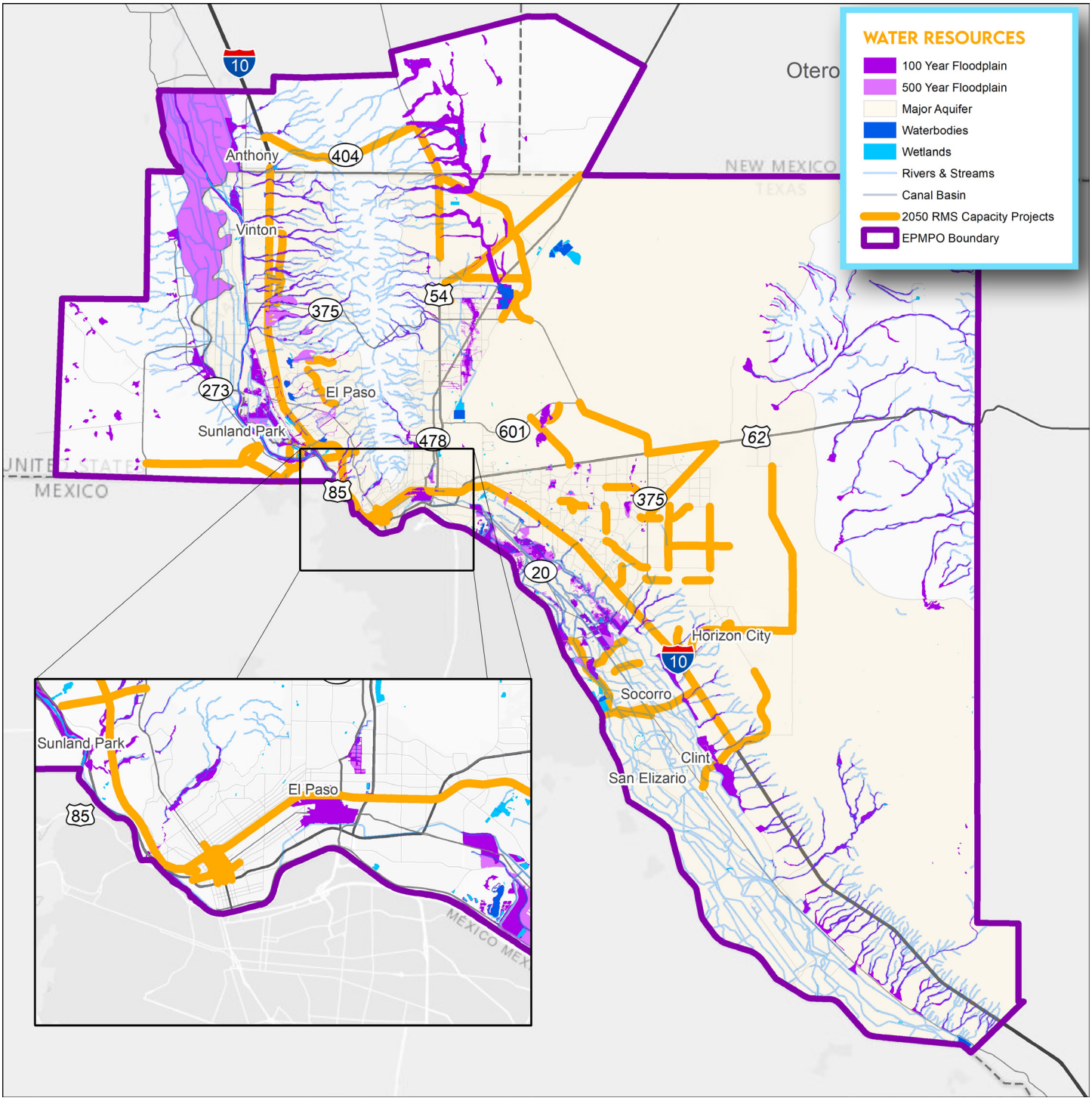


FIGURE 5-3: WATER RESOURCES



The same methodology used for Destino 2045 MTP was utilized to determine how projects identified in RMS 2050 might affect these resources. This methodology was originally developed by the Southeast Michigan Council of Governments and is an FHWA-endorsed GIS methodology. The analysis assembles projects into types, and then buffer zones are generated and mapped for each type of project. For the sake of the RMS 2050 system level analysis, only capacity projects were considered to have potential impacts on mapped data. Some projects, such as overlays, were excluded from this analysis; therefore, the total number of projects explored in this section does not reflect the total number of projects in the RMS 2050 MTP.

Buffer sizes were determined based on the type of environmental resource being examined, meaning smaller "areas of influence" were computed depending on the environmental resource. Some resources, such as recreation areas and historic sites, may only be impacted by projects in close physical proximity, while others (such as water resources) may still be impacted by a project some distance away. **Table 5-1** summarizes the buffer sizes assigned to each resource being examined. Once buffer sizes were determined, buffers and environmental resources were mapped to identify areas of overlap, as these are areas where an impact is possible. **Figure 5-4** provides an example of the buffer analysis, showing proposed projects as well as areas of possible project impacts.

