APPENDIX: DEMOGRAPHIC UPDATE

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El Paso Travel Demand Model
Demographic Development

March 2021

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VERSION HISTORY

Release Date	Version Number	Description
October 2020	**1.0**	**Original Submission**
December 10, 2020	**1.1**	**Minor revisions based upon quality review conducted by TxDOT and new information on Fort Bliss. Appendices added to document reviews and revisions.**
March 9, 2021	**1.2**	**Minor revisions based upon quality review conducted by TxDOT and new information on schools.**

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INTRODUCTION

This report describes the procedures and data sources used to develop the socioeconomic inputs for the milestone year and forecast years of the El Paso Travel Demand Model (TDM). TDMs measure the expected demand placed on the transportation system by the various activities of users in the study area. TDMs also attribute origin and destination points for the users' activities. To accomplish this, TDMs require reliable estimates and realistic forecasts for population and employment on which to base the models' assumptions.

The socioeconomic data needed to run the model was gathered from a mixture of sources, including public domain data sources, published commercial datasets, stakeholder input via the Delphi Process, table-top GIS analysis, and limited field review of the study area. The **Development of Base Year Socioeconomic Inputs** section of this report provides an overview of the information and methodology used in the development of the 2017 base year socioeconomic inputs, including details about these data sources. The data described in this section is of particular importance because it is used to validate the accuracy of the TDM's replication of the 2017 base year transportation system conditions.

The **Development of Forecast Year Socioeconomic Inputs** section of this report describes the process used to develop the horizon year and interim milestone year socioeconomic forecasts. This section includes an overview of the Delphi consensus-building process and its outcomes. The Delphi process was used to develop the final subarea control totals included in this section. This section also provides a description of the methodology and results of the allocation of the forecast year control totals to the Traffic Analysis Zone (TAZ) level.

Due to the importance of the socioeconomic inputs to the overall development and application of the El Paso TDM, the socioeconomic estimates and forecasts were developed in close cooperation with El Paso Metropolitan Planning Organization (MPO). The steps performed to acquire, assemble, and format the appropriate TAZ level socioeconomic data inputs for model development and application are also presented in this section.

DEVELOPMENT OF BASE YEAR SOCIOECONOMIC INPUTS

This section identifies the data sources and methodology used to develop the base year socioeconomic inputs for the El Paso TDM. The data described in this section consists of population, household, employment, and median income estimates at the TAZ level. This section also identifies and defines base year special generators within the El Paso TDM study area. Accurately defining the milestone year socioeconomic values is key to developing an accurate forecast, and important to ensuring that the milestone year El Paso TDM can be validated to represent the areas travel patterns.

STUDY AREA

The El Paso study area consists of the entire jurisdiction of El Paso County, which is located at the far western tip of the state of Texas, along with the southern portions of Doña Ana and Otero Counties in southern New Mexico The region is located in the northern part of the Chihuahuan Desert. The study area's terrain is mountainous, crossed by the Franklin Mountain range on the west side of El Paso County and the Hueco Mountain range on its east side. The Franklin Mountains bisect the city of El Paso, while the Hueco Mountains are located in an area of El Paso that is thinly populated. The area between the two mountain ranges is generally flat but, in places, is cut by arroyos and the historic floodplain of the Rio Grande River. The Rio Grande River traverses El Paso and Doña Ana Counties and provides the counties' only meaningful source of surface water. The Rio Grande also supports agriculture within its historic floodplain in both El Paso and Doña Ana Counties.

Most of the population within the El Paso MPO study area is concentrated in the City of El Paso. However, there are seven other smaller, incorporated cities in the region, which are: Socorro, TX; Horizon City, TX; Sunland Park, NM; Anthony, TX; Anthony, NM; Vinton, TX; and Clint, TX. There are also three other unincorporated communities that have distinct identities, which are: Fabens, TX; Santa Teresa, NM; and Chaparral, NM.

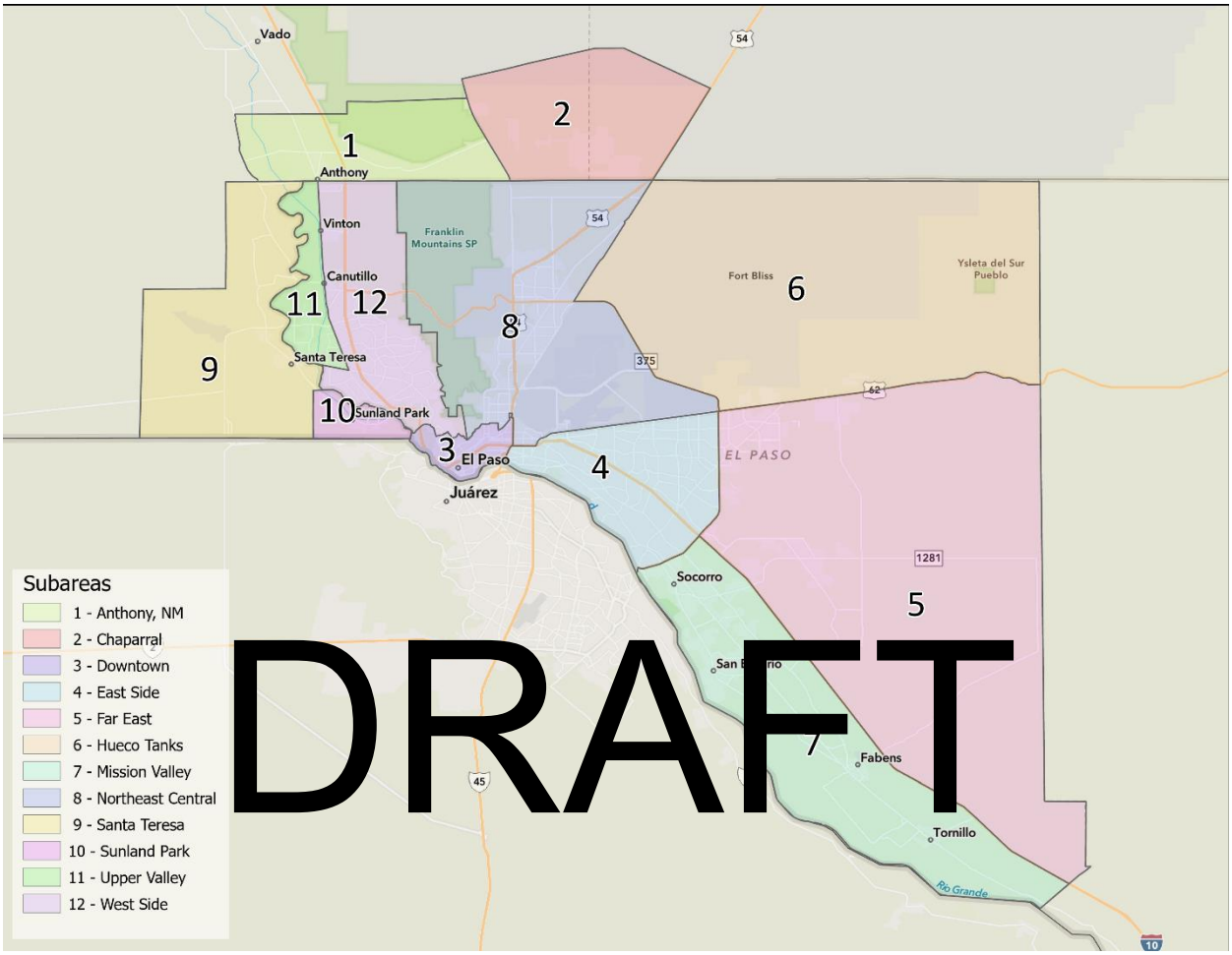
Although, El Paso County has an area of 1,057 square miles, there are sizeable portions that are either restricted or impracticable for private development. Most of the Franklin Mountains range is protected within the 24,000-acre Franklin Mountains State Park or lies within the contiguous 7,000-acre Castner Range at Fort Bliss. Fort Bliss is a 1,700 square mile U.S. Army base located in Texas and New Mexico, with its main post located contiguous with the City of El Paso. A large area of north central El Paso County is not available for private development because the area lies within Fort Bliss' boundaries. On the eastern side of El Paso County, water availability is limited or non-existent, which severely limits land development opportunities.

Development opportunities are further constrained by the tens of thousands of acres of land that were subdivided and sold by the Horizon Development Corporation, Ltd. during the late 1960s and early 1970s. Billed as an up-and-coming suburban community by its developers, water service and other infrastructure were never provided, and the land was essentially uninhabitable. However, by fracturing its ownership among literally thousands of landowners, it is now almost impossible to assemble a large tract of land among the parcels that would be suitable for redevelopment. This inability to assemble a large tract is primarily due to the expense and difficulty of identifying and finding owners or their heirs and the transaction costs of purchases. Additionally, there are still likely many owners or their heirs who hold unrealistic expectations of the land's true value. Another complicating factor is the Texas Colonias Fair Land Sales Act of 1995, which forbids the sale of subdivided land parcels of less than five

acres unless the seller provides access to water, wastewater, and drainage service. This law effectively prevents the owners of parcels from selling their subdivided lots to another person or entity who could assemble them for resale or development. To a lesser extent, there is also undevelopable land in Doña Ana County, east of IH 35 and north of the Texas-New Mexico border. This public land is owned by the U.S. Department of the Interior's Bureau of Land Management (BLM).

For study purposes, the MPO study area was split into 12 districts as shown in **Figure 1**. These 12 districts were developed according to the localized delineations of the region and were used to develop more accurate forecasts using an innovative forecasting method described later in this report.

Figure 1: El Paso TDM Study Area



BASE YEAR CONTROL TOTAL

To develop the base year control totals for the El Paso TDM study area, several reliable data sources were used. Sources for formulation of the 2017 population, household, and employment control totals included the following both government sources and proprietary sources:

- 2017 U.S. Census Bureau Population Estimates[1];
- 2017 American Community Survey (ACS) 5-year data and 1-year data[2];
- 2017 Texas Demographic Center (TDC) Population Estimates[3];
- 2017 Geospatial & Population Studies, University of New Mexico (UNMGPS) Population Estimates[4];
- Woods & Poole Complete Economic and Demographic Data Source (CEDDS).

Base year employment control totals were developed using the following sources:

- 2012 and 2017 U.S. Census Bureau County Business Pattern (CBP) data;
- 2012 and 2017 U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) data;
- 2012 and 2017 Bureau of Economic Analysis (BEA) county level employment data;
- Woods & Poole Complete Economic and Demographic Data Source (CEDDS);
- 2017 Annual Survey of Public Employment & Payroll (ASPEP);
- 2017 Integrated Postsecondary Education Data System (IPEDS) data; and
- 2017 Texas Education Agency (TEA) data;
- 2017 National Center for Education Statistics (NCES) data; and
- 2017 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) data.

The TDC demographic control total recommendations documented in the June 1, 2020 memorandum titled "Development of Demographic Control Totals for the El Paso Metropolitan Planning Organization" were adopted by the El Paso MPO. Since the TDC data did not include complete information for New Mexico counties, details were added to the TDC control totals for the two partial counties in New Mexico for group quarter population, households, and employment by type based on the information presented in the TDC control total memorandum. **Table 1** presents the adopted 2017 Base Year

[1] *More information can be found at https://www.census.gov/programs-surveys/popest.html*

[2] *More information can be found at https://www.census.gov/programs-surveys/acs/*

[3] *More information can be found at https://demographics.texas.gov/Data/TPEPP/Estimates/*

[4] *More information can be found at https://gps.unm.edu/about*

Population Control Totals by County, and Table 2 presents the adopted Employment Control Totals by County. **Table 13** in *Appendix A* provides a list the employment type definitions, which follow the TXDOT Socioeconomic Guidelines[5].

Table 1: Base Year Population County Control Totals

Area	Total Population	Group Quarter Population	Households	Average Household Size
El Paso County	840,410	14,228	269,523	3.07
Doña Ana County	215,579	6,573	75,441	2.77
Otero County	65,817	3,429	23,007	2.71
Doña Ana County within Study Area	47,108	29	13,486	3.49
Otero County within Study Area	10,531	2092	2408	3.50
Total Study Area	898,049	16,349	285,417	3.09

Table 2: Base Year County Employment Control Totals

Area	Total	Basic	Retail	Service	Education
El Paso County	3[illegible],204	62,85[illegible]	[illegible],774	12[illegible]988	37,590
Doña Ana County	[illegible],516	14[illegible]	[illegible],692	3[illegible]720	9,942
Otero County	17,371	2,316	2,563	10,824	1,668
Doña Ana County within Study Area	9,583	1,821	1,679	3,910	2,173
Otero County within Study Area	886	343	231	252	60
Total Study Area	311,673	65,016	76,684	130,150	39,823

[5] *Texas Department of Transportation, Transportation Planning & Programming. September 30, 2016. Socio-Economic Guidelines.*

BASE YEAR SOCIOECONOMIC ALLOCATION METHODOLOGY

This section describes the methodology used to allocate both population and employment to the TAZ level for inclusion in the El Paso TDM.

Population and Household Allocation Methodology

To allocate demographics to the TAZ level, 2017 population and household estimates were developed at the block level. The county control total for household population, group quarter population, and total households are first allocated to the census block group level based on 2017 ACS 5-year block group level data. The block group level group quarter population was directly allocated to the block level based on the 2010 census block level group quarter population. There was a lack of detailed information on growth patterns below the block group level. Therefore, the change in the number of workers living in each block from 2010 to 2017 (reported in the 2010 and 2017 LEHD LODES data set) and the number of households (from 2010 U.S. Census and 2017 ACS 5-year data) were used to estimate changes in the number of households at the block level. To ensure accuracy of the 2017 household total at the block level, ACS 2017 block group level household data were used as a population control, and accuracy checks were performed to ensure the accuracy of high-growth areas. The number of people in households within each block was derived by allocating block group population in households based on the total households multiply by the 2010 average household size. Once reasonableness checks were completed, the 2017 census block data was aggregated to the TAZ level. **Figure 2** shows the results of the demographic allocation to the TAZ level for the base year.

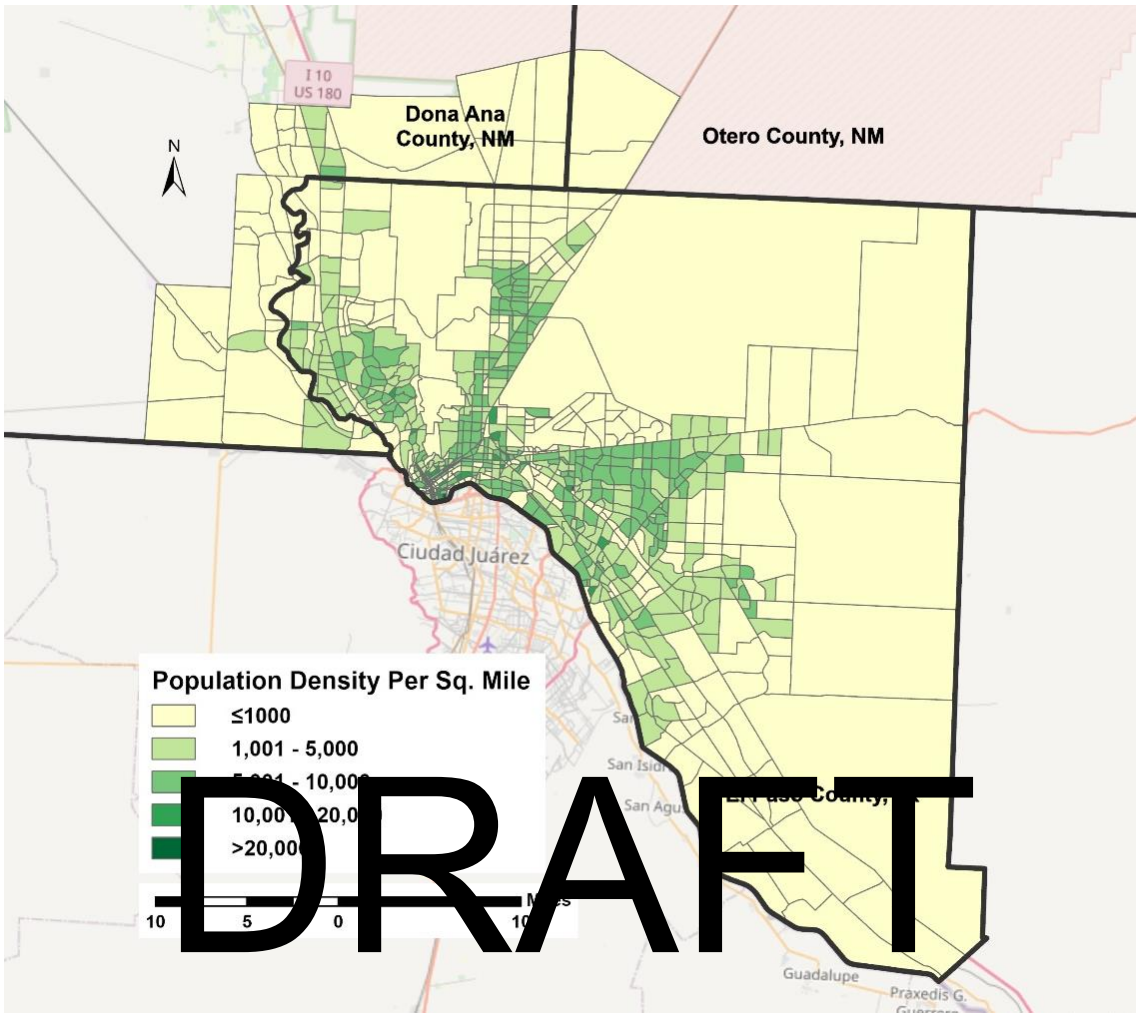


Figure 2: 2017 Population Density

Group Quarter Methodology

The base year county control total for group quarter population was allocated to the census block group level first based on 2017 ACS 5-year block group data. The estimated block group level group quarter population was then allocated to census blocks based on 2010 census block group quarter population. Finally, the census block level group quarter population was aggregated to develop the base year group quarter population for each TAZ.

Employment Allocation Methodology

2017 base year employment was allocated to the TAZ level using the 2017 InfoUSA data provided by the El Paso MPO. Since the InfoUSA data contains latitude and longitude attributes, the data can be directly aggregated to the TAZ level. To ensure accuracy, an extensive review of the InfoUSA data was conducted. This review focused on the accuracy of the locational information of the businesses and reasonableness of the level of employment presented in the data. Once reviewed and any necessary adjustments made, employment was aggregated to the TAZ level. When the aggregation process was

complete, a thorough quality assurance review of each TAZ was undertaken. Results of the 2017 employment TAZ allocation process are shown in **Figure 3**.

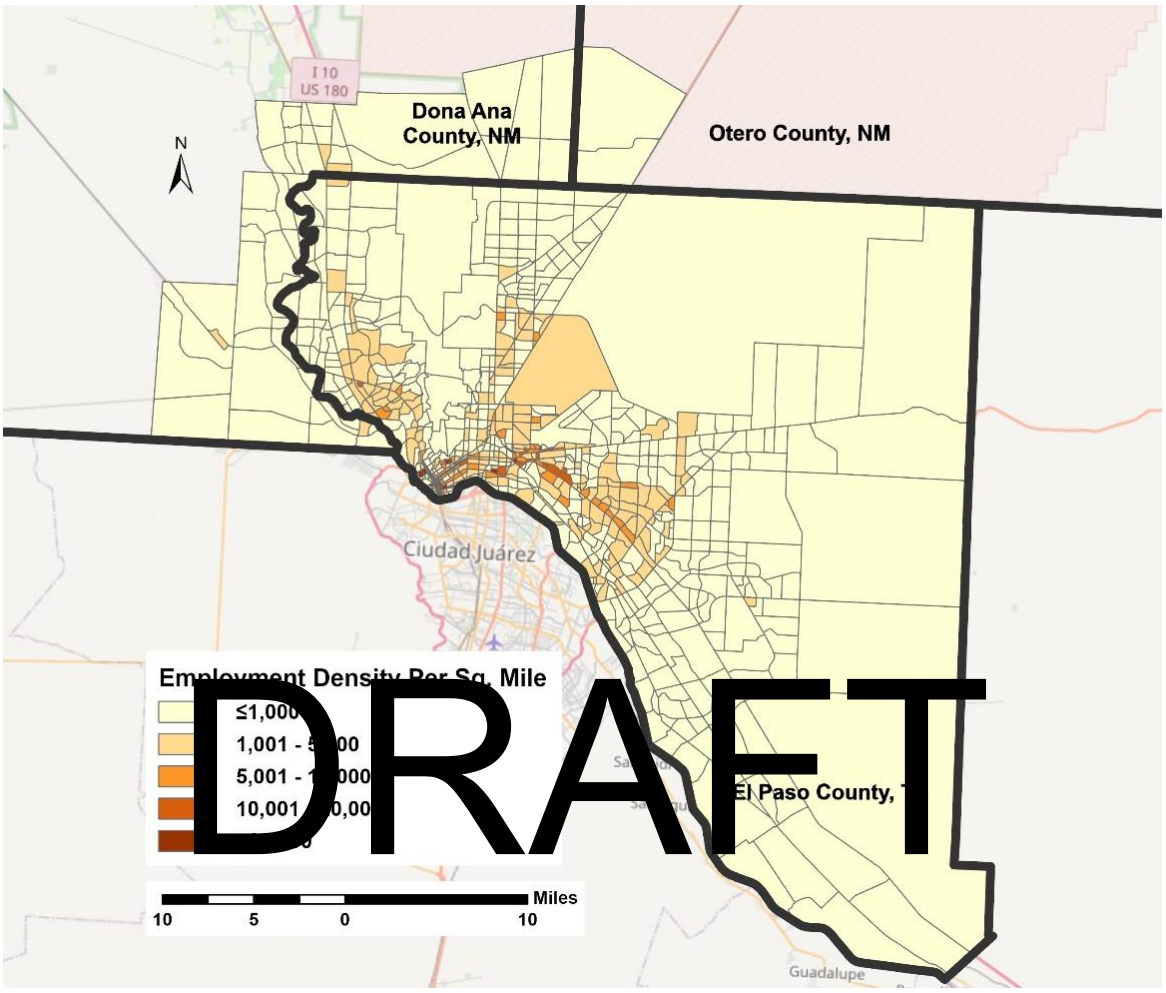


Figure 3: 2017 Employment Density

Average Worker Per household

Average worker per household information was derived based on 2017 ACS 5-Year block group level population employment status data.

BASE YEAR MEDIAN INCOME

Household distribution data by income is only available from the 2013-2017 ACS 5-year estimates at the census block group level. To develop median household income at the TAZ level, it was assumed that the household income distribution information at the block level was identical to the block groups, i.e., the percentages of household in each income group at the Census block group level was used in all of the blocks within the block group. Based on this assumption, the number of households by income

group at the TAZ level was calculated by aggregating the block level number of households by income group. Assuming that households were uniformly distributed within each income strata, the income which corresponds with the 50th percentile household was calculated as the median income of each TAZ. The median household income in the study area provided in the TDC control total memorandum was $40,302.

BASE YEAR SPECIAL GENERATORS

Special generators are activity centers that exhibit travel characteristics that do not follow the normal travel patterns in the study area. Typically, this means that a special generator attracts more trips than can be predicted using the normalized trip attraction rates from the study area data. There are several reasons for this phenomenon, as a result these special generators have been classified as:

- A site that operates 24/7 with multiple shifts of employees such as hospitals and border patrol stations;
- A site with high trip attraction rates and employment numbers, such as shopping malls and other retail centers;
- A site of unique character in comparison to other activity centers, such as regional airports and shipping ports; or
- A site with a special population of trip makers such as the students at a university or college, or active duty personnel at a military base.

The use of special generators in the model set should be exercised judiciously and to the minimum degree possible. This conservative approach is necessary because special generators require additional data, additional modeling steps, and call for a level of subjectivity that has the potential to bias model performance.

Except under very unusual circumstances, special generators do not include areas that are primarily the home-based production end of the trip such as residential areas. These areas are normally embraced within the limits of travel surveys, and the variations among types are typically accounted for during calibration of the model. Home-based trip attractions and trip productions and attractions for non-home-based travel play a larger role in special generator markets.

The special generators for the El Paso TDM were identified during the development of the demographic and employment data. These special generators were aggregated into education, basic, service, and retail employment categories. The final set of special generators was limited to locations that ensured consistency with the 2012 El Paso TDM and exhibited an exceptional amount of travel not expected to be otherwise accounted for through the normal trip generation model.

Data that can represent the size or the level of trip activities were assembled for each special generator. **Table 3** presents the special generator information for malls, hospitals, the airport, and university or colleges. K-12 schools are considered special generators, therefore employment for K-12 schools is presented in **Appendix B**.

Table 3: Special Generators

TAZ	Special Generator Description	SG Basic	SG Retail	SG Service	Edu2[6]
222	BASSETT PLACE MALL		741		-
713	CIELO VISTA MALL		2,087		-
411	SUNLAND PARK MALL		904		17
266	EL PASO COMMUNITY COLLEGE- ADMINISTRATIVE SERVICES CENTER	-	-	-	373
463	EL PASO COMMUNITY COLLEGE- MISSION EL PASO CAMPUS	-	-	-	214
498	EL PASO COMMUNITY COLLEGE- NORTHWEST CAMPUS	-	-	-	132
38	EL PASO COMMUNITY COLLEGE- RIO GRANDE CAMPUS	-	-	-	421
369	EL PASO COMMUNITY COLLEGE- TRANSMOUNTAIN CAMPUS	-	-	-	272
293	EL PASO COMMUNITY COLLEGE- VALLE VERDE CAMPUS	-	-	-	1,316
651	THE UNIVERSITY OF TEXAS AT EL PASO	-	-	-	3,519
220	VISTA COLLEGE, SOUTHWEST UNIVERSITY AT EL PASO	-	-	-	394
375	WESTERN TECHNICAL COLLEGE	-	-	-	103
610	WESTERN TECHNICAL COLLEGE	-	-	-	168
230	EL PASO INTERNATIONAL AIRPORT	339	106	839	-
272	DEL SOL MEDICAL CTR	-	-	1,100	
98	EL PASO LTAC HOSPITA	-	-	74	-
659	EL PASO PSYC ATRIC CT EL SO CHIL REN'S OSP AL, UNIVERSITY M DICAL CT EL SO, T AS TECH MEDI L CTR	-	-	4,444	-
319	FOUNDATION URGICA HOSP L PS	-	-	126	-
318	HIGHLANDS REGIONAL REHAB HOSP	-	-	130	-
663	HOSPITALS-SIERRA PROVIDENCE	-	-	765	-
97	KINDRED HOSPITAL-EL PASO, HOSPITALS-PROVIDENCE SIERRA, EL PASO SPECIALTY HOSPITAL	-	-	1,181	-
655	LAS PALMAS MEDICAL CTR	-	-	2,046	-
83	LAS PALMAS REHABILITATION HOSP	-	-	150	-
652	MESA HILLS SPECIALTY HOSPITAL	-	-	84	-
196	PAUL FOSTER SCHOOL OF MEDICINE	-	-	1,246	-
653	PROVIDENCE MEMORIAL HOSPITAL	-	-	1,347	-
101	UNIVERSITY BEHAVIORAL HEALTH	-	-	301	-
657	WILLIAM BEAUMONT ARMY MEDICAL CENTER			2,000	

Figure 4 presents a TAZ map for Fort Bliss. **Table 4** presents the special generator information for Fort Bliss, which was developed based on the employment and family information provided by the Fort Bliss representatives.