TABLE 5-1: ENVIRONMENTAL RESOURCE BUFFER SIZES

ENVIRONMENTAL RESOURCE	BUFFER SIZE
Floodways	.25 miles
Wetlands and Other Waters	.25 miles
Cemeteries	250 feet
Historic Sites	250 feet

Source: Wikimedia commons

FIGURE 5-4: EXAMPLE BUFFER ANALYSIS

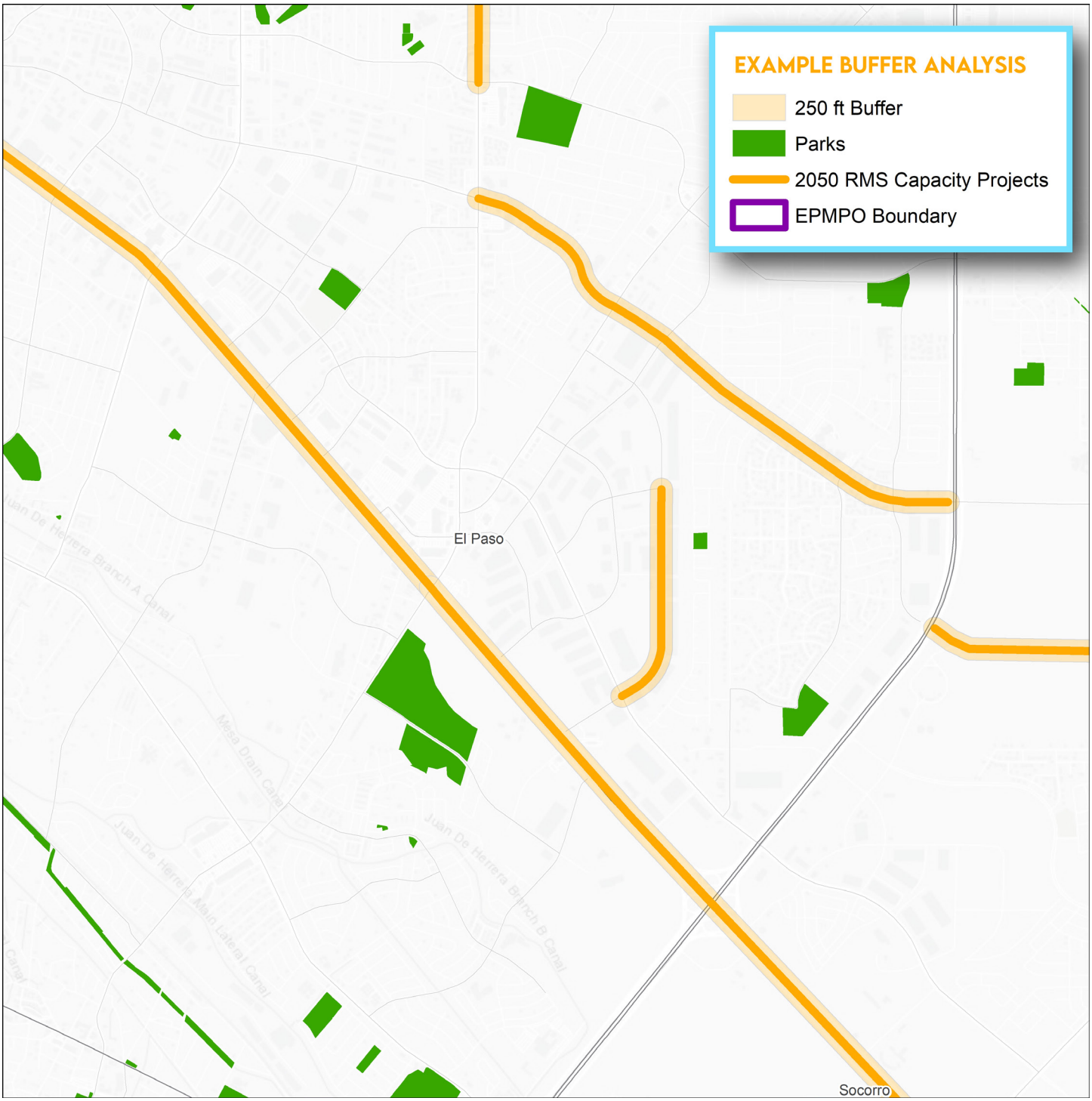


Table 5-2 and **Table 5-3** quantify the number of possible impacts to the inventoried resources for capacity projects. The risk to a major aquifer, wetlands, and flood hazard areas (100-year and 500-year floodplains) is the greatest with 49, 27, and 30 projects, respectively, potentially impacting those resources. The list of proposed potential improvements presents few concerns regarding cemeteries or historic resources with only one project within close proximity of a historic site and two potentially impacting cemeteries, while fourteen projects are located within close proximity to a park. **Table 5-4** lists the historic sites and districts and parks that may be impacted by the proposed transportation improvements.