[6] *These colleges and universities serve as special generators in the travel demand model. Only The University of Texas at El Paso has its employment represented as Education2. Other colleges and universities are represented with SG_EDU in the demographic file.*

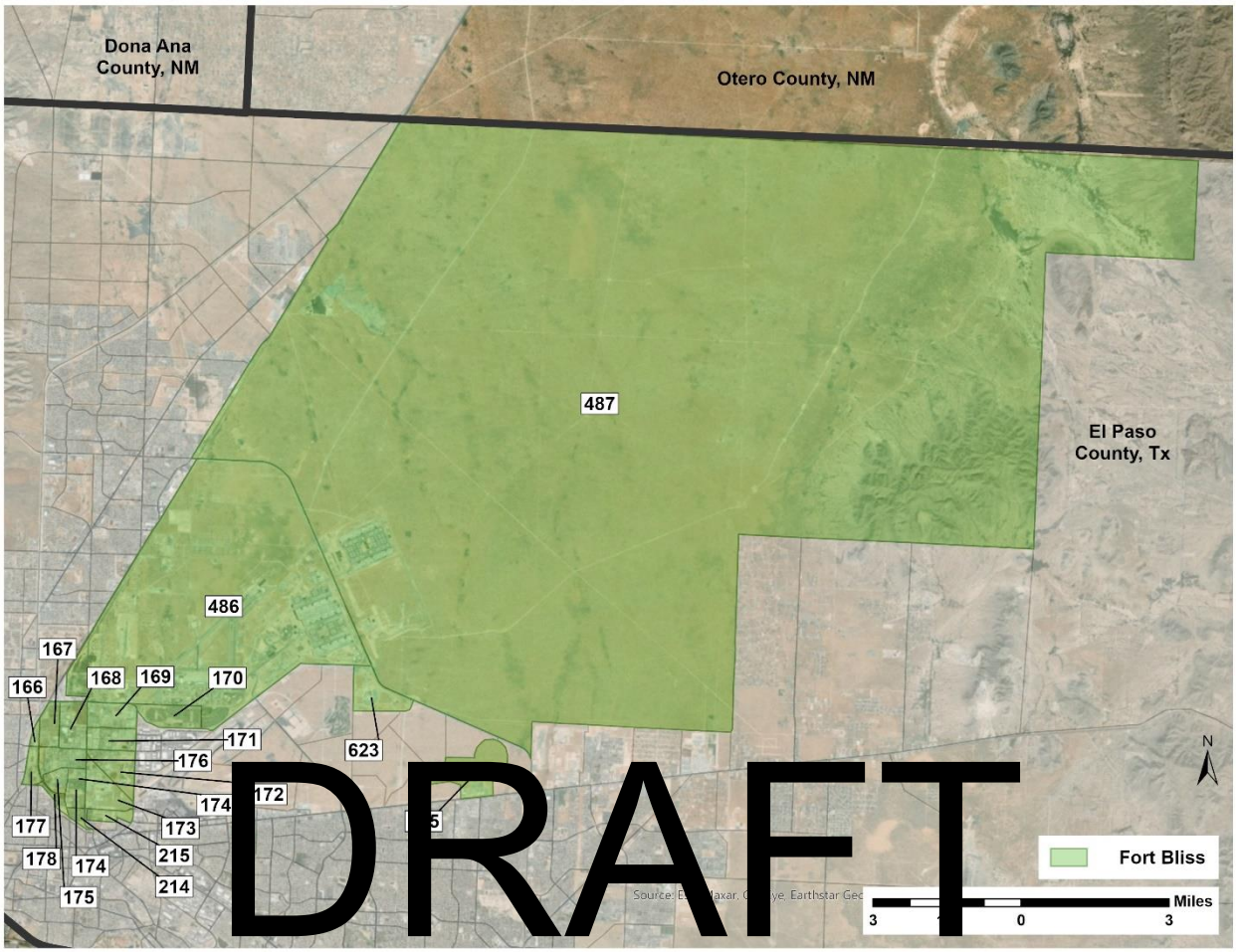


Figure 4: Fort Bliss

Table 4: Fort Bliss Zones

TAZ	Population	Households	SG Service Employment
166	-	-	391
167	2,061	609	455
168	-	-	1,489
169	131	-	1,331
170	2,347	552	156
171	978	-	1,667
172	1,147	107	2,412
173	-	-	1,360
174	2,310	426	162
175	161	40	1,041
176	1,436	277	1,774
177	160	41	454

TAZ	Population	Households	SG Service Employment
178	274	76	26
214	866	261	-
215	245	62	273
486	3,897	143	19,847
487	2,711	-	6,950
623	-	-	222
825	-	-	2,174

AREA TYPE

Area type was developed following the methodology and definition used for developing the area type for the 2012 El Paso TDM. An area type density factor for each TAZ was calculated according to the following formula (Where *k* is zone index.):

$$AT_k = \frac{Population_k + \frac{Regional\ Population}{Regional\ Employment} \times Employment_k}{Acre_k}$$

The Area Type densities were then used to define the area type based on the density factor associated with each area type. The five area types definitions are presented in **Table 5**.

Table 5: Area Type Definition

Area Type	Area Type Name	Area Type Density Factor Range
1	Business District	AT >= 54
2	Urban Intense	54 > AT >= 18
3	Urban Central	18> AT >= 6
4	Suburban	6 > AT >= 2
5	Rural	AT < 2

DEVELOPMENT OF FORECAST YEAR SOCIOECONOMIC INPUTS

This section outlines the methodology and process used to develop the forecast year socioeconomic inputs for the El Paso TDM. Forecast years for the El Paso TDM include 2022, 2027, 2030, 2032, 2040, and 2050. Forecast year demographics are provided on TAZ layers for each forecast year.

The development of 2050 demographics adopted a Delphi process to develop subarea control totals. The interim year demographics was developed based on interpolation of base year 2017 and forecast year 2050. The following sections provides an overview of the Delphi consensus-building process and its outcomes, forecast year county control totals, and the process to develop TAZ level forecast year demographics.

DELPHI PROCESS

As part of the development of reasonable horizon year forecasts for the El Paso TDM, a Delphi Process was conducted to help formulate population and employment projections for the region based on local knowledge. A Delphi Process has proven to be an effective tool for forecasting growth in areas with complex economies or areas where future growth rates are expected to differ from historical trends due to changing local conditions.

The following sub-sections provide a description of the El Paso Delphi Process, including panel recruitment, kickoff meeting, web-based exercises, and final results.

The Delphi method was originally developed in the 1950s to forecast the impact of technology on warfare. The process was developed because trend extrapolation did not adequately take into consideration the rapid changes in technology. The method was developed as a communication method to use the knowledge of a group of experts (as opposed to a single expert) to build a consensus on future outcomes through an iterative process. The success of the Delphi method used by the military in the 1950s was the catalyst for adapting the process for many different public and private projections of future trends.

In the context of this project, a Delphi Process was used to develop future regional population and employment forecasts for the El Paso TDM study area. The El Paso Delphi Process relied on the wisdom and expertise of over 70 community leaders with various areas of expertise and community knowledge to identify patterns in the growth and development of the community. The El Paso Delphi Process had three distinguishing features:

- Input was confidential (to the greatest extent possible) in that responses were not recorded using the name of the responder;
- The process was iterative until consensus was achieved; and
- Group responses were statistically interpretable.

The mechanics of the process involved an initial kickoff meeting, followed by two rounds of online activities. Due to the Covid-19 and social distancing order, the initial kickoff meeting as well as the iterative consensus-building rounds were held online. The Delphi process was used to produce a final product, which was population and employment control totals allocated to 12 subareas within the region.

Panel Recruitment

ATG sent invitation letters, via email, to approximately 94 community leaders throughout the El Paso region with expertise in a variety of areas. Of those invited, 74 accepted the invitation. The invitation letters invited the community stakeholder to participate as panel members in the El Paso Delphi Process. These panel members were recruited from regional government agencies; community organizations; the real estate and development communities; area employers; financial institutions; educational institutions; transit agencies, and other organizations. Invitations were sent to the following community agencies and organizations:

- Area Agency on Aging
- Border Trade Alliance
- Border Plex Alliance
- Dona Ana County
- El Paso County Parks & Rec
- El Paso County Planning
- Hunt Companies, Inc.
- Santa Teresa
- TRE & Associates
- Southwest Land Development
- Canutillo ISD
- Clint ISD
- El Paso ISD
- NMSU
- TTI
- UTEP
- UTEP-HUNT
- IBWC
- City of Anthony
- City of Clint
- City of El Paso
- City of El Paso Bridges
- City of El Paso Fire Dept
- City of Socorro Planning
- El Paso Airport
- El Paso Economic Develop
- Horizon City
- Town of Horizon City
- NM Border Authority
- RMA
- Medical Center of Americas
- Las Palmas Del Sol Medical Center
- Texas Tech Health Science Center
- Fideicomiso Puentes Front
- IMIP
- El Paso MPO
- Mesilla Valley MPO
- New Mexico DOT
- Sun Metro Planning
- UTEP
- Tiwa
- TXDOT- El Paso District
- El Paso Water Utilities
- City of Antony
- Town of Anthony, TX
- City of Sunland Park
- Village of Vinton
- Representative District 1
- Representative District 4
- Representative District 7
- District 8 Chief of Staff
- Commissioner Pct. 2
- Fort Bliss
- University Medical Center

Delphi Website

To provide a communication link with the panel members, ATG hosted the El Paso Delphi Process website. Website content included background information regarding the project; the Delphi Process; the online kickoff meeting and panel; contact information; and helpful links. The website also served as the portal for panel members to access the online sessions and for continued participation following the online kickoff meeting.

Delphi Online Kickoff Meeting

The online kickoff meeting for the El Paso TDM Delphi Process took place on June 11, 2020. The kickoff meeting provided the Delphi panelists an overview of the project and the expected outcomes of the Delphi process. There were 75 Delphi panelists participating in the 2-hour online kickoff meeting.

Main Objectives

Within the greater Delphi Process, the kickoff meeting was designed to address the following objectives:

- Explain the Delphi Process and the TDM forecast development process to participants,
- Identify local factors affecting growth,
- Discuss growth opportunities and constraints unique to the region, and
- Introduce the participants to the Delphi website and the concept of continuous participation.

To meet these objectives, participants took part in a series of activities that are outlined in the sections below.

Online Kickoff Meeting Activities

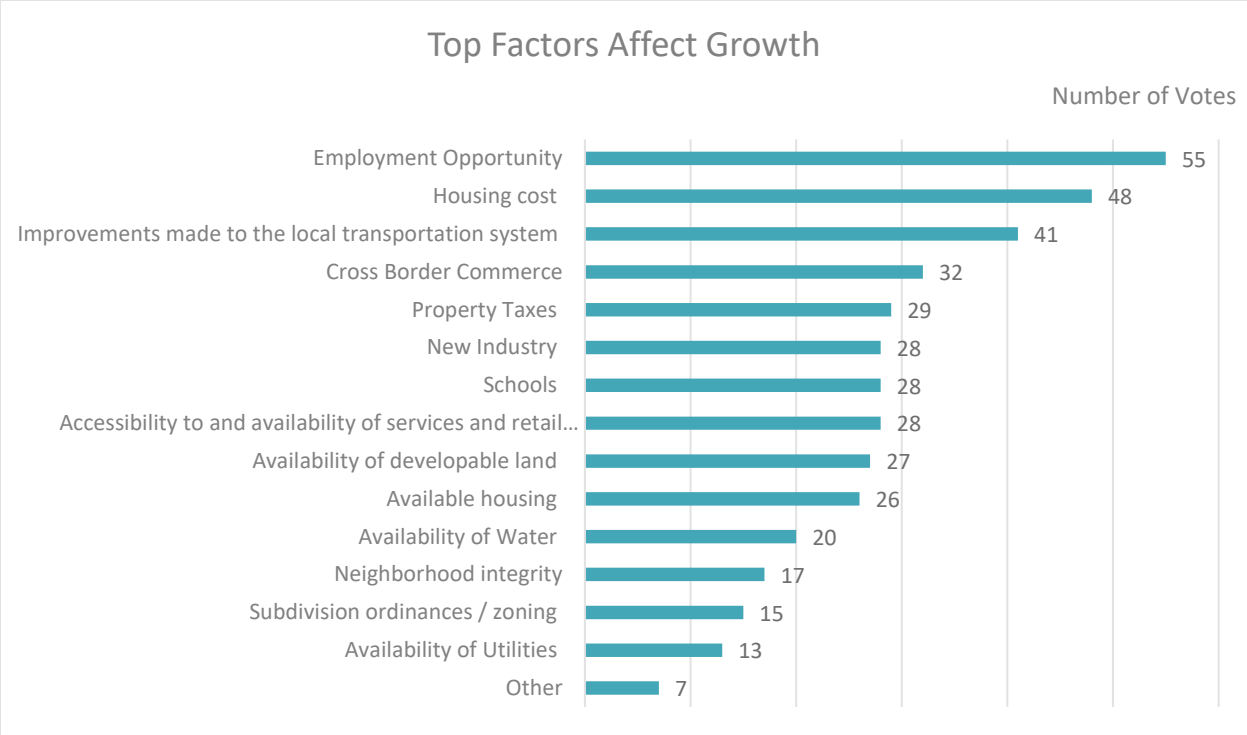
The objectives listed above were met through a set of activities performed through a series of online polls and group discussions. The moderator provided background information and facilitated the group discussions. Participants could see polling results instantly, which allowed them to re-evaluated the information and their opinion on the questions. While the group discussions are used to stimulate thought and share information amongst participants, the Delphi Process relies on individual responses to produce the population and employment forecast estimates.

Who's Here

The attendees began the meeting activities with an initial breakout session meant to familiarize them with the meeting platform and the rest of their group members. Participants were asked to introduce themselves to their breakout groups and state their employment or role in the El Paso region.

Local Factors that Affect Growth

For the second activity, participants were asked to select the top seven factors that most strongly impact growth in the El Paso region. This activity was designed to obtain a better understanding of which of these factors the participating regional experts viewed as having the greatest influence on growth patterns, and which factors were not perceived as important to the region. The activity also prepared participants to allocate the population and employment numbers to the subareas. The chart below summarizes the polling results during the kickoff meeting.



Other factors that were noted by the Delphi participants during the online kickoff meeting included:

- University-based, academic sector (urban economic research);
- University of Texas at El Paso;
- Access to healthcare;
- Safety and security;
- Near sourcing and return of business to the border region from Southeast Asia and changes in the global economy;
- Fort Bliss;
- Lack of corporate headquarters in El Paso;
- Tech and Innovation in energy production; and
- Renewable energy such as solar

Forecast Year Growth

Next, participants were presented with the population and employment projections developed by the Texas Demographic Center, see **Figure 5**. These projections provided the basic background information for participants participating in the later Delphi Web sessions.

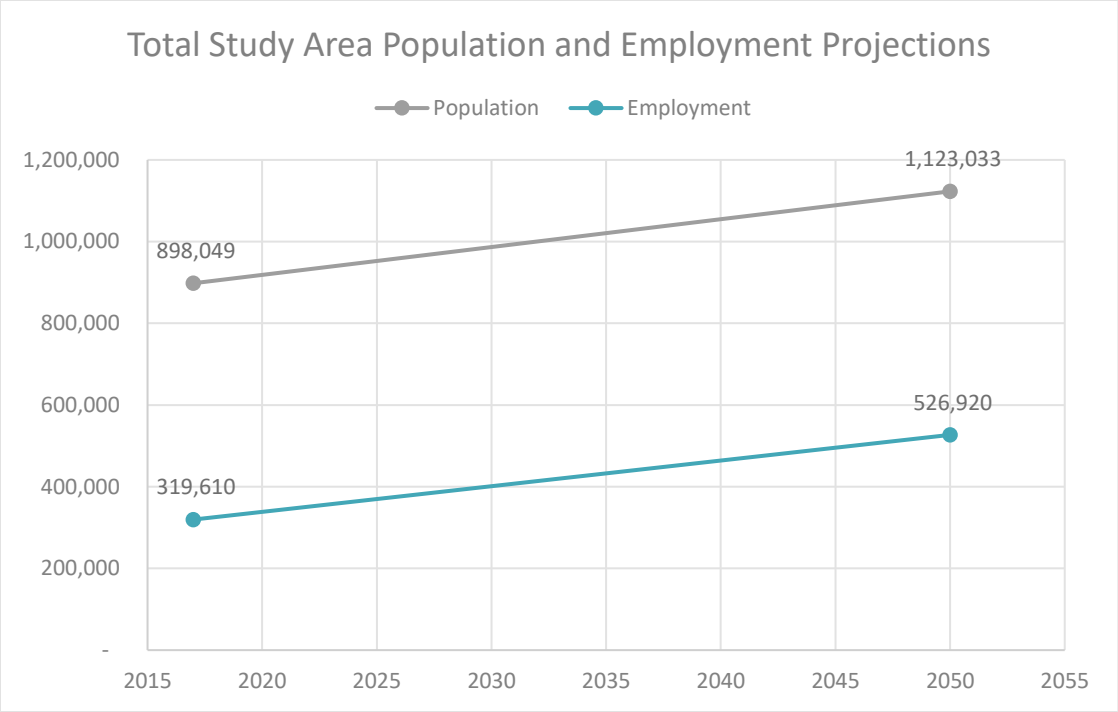


Figure 5: Total Population and Employment Projections

Opportunities and Constraints

Participants were asked to hold a discussion on the opportunities and constraints on growth in the region for each subarea in the online breakout room.

Presented with subarea maps, participants at each breakout room were asked to identify growth opportunities and constraints for the region and locate them on the map. Facilitators took notes and screenshots of participants' comments for each subarea. The results of the exercise served as an important component of the allocation of population and employment to TAZs. An example of a marked-up map from this exercise, on which participants circled the areas under discussion, is shown in Figure 6. Participants identified high and low growth areas; planned residential and commercial/industrial developments; areas with limited infrastructure environmental constraints; and transportation opportunities and constraints; among others. The identified opportunities and constraints collected during the kickoff meeting are summarized in Appendix C.

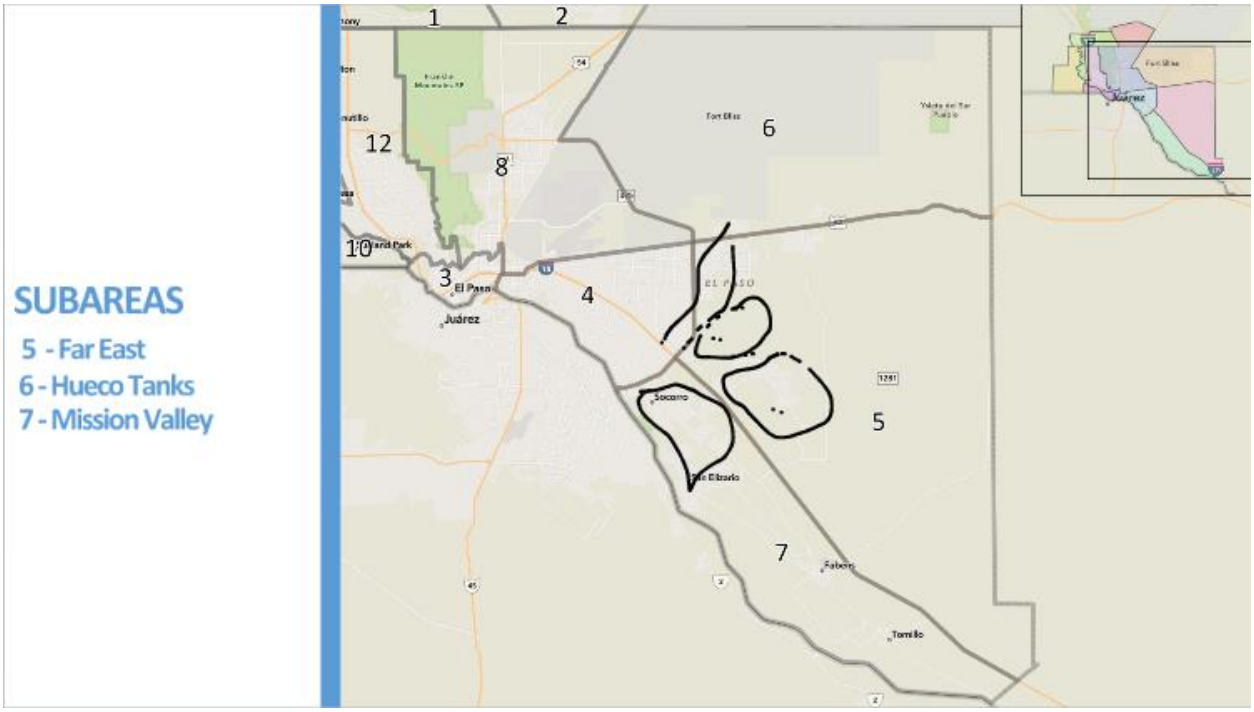
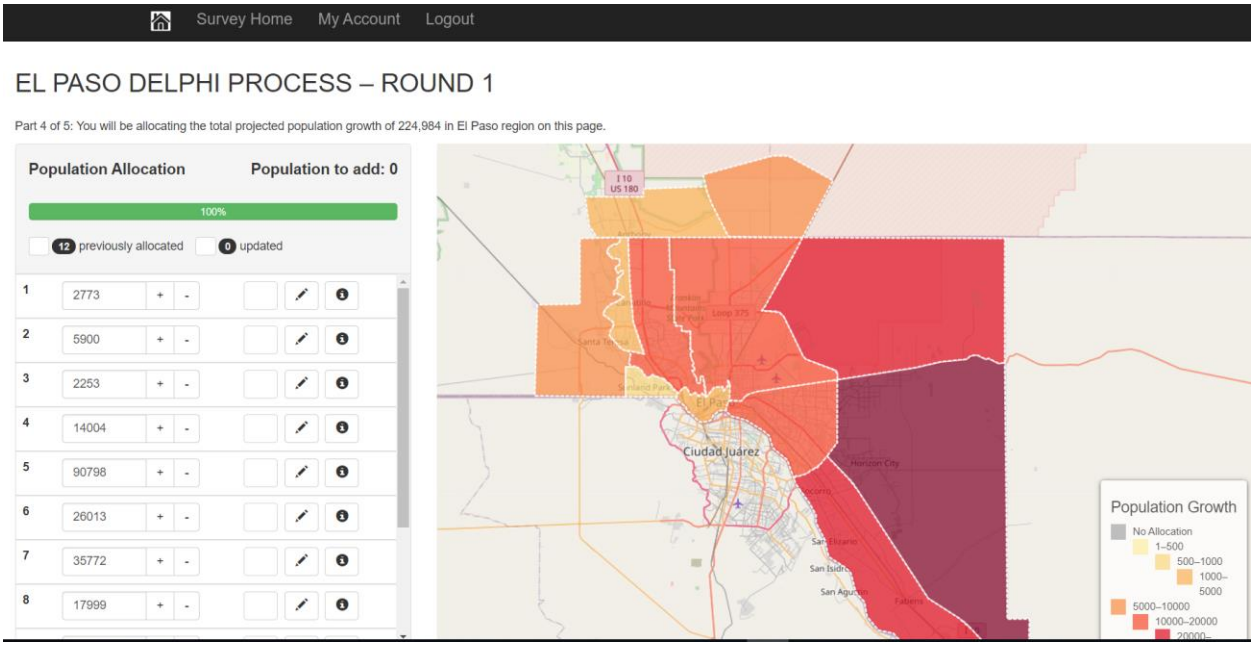


Figure 6: Screen Shot of Opportunities and Constraints Discussion

Orientation of the Web-based Process

During the online kick-off meeting, the Delphi panelists were presented the tool for the web-based exercise. **Figure 7** depicts an example of the population allocation tool used in the Delphi web-based process.

Figure 7: El Paso Delphi Process Web Session Interface



Online Kickoff Meeting Outcomes

Outcomes of the kickoff meeting included informing the participants about the process of the Delphi forecast development and its implications. During the meeting, participants also provided the project team with valuable insight into the general factors that affect growth in the region, as well as the unique growth opportunities and constraints in the El Paso region. Participants represented a wide variety of regional businesses, agencies, and organizations, which gave the Delphi panel a broad scope of regional expertise from which to draw. The inclusion of a broad range of expertise is an integral aspect of using the Delphi Process to develop reasonable growth forecasts for the region. Group discussions and activities paired with confidential individual responses gave the project team the necessary information to develop subarea growth forecasts.

Web Sessions

Following the online kickoff meeting, the remainder of the Delphi Process was conducted online through two rounds of exercises to continue the process of building a consensus amongst the participants on the growth patterns in the region. Through these online exercises, panel members refined opportunities and constraints developed from the kickoff meeting participation. The participants also developed subarea population and employment allocation numbers for 2050.

FORECAST YEAR CONTROL TOTALS

The forecast socioeconomic control totals were developed based on the TDC control total memo and are presented in **Table 6** through **Table 9**. The TDC forecasts of total population, household numbers, and group quarter population for El Paso County and the entire model area were adopted directly. The control total details for group quarter population and number of households for the two New Mexico partial counties in the region were developed following the guidelines presented in the TDC control total memo. The employment control total details by employment type were developed for each county based on employment type distribution and the reasonable ratio of employment to population recommended in the TDC control total memo.

Table 6: Control Total for El Paso County

	2022	2027	2030	2032	2040	2050
Population	890,020	921,042	936,697	946,200	984,173	1,046,847
Group Quarter	15,792	15,792	15,792	15,792	15,792	15,792
Households	292,960	311,607	321,736	328,534	354,134	389,563
HHSIZE	2.98	2.91	2.86	2.83	2.73	2.65
Total Employment	330,847	356,093	376,577	390,102	440,871	506,098
Basic	66,953	67,788	67,860	68,323	70,537	75,915
Retail	79,757	89,264	98,156	103,612	123,608	146,769
Service	146,072	160,931	170,191	176,306	198,913	228,055
Education	38,065	38,110	40,370	41,861	47,813	55,359

Table 7: Control Total for Dona Ana Partial County

	2022	2027	2030	2032	2040	2050
Population	51,915	54,319	55,690	56,502	59,507	66,189
Group Quarter	29	29	29	29	29	29
Households	15,294	16,412	17,120	17,609	19,711	22,692
HHSIZE	3.39	3.31	3.25	3.21	3.02	2.92
Total Employment	11,062	12,543	13,430	14,022	16,389	19,349
Basic	1,964	2,108	2,194	2,251	2,480	2,767
Retail	2,266	2,853	3,205	3,440	4,379	5,553
Service	4,497	5,085	5,437	5,672	6,612	7,787
Education	2,335	2,497	2,594	2,659	2,918	3,242

Table 8: Control Total for Otero Partial County

	2022	2027	2030	2032	2040	2050
Population	10,518	10,504	10,496	10,491	10,469	10,442
Group Quarter	1,398	1,398	1,398	1,398	1,398	1,398
Households	[illegible]	[illegible]	[illegible]76	[illegible]	[illegible]9	2581
HHSIZE	3.75	3.70	3.[illegible]7	3.66	3.59	3.50
Total Employment	974	[illegible]	1,11[illegible]	[illegible]	1,295	1,473
Basic	[illegible]	347	348	349	352	356
Retail	269	308	331	346	408	485
Service	300	349	378	397	475	572
Education	60	60	60	60	60	60

Table 9: Control Total for Total Model Area

	2022	2027	2030	2032	2040	2050
Population	952,453	985,865	1,002,883	1,013,193	1,054,149	1,123,478
Group Quarter	17,219	17,219	17,219	17,219	17,219	17,219
Households	310,688	330,479	341,332	348,630	376,374	414,836
HHSIZE	3.01	2.93	2.89	2.86	2.76	2.67
Total Employment	342,883	369,700	391,124	405,276	458,555	526,920
Basic	69,262	70,243	70,402	70,923	73,369	79,038
Retail	82,292	92,425	101,692	107,398	128,395	152,807
Service	150,869	166,365	176,006	182,375	206,000	236,414
Education	40,460	40,667	43,024	44,580	50,791	58,661

FORECAST YEAR SOCIOECONOMIC ALLOCATION METHODOLOGY

This section describes the methodology used to allocate forecast year population and employment to the TAZ level for inclusion in the El Paso TDM.

Population and Household Methodology

Subarea control totals for population were developed through the Delphi Process, and are presented in **Table 10**. These subarea control totals were used as population growth constraints. The subarea growth in the number of households was derived in proportion to subarea total population growth. It is noted that the average household size in the El Paso region are projected to be reduced from 3.09 in 2017 to 2.67 in 2050 based on the TDC control total memo. Therefore, population in the established communities are expected to experience some level of population reduction consistent with this regional household structure change. The subarea household growth was allocated to TAZs based on developable land, existing development density, and accessibility first. The TAZ average household size was then used to estimate population based on the reduced regional household size. The subarea total population was then allocated to TAZs based on each TAZ's allocated number of households and estimated household size.

Table 10: Population Allocation Identified by Delphi Process

Subarea	Subarea Name	Population Growth between 2017-2050
1	Anthon	3,331
2	Ch[illegible]par[illegible]	3,815
3	[illegible]wntown	7,949
4	East Side	15,468
5	Far East	82,183
6	Hueco Tanks	21,470
7	Mission Valley	31,361
8	Northeast Central	23,343
9	Santa Teresa	8,817
10	Sunland Park	3,029
11	Upper Valley	5,283
12	West Side	19,380

Employment Methodology

Subarea employment control totals were generated through the Delphi Process, and are presented in **Table 11**. The subarea employment growth within each subarea by employment type was first developed proportionally to the county level employment growth by employment type. The subarea employment growth by type was allocated to each TAZ based on zonal developable land, development density, and accessibility. If an area showed a high concentration of a certain employment type in the milestone year, it was deemed more attractive to that type of development in the future. TAZs that were proximate to concentrations of an employment sector were considered more attractive for growth in that sector. Because education employment is population-serving and tends to follow growth in the number of households, employment in schools at the TAZ level was based on a combination of developable land and population growth.

Table 11: Employment Allocation Identified by Delphi Process

Subarea	Subarea Name	Employment Growth between 2017-2050
1	Anthony, NM	910
2	Chaparral	1,356
3	Downtown	7,496
	East Side	17,184
	Far	80,899
	Hueco Tanks	19,454
7	Mission Valley	33,874
8	Northeast Central	25,307
9	Santa Teresa	6,808
10	Sunland Park	1,279
11	Upper Valley	4,456
12	West Side	16,224

Group Quarter Methodology

The forecast year group quarter population was developed by disaggregating the county control total group quarter population based on the base year TAZ group quarter population following the TDC control total memo recommendation.

Average Worker Per household

The average worker per household is assumed to be consistent with the trend in the zonal household size change. Therefore, the average number of workers per household was derived using the base year TAZ average number of workers per household and applying the change in the zonal household size between the base year and the forecast year.

Forecast Year Median Income

The forecasted El Paso model area median income by TDC is presented in **Figure 8**. **Table 12** presents the county level median income projected by the TDC, which predicted moderate declines in median household incomes (in constant 2017 dollars). The TAZ-level median household income was developed using 2017 - 2050 rates of change calculated for each county, using the following formula:

$$MI_{N_{future}} = MI_{N_{base}} \times (1 + r)^{(N_{future} - N_{base})}$$

Where,

$MI_{N_{future}}$ = Predicted future year median income

$MI_{N_{base}}$ = Last observed base year median income

N_{future} = Year of the desired future year

N_{base} = Year of last observed median income

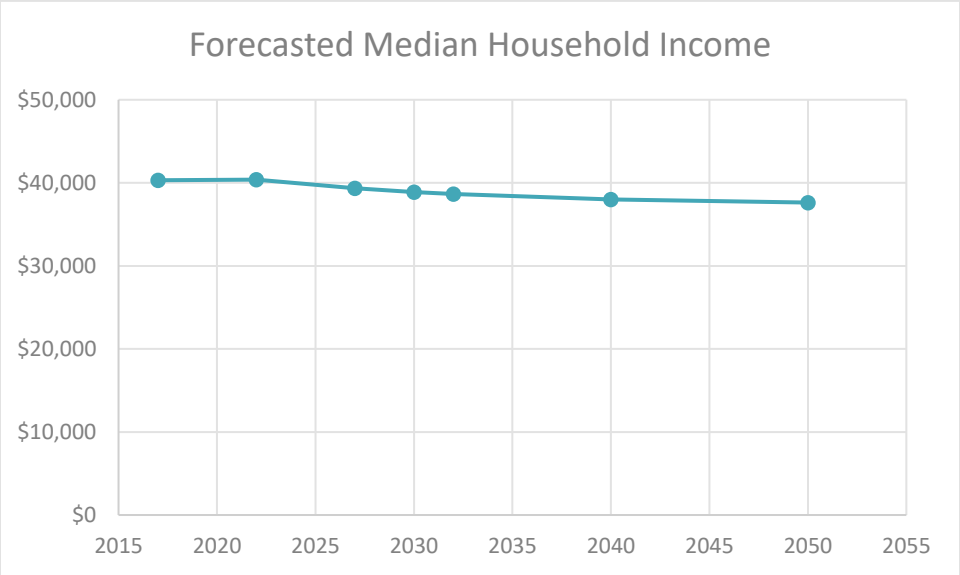
r = Calculated compound annual rate of growth

For TAZs with no previous population, but with potential to develop in the future, the median income for the subarea was assigned to the TAZ.

Table 12: TDC County Median Household Income Projection (2017 Dollars)

County	2017	2022	2027	2030	2032	2040	2050
El Paso	$42,498	$41,572	$40,661	$40,256	$40,042	$39,622	$39,738
Doña Ana	$33,399	$33,380	$31,690	$30,825	$30,337	$28,384	$25,840
Otero	$40,504	$41,324	$40,459	$40,089	$39,943	$39,260	$38,013

Figure 8: Model Area Forecast Year Median Household Income (2017 Dollars)



Forecast Year Special Generators

The forecast year special generators are assumed to remain unchanged from the base year special generators in the El Paso TDM.

Interim Forecast Year Socioeconomic Data Development

The interim forecast year socioeconomic data was developed based on linear interpolation between the base year 2017 and horizon year 2050. This process interpolated the change in demographics based on the change in the county level control total.

CONCLUSION

The data sources, methodology and analysis results used to prepare the above described base year and forecast year socioeconomic inputs for the El Paso TDM provide reliable estimates and realistic forecasts. The socioeconomic data developed in this effort provide a basis for replicating base year socioeconomic activity, as well as gauging the magnitude and distribution of the El Paso Region's anticipated future personal, social, recreational and economic activities.

The socioeconomic data described in this memo are derived from a variety of public domain data sources, published commercial datasets, and stakeholder input through a Delphi consensus building process, as well as online GIS analysis and limited field review of the study area. The base-year socioeconomic input data are aggregated at a level that does not disclose any personal or proprietary information so that the TDM can be used or distributed without any confidentiality constraints.

Because of the importance of the data to the development and application of the El Paso TDM, these socioeconomic estimates and forecasts were developed in close cooperation with the El Paso MPO.

APPENDIX A – EL PASO TDM EMPLOYMENT DEFINITIONS

Table 13 provides the employment definitions for the El Paso TDM based on the 2012 NAICS code following the TxDOT Socioeconomic Guidelines[7].

Table 13: Employment Type Definition

Type	2012 NAICS	Description
Basic	11	Agriculture, Forestry, Fishing and Hunting
	21	Mining, Quarrying, and Oil and Gas Extraction
	22	Utilities
	23	Construction
	31-33	Manufacturing
	42	Wholesale Trade
	48-49	Transportation and Warehousing (except postal service)
	5111	Newspaper, Periodical, Book, and Directory Publishers
	5112	Software Publishers
	512	Motion Picture and Sound Recording Industries (except motion picture and video exhibition)
	5151	Radio and Television Broadcasting
	5152	Cable and Other Subscription Programming
	5174	Satellite Telecommunications
Service	5171	Wired Telecommunications Carriers
	5172	Wireless Telecommunications Carriers (except Satellite)
	5179	Other Telecommunications
	518	Data Processing, Hosting, and Related Services
	519	Other Information Services
	52	Finance and Insurance

[7] *Texas Department of Transportation, Transportation Planning & Programming. September 30, 2016. Socio-Economic Guidelines.*

Type	2012 NAICS	Description
	53	Real Estate and Rental and Leasing
	54	Professional, Scientific, and Technical Services
	55	Management of Companies and Enterprises
	56	Administrative and Support and Waste Management and Remediation Services
	6114	Business Schools and Computer and Management Training
	6115	Technical and Trade Schools
	6116	Other Schools and Instruction
	6117	Educational Support Services
	62	Health Care and Social Assistance
	81	Other Services (except Public Administration)
	92	Public Administration
	721	Accommodation
Retail	44-45	Retail Trade
	491	Postal Service
	51213	Motion Picture and Video Exhibition
	71	Arts, Entertainment, and Recreation
	722	Food Services and Drinking Places
Education1	6111	Elementary and Secondary Schools
Education2	6112	Junior Colleges
	6113	Colleges, Universities, and Professional Schools

APPENDIX B – K THROUGH 12 SCHOOLS (EDUCATION 1)

Below is a list of the K-12 special generator list.

Table 14: K through 12 Education

TAZ	Special Generator Description	EDU1_2017
450	ALFONSO BORREGO SR EL	82
802	ALTA VISTA EARLY COLLEGE HIGH SCHOOL, BERINO ELEMENTARY	125
132	ALTA VISTA EL, PIPO ACADEMY OF HAIR DESIGN	69
761	AMERICAS H S, CAPT WALTER E CLARKE MIDDLE, SIERRA VISTA EL	640
393	ANDRESS H S, NEWMAN EL	365
591	ANN M GARCIA-ENRIQUEZ MIDDLE	103
798	ANTHONY CHARTER SCHOOL	22
745	ANTHONY EL, ANTHONY H S, ANTHONY MIDDLE	147
797	ANTHONY ELEMENTARY, LOMA LINDA ELEMENTARY, ANTHONY ON-TRACK PREK CENTER	163
4	AOY EL	103
244	ASCARATE EL	74
146	AUSTIN H S	248
509	BARRON EL	76
158	BASSETT MIDD[illegible]DENIN E[illegible]	209
122	BEALL EL	71
291	BEL AIR H S, SA[illegible]ELAND EL[illegible]SLE[illegible]NTER, PL[illegible]TO A[illegible]ADEM[illegible]	535
303	BEL AIR MIDDL[illegible]	124
739	BENITO MARTI[illegible]	90
455	BETHESDA CHRISTIAN ACADEMY	10
566	BILL CHILDRESS EL	74
740	BILL SYBERT SCHOOL	172
166	BLISS EL	87
232	BONHAM EL	64
121	BOWIE H S	251
399	BRADLEY EL	80
550	BROWN MIDDLE	137
233	BURGES H S	270
189	BURLESON EL	71
162	BURNET EL	61
769	CALVARY WEST CHRISTIAN SCHOOL	27
350	CAMINO REAL MIDDLE, PRESA EL	172
457	CAMPESTRE EL	96
840	CANUTILLO H S	277
495	CANUTILLO MIDDLE	103
368	CANYON HILLS MIDDLE	130
724	CAPISTRANO EL	76
100	CAREER & TECH ED CTR, ARMENDARIZ MIDDLE, YOUNG WOMEN'S STEAM RESEARCH & PREPARATORY ACADEMY	228
296	CEDAR GROVE EL, TEJAS SCHOOL OF CHOICE	132

TAZ	Special Generator Description	EDU1_2017
310	CESAR CHAVEZ ACADEMY	61
792	CHAPARRAL MIDDLE, CHAPARRAL ELEMENTARY	236
525	CHAPIN H S	318
539	CHARLES MIDDLE	114
265	CIELO VISTA EL	76
191	CLARDY EL	90
142	COLDWELL EL	90
136	COLLEGE CAREER TECHNOLOGY ACADEMY (CCTA)	71
553	CONGRESSMAN SILVESTRE & CAROLINA SCHOOL	90
298	CONSTANCE HULBERT EL	76
193	COOLEY EL	96
433	CORONADO H S	421
139	CROCKETT EL	108
548	DAVINCI SCHOOL FOR SCIENCE AND THE ARTS	90
559	DEANNA DAVENPORT EL	69
267	DEL NORTE HEIGHTS EL	71
325	DEL VALLE EL	87
348	DEL VALLE H S, LE BARRON PARK EL	427
243	DELTA ACADEM	53
694	DESERT HILLS E HORIZON MIDDLE	266
791	DESERT TRAIL E EMENTARY, SU RISE EMENTARY, CHAPARRA HIGH, CHAPARRAL ON-TRACK PREK CENTER	379
282	DESERT VIEW MIDDLE	61
732	DESERT WIND EL	153
396	DESERTAIRE EL	137
381	DOLPHIN TERRACE EL	105
114	DOUGLASS EL	64
384	DOWELL EL	66
361	DR LORENZO G LAFARELLE MIDDLE	18
832	DR SUE A SHOOK SCHOOL	124
689	EASTLAKE H S, COL JOHN O ENSOR MIDDLE, HORIZON HEIGHTS EL	611
274	EASTWOOD H S	275
275	EASTWOOD HEIGHTS EL	126
273	EASTWOOD KNOLLS	142
255	EDGEMERE EL	119
662	EL DORADO H S	316
287	EL PASO ACADEMY	34
506	EL PASO ACADEMY WEST	23
483	EL PASO ADVENTIST JR ACADEMY	4
639	EL PASO BRIDGES ACADEMY	13
46	EL PASO COUNTRY DAY SCHOOL	11
49	EL PASO H S	254
442	EL PASO JEWISH ACADEMY	9
115	EL PASO LEADERSHIP ACADEMY	39

TAZ	Special Generator Description	EDU1_2017
459	ERNESTO SERNA SCHOOL	132
461	ESCONTRIAS EL, ESCONTRIAS EARLY CHILD CTR, KEYS EL	147
622	FABENS H S, FABENS MIDDLE SCHOOL, FABENS EL, JOHANNA ODONNELL INT, TORNILLO H S, TORNILLO JH, TORNILLO INT	605
400	FANNIN EL	87
186	FATHER YERMO ELEMENTARY SCHOOL, FATHER YERMO HIGH SCHOOL, JEFFERSON H S, SILVA HEALTH MAGNET	368
96	FIRST PRESBYTERIAN PRESCHOOL	4
695	FRANK MACIAS EL, CARROLL T WELCH EL	288
547	FRANKLIN H S, HORNEDO MIDDLE, KOHLBERG EL	718
799	GADSDEN ELEMENTARY	89
765	GADSDEN HIGH	209
813	GADSDEN MIDDLE	146
260	GLEN COVE EL	148
497	GONZALO AND SOFIA GARCIA EL	80
79	GREEN EL	80
112	GUILLEN MIDDLE, HART EL	240
735	H D HILLEY EL	92
371	H R MOYE EL	101
292	HACIENDA HEIGHTS EL	98
392	HARMONY SCHOOL OF INNOVATION - EL PASO	195
347	HARMONY SCIENCE ACADEMY (EL PASO), HARMONY SCHOOL OF EXCELLENCE - EL PASO	280
198	HAWKINS EL	64
474	HELEN BALL EL, ELFIDA CHAVEZ EL, MONTWOOD MIDDLE	345
194	HENDERSON MIDDLE	137
835	HORIZON H S	245
480	HURSHEL ANTWINE SCHOOL, CHESTER E JORDAN	290
712	IMMANUEL CHRISTIAN SCHOOL, MACARTHUR EL-INT	184
259	INDIAN RIDGE MIDDLE	108
377	IRVIN H S, CROSBY EL	382
445	ITEC PREPARATORY ACADEMY	15
261	J M HANKS H S, EASTWOOD MIDDLE	538
482	JANE A HAMBRIC SCHOOL	188
679	JOHN DRUGAN SCHOOL	188
573	JOSE H DAMIAN EL	87
494	JOSE J ALDERETE MIDDLE, CANUTILLO EL	209
617	JOSEFA L SAMBRANO EL, LORENZO LOYA PRI	167
687	KEYS ACAD, OPTIONS H S	81
592	L G ALARCON EL	101
5	LA FE PREPARATORY SCHOOL	61
767	LA UNION ELEMENTARY	67
334	LANCASTER EL	90
360	LEE EL	90
697	LIFE CENTER CHRISTIAN ACADEMY	9

TAZ	Special Generator Description	EDU1_2017
425	LINCOLN MIDDLE	145
164	LOGAN EL	87
306	LOMA TERRACE EL	98
701	LOMA VERDE	103
208	LORETTO ACADEMY, HILLSIDE EL	128
468	LUJAN-CHAVEZ EL, SUN RIDGE MIDDLE	309
363	MAGOFFIN MIDDLE	140
660	MARGUERITE J LUNDY EL, WILLIAM C HERRERA EL, COLIN L POWELL EL	327
307	MARIAN MANOR EL	69
290	MESA VISTA EL	82
91	MESITA EL	192
170	MILAM EL	126
463	MISSION EARLY COLLEGE H S	61
755	MISSION RIDGE	124
426	MITZI BOND EL	105
432	MONTESSORI LEARNING CENTER	2
470	MONTWOOD H S	370
728	MOREHEAD MIDDLE, JOHNSON EL	203
99	MORENO EL, P[illegible]	94
395	MOST HOLY TR[illegible]ITY SCHO[illegible]L, P[illegible]RKLAND [illegible]S, PAR[illegible]LA[illegible] EL, PA[illegible]KLAND PRE K CE[illegible]TER	393
698	MOUNTAIN VIE[illegible] H S, EAS[illegible]MO[illegible]TAN[illegible]MIDDLE, [illegible]ONTA[illegible]A VIS[illegible] EL	348
582	MT FRANKLIN C[illegible]RISTIAN [illegible]CAD[illegible]MY	15
471	MYRTLE COOPER EL	105
257	NEW WORLD MONTESSORI SCHOOL, ROBBIN E L WASHINGTON EL	113
507	NIXON EL	108
300	NORTH LOOP EL	85
398	NORTH STAR EL	90
382	NORTHEAST CHRISTIAN ACADEMY, SCHUSTER EL	54
498	NORTHWEST EARLY COLLEGE H S (NWECHS)	53
473	O'SHEA KELEHER EL, WILLIAM D SLIDER MIDDLE, VISTA DEL SOL EL	312
331	OUR LADY OF THE VALLEY SCHOOL, YSLETA EL	104
446	PALM TREE ACADEMY	11
366	PARK EL	103
380	PARKLAND MIDDLE	197
283	PASEO DEL NORTE ACADEMY-VISTA DEL SOL CHARTER HIGH	18
648	PASO DEL NORTE ACADEMY-MESA CHARTER H S	13
663	PASO DEL NORTE SCHOOL	183
312	PASODALE EL, RIO BRAVO MIDDLE	213
429	PEACE LUTHERAN PRESCHOOL & DAYCARE, GUERRERO EL, HOWARD BURNHAM EL	168
258	PEBBLE HILLS EL	130
675	PEBBLE HILLS H S	363
431	POLK EL	105
316	PREMIER H S OF EAST EL PASO	13
544	PREMIER H S OF EL PASO	18

TAZ	Special Generator Description	EDU1_2017
481	PURPLE HEART EL	132
435	PUTNAM EL	80
180	RADFORD SCHOOL	37
317	RAINBOW SCHOOL	1
246	RAMONA EL	69
748	RED SANDS EL	116
731	RICARDO ESTRADA MIDDLE	105
775	RIVERSIDE ELEMENTARY	120
297	RIVERSIDE H S, RIVERSIDE MIDDLE	293
456	ROBERT R ROJAS EL	90
428	ROBERTS EL	76
216	ROSS MIDDLE, HUGHEY EL	238
152	RUSK EL	58
448	SAN ELIZARIO H S	201
771	SANTA TERESA HIGH, SANTA TERESA ELEMENTARY	295
777	SANTA TERESA MIDDLE, GADSDEN ADMIN COMPLEX PREK CENTER	132
264	SCOTSDALE EL	145
327	SHILOH CHRISTIAN ACADEMY, FAITH CHRISTIAN ACADEMY	34
462	SOCORRO H S, [illegible]	555
460	SOCORRO MID[illegible]E	103
337	SOUTH LOOP E[illegible]	58
479	SPEC RAFAEL H[illegible]NANDO[illegible]IDD[illegible]E, SGT R[illegible]BERT[illegible]ITUART	295
669	SSG MANUEL R[illegible]UENTES, JAMES P BUTLER EL	282
61	ST CLEMENT'S PARISH SCHOOL	34
441	ST FRANCIS MONTESSORI CHRISTIAN SCHOOL, RIVERA EL	73
133	ST JOSEPH'S SCHOOL	26
420	ST MARKS SCHOOL	39
418	ST MATTHEW CATHOLIC SCHOOL, COMMUNITY OF FAITH CHRISTIAN SCHOOL	32
53	ST PATRICK CATHEDRAL SCHOOL, CATHEDRAL HIGH SCHOOL	48
262	ST RAPHAEL SCHOOL, CHRISTIAN SCHOOLS OF EL PASO, JESUS CHAPEL SCHOOL, EAST POINT EL	189
372	STANTON EL	76
779	SUNLAND PARK ELEMENTARY, DESERT VIEW ELEMENTARY	163
25	TELLES ACADEMY, TELLES ACADEMY J J A E P	23
390	TERRACE HILLS MIDDLE, COLLINS EL	184
311	THOMAS MANOR	103
281	TIERRA DEL SOL EL	110
501	TIPPIN EL	101
534	TOM LEA JR EL, RICHARDSON MIDDLE	248
635	TORNILLO EL	53
369	TRANSMOUNTAIN EARLY COLLEGE H S	66
157	TRAVIS EL	76
293	VALLE VERDE EARLY COLLEGE H S	48
720	VALLEY VIEW MIDDLE, MISSION VALLEY EL	197
707	VISTA DEL FUTURO CHARTER SCHOOL	69

TAZ	Special Generator Description	EDU1_2017
280	VISTA HILLS EL	108
278	WEE WISDOM	1
443	WESTERN HILLS ACADEMY, WESTERN HILLS EL	96
375	WHITAKER EL	80
104	WIGGS MIDDLE, LAMAR EL, ABOUT FACE PROGRAM EL	234
615	WM DAVID SURRATT EL, CLINT H S, CLINT J H SCHOOL, CLINT ISD EARLY COLLEGE ACADEMY	374
270	YOUNG WOMEN'S LEADERSHIP ACADEMY	58
330	YSLETA H S, ALICIA R CHACON, YSLETA MIDDLE	455
788	YUCCA HEIGHTS ELEMENTARY	60
416	ZACH WHITE EL	87
125	ZAVALA EL	50

APPENDIX C – OPPORTUNITIES AND CONSTRAINTS IDENDIFIED BY THE DELPHI PANEL

Subarea 1 – Anthony

- NE Bypass will open the area up with 404 being improved
- New Mexico will be replacing the 404-I-10 bridge, the improvement will be from 2 to 4 lanes
- Transportation improvements may be setting up for future growth
- NE Pkwy renamed to Borderland Expressway. Diagonal facility to end at Loop 375 - 10.8 miles.
- Improvements will provide better access to NE El Paso.
- Constraints due to federal and military installations in New Mexico and Texas
- Anthony Gap 404 will connect to 375 – will have to manage growth
- New national monument, potential to attract tourists, ecotourism
- NMDOT HWY 404 intersect HWY 213. Will open land for improvements, potential to create growth towards Chaparral
- City of Anthony masterplan for economic development is in place, expecting growth
- Developable land, cheap housing and close to El Paso
- Lacks connectivity, infrastructure
- Missing the Quality of Life attraction compared to other regions
- NM 404 and I-10 interchange is being expanded significantly to a 4-lane borderland expressway. More development opportunities are expected in close proximity to the roadway
- There is much BLM (Bureau of Land Management) controlled land that will restrict growth outwards. Donna Anna County would be helpful in exploring this region more.
- Not a lot going on in this area
- Not economically vibrant
- Eastside is less attractive
- More options on the westside of I-10
- 404- Woodland Express

Subarea 2 – Chaparral

- Chaparral, not sure how well development is doing, parkway will help
- Developable land, cheap housing and close to El Paso
- Lacks connectivity, infrastructure
- Missing the Quality of Life attraction compared to other regions

Subarea 3 - Downtown

- Largely built out (not much room for further development)
- Widening of interstate (re imagine I-10 study)
- South side of district, new toll way and reconstruction of loop
- Border west expressway, no further plans
- Want to start study, some new connections (Pisano, cole/cold? St.)
- Pisano under-utilized