TABLE 5-2: NUMBER OF PROJECTS WITH POSSIBLE IMPACTS TO INVENTORIED WATER RESOURCES

WATER RESOURCE	NUMBER OF PROJECTS
Canal Basin	3
Flood Hazard Areas	30
Major Aquifer	49
Wetlands	27
Water Bodies	5
Rivers/Streams	28*

**Many areas classified as rivers and streams are also classified as wetlands and may have produced duplicate results.*

TABLE 5-3: NUMBER OF PROJECTS WITH POSSIBLE IMPACTS TO PARKS AND CULTURAL RESOURCES

PARK/CULTURAL RESOURCE	NUMBER OF PROJECTS
Public Schools	8
Parks	9
Office of Stormwater Management (OSM) Parks	5**
Solid Waste Facility	2
Historic Sites	1
Cemeteries	2
Historic Districts	4

***Some parks are also classified as OSM parks and may have produced duplicate results*

TABLE 5-4: RESOURCE SPECIFIC IMPACTS OF SPECIFIC PROJECTS

PROPOSED PROJECT	POTENTIALLY IMPACTED RESOURCES
I-10 Widening at Downtown	Old Fort Bliss Historic Buildings/Structures
	Old San Francisco District
	Sunset Heights District
	Multiple Historic Buildings
	Grace Chope Park
Nuevo Hueco Tanks Extension	Mission Trail Historic District
I-10 Seg3A (Copia to Paisano)	Lincoln Park
	Saipan-Ledo Park
Arterial 1 East (1682 Blvd.)	Ernesto Serna Elementary/Middle School
I-10 Widening (FM 1905 to SH 20)	Westside Community Park
I-10 Seg1G (Thorn to Executive)	Buena Vista Park
	Pacific Park
Tierra Este (Arterial 1)	Frank "Francis" T. Hourigan Park
	Mesquite Trails Park #6
Border Hwy East (BHE), PH2	Cougar Park
Rio Vista Rd. Widening	Bulldog Championship Park
Borderland Expressway	Northern Lights (South Park)
	Northern Lights (North Park)

The systems-level analysis of potential environmental impacts is intended to function as a resource for agencies and elected officials responsible for project implementation. Detailed project-level analysis is required in order to definitively identify adverse impacts from specific projects. The buffer analysis is a useful method for narrowing the focus of such studies, but it should be noted that proximity or overlap of a project buffer and environmental resource alone does not mean an impact is present (nor does the lack of an overlap indicate that an impact will not occur).

POTENTIAL MITIGATION ACTIVITIES

Federal regulations require the metropolitan planning process to include "a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan." FHWA recommends an ordered approach to mitigation known as "sequencing" that involves understanding the affected environment and assessing transportation effects through project development. This ordered approach involves:

- Avoiding the impact altogether;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
- Compensating for the impact by replacing or providing substitute resources.

Recognizing that the type and the level of mitigation activities will vary depending on the scope of the project, a toolbox of mitigation measures and general areas where these activities can be implemented was proposed for Destino 2045 MTP, the toolbox is still applicable for the RMS 2050 MTP.

These measures, listed in **Table 5-5**, are intended to be regional in scope and may not necessarily address potential project-level impacts. As proposed projects progress through the project development process, mitigation should be an integral part of alternatives development and the analysis process from the start in order to maximize effectiveness.

TABLE 5-5: POTENTIAL MITIGATION ACTIVITIES

RESOURCE	MITIGATION MEASURES
Wetlands Or Water Resources	Avoidance, minimization, compensation
	- Preservation
	- Creation
	- Restoration
	- In-lieu fees
	- Riparian buffers
	- Design exceptions and variances
	Environmental compliance monitoring
Forested And Other Natural Areas	Avoidance, minimization
	Replacement property for open space easements to be of equal fair market value and of equivalent usefulness
	Design exceptions and variances
	Environmental compliance monitoring
Agricultural Areas	Avoidance, minimization
	Design exceptions and variances
	Environmental compliance monitoring
Endangered And Threatened Species	Avoidance, minimization
	Time-of-year restrictions
	Construction sequencing
	Design exceptions and variances
	Species research/fact sheets
	Memoranda of Agreement for species management
	Environmental compliance monitoring
Ambient Air Quality	Transportation control measures
	Transportation emission reduction measures
Cultural Resources	Avoidance, minimization
	Landscaping for historic properties
	Preservation in place or excavation for archeological sites
	Design exceptions and variances
	Environmental compliance monitoring
Parks And Recreation Areas	Avoidance, minimization, mitigation
	Design exceptions and variances
	Environmental compliance monitoring

AIR QUALITY

Improving regional air quality and maintaining compliance with federal air quality standards is a fundamental consideration in the metropolitan transportation planning process. The construction of new transportation infrastructure increases the capacity for vehicles on regional roadways, which has the potential to increase traffic-related air pollutants in the MPO study area.

In 1963, in response to increasing air pollution, the U.S. Congress passed the original Clean Air Act which established a federal program for researching techniques to monitor and control air pollution. The Clean Air Act of 1970 increased federal enforcement authority and authorized the development of national ambient air quality standards to limit common and widespread pollutants. These standards, known as the National Ambient Air Quality Standards (NAAQS), define the allowable concentration of pollution in the air for six "criteria" pollutants, including carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide.

The Clean Air Act identifies two types of national ambient air quality standards:

- Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.
- Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Source: tceq.texas.gov

The existing standards for each of the six criteria pollutants are listed in **Table 5-6**. The units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m3).

In November 2021, EPA completed its response to the D.C. Circuit Court's remand of certain air quality designations for the 2015 Ozone NAAQS by expanding its initial designations of 2018 for the Doña Ana County, New Mexico area. The Doña Ana County, New Mexico nonattainment area now includes all of El Paso County, Texas and has been renamed El Paso-Las Cruces, Texas-New Mexico marginal nonattainment area. Therefore, the RMS 2050 MTP is required to maintain compliance with the 2015 Ozone rule.

Regions are designated by the EPA as either in attainment or nonattainment for NAAQS. Attainment means the concentration of each pollutant does not exceed NAAQS. Non-attainment means the concentration of at least one pollutant exceeds the maximum defined threshold. If an area is designated as non-attainment, the state must develop and submit a state Implementation Plan (SIP). The SIP addresses each pollutant that exceeds NAAQS and establishes an overall regional plan to reduce air pollution emission levels,

TABLE 5-6: EXISTING STANDARDS FOR CRITERIA POLLUTANTS

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m3 (1)	Not to be exceeded
Nitrogen Dioxide (NO2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM2.5	primary	1 year	12.0 µg/m3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m3	98th percentile, averaged over 3 years
	PM10	primary and secondary	24 hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O3 standards.

(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

designed to return the area to, and maintain, attainment status. Once a nonattainment area meets the standards, EPA will designate the area to attainment as a "maintenance area." Maintenance areas are required to have a Maintenance Plan in place to ensure continued attainment of the respective air quality standard. The Clean Air Act defines specific timetables to attain air quality standards and requires non-attainment areas to demonstrate reasonable progress in reducing air pollutants until the area achieves attainment.

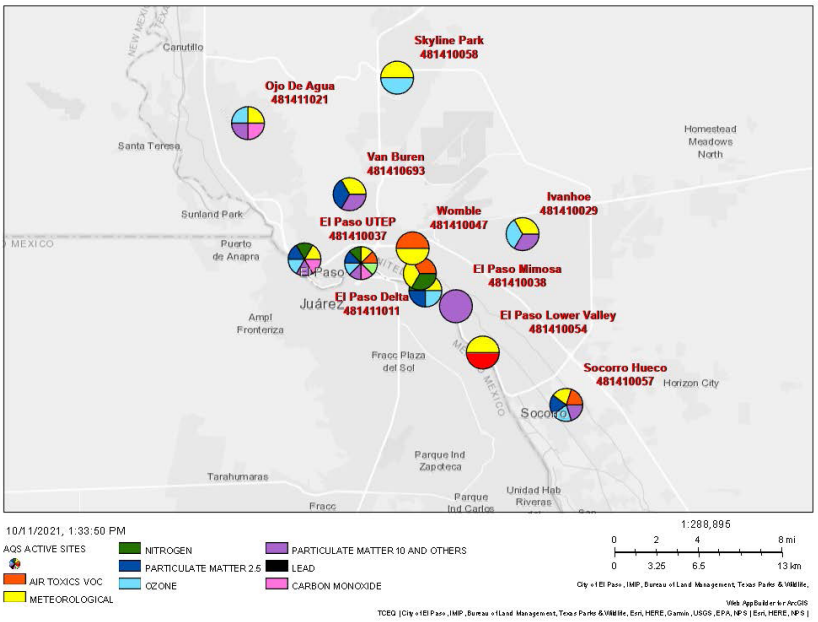
AIR QUALITY IN THE EPMPO AREA

There are twelve air quality monitoring sites in the El Paso region that form part of Texas' monitoring network. The Ojo De Agua site monitors CO, O3, PM10 (FRM) and wind. The Skyline Park location monitors O3, temperature, and wind. The Van Buren Site monitors PM10 using FRM, PM2.5 using a continuous tapered element oscillating microbalance (TEOM), relative humidity, temperature, and wind. The El Paso UTEP site monitors CO, Dew Point, NOX, Ozone, PM10 (TEOM), PM2.5 (FRM), PM2.5 (TEOM), UV radiation, solar radiation, precipitation, relative humidity, temperature, and wind.

The El Paso Chamizal site operates an automated gas chromatograph. Gas chromatography (GC) is a common type of chromatography used in analytical chemistry for separating and analyzing compounds that can be vaporized without decomposition. Typical uses of GC include testing the purity of a particular substance or separating the different components of a mixture (the relative amounts of such components can also be determined). This site monitors CO (high sensitivity), dew point, NOX, NOY (high sensitivity), Ozone, PM Coarse, PM2.5 (FRM), PM2.5 (speciation) SO2 (high sensitivity), relative humidity, solar radiation, temperature, and wind. The Womble site operates a single canister and monitors temperature and wind.

The El Paso Delta site similarly monitors NOX temperature and wind. The Ascarate Park SE site monitors barometric pressure, Dew Point, NOX, Ozone, PM2.5 (TEOM), relative humidity, solar radiation, temperature, visibility, and wind. The Ivanhoe site monitors Ozone, PM10 (FRM), relative humidity, temperature, and wind. The Mimosa Site monitors PM10 (FRM). The El Paso Lower Valley site monitors H2S, temperature, and wind. The Socorro Hueco site monitors Canister, O3, PM10 (FRM), PM10 (TEOM), PM2.5 (TEOM), temperature, and wind. The locations of all El Paso air monitoring sites overseen by the Texas Commission on Environmental Quality (TCEQ) are shown in **Figure 5-5**.

FIGURE 5-5: TEXAS AIR QUALITY MONITORING SITES



TRANSPORTATION CONFORMITY ANALYSIS

The cities of El Paso and Anthony, NM have been designated as moderate non-attainment areas for Particulate Matter, 10 microns or less (PM10) since 1991, although there is no emissions budget established for Anthony. A small portion of the City of El Paso has been operating under an EPA-approved 10-year maintenance plan for Carbon Monoxide (CO) since 2008. The limited maintenance plan covering CO for the next 10 years was approved by the EPA in September 2017.