- Areas for business growth, but additional transportation connections needed
- Potential for revitalization of downtown
- Constrained, but opportunities with better transportation access
- UTEP, previous Asarco property, could be developed/utilized
- Possible growth/densification associated with BRT visioning exercises
- Not only for our desire to see infill and growth when it comes to housing options, but also due to our push to continue growing the Medical Center of the Americas footprint. As University Medical Center, El Paso Children's, Texas Tech, the Medical Center of the Americas Foundation, Silva Magnet and others continue to grow, we'll see a push for more housing, restaurants, apartments, added traffic, etc.
- Contains TxDOT investments, UTEP land (ex-brownfield), high development potential. Also contains blighted areas, degradation, aging houses, etc.
- Large infrastructure investment
- Dynamic, employment investment, new office building downtown
- School district employment center moved into subarea
- South portion of subarea vibrant, retail
- I-10 from Executive to US 54, economic growth potential/occurring
- Potential negative caused by freeways overpassing/intersecting western portion of subarea (I-10 turning north towards NM)
- Population decl[illegible] increase could be pulling from
- City wants to promote densification. Example Alameda corridor initiative.
- Lots of schools getting closed in the central area and opening up new ones on the outskirts.
- Age concentrations in certain areas.
- There is a major upgrade to I-10 that is likely to see an increase in development. More so residential. Traffic from Bowie High School is being rerouted as a result of the upgrade and impacting both vehicle and cargo traffic. Sun Metro had been talking about putting a transportation center near the Bowie High School, but not sure if that is still planned or not.
- County is engaging in a historical study in this region that might see it designated as historic in the future.
- N of I-10, the Sunset Heights region, is already a historic district.
- UTEP is in talks of acquiring land next to I-10 where an old Circle Smelting Company had been.
- Traveling on Paisano Dr in the eastbound direction is very congested when connecting to Loop 375 - Panel member believes this is a TxDOT facility, but recent changes/rerouting in the area has made this roadway very difficult to travel on
- Former ASARCO land (old plant) and development
- ASARCO area- old smokestacks - area is restricted in type of development – no residential
- South has border, north bounded by I-10, geographic constraint- infill in uptown on other side of I-10, school district moving there
- High density development best chance - New streetcar corridor - Infill between UTEP and downtown - 5 new hotels near streetcar - 7 story by El Paso Community College
- Focus on improvement of access between CBD and Medical Center of the Americas. Also, UTEP and CBD
- Medical Center of the Americas trying to bring development as they are a large employer

- Constraints – lack of investment in ports of entry - Lots of pedestrians crossing for school or work each day
- Stronger restriction on border crossing hurts area - Lots of school college crossings
- UTEP opportunities
- Baseball stadium
- Border Highway Plan
- Union Pacific Railroad
- Focus in Downtown
- Mobility Plan identified areas
- Frontage Roads

Subarea 4 – East Side

- W I-10 area by Robert E Lee
- Loop corridor – Montana and Loop 375 is a high growth area
- Infrastructure change along Montana Ave corridor from loop 375 – significant change in transportation infrastructure aspect
- Zaragoza Bridge – infrastructure growth (Wynn Rd)
- Empty pieces of land by Zaragoza – owners holding back for the right buyer
- SE quadrant of Loop and I-10 close to Subarea 7 a whole lot of vacant land but don't know if ready for development
- Loop 375 is a potential growth corridor
- Circled is the Medical Center of the Americas
- Horizon, Far East El Paso: existence of fractionalized lots of land – tends of thousands of acres owned by many people à creates a barrier to development because of all of the individual lot owners (1/4 acre, ½ acre, 1 acre) – limits the Horizon boundaries, cannot continue to grow and get annexed
- Looking at Central Appraisal records and GIS data you will find so many small lots
- On the MUD side, these lots might be miles away from the nearest infrastructure/utility line.
- Should unify property to allow it to grow
- Not just Horizon issue, El Paso has grown to that edge as well and they are restricted on the East side from growing any further - Landlocked in Horizon because of this issue - Not very good resolution yet, has been an issue for a long time but has recently become an acute issue.
- TX legislature has not been forthcoming with a solution.
- The solution has to be organic in some way.
- Transportation infrastructure on the East Side (expansive growth at the moment): considerable improvement in East/West connectivity (e.g., I-10), however east of the loop there's very little North/South connectivity, funneling everything towards the West – will continue to be an issue until we get a major highway to connect to the Far East side. Population east of the loop now exceeds population west of the loop and the upper valley.
- Largely developed, mainly infill opportunities
- University/MCA Medical Center huge employment hub
- New malls, retail opportunity along corridors

- Historically underserved re: transit and roadway investments
- Potential Public Private Partnership investments in northeast region of subarea
- TxDOT I-10 project
- US 54 to Loop 375, added capacity
- Spur 601, US 61 capacity improvements
- Lateral corridors historically most congested due to lack of investment
- Constraints - Ports of Entry, New NAFTA starts July 1st - Companies looking to move south of the border - Freight and truck congestion (9, 10, 4 and 7)
- Close to border- investment on both sides of border, Zaragoza Port of Entry has development of warehouses and manufacturing
- Medical center
- Lots of truck traffic
- Crossing Americas
- Pell Grant has options in the area
- There are a lot of Recreational Centers with upcoming improvements
- New Parks and Walking Trails

Subarea 5 – Far East

- John Hayes, connect with Derrington
- Much fractional owned (5-10 acre pieces)
- Developers seeing a fair amount of development - Paper plats - Plenty in El Paso ETJ
- Within the City very little growth anticipated the next 10 years due to the city's stance on annexation.
- Amazon Center, new retail center outside of which is fractionalized ownership
- Has the highest density pop and will continue to develop at the fastest rate until you run out of raw land to develop – still quite a number of parcels that developers can work on for the next 10 years then will hit the wall of fractionalized lots
- Beginning to see growth extend from Subarea 4 - Developable land, housing opportunities with connection to El Paso Downtown
- Far eastside - Coming from an economic perspective - Lots of large scale projects - We track building development - Over 1 million sqft of spec development – (Subareas, 4, 5, northern part of 7) - Housing is cheaper, everyone is moving out there - Restrictions with the state boundaries on the west side.
- Lots of developable land - The county is investing a lot of dollars in this region as developers are shifting this focus to this area.
- High growth expansion in this area - Not only residential, but significant commercial, health, service growth also occurring - Development expanding from Montana/Zaragoza region and expanding east - Lots of development around Pebble Hills High School - Approaching ETJ (extra territorial jurisdiction?)
- Similar growth scenario as comment 1 - New "Eastlake" development that is rapidly expanding. Approaching ETJ (extra territorial jurisdiction?) - More connections are being added to get more traffic to Loop 375 and I-10 - Expected to have more growth – connections to Montwood Dr as well
- Population declining in 3 - increase in 5 could be pulling from 3

- As move to less dense areas to each 5 6 7, less utilities
- Lots of growth in this area
- Fastest growing in El Paso

Subarea 6 – Hueco Tanks

- Largely constrained by Ft Bliss
- Not much potential in area because of military presence
- Limitations on the extension of utilities
- Fort bliss changing entrances. Traffic patterns shifting to LP 375
- As move to less dense areas to each 5 6 7, less utilities

Subarea 7 – Mission Valley

- Lots of potential, Socorro, south of City Limits. Some lack of infrastructure, but area is developing
- City of Clint has a small municipal budget, low growth - Surrounded by TxDOT sponsored projects, can't afford road rehabilitation
- Horizon and Socorro growth putting strain on Clint
- Typically underserved by public transportation and infrastructure investments
- TxDOT working on Tornillo POE improvements connecting to US 62/180
- City wants to promote densification. Example Alameda corridor initiative
- Mission valley – missed opportunity for tourism with missions – single family housing now
- As move to less dense areas to each 5 6 7, less utilities
- Oldest mission in TX and farming areas - Balance growth and farming
- Ysleta del Sur Pueblo (Tigua Indians) has land holdings in the areas circled near this comment
- Pueblo has large expansion and increase of population along Socorro Rd. Pueblo has significant land development near the intersection of Socorro and Loop 375 - Needs better connections to I-10 and Loop 375 to close the loop - Border Highway East is supposed to help with some congestion
- A lot of community growth in this area - Needs better connections to I-10 and Loop 375 to close the loop - Border Highway East is supposed to help with some congestion

Subarea 8 – Northeast Central

- Opportunity for some land sale to developers - Inside the loop (Ft. Bliss sale - MPO may have some info)
- Corner of 8 and 6 land swap with the general land office – 1200 acres – land will be available for development soon.
- Master plan area, huge piece of land that the city owns – ripe for development, perhaps along US 54 close to state park
- Geographical barriers (Ft. Bliss, State Park)
- Borderland express development could spur growth
- Developable land near Airport, growth opportunity
- Area somewhat of a City of El Paso land bank (El Paso Water Dept?) at top of subarea, potential for city development

- Limitations on the extension of utilities
- Airport area is one of the last intercity locations prime for development - There will be a lot of commercial and industrial development along Global Reach Dr. Mostly commercial along the frontage, with more industrial in the back
- Immediately east of the airport, Fort Bliss is planning an annexation - There will be a residential community - On Iron Medics Road, there is a new hospital being built that will be the largest department army hospital in the world - A community college is planned to be built south of that hospital
- Montana Rd is being upgraded to a double decker roadway in response to the rapid growth - Phase 1 stretches from the west to Loop 375, and Phase 2 will continue onwards - This goes hand-in-hand with the growth discussed in subarea 5
- City targeting for devolvement north of airport - With incentives. Middle part of 8
- New NE is area new road connecting to subarea - Grey area near state park with be protected
- See changes to travel demand on 375 once connected to 404
- Cargo traffic on outer loop maybe - No large truck on trans-mountain. But they could use route 404 (trucks)
- Butter field at airport - targeted investment zones
- Opportunities south of 375

Subarea 9 – Santa Teresa

- Some activity along 136/178
- large industrial park growth in subarea 9, with a residential housing community planned to be developed - Some businesses and housing expected. Growth would likely spill slightly into subarea 10
- POE direct to NM
- 3- POE
- Art Craft Road
- Farmland turning to single family homes and development
- Will grow south to north
- Existing Santa Thresa POE - widening connections, interchange upgrades
- Potential BRT from new Port of Entry to Westwind, densification potential
- Potential rail crossing west of ST POE - Mexico side N/S
- Study looked at E/W connection parallel to the border (roadway, HNTB study done for NM)
- Potential road connection up to Las Cruces airport, connect to I-10
- Opportunity for employment growth created by industrial park/ Santa Teresa Port of Entry freight traffic (high volumes)
- NMDOT putting lots of money towards Santa Teresa infrastructure and connectivity to Port of Entry
- Large investments into Subarea 9 due to expected industrial growth to link industrial parks and housing developments
- There is a large industrial park expansion planned here.
- there is a large residential development planned here - Permits are being acquired now.
- A lot of housing expected in this area. 2,000 – 3,000 homes expected

Subarea 10 – Sunland Park

- Main concentration centers around the race track and their proposed international POE – racetrack area has pretty much filled in, still seeking permit for their POE (been going on for the last 15 years – money is being spent on it) - Struggles with Mexican funding
- Potential for a new POE at the Anapra location
- Potential BRT from new Port of Entry to Westwind, densification potential
- Potential rail crossing west of ST POE. Mexico side N/S
- Study looked at E/W connection parallel to the border (roadway, HNTB study done for NM)
- Sunland Park - there is pursuit of a presidential permit for a border crossing at this location - It may still be too early to know if it will happen for sure, but it is currently planned as a passenger vehicle only crossing - It could support commercial if required
- Port of Entry
- Projects for a Riverwalk

Subarea 11 – Upper Valley

- Save the Valley organization? Resisting development in that area – group is still active
- Heavy Traffic, new residential along connector going through subarea 11 (Paseo del Norte) - Critical for trade with Mexico
- 5- old farm communities
- Heavy traffic and lack connectivity
- Lower taxes in this area
- Potential road connection up to Las Cruces airport, connect to I-10
- Growth occurring far west side, Upper Valley - 250 house development in Vinton. Adequate public facilities/infrastructure growth occurring to accompany development - Area still needs better connectivity to accommodate growth
- Upper Valley citizens may be opposed to growth, like agriculture/small farms
- Ongoing and new residential development expected in area

Subarea 12 – West Side

- NE quadrant of loop and I-10, growing area
- Also new development just south of the loop 375
- East of little square cannot be built – mountains
- Region 12 - Lots of open areas around mesa hills (I-10). Constraint - Why is development not occurring here?
- Four more development begins seen - New open space (1000 acres) in area
- Connection to Sunland Park Drive
- Potential BRT from new Port of Entry to Westwind, densification potential
- Potential rail crossing west of ST Port of Entry - Mexico side N/S
- Potential road connection up to Las Cruces airport, connect to I-10

- Growth occurring far west side, Upper Valley - 250 house development in Vinton - Adequate public facilities/infrastructure growth occurring to accompany development - Area still needs better connectivity to accommodate growth
- Vinton employment base on industrial plants
- Growth trending north and south of Transmountain - Open space earmarked for development.
- Ongoing and new residential development expected in area
- Constrained, but opportunities with better transportation access
- Keeps growing and expanding to the north
- Subdivisions coming
- Vacant lots
- Residential growth

APPENDIX D – TXDOT QUALITY REVIEW RESULTS

In its role as a Delphi Panel member and valued planning partner, the El Paso District of TxDOT contracted for a quality review of the 2050 demographics. The recommendation of this quality review where summarized in Table 33 of report it produced. A copy of this table is included below with the addition of responses and actions taken by the demographic forecasting team as a result. The TxDOT report is titled:

Future Year Socioeconomic Data Review, El Paso MPO's New Travel Demand Model Peer Review, November 13, 2020, CDM under contract to TxDOT El Paso District.

Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
Missing Values Review	None.	N/A	
Zero Population Review	Review the 36 TAZs with no housing from aerial imagery but shown to have higher than expected population for year 2022.	Page 3 (Zero Population Review, Table 1)	The 2022 values are reasonable for use in TDM for three reasons: 1) more than half of the zones in the list are reasonable when comparing base and forecast year; 2) the TDC provided county control totals for the 2022 interim year, Specific control totals were provided for population, households, and E/P ratio range. To maintain a smooth transition from 2017 to 2050 across the entire region, the 2022 were interpolated; 3) the amount of population is relatively small and will not have meaningful impact on the travel demand model forecast. As such it is reasonable to keep these few small values and avoid inconsistent development trends across the various forecast years.
	Review the 3 TAZs with housing based on aerial imagery but shown to have zero population in year 2022.		TAZ 177 has 40 households along its border with TAZ 176 within Fort Bliss, and the households in TAZ 177 were included in neighboring TAZ 176 during demographic development. These 40 households in TAZ 177 were moved to neighboring TAZ 176 to correct this issue. TAZ 353 includes a trailer park for Fort Bliss RVs and does not serve as long term housing. TAZ 406 is the historic La Calavera Neighborhood, which has been referred to as the ghost town since the ASARCO closure. As such, TAZ 353 and TAZ 406 are correct. Any change to the households in TAZ 177 and neighboring TAZ 176 will have almost no impact on roadway volumes produced by the model.
Consistency	Review special generator	Page 3	The TxDOT-TPP standard operating

Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
Review	employment for all TAZs in future years and verify if they should show some growth.	(Consistency Review)	procedure (SOP) is to keep the special generator steady through forecast years unless specific information about the facility is available.
	Add descriptions for the special generators.		Since the special generator description is on the final TAZ layer, the special generator description will be carried onto every year when we deliver the final TAZ layer with demographics.
MHI Review	Review the potential income redistribution in the TAZs of the middle three income groups	Page 5 (Figure 1)	The distributions of households by TAZ median income is mathematically different from the distribution of households by income group. Median income has been calculated based on the 50th percentile income household within each TAZ. The forecast year TAZ median household incomes were developed by applying the county level median income growth rate to the base year TAZ median household income. It is unclear how CDM's Figure 1 was developed; however, the change in the redistribution shown in Figure 1 likely comes from TAZs with zero population in base year and have population and a median income in 2022 and other forecast years. The TAZ median income for newly developed zones adopted the median income in nearby zones of similar density.
Average Household Size Review	Verify average household size in the 27 TAZ with low average household size but large numbers of housing units, as shown in Table 8.	Page 6 (Table 8)	The regional control total population and household dictate a lower household size for the region that carried down to the TAZ level.
Group Quarter Population Review	Review Group Quarter population growth in future years and verify if they should remain constant (Table A-2).	Page 7 (GQ Population Growth in Future Years)	Based on TPP standard practice, the group quarter population is assumed to remain unchanged through the forecast years. The group quarter population control total was adopted from TDC control total memo.
	Review the TAZs with very low and very high GQ population (Table 9 and Table 10).	Page 7 (Very low and very high GQ Populations)	The TAZ group quarter population was developed by apportioning the county control total group quarter population based on the Census block level group quarter population, then aggregating to the TAZ level. Census data at the block level includes small group quarters. These group quarters were included at the TAZ level. As some group quarters such as group homes are not

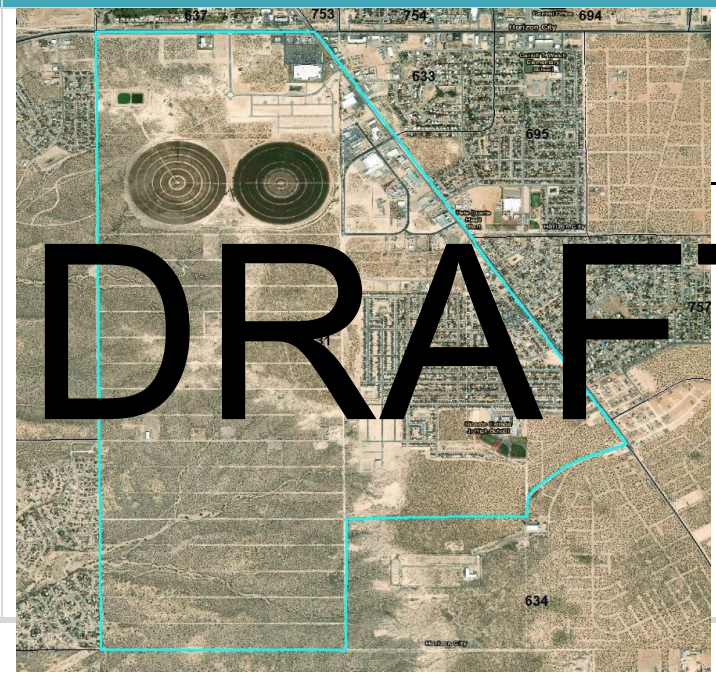
Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
			easily identifiable, it would be arbitrary to remove group quarters simply because the amount of the group quarter population. These small group quarters do not have meaningful impacts on the model, the high GQ population is based on census information, so we recommend leaving the GQ population as is.
	Review the 11 TAZs with Observed Nursing Homes but no GQ Population (Table 11).	Page 8 (TAZs with Nursing Homes)	During the development of the base year, group quarter information was pulled from the block level information available from the 2010 Census and the block group level group quarter population totals available from the Census's 2017 ACS data. The facilities identified by CDM may be newer or could have been missed by the Census. These will not have a significant impact to the model. No changes are recommended.
Employment Review	Review TAZs with school in all model years (2017-2050) and resolve/justify the incompatibility issue.	Page 8	Our methodology allocated Edu1 to grow with residential population growth, also based on available land. All interim years were interpolated.
	Review employment levels by school and school locations, including TAZ 293 and TAZ 498.	Page 8	is reasonable. Both TAZs have high school. AZ 293 has Valle Vere Early College High School, TAZ 498 has Northwest Early College High School.
	Review the 67 TAZs with EDU1 Employment in Potentially Incompatible Areas (Table 13).	Page 9 (Table 13)	20 of the 67 TAZs have schools identified in the TEA/NCES data. The rest of the 47 TAZs were forecasted to have EDU1 employment where there is population growth and land available.
	Review EDU1 employment in TAZ 317 and 483 (Table 14).	Page 9 (Table 14)	School employment for the base year was based on data from TEA (public school) and NCES (private school). In these two cased the underlying data reported low employment. As the number of schools is small and the employment this will not have meaningful impact to the model. As this would impact the base year, we suggest leaving it as is.
	Review the 12 TAZs with EDU2 employment but no observed university sites (Table 15).	Page 9 (Table 15)	Theses EDU2 locations were included with IPEDS data used. This data includes some smaller higher education/vocational agencies as well. These facilities are not large enough to be special generators, and their employment category is EDU2. The results are reasonable.
	Review the 8 TAZs with	Page 9	These TAZs have Edu1 and Edu2 based on

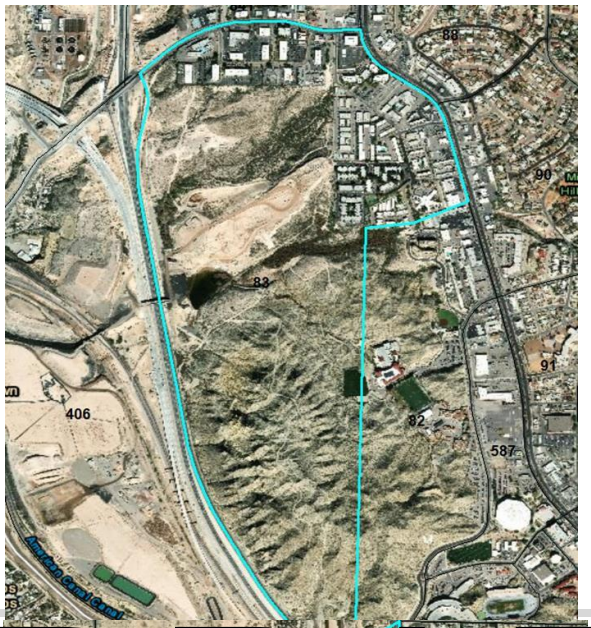
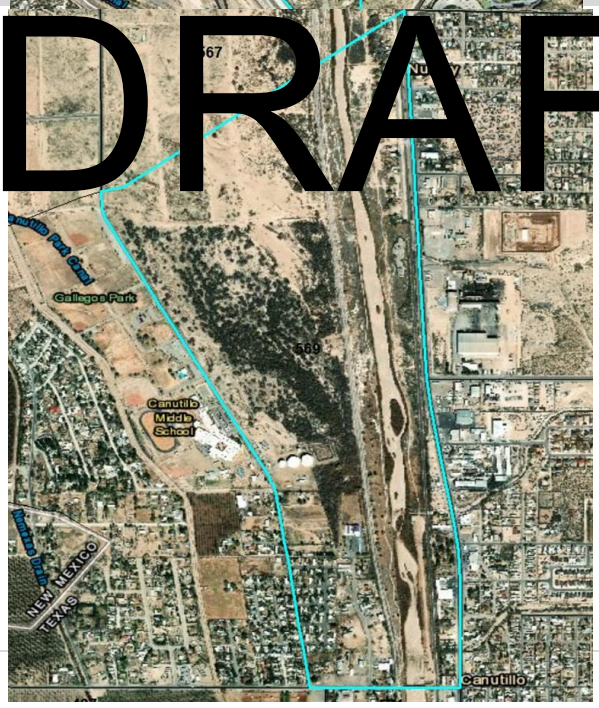
Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
	college sites based on aerial imagery but shown to have both EDU1 and EDU2.		TEA, NCES and IPEDS data. A google map review confirmed the locations and employment are reasonable.
Emp-Pop Ratio Review	None.	N/A	
Area Type Review	Review inconsistency in Area Types among model years (Table A-3).	Page 10 (Table 17-20, Table A-3 in Appendix A)	The area type is determined by the definition of area type. Area type is calculated based on population and employment density. As population and employment increase and decrease across years, area type can change.
Zonal Density Review	Review the growth in density in TAZ 600 and 748.	Page 12	The growth density when compared to areas already developed appear to be reasonable.
Magnitude Checks	Review the growth in magnitude in TAZ 600 and 748 in northeast El Paso County.	Page 12, Figure B-3 thru Figure B-8 in Appendix B	TAZ 600 grows by 8,243 in employment and 8,581 in population, TAZ 748 grows by 3,785 in employment and 9,258 in population. This appears to be reasonable given the available land appears able to accommodate the growth.
Growth Pattern Checks	Review the growth pattern in TAZ 600 and 748.	Page 13, Figure B-18 thru B- 20	TAZ 600 has 8,243 employment growth and 8,581 in population growth, TAZ 748 has 3,785 employment growth and 9,258 in population growth. This appears to be reasonable given the available land appears able to accommodate the growth.
	Review rural TAZs with drastic decreases in household size.	Page 16, Figure B-21	The regional control total population and household dictate a lower household size for the region that carried down to the TAZ level.
Other Study Checks	CDM Smith Review Report:	Page 17	
	· Review inconsistency in Area Types among model years.		see response for previous comment
	· Review recommendations under Median Household Income Checks, Magnitude Checks, and Growth Pattern Checks sections.		see response for previous comment
	DSK Review Report:	Page 19, Figure B-22	
	· Verify the planned/committed developments in this area including the Northeast Property.		Over 15,000 population growth and 15,000 employment growth is forecasted in the RMS TDM for the Northeast Property Area. The forecasted growth pattern and magnitude appears reasonable and is consistent with available land and along

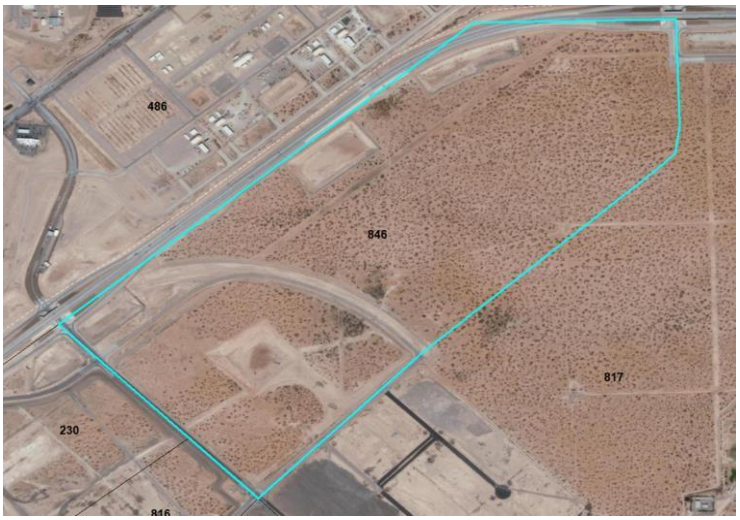
Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
			major roadways.
	· Further review the 2040 employment data in the DKS study area.		About 15,000 employment was allocated to this area in the RMS TDM, which is about 60% of the total employment growth in the Northeast Central area.
	· Further review the TAZs showing a decreasing population from 2017 to 2050.		Employment is often increasing in TAZ's where population is decreasing. Additionally, the regional household size is forecasted to decreasing. As such there is often few people in households. The regional control total population and household dictate a lower household size for the region that carried down to the TAZ level and resulted in the decreasing population from 2017 to 2050 in the established communities.
	HNTB Review Report:		
	· Further review the district level population and employment distribution, especially for the Northeast Central District and the internal distribution within this district.	Page 21	The CDM comparison in Table 29 compared [illegible] Model (Horizon, Destino, RMS) produced over the last 10 to [illegible]. The district level population distributions are largely consistent among the three TDMs. The district level employment level distribution shows some differences. Mainly in the Hueco Tanks, Far East, and Downtown subareas. The district level distribution for the RMS model was based on Delphi panel input along with current data and wisdom. The distribution within the Northeast central district, seem reasonable.
	· Review the comparison between model volumes and observed volumes and identify any discrepancies that could be results from any SED issues.		This task cannot be done at current stage of model development.
	Airport Area Studies:		
	Further review the SED of the TAZs within the airport study area, in all model years.	Page 21 (Table 31)	The current demographic forecast is based upon regional control totals and Delphi input. The zones west and south of airport appear reasonable given the guidance received. The forecast for zones east of the airport is dependent on if Fort Bliss decides to develop or sell portions of its land.

Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken
Random Spot Checks	Review the 5 TAZs 5 showing significant growth where the existing land use does not show strong evidence or enough capacity for such growth. See tab "Spot Checks"	Page 23 (Table 32), Table A-4 in Appendix A	The growth is reasonable based on the subarea level total and the locations of growth indicated by the Delphi panel.

The random spot checks conducted are addressed in the following table.

TAZ	TxDOT / CDM Note	Spot Aerial Image	Response to Recommendation and Actions Taken
731	Shows large change in 2050		The TAZ appears reasonable based on guidance from the Delphi Panel on the level of growth for the subarea

TAZ	TxDOT / CDM Note	Spot Aerial Image	Response to Recommendation and Actions Taken
83	Shows large change in 2050		The TAZ appears reasonable based on guidance from the Delphi Panel on the level of growth for the subarea
569	Shows large change in 2050		The TAZ appears reasonable based on guidance from the Delphi Panel on the level of growth for the subarea

TAZ	TxDOT / CDM Note	Spot Aerial Image	Response to Recommendation and Actions Taken
846	Shows large change in 2050		Delphi panelist indicated this area is likely to be developed. Appears to be reasonable.

TAZ	TxDOT / CDM Note	Spot Aerial Image	Response to Recommendation and Actions Taken
826	Shows large change in 2050		This increase is acceptable because the employment density is around 4,000, which is about 50% of the high-density commercial areas along I-10. Comparing to the C&M proposed population of 11,811 and employment of 747 for this zone in this CDM review (Page 22, Fig 5), this RMS TDM forecast is more reasonable. The density in this area was slightly reduced to accommodate development within nearby Fort Bliss for which the details were provided after the Delphi was completed.

FINAL REVIEW

Final comments received on the December 17, 2020, are addressed below in Table 15. . The comments reflect discussions between the MPO and TxDOT.

Table 15: Response to Follow Up Review Comments from TXDOT/CDM

ID	Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken	CDM Smith Review Response	20201229 CS/ATG Response
11	Employment Review	Review TAZs with school in all model years (2017-2050) and resolve/justify the incompatibility issue.	Page 8	Our methodology allocated Ed[illegible] to grow [illegible] residential population growth also based on availa[illegible] land. A[illegible] were interpolated.	Consideration. The new TDM has 222 TAZs with school in 2017 and 258 TAZs with school in 2022 and all other future year[illegible] of [illegible] schools bet[illegible]een 2017 and 2022 seems high and we suggest that [illegible]be the [illegible] of TAZs with [illegible]ol sho[illegible] also grow smo[illegible]hly f[illegible]m 2017 to future years. We a[illegible]ee with interpolating SE data for interim years.	We recommend the procedure used that estimates future location of K-12 schools and gradually grows the employment at these locations. Future school locations are not known for the long term and this procedure keeps us from overloading existing school locations and spreads new school site to reasonable locations. The interpolated school employment levels [illegible]"correct" but are reasonable [illegible]or planning. [illegible]his procedure also prevents [illegible]verloading a subset of estimated [illegible]uture school locations in the short [illegible]erm by growing all potential school locations gradually. With the above consideration, additional school information was collected from school districts and was used to forecast near term (2022) school enrollment and employment information.
19	Zonal Density Review	Review the growth in density in TAZ 600 and 748.	Page 12	The growth density when compared to areas already developed appear to be reasonable. See "Additional Explanation" tab at Row 75 for maps showing TAZ 600 and TAZ 748 population and employment.	Justification. The density itself is reasonable, however, we are wondering if the growth is justified -- is this development based on any published plan/policy document, e.g. community plan? Or is this based on the	Density in the Hueco Tanks subarea was largely determined by the allocation of population and employment selected by the Delphi Panel and the amount of developable land within the subarea. The Delphi Panel noted that development would densify as land east of Fort Bliss and

ID	Review Type	TxDOT/CDM Recommendation	Location in CDM Report	Response to Recommendation and Actions Taken	CDM Smith Review Response	20201229 CS/ATG Response
					Delphi process feedback?	the airport is developed.
20	Magnitude Checks	Review the growth in magnitude in TAZ 600 and 748 in northeast El Paso County.	Page 12, Figure B-3 thru Figure B-8 in Appendix B	TAZ 600 grows by 8,243 in employment and 8,581 in population, TAZ 748 grows by 3,785 in employment and 9,258 in population. This appears to be reasonable given the available land appears able to accommodate the growth.	Justification. We agree that the vacant land resources can accommodate this growth. We were wondering if the growth is justified by planning documents or the Delphi process.	
21	Growth Pattern Checks	Review the growth pattern in TAZ 600 and 748.	Page 13, Figure B-18 thru 20	TAZ 600 has 8,243 in employment growth and 8,581 in population growth. TAZ 748 has 3,785 in employment growth and 9,258 in population growth. This appears to be reasonable given the available land appears able to accommodate the growth.	Justification. We agree that the vacant land resources can accommodate the growth. We were wondering if the growth is justified by planning documents or the Delphi process.	
22		Review rural TAZs with drastic decreases in household size.	Page 16, Figure B-21	The regional control total population and household dictate a lower household size for the region that carried down to the TAZ level.	Verification. We understand that the regional household size decreases as the control total trend dictates, but this may not explain why some rural TAZs are showing much larger decrease than urban TAZs. Is there any particular factor in the disaggregation process that might have caused this distribution?	The count level control totals both increase population and decrease household size (HHS). We reviewed this dichotomy and debated how to most reasonably account for this decrease. The scenario you have been reviewing has the benefit of avoiding dramatic declines in household within the core of the city and accommodates the large population increase in the Far East subarea (the rural area).

SCHOOL LOCATIONS

Table 16 shows the collected school consolidation and construction information in the near term. This information is being used to update the 2022 K-12 education employment and enrollment information. The update was carried over to all forecast years. Specific information was collected for K-12 school location to ensure that the near-term school consolidations and construction are reflected in the 2022 model year and carried forward.

Table 16: Additional School Information

ISD	Description	Location Comment	TAZ	Type
El Paso	Dr. Josefina Villamil Tinajero School (PK-8) is 63% complete and will consolidate Henderson Middle and Clardy Elementary. It is set to be finished by Fall 2022 and will include a new 50,000 square foot building addition for Pre-Kindergarten through first grade.	Location: Henderson Middle School, 5505 Robert Alva Ave, El Paso, TX 79905 Based on the imagery: https://www.episd.org/Page/941 TAZs next to each other, no need to adjust.	194	Consolidation
El Paso	Henderson Middle		194	
El Paso	Clardy Elementary		191	
El Paso	Dr. Joseph Torres Elementar[illegible]which wa[illegible]cently [illegible]mpleted, [illegible]solidates Bradley Elementary and Fan[illegible] Elementar[illegible]nd in[illegible]udes a new [illegible]000 squ[illegible]e foot building addition.	Location: 10700 Rushing Rd, El Paso, TX 79924; TAZ 39[illegible] Based [illegible]the imagery: https:/[illegible]02201707.schoolwir[illegible]net/Page/946 TAZs n[illegible] to each other, no ne[illegible] to adjust.	399	Consolidation
El Paso	Bradley Elementary		399	
El Paso	Fannin Elementary		400	
El Paso	Arcadio “Coach Archie” Duran Elementary will consolidate Crosby, Dowell and Schuster Elementary Schools into a new 900 student capacity elementary campus and Dowell Elementary will be demolished. The project is 73% complete and set to be finished by Summer 2021.	Location: Dowell El, 5249 bastille avenue el paso TX; TAZ 384 Based on the imagery: https://tx02201707.schoolwires.net/Page/947 TAZs next to each other, no need to adjust.	384	Consolidation
El Paso	Dowell Elementary		384	
El Paso	Schuster Elementary		382	
El Paso	Crosby Elementary		377	
El Paso	Coach Wally Hartley School (PK-8) will consolidate Hughey Elementary and Ross Middle School. This project is 14% complete, set to be finished by Fall 2023 and will include a new Middle School building addition and renovations to Hughey Elementary.	Location: Hughey Elementary, 6201 Hughey Dr, El Paso, TX 79925; TAZ 216 Both schools in the same TAZ, no need to adjust	216	Consolidation
El Paso	Hughey Elementary		216	

El Paso	Ross Middle School		216	
El Paso	Donald Lee Haskins School (PK-8) will consolidate Lincoln Middle School, Roberts and Bond Elementary schools. This project is 81% complete, set to be finished by Summer 2021 and will include building additions and renovations to Lincoln Middle. The new Middle School building is completed.	Location: Lincoln Middle School, 500 Mulberry Ave, El Paso, TX 79932; TAZ:425 TAZs next to each other, no need to adjust	425	Consolidation
El Paso	Lincoln Middle School		425	
El Paso	Bond Elementary		426	
El Paso	Roberts Elementary		428	
El Paso	General Douglas MacArthur Intermediate (PK-8) will consolidate MacArthur ES-Intermediate & Bonham Elementary. This project is 74% complete, set to be finished by Spring 2021 and will include additions and renovations to the fine arts department and a new playground.	Location: MacArthur Elementary-Intermediate School, 8101 Whitus Dr, El Paso, TX 79925; TAZ: 712 Update K-12 employment and enrollment	712	Consolidation
El Paso	MacArthur ES-Intermediate		712	
El Paso	Bonham Elementary		232	
El Paso	Charles Q. Murphree School (PK-8) will consolidate Morehead Middle School & Johnson Elementary. The project is 45% complete, set to be finished by Summer 2022 and will include a building addition, multipurpose and special education classrooms and renovations to Johnson Elementary.	Location: [illegible] 99 Cabaret Dr, El Paso, TX 79912; TAZ: 728 Both schools in same TAZ, no need to adjust	728	Consolidation
El Paso	Johnson Elementary		728	
El Paso	Morehead Middle School		728	
El Paso	Captain Gabriel Navarrete Middle School will consolidate Bassett and Armendariz Middle Schools into a new 1,000 student capacity middle school. The project is 10% complete, expected to be completed by Spring 2022.	Based on the imagery: TAZ: 161 https://tx02201707.schoolwires.net/Page/949 Update K-12 employment and enrollment. Currently no K-12 employment at this TAZ	161	Consolidation
El Paso	Bassett Middle School		158	
El Paso	Armendariz Middle School		100	

El Paso	Bobby Joe Hill School (PK-8) will consolidate Terrace Hills Middle and Collins Elementary schools, is 60% complete, set to be finished by Spring 2022 and will include building additions, library expansion and other renovations.	Location: Terrace Hills Middle School, 4835 Blossom Ave, El Paso, TX 79924; TAZ: 390 Based on the imagery: https://tx02201707.schoolwires.net/Page/945 Both schools in the same TAZ. No need to adjust.	390	Consolidation
El Paso	Terrace Hills Middle School		390	
El Paso	Collins Elementary school		390	
Ysleta ISD	Scottsdale Elementary School, a new facility, is set to be finished by July 2022.	Location: Scottsdale Elementary School, 2901 McRae Blvd, El Paso, TX 79925; TAZ 264 https://www.yisd.net/Page/16152 Add new K-12 employment and enrollment.	264	New school
Ysleta ISD	Dolphin Terrace Elementary/ rkland Pre- dergarten, a new ility, is expected to be finished by Ju 2022.	Locatio rk, 4; TAZ 381 https: ww.yisd.net/Page/16 2 dd ne K-12 employment an nrollment.	381	New School
Socorro	Cactus Trails Elementary School was completed in Summer 2019.	Z 67 https: ww.sisd.net/Page/58 2 Add new K-12 employment and enrollment.	670	New school
Socorro	TBD, a new combo school for the Eastlake area, to relieve Col. John O. Ensor Middle School. Expected phased completion in 2021. Assume to be in the same TAZ as Col. John O. Ensor Middle School	TAZ 689 (Likely) https://www.sisd.net/Page/58862	689	New school

APPENDIX E –FORT BLISS QUALITY REVIEW RESULTS

During the quality review process, it was discovered that several tracts of land east of the airport and adjacent to Fort Bliss or part of Fort Bliss are part of a planned development that includes a new community college campus. An update was made to William Beaumont Army Medical Center (WBMC) based on the anticipated opening date of its new facility at Fort Bliss.

FORT BLISS DEVELOPMENT

Figure 9 depicts a planned development on the eastern portion of Fort Bliss. Within the travel demand model this area is represented by the green shaded TAZs in Figure 10. This area is assumed to be developed in 2040 and 2050.

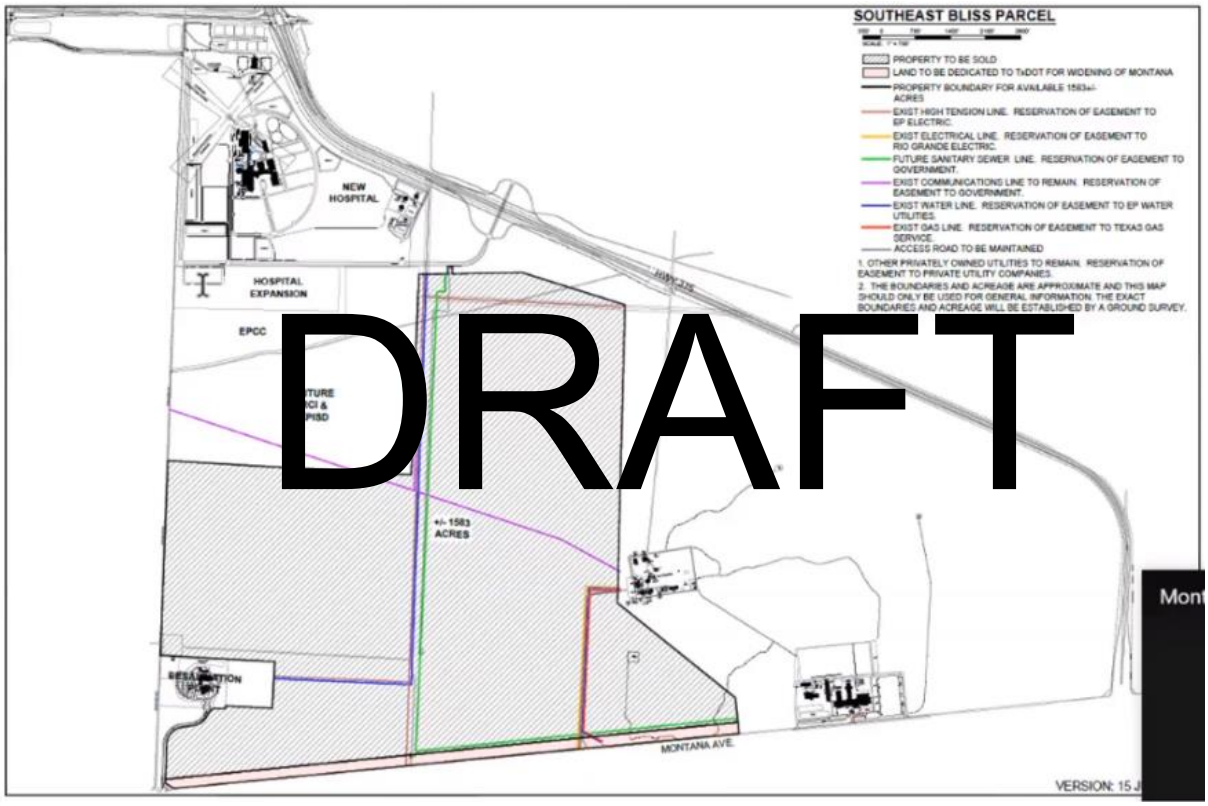


Figure 9: Development Plan

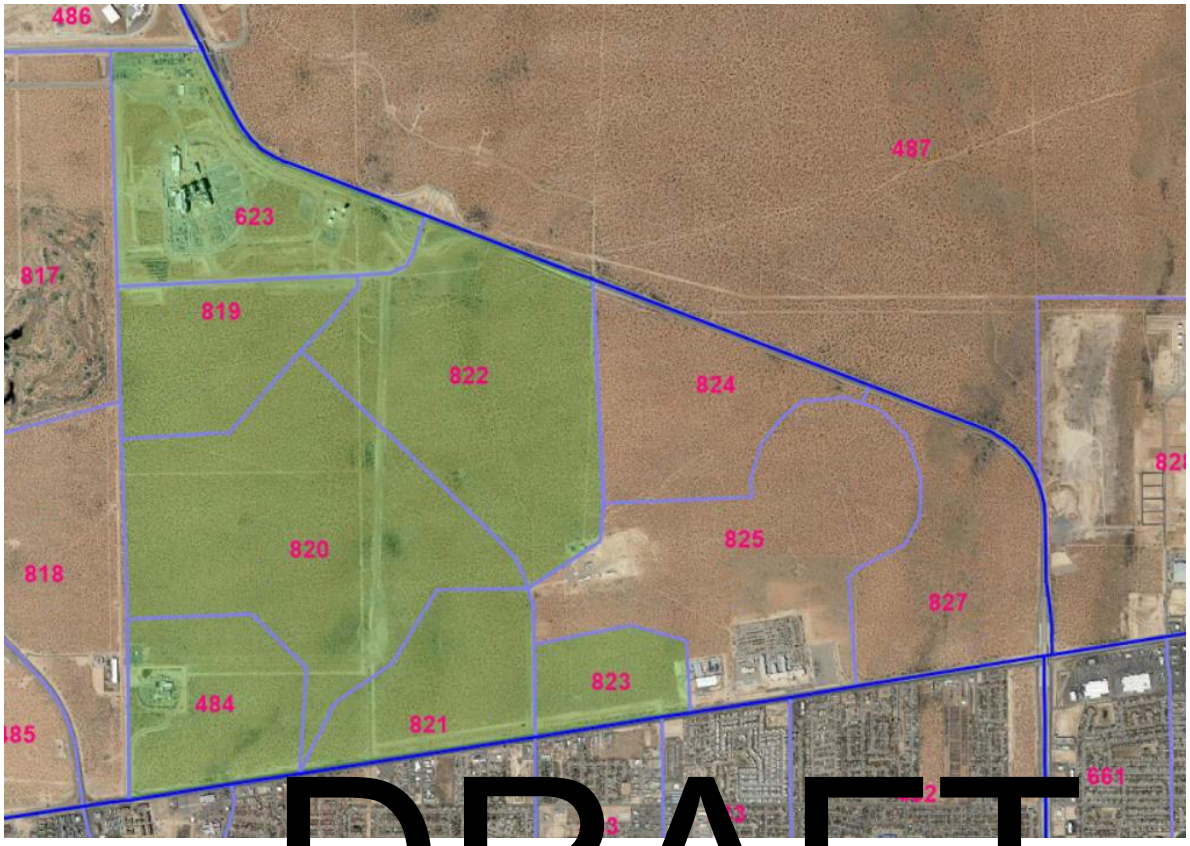


Figure 10: TAZs Assumed to Start Developing in 2040

The table below lists the employment changes made at a District Level:

Table 17: 2050 District Level Control Total Comparison

ID	District	Original Delphi EMP Growth	Updated Delphi EMP Growth	Change
1	Anthony, NM	910	910	-
2	Chaparral	1,356	1,356	-
3	Downtown	7,496	7,496	-
4	East Side	17,184	17,184	-
5	Far East	80,899	80,899	-
6	Hueco Tanks	22,554	19,454	(3,100)
7	Mission Valley	33,874	33,874	-
8	Northeast Central	22,207	25,307	3,100
9	Santa Teresa	6,808	6,808	-
10	Sunland Park	1,279	1,279	-
11	Upper Valley	4,456	4,456	-
12	West Side	16,224	16,224	-
Total		215,247	215,247	-

It was not necessary to move population and household from the Hueco area to the area of Fort Bliss under development. Figure 11 (TAZ number in pink, HH is in black) shows the current allocation of population and household allocation for 2050 around the target area. It can be seen that a total of 3,325 households with 9,060 in population were allocated in the green zones with reasonable density. As such, it appears a reasonable amount of population growth was allocated to the base during the Delphi, we just need to shift it to adjacent zones within the same district.

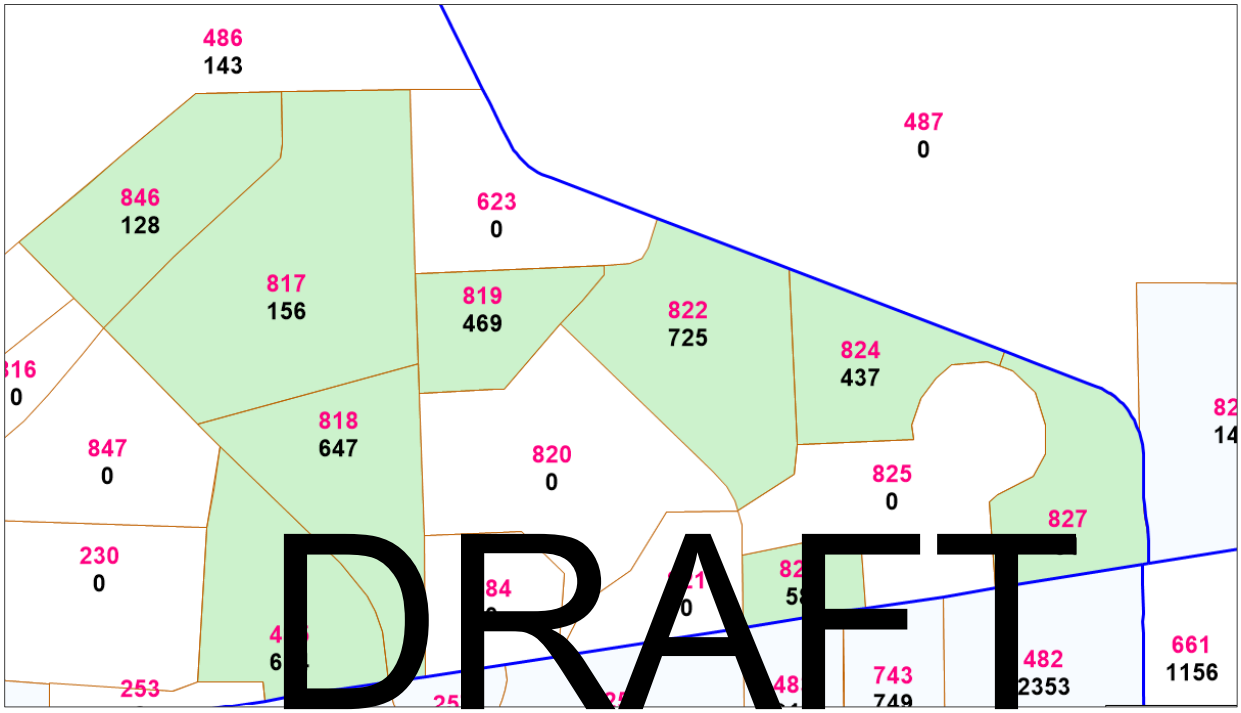


Figure 11: Current 2050 Population and Household Allocation Around Target Area

The figure below shows the proposed 2050 employment revisions. Within the TAZs:

- Pink numbers represent the TAZ number
- Black numbers represent the proposed employment revisions.

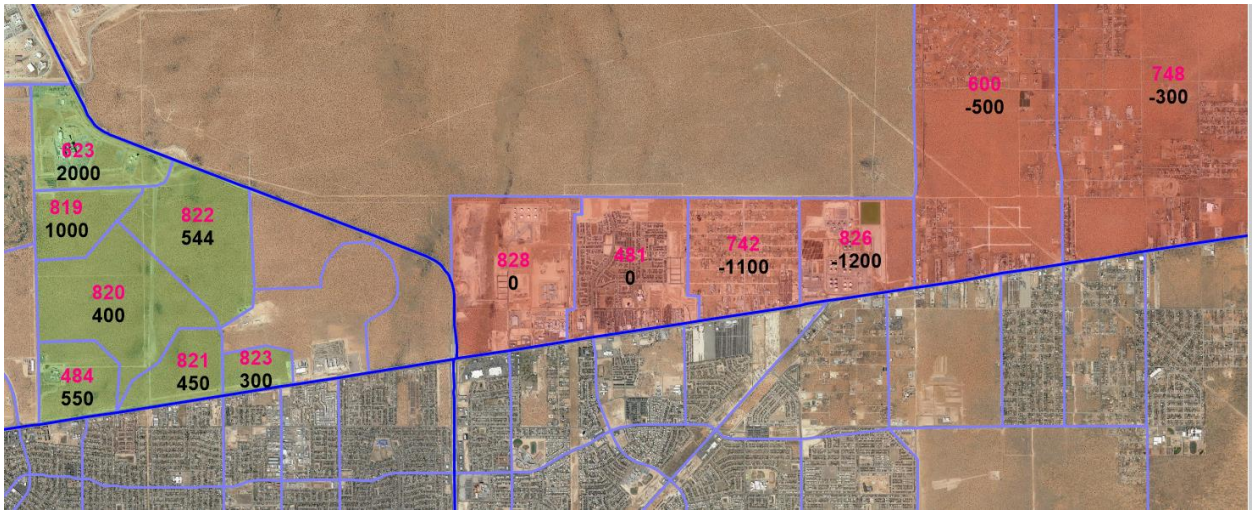


Figure 12: Proposed Employment Revisions

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The table below shows the 2050 proposed employment for area being developed, and the corresponding employment reduction from Hueco Tanks TAZs. The re-allocated household and population to the target area is also shown in Table 18. Table 19 shows the proposed 2040 employment in the green shaded target area and the proposed change in the Hueco Tanks area.

Table 18: Proposed 2050 Demographic for Target Area, and employment change in the Hueco Tanks Area

TAZ	Acres	Proposed Service Emp	Proposed Retail Emp	Proposed New Edu1	Proposed Edu2	HH	POP	Notes
623	449	2,222						The employment is assumed to be the same as the current William Beaumont Army Medical Center and US Army Corps of Engineers. Assume to move the existing WBAMC hospital employment over starting model year 2022.
819	270	300			700			Proposed EPCC, RCI and EPISD. EPCC campus is assumed have 700 employees. This was estimated based on the average of the two largest existing EPCC campuses of (1,3[illegible] and 272). The EPISD and RCI components are assumed have total of 300 in employment.
820	764	300	100			[illegible]	2,600	Adopt TAZ 48[illegible] density and emp mix
822	646	300	100	144		800	2,200	Adopt TAZ 48[illegible] density and emp mix. This zone was previously assumed to have reduction 1 employment of 144. We have kept this emp in place. This 144 is not drawn from Hueco Tanks.
484	282	331	250			700	2,000	Adopt TAZ 483 density and emp mix. This zone was previously assumed to have 31 service employment. We assume additional 300 is drawn from Hueco Tanks.
821	264	200	250			650	1,559	Adopt TAZ 483 density and emp mix
823	138	200	100			225	700	Adopt TAZ 257 similar development
826	538	-900	-200					
742	610	-900	-200					
481	751							
828	892							
600		-200	-400					
748		-300						

Notes: Green shaded TAZs are areas proposed to be developed and within Fort Bliss. Scheduled to be developed by 2040. The reddish shaded TAZs are within the Hueco Tanks subarea from which demographics were reduced (moved). It is noted that TAZ 623 has the future Fort Bliss medical center, we assume that will in operation in 2022, with employment equal to the current VA hospital. The current WBAMC employment is moved to the TAZ 623 in 2022.