The Transportation Conformity Analysis performed for the RMS 2050 MTP demonstrates that the projected emissions of VOC, NOX (Ozone), and PM 10 conform to the Motor Vehicle Emissions Budget (MVEB) enacted by TCEQ and approved by the EPA. An interim emissions test no-greater-than-baseline-year was developed for the portion of Doña Ana County near Sunland Park, NM non-attainment area.

This transportation conformity analysis was obtained by projecting vehicle miles and hours traveled from the Travel Demand Model, calculating emissions of these vehicles using the MOtor Vehicle Emission Simulator (MOVES2014b) (latest release December 2018) and AP-42 section 13.2.1 models (EPA, January 2011), and comparing the results to the MVEB for El Paso County, and comparing the results of the 2017 baseline year against the analysis years 2022, 2032, 2040 and 2050 according to the interim emissions test no-greater-than-baseline-year for the portion of Doña Ana County near Sunland Park, NM non-attainment area.

Although the PM10 nonattainment area is the City of El Paso, the PM10 budget includes all of El Paso County.

The TDM has a validated 2017 base year with forecast network years of 2022, 2032, 2040 and 2050. The forecast years incorporate projects proposed in the MTP and TIP. The model outputs were sent to the Texas A&M Transportation Institute (TTI) for emissions analysis.

TABLE 5-7: MOTOR VEHICLE EMISSIONS BUDGETS FOR OZONE AND PM10 NON-ATTAINMENT AREAS

	NOx	VOCs	PM10
Classification	Marginal Non Attainment	Marginal Non Attainment	Moderate Non Attainment
MVEB tons/day	39.76 [1]	36.23 [1]	12.05 [2]

1) Transportation Conformity: Motor Vehicle Emissions Budgets (MVEB) (Appendix A: El Paso Ozone)

2) Transportation Conformity: Motor Vehicle Emissions Budgets (MVEB) (Appendix A: El Paso PM-10)

TABLE 5-8: EL PASO CONFORMITY ANALYSIS SUMMARY (EMISSIONS EXPRESSED IN TONS PER DAY)

POLLUTANT	BUDGET	2022 [1,2]	2032 [1,2]	2040 [1,2]	2050 [1,2]
VOC [1]	**36.23 [4]**	7.01	3.99	3.07	2.90
NOx [1]	**39.76 [4]**	13.02	6.95	5.93	6.10
PM10 [2]	**12.05 [3]**	7.03/7.61	7.85/8.47	8.36/9.02	9.09/9.81

1) Ozone (VOC and NOx) emissions include summer figure. Using 2017 weather station data. Analysis year emissions were calculated using 2017 meteorological data due to insufficient SIP data.

2) PM10 emissions include summer/ winter figures. Using 2017 weather station data. Analysis year emissions were calculated using 2017 meteorological data due to insufficient SIP data.

3) Transportation Conformity: Motor Vehicle Emissions Budgets (MVEB) (Appendix A: El Paso PM-10).

4) Transportation Conformity: Motor Vehicle Emissions Budgets (MVEB) (Appendix A: El Paso Ozone).

TABLE 5-9: SUNLAND PARK OZONE NONATTAINMENT AREA ANALYSIS SUMMARY [1] (EMISSIONS EXPRESSED IN TONS PER DAY)

YEAR	POLLUTANT (TONS/DAY)	
	VOC	NOx
2017 Baseline year	**0.05**	**0.11**
2022	0.05	0.08
2032	0.02	0.04
2040	0.02	0.03
2050	0.02	0.03

1) This conformity determination demonstrates that the total emissions calculated from the modeled roadway network for future years will be at levels below the baseline year (2017) as required for the interim emissions test no-greater-than baseline year. Table 5-9 provides the conformity results for the VOC and NOx no greater-than-baseline year emissions tests.

ENVIRONMENTAL JUSTICE ANALYSIS

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, educational level, or income with respect to the development, implementation, and enforcement of environmental laws. Environmental Justice seeks to ensure that minority and low-income communities have access to public information for human health, environmental planning, regulations, and enforcement. It ensures that no population, especially the elderly and children, are forced to shoulder a disproportionate burden of the negative human health and environmental impacts of pollution or other environmental hazards. Title VI of the Civil Rights Act (42 US Code 2000 and Executive Order 12898) requires an Environmental Justice review, which entails a thorough evaluation of project effects to persons belonging to low-income populations and minority groups.

Using the guidance contained in the metropolitan planning regulations, Environmental Justice considerations were incorporated into the development of the RMS 2050 MTP through the following steps:

ENVIRONMENTAL JUSTICE AND THE MTP

1. A GIS-based analysis of the proximity of proposed transportation improvements to Environmental Justice communities was performed;
2. The EPMPO ensured that public transportation providers, upon which the Environmental Justice community is most dependent, were strong partners in the planning process; and
3. The EPMPO focused on developing a multimodal transportation system that served diverse travel markets and supported the trip purposes of various transportation consumers, including the identified Environmental Justice population.