Table 19: Proposed 2040 Demographic Change replaced to Fort Bliss development

TAZ	Acres	Proposed Service Emp	Proposed Retail Emp	Proposed New Edu1	Proposed Edu2
623	449	2,222			
819	270	150			350
820	764	150	50		
822	646	150	50	86	
484	282	181	125		
821	264	100	125		
823	138	100	50		
826	538	-450	-100		
742	610	-450	-100		
481	751				
828	892				
600		-100	-200		
748		-150			

We assumed that the newly developed Fort Bliss area will achieve around 40%to 50% of its scheduled growth by 2040 and the remaining by 50% to 60% by 2050. The amount of growth diverted allows for consistent growth in the Hueco Tanks area and maintains the county control totals.

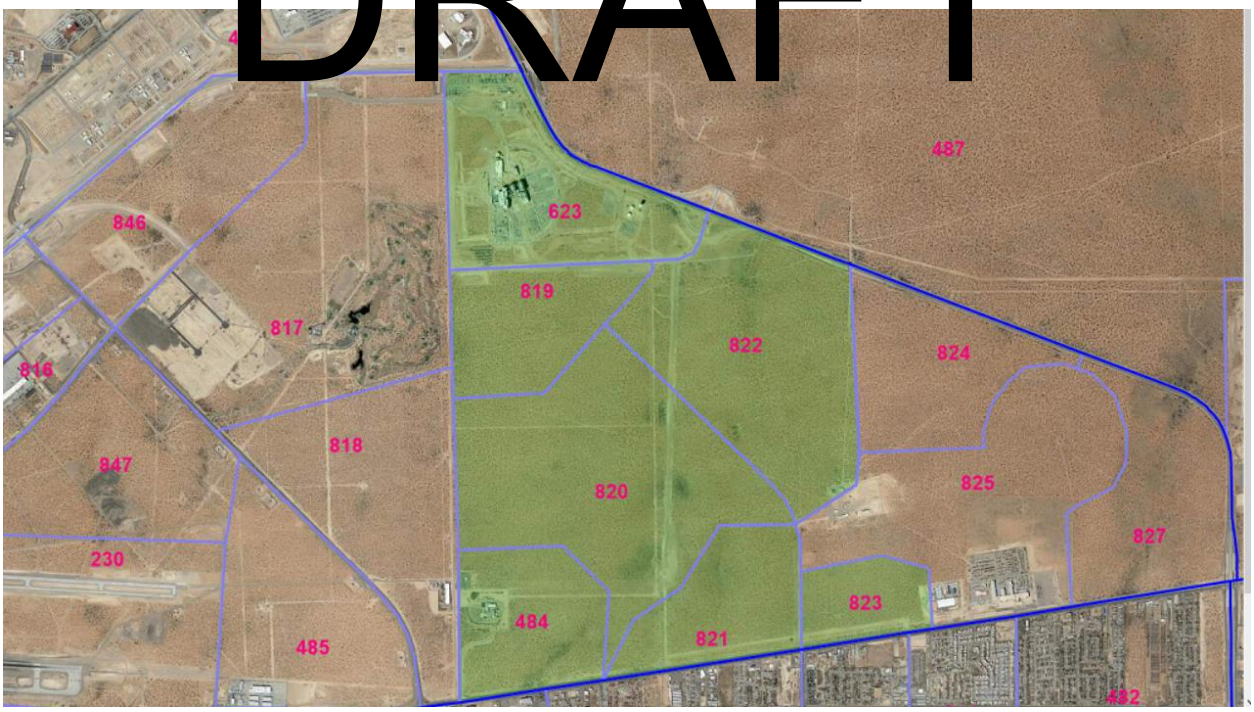

Figure 13: Area of Development TAZ Numbers

WILLIAM BEAUMONT ARMY MEDICAL CENTER UPDATE

The current William Beaumont Army Medical Center (WBMC) is located in TAZ 657, which is under-represented in the base year demographics. The following revisions were made to update the facility:

1. Added 1,836 service employment to TAZ 657 based on research on the facility. This will bring medical center service employment up to about 2,000. The 2,000 service employees, and the facility, are designated as SG service employment.
2. Removed 1,836 SG service employment from Fort Bliss TAZ 486 (See TAZ location in blue shaded area).

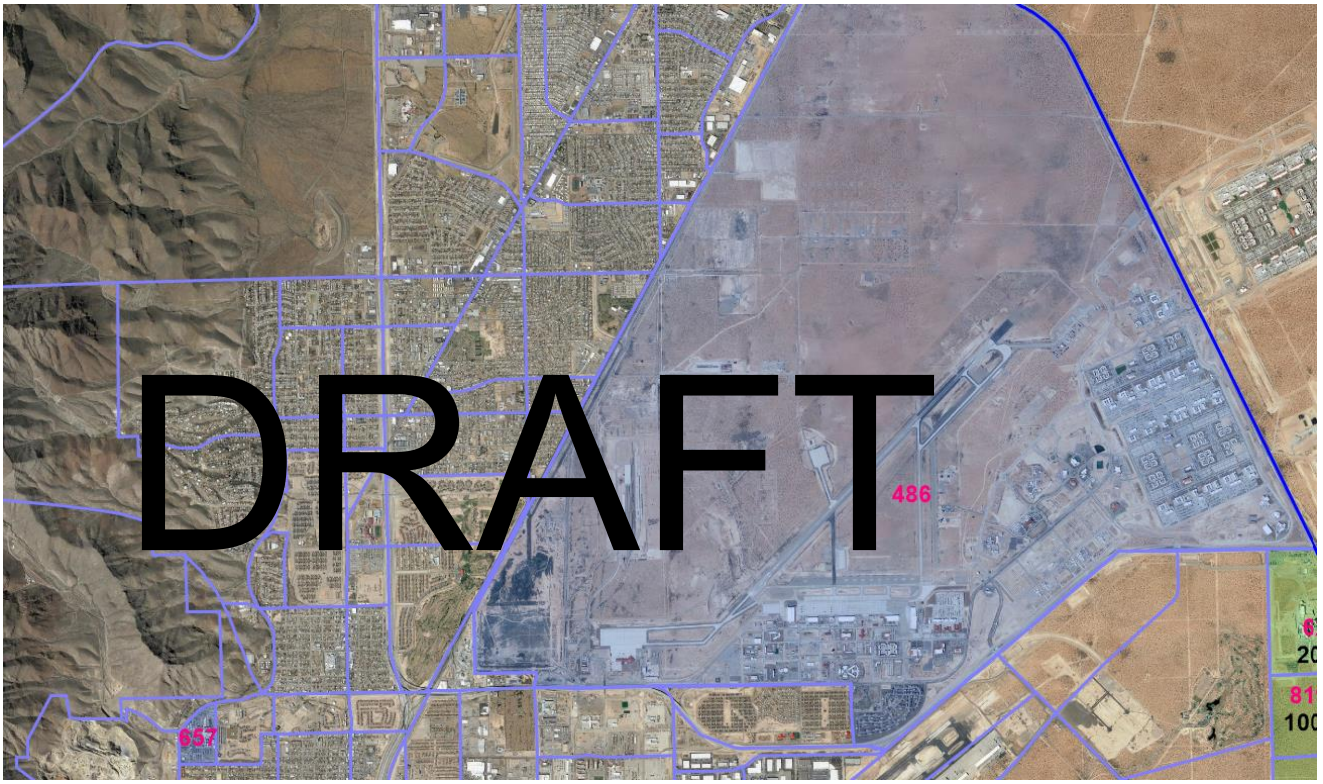

Figure 14: William Beaumont Army Medical Center Locations

WBMC References:

The six-building complex includes the seven-story, 135-bed hospital, two six-story clinic buildings, administration building, clinical investigation, or research, building with labs and central utility building with power generators. All the buildings, except for the research building are in one connected complex.

It's replacing the 47-year-old, 12-story, 670,024 square-foot, 115-bed Beaumont hospital now located on Fort Bliss land at 5005 N. Piedras St., in North Central El Paso. About 2,000 people, including about 1,000 civilians, work at the hospital — a number that is expected to stay about the same at the new campus, reported Amabilia Payen, a spokeswoman for the hospital.

From <https://www.elpasotimes.com/story/news/2019/10/17/fort-bliss-hospital-beaumont-army-medical-texas-construction-budget/1895751001/>

Development of Demographic Control Totals for El Paso Metropolitan Planning Organization

University of Texas at San Antonio

January 2022

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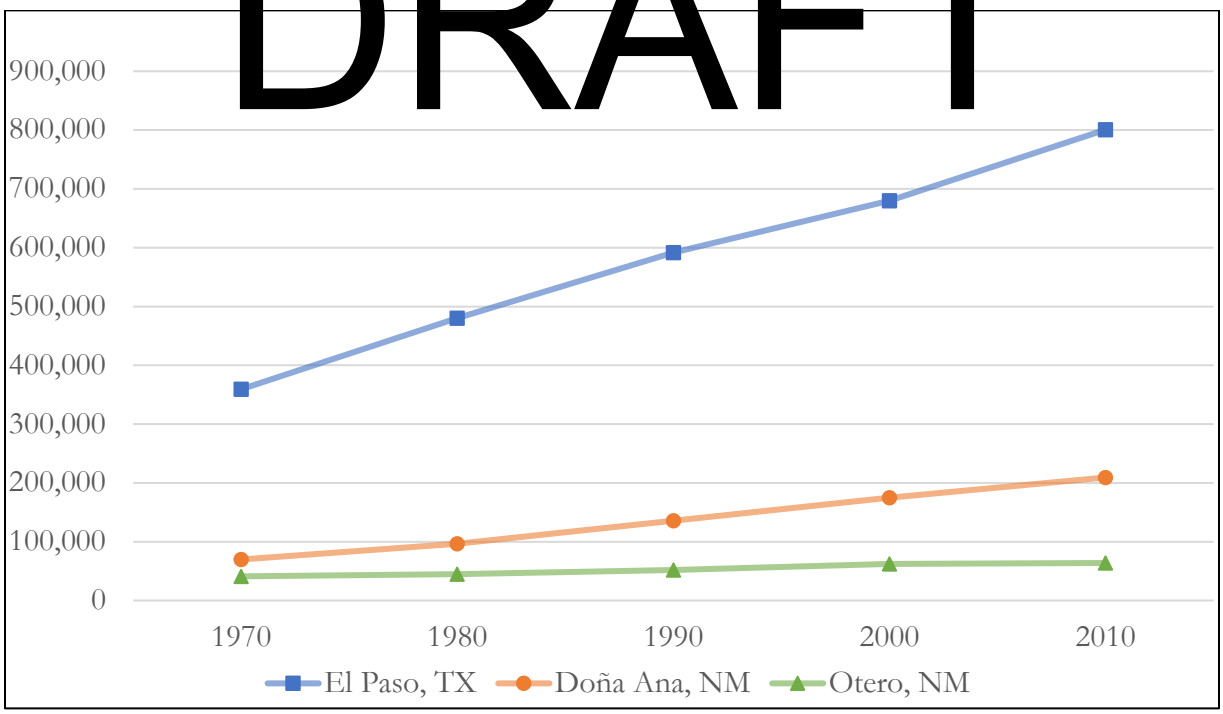
Introduction

The purpose of this technical memorandum is to present population, household, income, and employment trends and information in El Paso County, Texas, Doña Ana County and Otero County, New Mexico as well as the El Paso Model Area Boundary (MAB) for use in developing demographic inputs for the area travel demand model (TDM). Data developed within this memorandum is designed to present sufficient information on past, current, and anticipated future trends such that estimates of those data elements for the 2017 base year, and projections for 2022, 2027, 2030, 2032, 2040 and 2050 can be assessed for reasonableness. Please note that for purposes of this document, data from the Census Bureau's American Community Survey (ACS) is the 1-year survey unless otherwise specified. Also note that the Texas State Data Center changed its name to the Texas Demographic Center in 2016.

Analysis of Population Growth Trends and Base-Year Estimates

Population data from the U.S. Census Bureau from 1970 through 2010 were obtained for El Paso, Doña Ana, and Otero counties. Over the past 40 years these counties have grown and together added over 600,000 people. Combined, the counties have grown over 128% during this period.

Figure 1. Population Growth in El Paso, Doña Ana, and Otero Counties 1970 – 2010.



Source: U.S. Census Bureau.

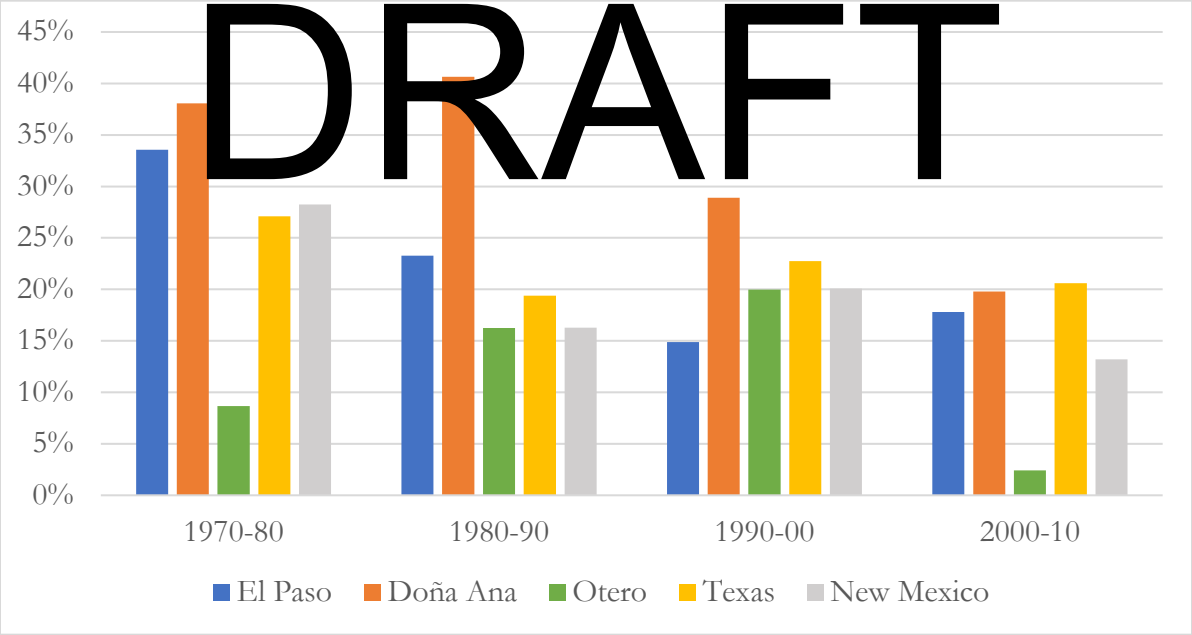
Table 1 provides the population percent change for El Paso, Doña Ana, and Otero counties for each decade from 1970 through 2010. These data reflect the official population count for the counties and the states and are useful in the analysis of past and current growth trends. Figure2 graphically illustrates this growth.

Table 1. Population Percent Change for El Paso, Doña Ana, and Otero Counties and Texas and New Mexico, 1970-2010.

	Percent Growth				
	1970-80	1980-90	1990-00	2000-10	1970-2010
El Paso County, TX	33.57%	23.28%	14.88%	17.81%	122.84%
Doña Ana, NM	38.08%	40.66%	28.91%	19.78%	199.88%
Otero, NM	8.68%	16.26%	19.97%	2.41%	55.24%
State of Texas	27.08%	19.38%	22.76%	20.59%	124.58%
State of New Mexico	28.24%	16.28%	20.06%	13.20%	102.68%

Source: U.S. Census Bureau.

Figure 2. Population Percent Change for El Paso, Doña Ana, and Otero Counties and Texas and New Mexico, 1970–2010.



Source: U.S. Census Bureau.

Table 2 provides the compound annual growth rate (CAGR) by decade for the same period compared to the growth for the state as a whole. On an average annual basis, El Paso and Texas share a similar CAGR over the past four decades (1970 to 2010), while Otero has trailed state growth and Doña Ana has outpaced state growth during this time.

Table 2. Historical Compound Annual Population Growth Rate by Decade for El Paso, Doña Ana, and Otero Counties and Texas and New Mexico, 1970-2010.

	Compound Annual Growth Rate				
	1970-80	1980-90	1990-00	2000-10	1970-2010
El Paso County, TX	2.94%	2.11%	1.40%	1.65%	2.02%
Doña Ana County, NM	3.23%	3.41%	2.54%	1.80%	2.75%
Otero County, NM	0.83%	1.51%	1.82%	0.24%	1.10%
State of Texas	2.43%	1.79%	2.07%	1.89%	2.04%
State of New Mexico	2.49%	1.51%	1.83%	1.24%	1.77%

Source: U.S. Census Bureau.

Suggested 2017 Base year Population Control Totals

Estimates of the 2017 population and the compound annual growth rates since 2010 from the Texas Demographic Center (TDC), the University of New Mexico Geospatial and Population Studies (UNMGPS), and the U.S. Census Bureau's American Community Survey (ACS) program are presented in Table 3. Note that the population projections presented in the next section are based on trends experienced between 2010 and 2015 in Texas and between 2000 and 2010 in New Mexico. Similarly, the base year 2017 estimates are based on more recent trends found in the ACS data and the administrative record data sources of the TDC and UNMGPS. Since there is only a small difference between the two estimates, either could be chosen as the base year with a negligible effect on the forecasts overall. The MAB geography is used to derive the portion of the county population within the study area based on the block group data from the 2017 ACS (5-Year) data. The percent of the county covered by the MAB was calculated from the population in the block groups with their population centroid situated inside vs. outside the MAB in the county. For El Paso, Doña Ana, and Otero counties combined, approximately 80.1% of the combined population is within the MAB.

Table 3. Comparison of Recent Population Estimates and Growth Rates for El Paso, Doña Ana, and Otero Counties and the El Paso MAB, 2010-2017.

	2017 Population Estimates	
	TDC	ACS (1 YR)
El Paso County, TX Population	845,954	840,410
Population Change Since 2010	45,307	39,763
Percent Change Since 2010	5.36%	4.73%
Compound Annual Growth Rate (CAGR) since 2010	0.79%	0.69%
	UNMGPS	ACS (1 YR)
Doña Ana County, NM Population	216,637	215,579
Population Change Since 2010	7,404	6,346
Percent Change Since 2010	3.42%	2.94%
Compound Annual Growth Rate (CAGR) since 2010	0.50%	0.43%
	UNMGPS	ACS (1 YR)
Otero County, NM Population	65,858	65,817
Population Change Since 2010	2,061	2,020
Percent Change Since 2010	3.13%	3.07%
Compound Annual Growth Rate (CAGR) since 2010	0.45%	0.45%
El Paso MAB Population	903,83	898,049
Population Change Since 2010	47,255	41,473
Percent Change Since 2010	5.23%	4.62%
Compound Annual Growth Rate (CAGR) since 2010	0.77%	0.68%
MAB Combined Percent of County Population	80.09%	80.05%

Source: U.S. Census Bureau, Texas Demographic Center, and University of New Mexico Geospatial & Population Studies.

Analysis of Population Projections

Population projections are not intended to represent the definitive number of persons that will reside within a certain location in a certain year. Rather, population projections represent migration trends (in migration and out migration) and natural increase (births and deaths) using currently available data. The TDC projections are available in one-year increments based on the migration scenario experienced in Texas between 2010 and 2015, and their most current population forecast was published in 2018. The UNMGPS projections are available in five-year increments based on half of the net migration experienced in New Mexico between 2000 and 2010, and their most current population forecast was published in 2015, which covers a projection horizon between 2020 and 2040. Note that the 2050 population projections for Doña Ana and Otero counties were produced based on the trended average age-sex specific compounded annual growth rate between 2017 and 2040.

Table 4 shows the population projections and percent change for El Paso, Doña Ana, and Otero counties and the El Paso MAB through 2050 as well as the CAGR. As Figure 3 illustrates, under the migration scenario experienced between 2010 and 2015, the population in El Paso County would be expected to increase steadily through 2050. On the other hand, under the scenario of receiving half of the net migration observed between 2000 and 2010, Doña Ana County would be expected to increase steadily through 2040, while Otero County would be expected to decline slightly over the same time period. Given the population in El Paso County has a disproportionally large share (over 93%) of the El Paso MAB population, El Paso MAB and El Paso County seem to share a similar pattern of the population trajectory. Since it is not possible to know the future extent of the MAB, the forecast assumes the current relationship remains constant.

Suggested 2050 Forecast Year Population Control Totals

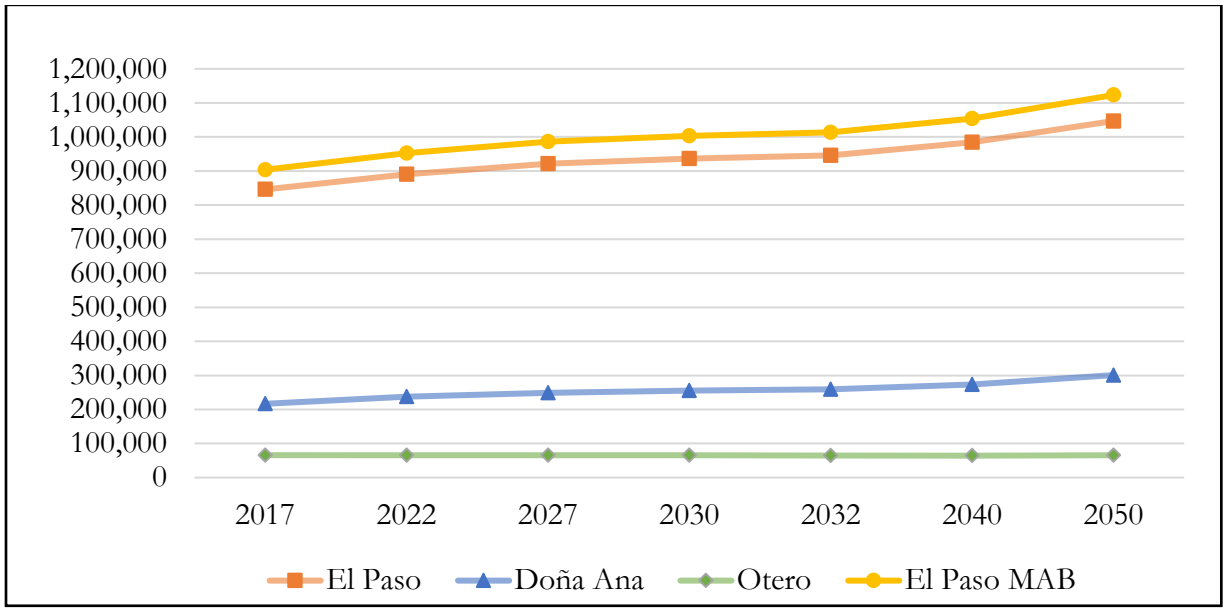
Barring any unexpected economic changes, the growth projected under the migration scenarios experienced by both Texas and New Mexico appear reasonable for the El Paso MAB. As presented in Table 4, the growth rate projected (0.67%) is close to the growth (TDC: 0.77% or ACS: 0.67%) in the period 2010-2017 shown in Table 3. Of course, a local review of the numbers should be made to determine the forecast used. Note the proportion of population in El Paso that is in the MAB is 100%, while it is approximately 22% in Doña Ana and about 16% in Otero.

Table 4. Population Projections and Percent Change for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

	Projection			
	El Paso, TX	Doña Ana, NM	Otero, NM	El Paso MAB
2017 TDC/UNMGPS Population	845,954	216,637	65,858	903,831
2022 Population	890,020	237,550	65,773	952,453
Percent Change 2017-2022	5.21%	9.65%	-0.13%	5.38%
2027 Population	921,042	248,701	65,485	985,865
Percent Change 2022-2027	3.49%	4.69%	-0.44%	3.51%
2030 Population	936,697	255,070	65,304	1,002,883
Percent Change 2027-2030	1.70%	2.56%	-0.28%	1.73%
2032 Population	946,200	258,857	65,173	1,013,193
Percent Change 2030-2032	1.01%	1.48%	-0.20%	1.03%
Population 2040	984,173	273,074	64,402	1,054,149
Percent Change 2032-2040	4.01%	5.49%	-1.18%	4.04%
2050 Population	1,046,847	300,860	65,265	1,123,033
Percent Change 2040-2050	6.37%	10.18%	1.34%	6.53%
CAGR between 2017-2040	0.66%	1.01%	-0.10%	0.67%
CAGR between 2017-2050	0.65%	1.00%	-0.03%	0.66%

Source: Texas Demographic Center, 2018, and University of New Mexico Geospatial & Population Studies, 2015.

Figure 3. Population Projections for El Paso, Doña Ana, and Otero Counties and the El Paso MAB through 2050.



Source: Texas Demographic Center, 2018, and University of New Mexico Geospatial & Population Studies, 2015.

Analysis of Group Quarters Population and Base Year Estimates

The group quarters (GQ) population are available from the Census Bureau's 2010 decennial census counts and the 1-Year ACS estimates. These numbers are shown together in Table 5 for comparison purposes, although the census is a full count and the ACS is a sample. Since 2000, GQ population has remained relatively stable in El Paso and Doña Ana counties, while in Otero County the GQ population has increased during the same time period. Since the GQ population in El Paso County accounted for the majority (over 94%) of the GQ population in the El Paso MAB, the GQ population in the El Paso MAB has remained relatively stable as well. Of course, as the baby boomers continue to age, group quarters in the form of nursing home occupancy may see an increase. Note, the percentage of GQ population in El Paso County that is in the MAB is 100%, while it is approximately 0.5% in Doña Ana County and about 61% in Otero County.

Table 5. Recent Census Trends in Group Quarters Population for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

County		Group Quarters					
		2000	2010	2011	2013	2015	2017
El Paso, TX	Total GQ Pop	12,744	15,792	13,930	15,516	15,068	14,228
	% of Population	1.9%	2.0%	1.7%	1.9%	1.8%	1.7%
Doña Ana, NM	Total GQ Pop	5,019	4,581	4,807	4,667	4,941	6,573
	% of Population	3.0%	2.2%	2.3%	2.2%	2.3%	3.0%
Otero, NM	Total GQ Pop	1,228	2,306	2,409	3,571	3,555	3,429
	% of Population	2.0%	3.6%	3.7%	5.4%	5.5%	5.2%
El Paso MAB	Total GQ Pop	13,517	17,219	15,421	17,714	17,257	16,349
	% of Population	1.9%	2.0%	1.8%	2.0%	1.9%	1.8%

Source: U.S. Census Bureau.