Identifying potential impacts on Environmental Justice communities involves a three-step process like the one used for the environmental mitigation analysis:

- Identify minority and low-income populations as described in Title VI;
- Identify and assess the potential impacts of proposed transportation improvements on these communities; and
- Address possible mitigation activities at a system-wide level

TABLE 5-10: SOCIO-ECONOMIC INDICATORS OF THE EPMPO METROPOLITAN PLANNING AREA

	2018	PERCENT OF TOTAL POPULATION
Total Population	882,680	
Total Minority Population[a]	776,182	87.93%
Black or African American	25,756	2.92%
American Indian or Alaska Native	2,266	0.26%
Asian	9,313	1.06%
Native Hawaiian or Other Pacific Islander	1,022	0.12%
Hispanic or Latino	730,262	82.73%
Some Other Race Alone	426	0.05%
Two or More Races	7,137	0.81%
White (Non-Hispanic)	106,498	12.06%
Total Population for Whom Poverty Status is determined	867,135	
Low Income Population[b]	191,863	22.13%

a) Minority incudes population who identify their race as any race other than white, or who identify their ethnicity as Hispanic or Latino. Table B03002

b) Low income population includes individuals whose income is below the poverty percent. Table B17021

Source: 2018 American Community Survey 5-Year Estimates. ACS data are based on a sample and are subject to sampling variability

Executive Order 12989 defines Environmental Justice populations as low-income and minority groups. This rule states that federally funded agencies must identify and address disproportionately high and adverse impacts of their programs, policies, and activities on Environmental Justice populations. To identify these populations, an Environmental Justice Index was determined for low-income and minority population for 2018 (latest available at the time of the analysis).

Environmental Justice Index is a method that has been used by several MPOs including NCTCOG and H-GAC to satisfy FTA requirements. The method identifies Environmental Justice populations using demographic data at the census block group level. A census block group is considered to have a high concentration when the block group percentage for the socio-economic indicator exceeds the regional percentage. The Environmental Justice Index map is meant to identify where further analysis is needed and is not meant to act as the analysis itself. Data for the index is based on American Community Survey 5-year estimates.

Variables used to calculate the Environmental Justice Index are:

TOTAL MINORITY POPULATIONS

The Total Minority variable describes the percentage of Total Minority persons in the block group. Racial or ethnic minority groups that are included in the Total Minority variable for the Environmental Justice Index (EJI) include:

- American Indian or Alaska Native Race
- Asian Race
- Black or African American Race
- Hispanic or Latino Ethnicity
- Native Hawaiian or Other Pacific Islander Race
- Some other race (non-White)
- Two or More Races (could include white)

Total Minority is the sum of the number of individuals who are Hispanic or Latino and the number of non-Hispanic non-Latino individuals who identify as one of the above minority race categories. This prevents double-counting of Hispanics or Latinos who also identified themselves as a race or races other than white. Each block group is displayed as either above or below/equal to the regional percentage for Total Minority.

The EPMPO region is a "majority minority region". Hispanic/Latino residents are the most numerous racial/ethnic group in the EPMPO area with 82.7%. The regional percentage for Total Minority is 87.9%

LOW-INCOME POPULATIONS

The regional percentage of persons below the poverty level for the EPMPO area is 22.1%. Low-income populations are the individuals identified below the poverty level as determined by the Census Bureau. The Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family threshold, then that family and every individual in it is considered in poverty.

The Environmental Justice Index was designed to represent block groups above the regional percentage for one or both EJ variables. The Environmental Justice map (**Figure 5-6**) presents the regional percentage for both EJ variables in relation to RMS 2050 capacity expansion transportation projects.

As stated earlier, project-scale studies should be conducted in the planning and environmental phases of each project to determine actual impacts to these communities. 34 MTP projects are potentially impacting the identified Environmental Justice areas. Approximately 61% percent of capacity expansion projects may impact identified Environmental Justice areas.

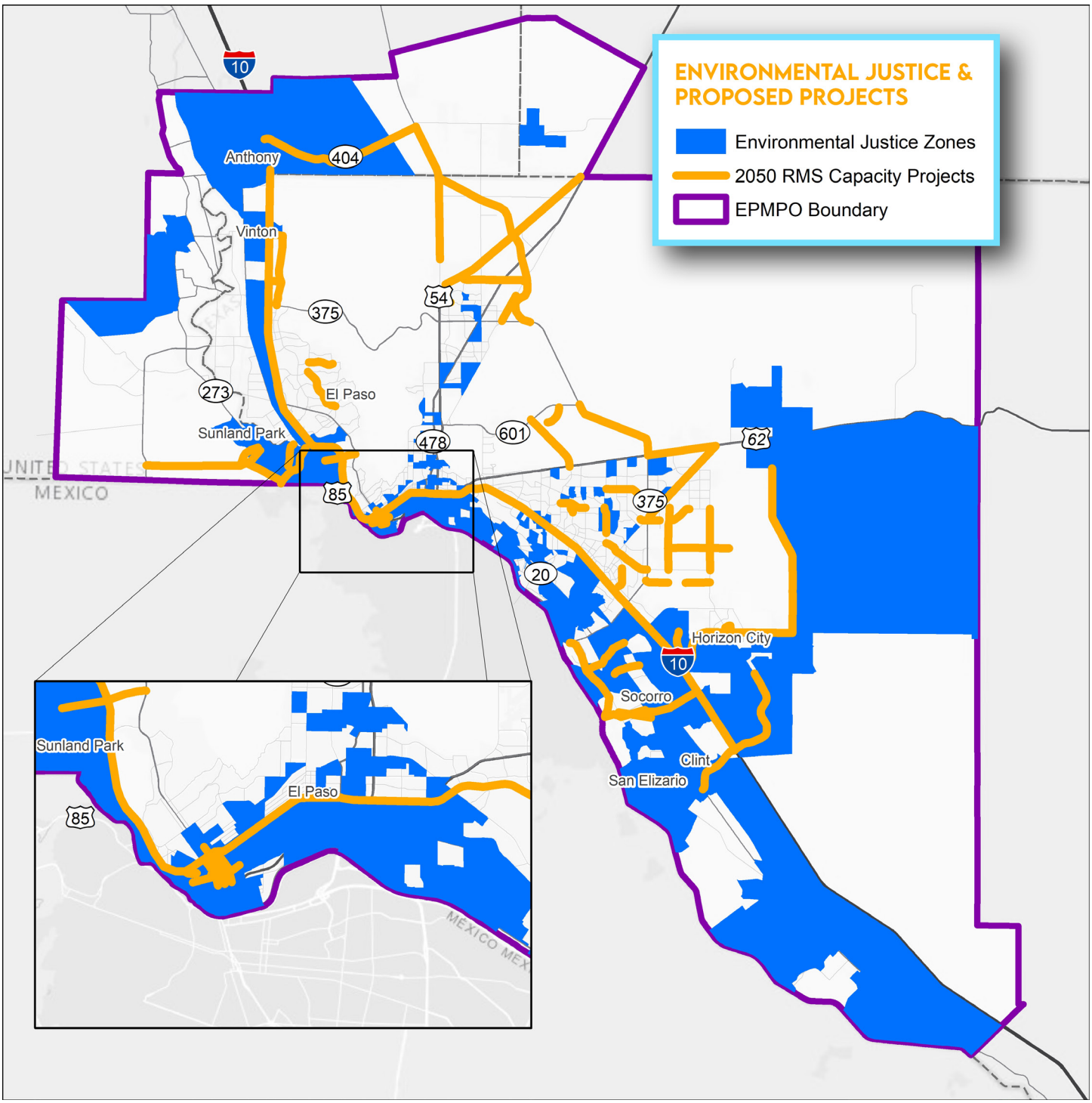
Like the environmental mitigation analysis, a more detailed, project-level analysis will need to be performed to better understand the likely impacts of transportation improvements on Environmental Justice populations. The proximity of projects to Environmental Justice populations may have both positive and negative impacts. For example, it is assumed that the mobility, access, and safety benefits of most projects accrue most strongly to those areas in close proximity to the project. Therefore, if the project objectives are consistent with the travel market needs of adjacent communities, the project is viewed as having a positive impact.

On the other hand, the physical impacts of project construction and footprint also have the greatest negative impacts on adjacent communities. Large infrastructure projects whose objectives are not consistent with community needs represent potential negative impacts. Examples include the construction of a new railway line that may create safety and noise pollution concerns, the construction of a new roadway that divides an existing community or creates barriers to other resources and/or activities, or improvements that may increase freight traffic or the movement of hazardous materials through low-income areas.

The key consideration in determining unintended consequences or disparate impacts to Environmental Justice populations is how the project objectives match the community's transportation needs.

The EPMPO is committed to working with project sponsors to mitigate negative impacts on Environmental Justice communities using measures such as impact avoidance or minimization and context sensitive solutions (appropriate functional and/or aesthetic design features).

FIGURE 5-6: ENVIRONMENTAL JUSTICE AND PROPOSED PROJECTS



SYSTEM LEVEL PERFORMANCE EVALUATION

As described in Chapters 2 and 3, the EPMPO has adopted a series of performance measures that allow the MPO to quantify the potential impacts that the RMS 2050 plan will have towards achieving the region's mobility and quality of life goals. The final evaluation performed as part of the systems level evaluation of the proposed projects compared the performance measures calculated for the 2017 Base Year and 2050 "No Build" Scenarios to the performance of the 2050 "Build" Scenario. In general, the Build Scenario improves on almost every performance measure when compared to the No-Build scenario, although there is a moderate increase in the total and per-capita VMT (and subsequently a modest increase in the estimated average trip cost).

The percent of non-single occupancy vehicle (SOV) trips remains the same in the Build and No Build scenarios, as there are no major differences in implementation of Travel Demand Management Strategies between the two scenarios. Additional or more specific performance measures can be obtained directly from the Travel Demand Model's output Summary Report.

The results of the scenario analysis comparisons for performance measures are shown in **Table 5-11.**

When comparing maximum daily CO emissions base year to the Build and No-Build scenarios, a large reduction is observed due primarily to advances in motor vehicle technology. These emissions were calculated by utilizing the enhanced Transportation Air Quality Sketch Planning Tool for the El Paso Region (Sketch Tool), prepared under a grant from the Texas Commission on Environmental Quality (TCEQ) by Texas A&M Transportation Institute.