Suggested 2017 Base Year Group Quarters Control Totals

Unless there is some local evidence to the contrary, one of the 2017 GQ estimates from Table 6 should be used. The ACS estimate of 14,228 people equates to approximately 1.7% of the El Paso population, while the estimated 15,792 people based on TDC numbers represents about 1.9%. For Doña Ana County, GQ represents about 2.1% from the ACS and 3.0% from the UNMGPS, respectively, for Otero County, the corresponding numbers are 3.5% and 5.2%, respectively.

Table 6. 2017 Group Quarters Population for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

El Paso County, TX	TDC/UNMGPS Estimate 2017	ACS Estimate 2017
Total County Population	845,954	840,410
Group Quarters Population	15,792	14,228
% of Total Population	1.9%	1.7%
Doña Ana County, NM		
Total County Population	216,637	215,579
Group Quarters Population	4,581	6,573
% of Total Population	2.1%	3.0%
Otero County, NM		
Total County Population	65,858	65,817
Group Quarters Population	2,306	3,429
% of Total Population	3.5%	5.2%
El Paso MAB		
Total County Population	906,318	898,049
Group Quarters Population	17,428	16,349
% of Total Population	1.9%	1.8%

Source: U.S. Census Bureau, Texas Demographic Center, and University of New Mexico Geospatial & Population Studies.

Group Quarters Population Projections

The group quarters (GQ) population was excluded from the population projections based on the cohort component method. Since group quarters typically house population of specific ages (e.g., college dorms, nursing homes, military quarters), GQ population does not "age" throughout the population projection processes. Instead, GQ population was assumed to remain stable (or unchanged) in these processes. Of course, as the baby boomers continue to age, group quarters in the form of nursing home occupancy may see an increase. Also, planned changes to prisons, college dorms, or military quarters may alter the size of GQ population. Table 6 provides the group quarters population for El Paso, Doña Ana, and Otero counties and the El Paso MAB. The forecasted MAB figures for Group Quarters were calculated based on the estimated split of approximately 100% of future GQ population in El Paso County would be in the MAB and about 0.5% and 61% of the GQ population in Doña Ana County and Otero County respectively. Specific local knowledge of planned changes to future group quarters, such as planned prison or college dorm expansion, can be used to further refine the forecast for group quarters population.

Table 7. Projected Group Quarters Population for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

	2022	2027	2030	2032	2040	2050
El Paso, TX	15,792	15,792	15,792	15,792	15,792	15,792
Doña Ana, NM	4,581	4,581	4,581	4,581	4,581	4,581
Otero, NM	2,306	2,306	2,306	2,306	2,306	2,306
El Paso MAB	17,219	17,219	17,219	17,219	17,219	17,219

Source: Texas Demographic Center, 2018.

Suggested 2050 Forecast-Year Group Quarters Control Totals

Based on the information described above, the suggested future GQ population should be taken into consideration in light of specific local knowledge about planned changes to future group quarters. Otherwise, the suggested future GQ population should remain the same as the base year GQ population.

Analysis of Household Growth Trends and Base Year Households

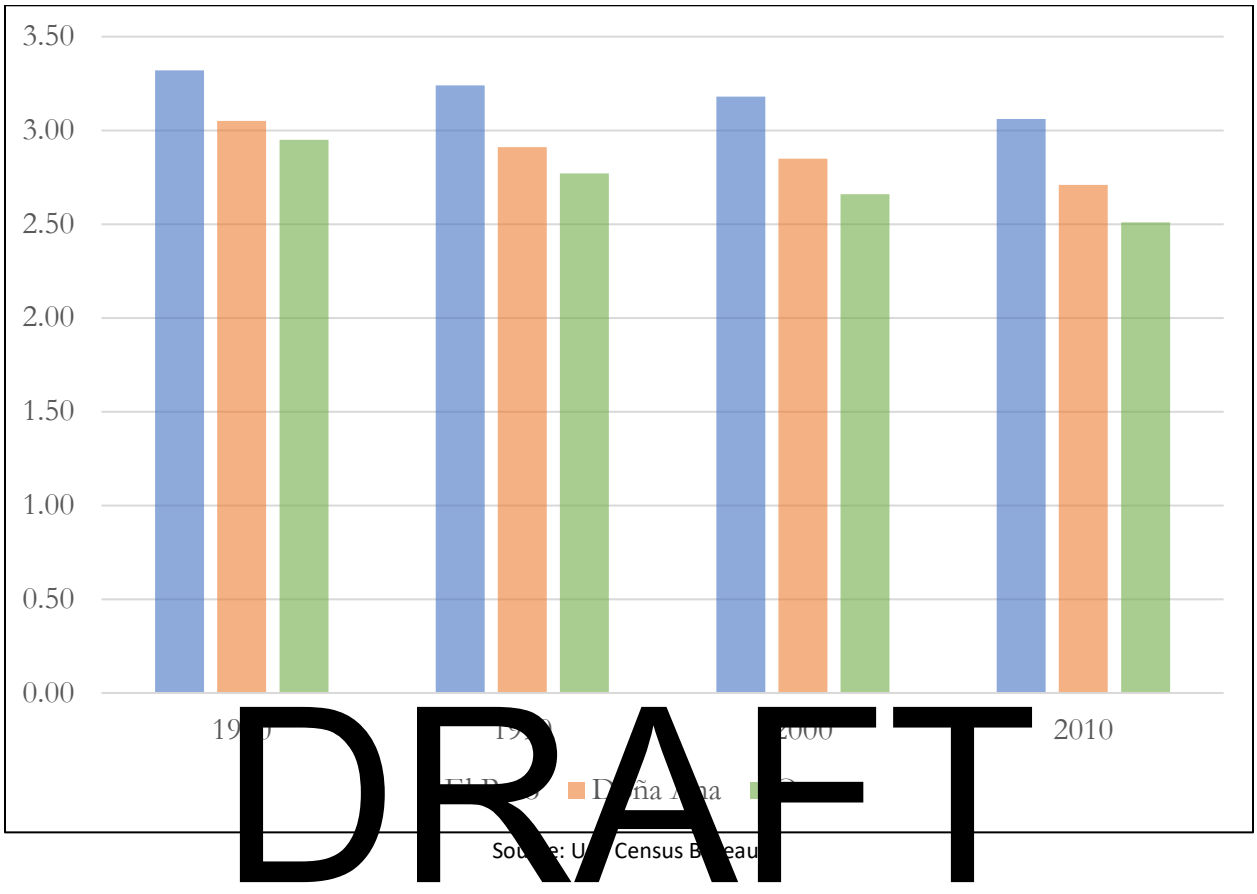
Table 8 shows the number of households and the average household size in El Paso, Doña Ana, and Otero counties for each decennial census year from 1980 to 2010. As indicated by the data, average household size has decreased since 1980. Figure 4 graphically depicts this change over the past 40 years. This overall decrease is consistent with the trend across the U.S. and is due to a number of factors such as increasing age before marriage, a growing number of one-parent households, aging population, and decreasing fertility rates. The general trend is for this decline to continue into the future.

Table 8. Historical number of Households and Average Household Sizes for El Paso, Doña Ana, and Otero Counties, 1980 – 2010.

Area	1980		1990		2000		2010	
	Number	Avg. HH Size	Number	Avg. HH Size	Number	Avg. HH Size	Number	Avg. HH Size
El Paso, TX	140,806	3.32	178,366	3.24	210,022	3.18	256,557	3.06
Doña Ana, NM	30,402	3.05	45,029	2.91	59,556	2.85	75,532	2.71
Otero, NM	14,608	2.95	18,155	2.77	22,984	2.66	24,464	2.51

Source: U.S. Census Bureau.

Figure 4. Trend in Average Household for El Paso, Doña Ana, and Otero Counties, 1980 – 2010.



Suggested 2017 Base Year Household Control Totals

For Table 9, the ACS and the TDC figures use the 2017 estimates of population. Note that UNMGPS does not produce estimates for households, so there is no information about estimated average household size. The TDC and UNMGPS group quarters are derived from the 2010 census group quarters population. The MAB portion of the three counties (El Paso, Doña Ana, and Otero) was calculated based on the 2017 ACS (5-year) portion of GQ population in this boundary. It should be noted that in the El Paso MAB section of Table 10, we assume that these three counties will maintain the same population composition within the MAB for future years.

Table 9. 2017 Estimates of Households for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

El Paso County, TX	TDC/UNMGPS Estimate 2017	ACS Estimate 2017
Total County Population	845,954	840,410
Group Quarters Population	15,792	14,228
Population in Households	830,162	826,182
Households	280,146	269,523
Average Household Size	2.96	3.07
Doña Ana County		
Total County Population	216,637	215,579
Group Quarters Population	4,581	6,573
Population in Households	212,056	209,006
Households	N/A	75,441
Average Household Size	N/A	2.77
Otero County		
Total County Population	65,858	65,817
Group Quarters Population	2,306	3,429
Population in Ho[illegible]	63,552	62,388
Households	N/A	23,007
Average Household Size	N/A	2.71
El Paso Metropo[illegible]an Area Boundary (MAB		
Total MAB Population	906,318	898,049
MAB Group Quarters Population	17,428	16,349
MAB Population in Households	888,890	881,700
MAB Households	N/A	285,417
MAB Average Household Size	N/A	3.09

Source: U.S. Census Bureau, Texas Demographic Center, and University of New Mexico Geospatial & Population Studies.

Analysis of Household Projections

Household projections from the Texas Demographic Center for El Paso County and El Paso MAB are presented in Table 10. Note that the University of New Mexico Geospatial and Population Studies does not perform household projections. Therefore, for Doña Ana and Otero counties, the average compounded annual growth rate of households derived from the Census and one year ACS data was employed to produce their household projections. To clarify, these projections are based on trended values of the four decennial Census (1980, 1990, 2000, and 2010) and the eight waves of the one year ACS (2011-2018). Overall, the future household size will decline through the interim year 2022 and the forecast year 2050.

As mentioned earlier, there are many factors that have driven the decrease in average household size over the past several decades in the El Paso MAB and the United States. The general consensus is that average household size will continue to decline but at a reduced rate. The MAB household size was calculated based on shares of the three counties regarding the household population and households included in the MAB.

Suggested Forecast Household Control Totals

Table 10 below provides the suggested control totals for the number of households in the forecast years; these numbers are based on the 2018 population forecast by the Texas Demographic Center.

Table 10. 2022 through 2050 Forecast of Households and Average Household Size for El Paso, Doña Ana, and Otero Counties and the El Paso MAB.

El Paso, TX	TDC Forecast 2022	TDC Forecast 2027	TDC Forecast 2030	TDC Forecast 2032	TDC Forecast 2040	TDC Forecast 2050
Total Population	890,020	921,042	936,697	946,200	984,173	1,046,847
Group Quarters Population	15,792	15,792	15,792	15,792	15,792	15,792
Population in Ho	8	905,25	920,	930,	968,381	1,031,055
Households	2 2,960	311,6 7	321, 6	328,534	354,134	389,563
Average Household Size	2.98	2.	2.8	2.83	2.73	2.65
Doña Ana, M						
Total Population	237,550	248,701	255,070	258,857	273,074	300,860
Group Quarters Population	4,581	4,581	4,581	4,581	4,581	4,581
Population in Households	232,969	244,120	250,489	254,276	268,493	296,279
Households	85,027	91,175	95,075	97,767	109,320	125,699
Average Household Size	2.74	2.68	2.63	2.60	2.46	2.36
Otero, NM						
Total Population	65,773	65,485	65,304	65,173	64,402	65,265
Group Quarters Population	2,306	2,306	2,306	2,306	2,306	2,306
Population in Households	63,467	63,179	62,998	62,867	62,096	62,959
Households	23,936	24,175	24,319	24,416	24,806	25,303
Average Household Size	2.65	2.61	2.59	2.57	2.50	2.49

Source: Texas Demographic Center (2018) and University of New Mexico Geospatial & Population Studies (2015).

Table 10. (continued)

El Paso MAB	TDC Forecast 2022	TDC Forecast 2027	TDC Forecast 2030	TDC Forecast 2032	TDC Forecast 2040	TDC Forecast 2050
MAB Population	952,453	985,865	1,002,883	1,013,193	1,054,149	1,123,033
Group Quarters Population	17,219	17,219	17,219	17,219	17,219	17,219
Population in Households	935,234	968,646	985,664	995,974	1,036,930	1,105,814
Households	310,688	330,479	341,332	348,630	376,374	414,836
Average Household Size	3.01	2.93	2.89	2.86	2.76	2.67

Source: Texas Demographic Center (2018) and University of New Mexico Geospatial & Population Studies (2015).

Analysis of Trends in Median Household Income and Base Year Median Household Income

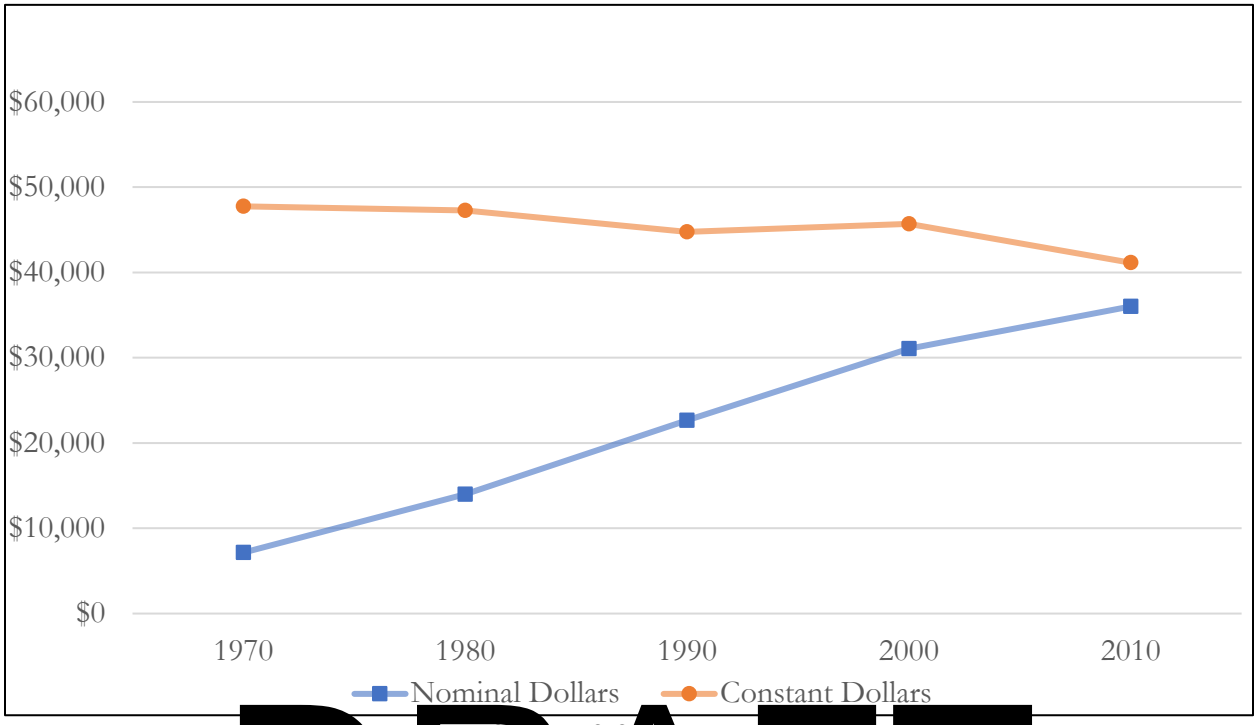
Table 11 shows the median household income from 1970 through 2010 in nominal and constant 2017 dollars for El Paso, Doña Ana, and Otero Counties. The 1970 through 2010 incomes from the decennial census and the 2010 ACS (1-Year) are graphed in Figures 5a, 5b, and 5c. Over the years, real income growth in these three counties, as measured in constant dollars, has declined since 1970. However, real income has remained stable (around $45,000) in Otero County bet[illegible]0 an[illegible]

Table 11. Median Household Income for El Paso, Doña Ana, and Otero Counties 1970–2010 in 2017 Dollars

	1970	1980	1990	2000	2010
El Paso, TX					
Constant Dollars	$47,758	$47,278	$44,765	$45,693	$41,146
Nominal Dollars	$7,150	$14,002	$22,644	$31,051	$36,015
Doña Ana, NM					
Constant Dollars	$49,394	$41,740	$43,213	$43,864	$40,249
Nominal Dollars	$7,395	$12,362	$21,859	$29,808	$35,230
Otero, NM					
Constant Dollars	$54,217	$45,299	$44,725	$45,413	$45,259
Nominal Dollars	$8,117	$13,416	$22,624	$30,861	$39,615

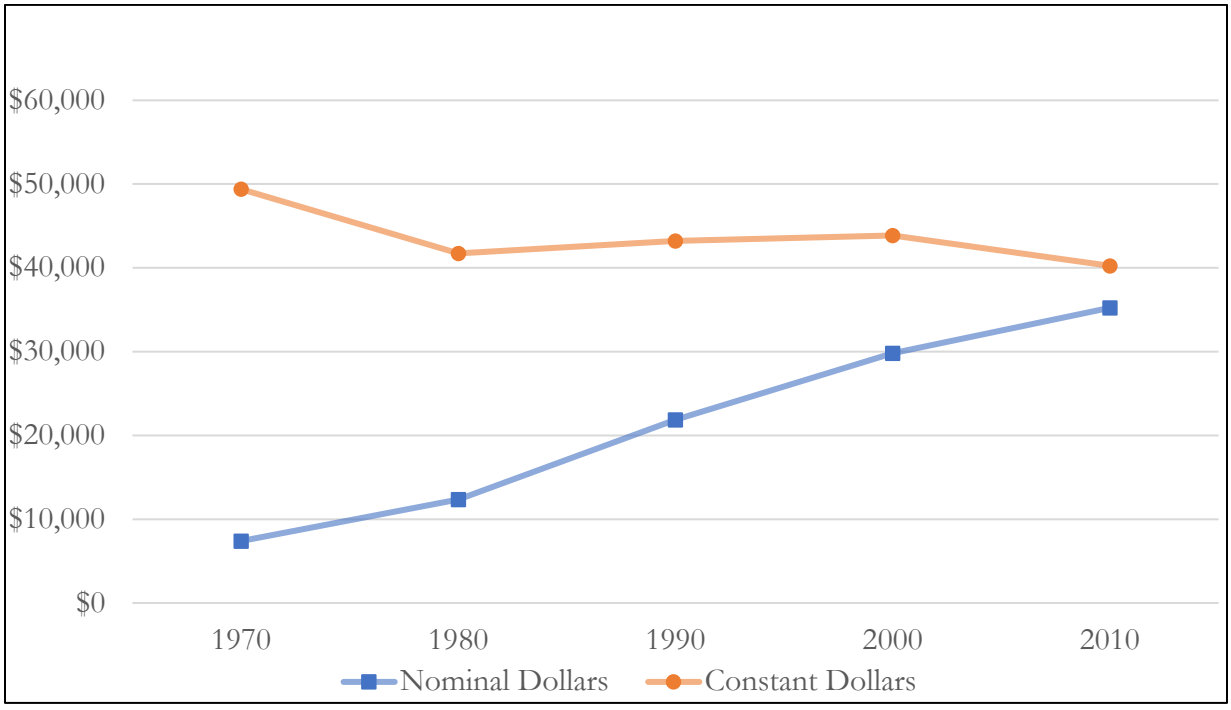
Source: U.S. Census 1969, 1979, 1989, 1999, and 2010 1-Year American Community Survey.

Figure 5a. Historical Median Household Income for El Paso County 1970-2010 in Nominal and Constant 2017 Dollars



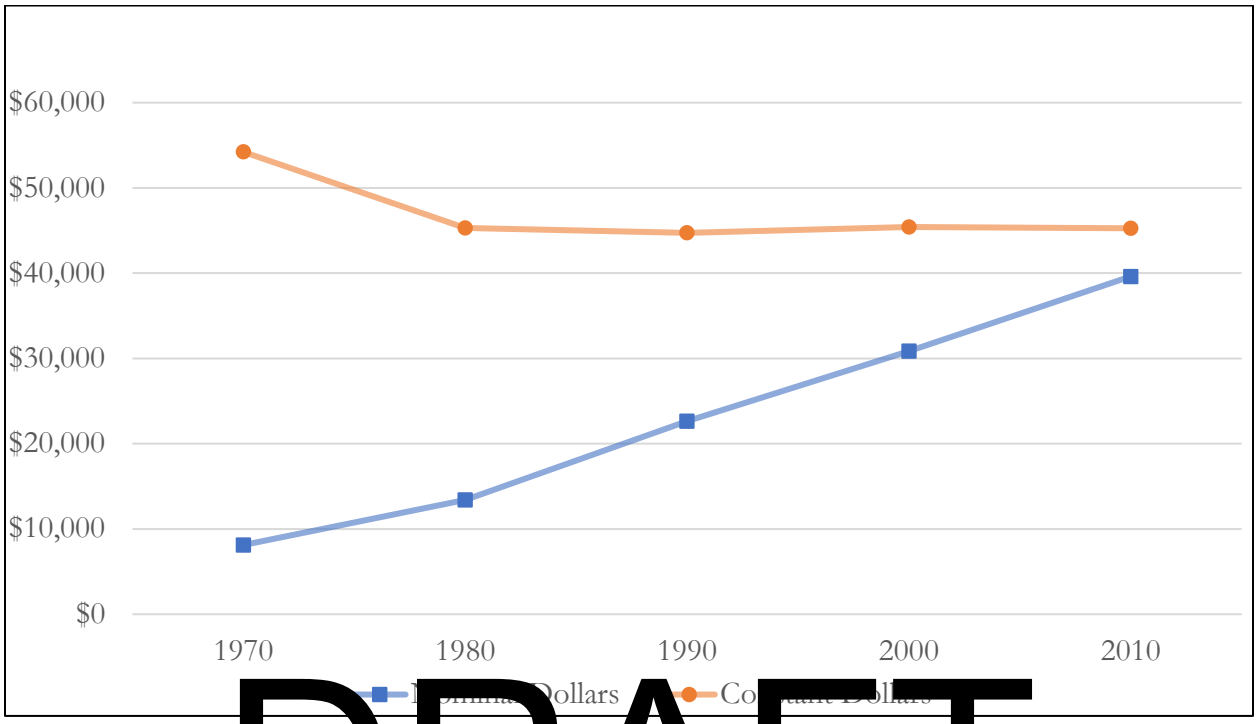
Source: U.S. Census Bureau.

Figure 5b. Historical Median Household Income for Doña Ana County 1970-2010 in Nominal and Constant 2017 Dollars.



Source: U.S. Census Bureau.

Figure 5c. Historical Median Household Income for Otero County 1970-2010 in Nominal and Constant 2017 Dollars.



Suggested 2017 Base year Median Household Income Control Total

Table 12 presents the 2017 1-Year ACS estimated median household income for the three counties and the El Paso MAB, as well as the upper and lower limits based on the margin of error. The El Paso MAB income was based on the medians calculated from grouped values at the block group level. The limits were calculated using the margin of error derived from the weighted standard error of the estimates, based on the three counties' shares of households inside the MAB. It is suggested that the "Estimate" value be used unless there are local data sources that indicate otherwise. These income figures are presented in constant 2017 dollars as required for TDM purposes.

Table 12. Estimated Median Household Income for El Paso, Doña Ana, and Otero Counties and the El Paso MAB in 2017 Dollars.

	2017 Median Household Income Range		
	Lower Limit	Estimate	Upper Limit
El Paso, TX	$42,498	$44,489	$46,480
Doña Ana, NM	$33,399	$37,144	$40,889
Otero, NM	$40,504	$43,887	$47,270
El Paso MAB	$40,302	$42,462	$44,622

Source: U.S. Census Bureau.

Analysis of Forecast-Year Median Household Income

Projections of median household income were obtained from the TDC for El Paso County for the years 2022 through 2050 using the latest migration scenarios available. No forecast was found for Doña Ana and Otero counties, so figures were estimated using a trend line based on nominal dollars between 1970 and 2018. To clarify, these projections are based on trended values of the five decennial Census (1970, 1980, 1990, 2000, and 2010) and eight waves of the one year ACS (2011-2018). The incomes were converted to represent constant 2017 dollars using the Consumer Price Index for All Urban Consumers (CPI-U) and all values to nominal dollars using the CPI forecast prepared by the Texas State Comptroller's Office (Fall, 2019). As Table 13 illustrates, median household income in El Paso, Doña Ana and Otero counties is expected to continue to increase in nominal dollars and decrease in constant dollars.

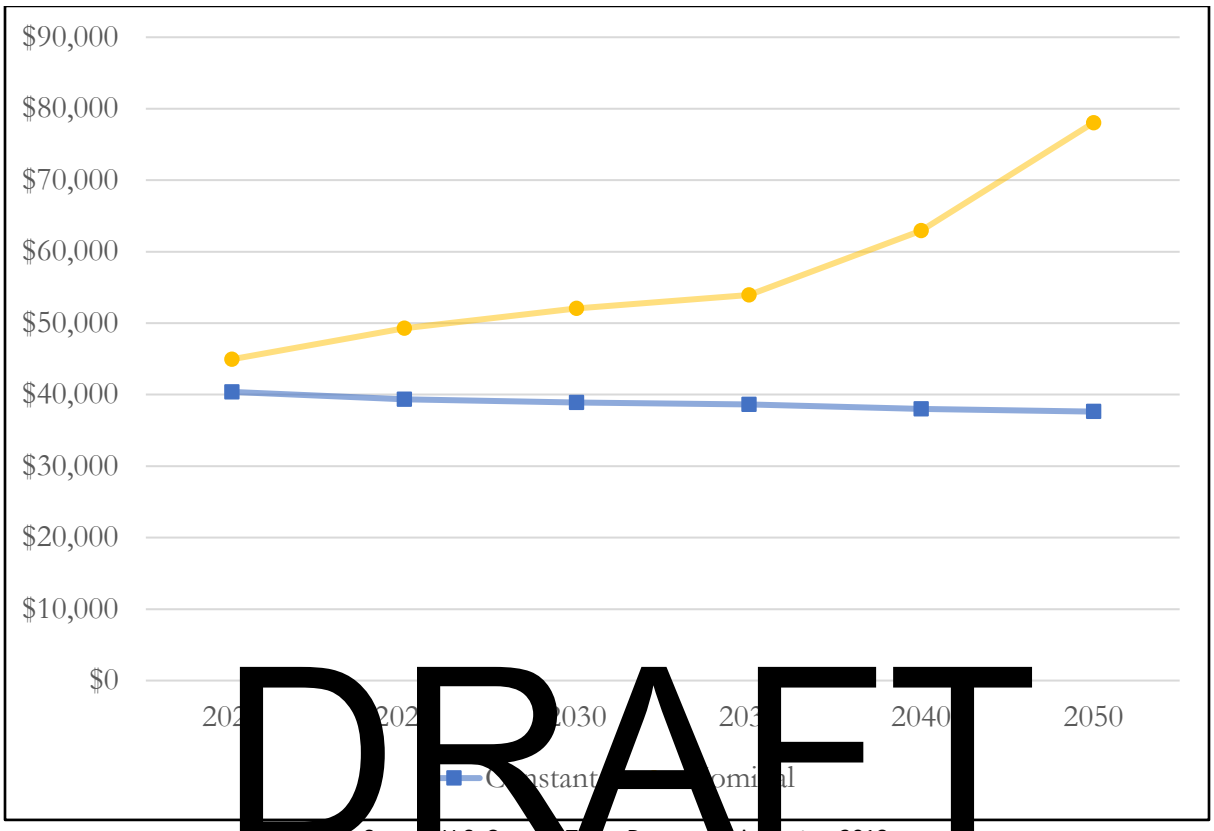
Table 13. Projected Median Household Income in Constant 2017 and Nominal Dollars for El Paso, Doña Ana, and Otero Counties.