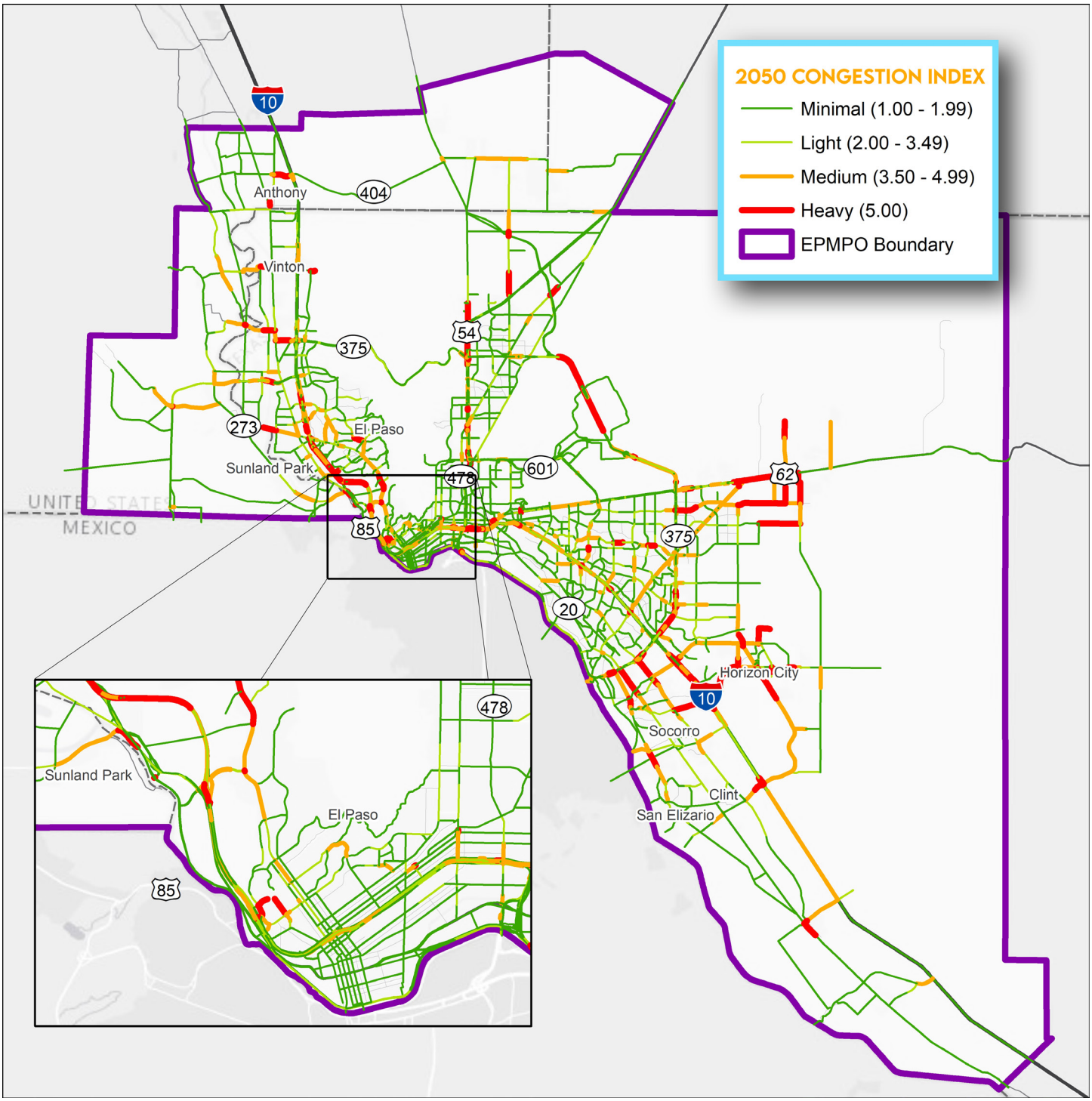
The Sketch Tool-TDM Module is based on MOVES emission rates for different vehicle types and activity types (See Appendix K).

TABLE 5-11: SCENARIO PERFORMANCE MEASURE COMPARISON

	2017 BASE	2050 NO-BUILD	2050 BUILD	BASE VS. NO-BUILD	BASE V.S BUILD	NO-BUILD VS. BUILD
Travel Time Index	1.13	1.18	1.14	+4%	+1%	-3%
PM Peak Hour Delay per Capita (mins)	0.38	0.62	0.48	+63%	+26%	-23%
Average peak-period commuter minutes in EJ zones	33.56	36.51	36.11	+9%	+8%	-1%
% of population within 1/2 mile of high-quality rapid transit stops	3.66%	18.81%	18.70%	+270%	+300%	+8%
% of jobs within 1/2 mile of high-quality rapid transit stops	11.23%	25.56%	25.47%	+121%	+121%	0%
% of non-SOV trips	56.60%	56.50%	56.50%	0%	0%	0%
Average trip costs	$2.33	$2.34	$2.42	0%	+4%	+3%
Max daily CO emissions [Ton/day]	82.33	27.77	32.77	-66%	-60%	+18%
Max daily PM10 emissions [Ton/day]	5.02	6.86	6.86	+37%	+37%	0%
Daily VMT Total (million miles)	17	22.8	23.6	+34%	+39%	+4%
Daily VMT per capita	19.4	20.66	21.43	+6%	+10%	+4%

Forecasted year 2050 shows anticipated roadway performance including the proposed improvements for RMS 2050. In general, the outputs indicate reduction from heavy to medium congestion along IH-10 and Loop 375 south of Spur 601. However, there is also a significant increase in the amount of moderate to heavy congestion through the network. In general, forecasted increases in congestion are shown along Loop 375 north of Spur 601 and along Montana Avenue East of Zaragoza Boulevard. A major takeaway from the analysis is the significant increase in congestion particularly in the Mission Valley region near the City of Socorro and far east region at the County of El Paso and Horizon City. These congestion patters are prevalent even with the proposed improvements for RMS 2050 which provides an eye opening to stakeholders to either prevent or avoid the increase demographics by preventing sprawling and/or promoting alternate modes of transportation.

FIGURE 5-7: CONGESTION INDEX 2050



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