El Paso, TX	2022	2027	2030	2032	2040	2050
Constant 2017 Dollars	$41,572	$40,661	$40,256	$40,042	$39,622	$39,738
Nominal Dollars	$46,275	$50,898	$53,880	$55,899	$65,644	$82,428
Doña Ana, NM						
Constant 2017 Dollars	$33,380	$31,690	$30,825	$30,337	$28,384	$25,840
Nominal Dollars	$37,151	$39,6[illegible]	$41,657	$42,351	$47,025	$53,599
Otero, NM						
Constant 2017 Dollars	$41,324	$40,459	$40,089	$39,943	$39,260	$38,013
Nominal Dollars	$45,999	$50,646	$53,656	$55,762	$65,044	$78,849

Source: Texas Demographic Center, 2018.

Figure 6 graphs the projected median household income in both nominal dollars and 2017 constant dollars for the El Paso MAB. While the MAB shows overall growth in nominal dollars, for the Texas counties, the process of estimating future household income is based on the historical relationship between race, ethnicity, and income. If this does not change, the likelihood is that incomes across the state of Texas as well as within the MAB will decline in constant dollars for future years.

Figure 6. Future Trends in Median Household Income for El Paso MAB 2017-2050.



Source: U.S. Census, Texas Demographic Center, 2018.

Suggested Forecast-Year Median Household Income Control Totals

Table 14 contains the forecast year median household income for the El Paso MAB under the most recent migration scenario. As mentioned earlier, the values are from the TDC projections of median household income and adjusted to 2017 dollars for modeling purposes. Note that the MAB median income was calculated based on the three counties' shares of households inside the MAB from the 2017 ACS (5-Year) data.

Table 14a. Suggested Forecast Year Median Household Incomes in Constant 2017 and Nominal Dollars for the El Paso MAB.

El Paso MPO	2022	2027	2030	2032	2040	2050
Constant 2017 Dollars	$40,382	$39,363	$38,895	$38,647	$37,988	$37,625
Nominal Dollars	$44,951	$49,274	$52,058	$53,951	$62,937	$78,044

Source: Texas Demographic Center, 2018.

Analysis of Employment Trends and Base Year Employment Estimates

Historical employment data for El Paso County was obtained from the Texas Workforce Commission (TWC). The New Mexico Workforce Connection (NMTC) provided historical data for Doña Ana and Otero counties. Tables 15a, 15b, and 15c show the historical employment data by type for 1990, 2000, 2005, and 2010. Note that the data were only available for Doña Ana and Otero counties in 2005 and 2010. The data are graphed in Figure 7 below. In terms of scale, El Paso has added over 64,000 jobs in the twenty year period while Doña Ana has added over 3,000 jobs and Otero County has lost about 1,100 jobs between 2005 and 2010. The data on percent of total employment by type indicates the share of basic employment has decreased in all three counties, whereas the service employment share has increased in El Paso and Doña Ana but slightly decreased in Otero. Generally, percent retail has remained stable in El Paso and Doña Ana, but slightly increased in Otero in the past. The Education sector makes up a smaller proportion of the job market and has maintained the share in the past. Note: the breakdown of employment by type may have been calculated differently in New Mexico than in Texas. The numbers are presented as provided for Doña Ana and Otero counties.

Table 15a. Historical Employment by Type for El Paso County, 1990-2010.

	Basic	Retail	Service	Education	Total
Numb					
19 0	7 ,08	4 ,707	5,147	21,132	207,073
20 0	7 ,94	5,912	,010	27,870	249,734
20 5	2,78	6 ,07	101 ,744	31,996	256,606
2010	58,050	63,148	112,701	37,278	271,177
Percent					
1990	35.78%	22.56%	31.46%	10.21%	100.00%
2000	31.21%	22.39%	35.24%	11.16%	100.00%
2005	24.47%	23.41%	39.65%	12.47%	100.00%
2010	21.41%	23.29%	41.56%	13.75%	100.00%

Source: Texas Workforce Commission.

Table 15b. Historical Employment by Type for Doña Ana County, 1990-2010.

	Basic	Retail	Service	Education	Total
Number					
1990	N/A	N/A	N/A	N/A	N/A
2000	N/A	N/A	N/A	N/A	N/A
2005	16,792	8,172	30,259	11,466	66,689
2010	14,936	8,225	35,257	11,404	69,822
Percent					
1990	N/A	N/A	N/A	N/A	N/A
2000	N/A	N/A	N/A	N/A	N/A
2005	25.18%	12.25%	45.37%	17.19%	100.00%
2010	21.39%	11.78%	50.50%	16.33%	100.00%

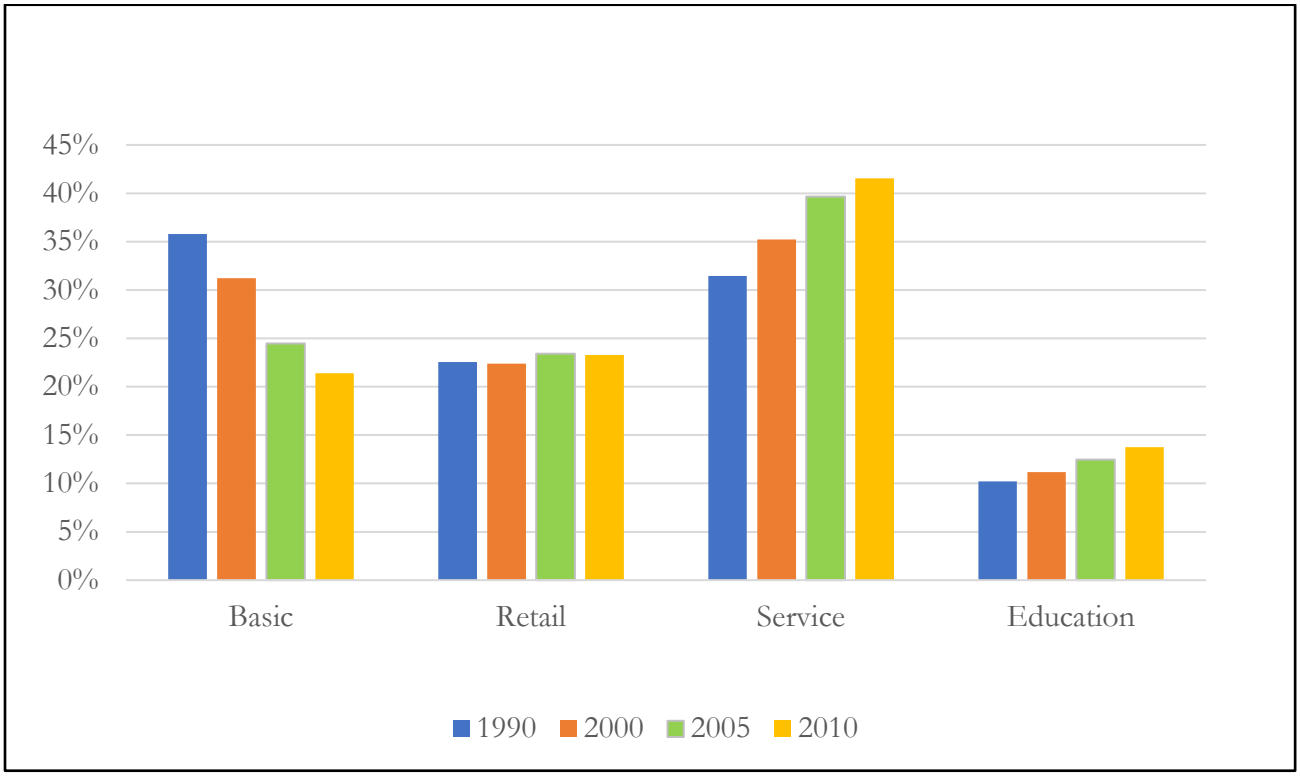
Source: New Mexico Workforce Connection.

Table 15c. Historical Employment by Type for Otero County, 1990-2010.

	Basic	Retail	Service	Education	Total
Number					
1990	N/A	N/A	N/A	N/A	N/A
2000	N/A	N/A	N/A	N/A	N/A
20[illegible]	[illegible]2,93[illegible]	[illegible],422	[illegible]11,039	1,748	18,143
20[illegible]0	[illegible]61[illegible]	[illegible],684	[illegible]0,064	1,704	17,067
Percer[illegible]					
19[illegible]	N/[illegible]	[illegible]/[illegible]	[illegible]/A	N/A	N/A
2000	N/A	N/A	N/A	N/A	N/A
2005	16.17%	13.35%	60.84%	9.63%	100.00%
2010	15.32%	15.73%	58.97%	9.98%	100.00%

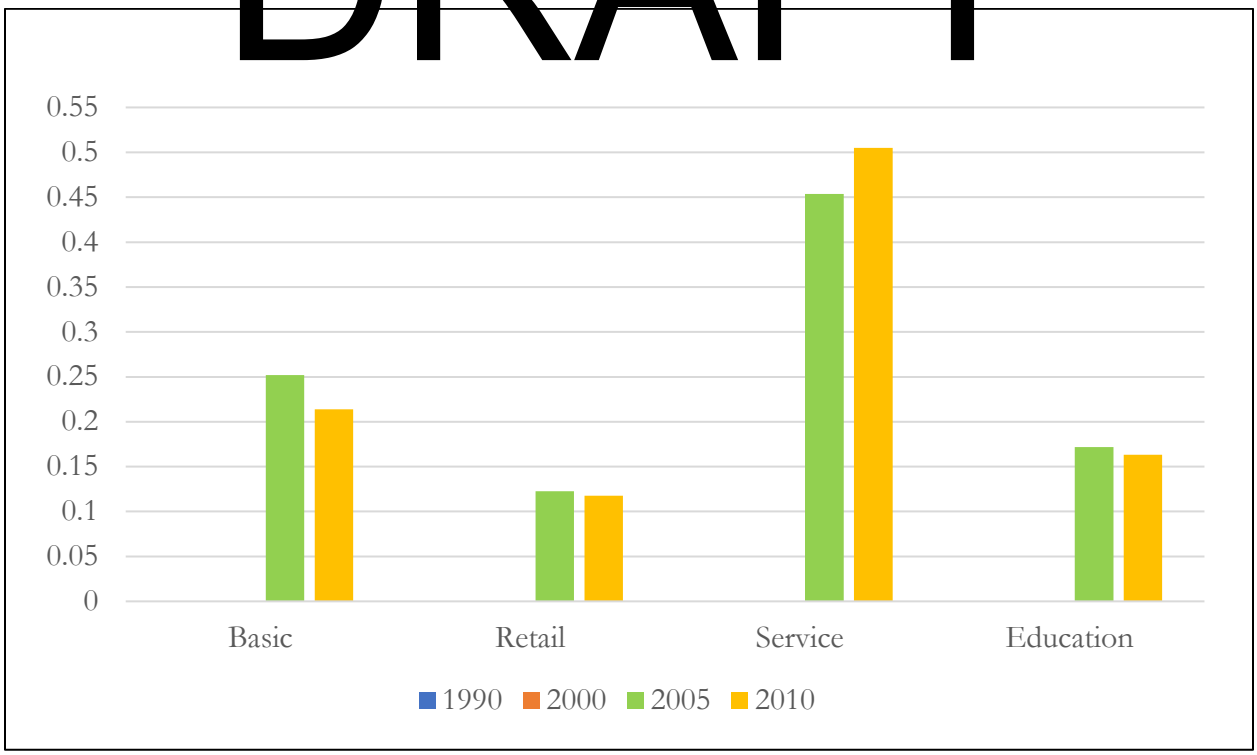
Source: New Mexico Workforce Connection.

Figure 7a. Historical Percent Employment by Type for El Paso County, 1990-2010.



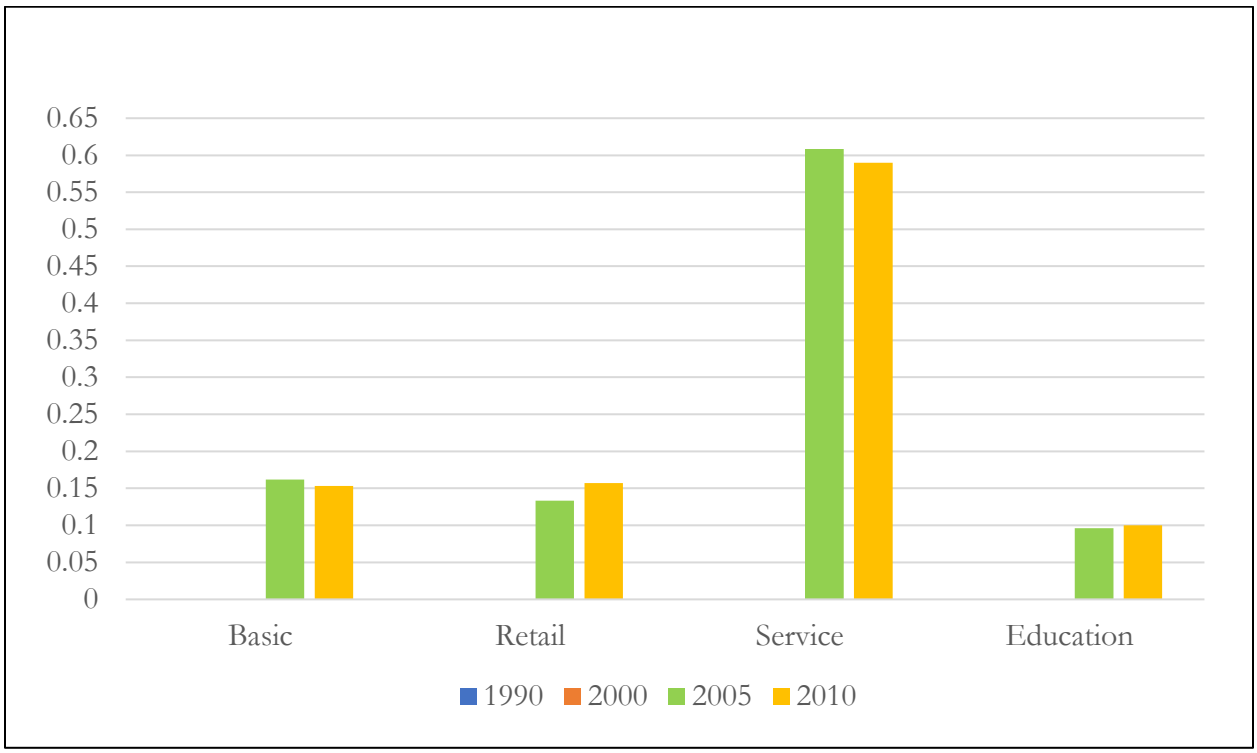
Source: Texas Workforce Commission.

Figure 7b. Historical Percent Employment by Type for Doña Ana County, 1990-2010.



Source: New Mexico Workforce Connection.

Figure 7c. Historical Percent Employment by Type for Otero County, 1990-2010.



Source: New Mexico Workforce Connection.

Suggested Base Year Employment Control Totals

The Texas Workforce Commission (TWC) data for 2010 were used to develop the base year employment for the El Paso MAB Texas portion, while employment by type in the MAB New Mexico portion was extracted from the New Mexico Workforce Connection data. Table 16 breaks out total employment into sub-totals by employment type. All employment that falls inside El Paso County is counted towards the total employment of the El Paso MAB. Since there was no address level employment data available, the MAB New Mexico portion for Doña Ana and Otero counties is estimated using the same percentage as the population.

It should be expected that during the base year TAZ level review of the establishments with addresses, some of these businesses may be located outside the county, or the given employment number represents the total company employment instead of the local branch. As a result, it is expected that the final base year employment developed using this data may not match the totals in this table. Another reason, as mentioned previously, would be because of the different way the employment types were determined in New Mexico vs. Texas. It is therefore likely to result in different total employment in Doña Ana and Otero counties than listed in the table. If the base year breakdown of actual employment data is available from the last MTP process, this might provide a more accurate picture.+

Table 16. 2017 Employment Control Totals for El Paso, Doña Ana, and Otero Counties, and the El Paso MAB.

	Basic	Retail	Service	Education	Total Employment
El Paso County	62,852	74,774	125,988	37,590	301,203
Doña Ana County	14,162	8,692	38,720	9,942	71,516
Otero County	2,316	2,563	10,824	1,668	17,371
El Paso MAB	66,317	77,083	136,180	40,029	319,610

Source: Texas Workforce Commission & New Mexico Workforce Connection.

Analysis of Employment Projections

Future employment is dependent on numerous factors such as population, type of labor force, labor force participation, educational attainment, economic conditions, and technology changes. It is difficult to foresee, much less to project, many of the factors that affect employment levels, but reasonable forecasts of employment can be made based on analysis of population and employment relationship trends. Specifically, future total employment is estimated by using the employment to population ratio trend.

By way of background, it is important to note that the ratio of employment to population varies by area and is contingent on the type of development and the household structure and size. Generally, urban areas that consist of several counties have a core county, the county with the highest density of population and employment. For example, Travis County is the core county in the Austin urbanized area, and it has an employment to population ratio higher than any of the other four counties included in the urbanized area. Core counties have a higher ratio because the greater employment opportunities draw people seeking work from surrounding counties. While the core county tends to maintain a higher employment to population ratio, over time the other counties in the metro area will begin to increase their ratio as population increases. This is often due to the growth in retail and service employment that occurs as population increases in these outlying counties.

Table 17 documents the historical ratio of employment to population for El Paso, Doña Ana, and Otero counties for the years 1995, 2000, 2005 and 2010. The data shows that the ratio for El Paso County in 1995 was over 35 percent, and decreased between 1995 and 2010 by less than 2 percent. The ratio for Doña Ana and Otero counties has increased between 1995 and 2005 by 6 and 8 percent respectively, followed by a decrease between 2005 and 2010 by 1 and 4 percent respectively.

Table 17. Historical Employment to Population Ratio Trend for El Paso, Doña Ana, and Otero Counties, 1995-2010.

El Paso County	1995	2000	2005	2010
Employment	231,927	249,734	256,606	271,177
Population	654,250	679,622	728,095	800,647
Employment/Population	35.45%	36.75%	35.24%	33.87%
Doña Ana County	**1995**	**2000**	**2005**	**2010**
Employment	58,817	71,282	80,297	86,337
Population	161,014	174,682	189,199	209,233
Employment/Population	36.53%	40.81%	42.44%	41.26%
Otero County	**1995**	**2000**	**2005**	**2010**
Employment	19,233	22,933	25,497	23,170
Population	59,516	62,298	62,533	63,797
Employment/Population	32.32%	36.81%	40.77%	36.32%

Source: U.S. Census Bureau, Texas Workforce Commission, and New Mexico Workforce Connection.

The employment to population ratio has slightly increased for El Paso while remained stable for Doña Ana and Otero counties between 2011 and 2017, as noted in Table 18. Given the long term ratio data, it is difficult to predict the future ratio for each county. However, if the local analysis indicates that growth would be expected, it is likely that the ratio may increase over the forecast period or at least remain stable.

Table 18. Recent Employment to Population Ratio Trend for El Paso, Doña Ana, and Otero Counties, 2011-2017.

El Paso County	2011	2013	2015	2017
Employment	271,177	282,442	292,216	301,203
Population	800,647	829,726	837,353	845,954
Employment/Population	33.87%	34.04%	34.90%	35.61%
Doña Ana County	**2011**	**2013**	**2015**	**2017**
Employment	69,822	71,369	71,627	71,516
Population	209,233	215,104	216,260	216,638
Employment/Population	33.37%	33.18%	33.12%	33.01%

Source: Texas Demographic Center, University of New Mexico Geospatial & Population Studies, Texas Workforce Commission, and New Mexico Workforce Connection.

Table 18. Recent Employment to Population Ratio Trend for El Paso, Doña Ana, and Otero Counties, 2011-2017.

El Paso County	2011	2013	2015	2017
Employment	271,177	282,442	292,216	301,203
Population	800,647	829,726	837,353	845,954
Employment/Population	33.87%	34.04%	34.90%	35.61%
Doña Ana County	**2011**	**2013**	**2015**	**2017**
Employment	69,822	71,369	71,627	71,516
Population	209,233	215,104	216,260	216,638
Employment/Population	33.37%	33.18%	33.12%	33.01%

Source: Texas Demographic Center, University of New Mexico Geospatial & Population Studies, Texas Workforce Commission, and New Mexico Workforce Connection.

Once the county-level ratio of employment to population is determined, future estimates of employment by type must be determined. The recent trends in employment by type (basic, retail, service, and education) are provided in Table 19 as part of the employment analysis for the 2017 base year. In this more recent period, the percent of basic employment type has remained stable for El Paso while slightly decreased for Doña Ana and Otero counties. The percent of retail employment for El Paso and Service employment for Doña Ana and Otero counties have slightly increased. During the same time period, the percent of education employment for El Paso and Doña Ana and retail employment for Otero have slightly decreased. This table includes the last year employment by type data is available from Texas Workforce Commission and New Mexico Workforce Connection.

Table 19. Recent Trends in Employment by Type in El Paso, Doña Ana, and Otero Counties, 2011-2017.

El Paso County					
Number	**Basic**	**Retail**	**Service**	**Education**	**Total**
2011	57,333	65,032	115,609	36,894	274,868
2013	57,869	69,177	118,475	36,921	282,442
2015	60,670	72,617	122,440	36,489	292,216
2017	62,852	74,774	125,988	37,590	301,203
Percent					
2011	20.86%	23.66%	42.06%	13.42%	100.00%
2013	20.49%	24.49%	41.95%	13.07%	100.00%
2015	20.76%	24.85%	41.90%	12.49%	100.00%
2017	20.87%	24.83%	41.83%	12.48%	100.00%
Doña Ana County					
Number	**Basic**	**Retail**	**Service**	**Education**	**Total**
2011	15,203	8,489	35,673	11,046	70,411
2013	14,847	8,876	36,515	11,131	71,369
2015	14,695	8,813	37,136	10,983	71,627
2017	14,162	[illegible]	38,720	[illegible]	[illegible]
Percent					
2011	21.59%	[illegible]	50.66%	[illegible]	100.00%
2013	20.80%	12.44%	51.16%	15.60%	100.00%
2015	20.52%	12.30%	51.85%	15.33%	100.00%
2017	19.80%	12.15%	54.14%	13.90%	100.00%

Source: Texas Workforce Commission and New Mexico Workforce Connection.

Table 19. (Continued)

Otero County					
Number	**Basic**	**Retail**	**Service**	**Education**	**Total**
2011	2,409	2,676	10,245	1,622	16,952
2013	2,482	2,546	10,771	1,741	17,540
2015	2,381	2,744	10,669	1,660	17,454
2017	2,316	2,563	10,824	1,668	17,371
Percent					
2011	14.21%	15.79%	60.44%	9.57%	100.00%
2013	14.15%	14.52%	61.41%	9.93%	100.00%
2015	13.64%	15.72%	61.13%	9.51%	100.00%
2017	13.33%	14.75%	62.31%	9.60%	100.00%

Source: Texas Workforce Commission and New Mexico Workforce Connection.

Suggested Forecast-Year Employment Control Totals

Table 20 contains a reasonable range for the employment to population ratio for the interim and forecast years for El Paso, Doña Ana, and Otero counties as well as the El Paso MAB, based on the trended employment to population ratios between 1990 and 2018. After the local selection of a ratio, it should be used in conjunction with the selected population control totals to develop the estimated total employment for the interim and forecast years as needed.

Table 20. Suggested Range of Employment to Population Ratios for El Paso, Doña Ana, and Otero Counties, and the El Paso MAB.

	2022		2027		2032		2040		2050	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
El Paso County	36%	37%	37%	39%	39%	41%	42%	45%	45%	49%
Doña Ana County	39%	41%	39%	42%	41%	42%	41%	45%	41%	46%
Otero County	35%	38%	36%	39%	38%	39%	37%	43%	38%	45%
El Paso MAB	36%	37%	37%	39%	40%	40%	42%	45%	45%	49%

Source: Texas Demographic Center

Table 21 provides a reasonable range of percent employment by type for the interim and forecast years for El Paso, Doña Ana, and Otero counties. The selected percent by type should be used in conjunction with the forecast year(s) total employment estimated using the employment to population ratio to develop estimates of the employment by type.

Table 21. Estimated Range of Percent Employment by Type for the El Paso MAB.

El Paso MAB	2022		2027		2032		2040		2050	
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Basic	19%	21%	17%	21%	16%	19%	14%	18%	11%	16%
Retail	23%	25%	23%	27%	24%	27%	24%	30%	25%	32%
Service	43%	45%	43%	47%	44%	48%	44%	50%	45%	53%
Education	11%	12%	11%	12%	10%	12%	9%	12%	8%	11%

Source: Texas Demographic Center, 2018.

Table 22 below is an example of estimating total employment and employment by type. Using the table will provide users some flexibility to tailor the forecast to their community based on local knowledge. As mentioned before, the selection of a forecast year employment/population ratio is the starting point. Note that the selected percentages for each type of employment must sum to 100 percent.

Table 22. Example Estimating 2050 Employment and Employment by Type for the El Paso MAB.

2050 MAB Population	1,123,033	
2050 Employment/Population Ratio	0.47	
2050 Total Employment	526,920	
2050 Employment by Type	Percent	Number
Basic	15.0%	79,038
Retail	29.0%	152,807
Service	45.0%	237,114
Education	11.0%	57,961
Total	100.0%	526,920

Source: Texas Demographic Center.

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Appendix A

El Paso MPO Area Population Pyramids

The 2017 and the 2050 population pyramids have been included on the following pages as additional information to help understand future changes in the El Paso MPO planning area.

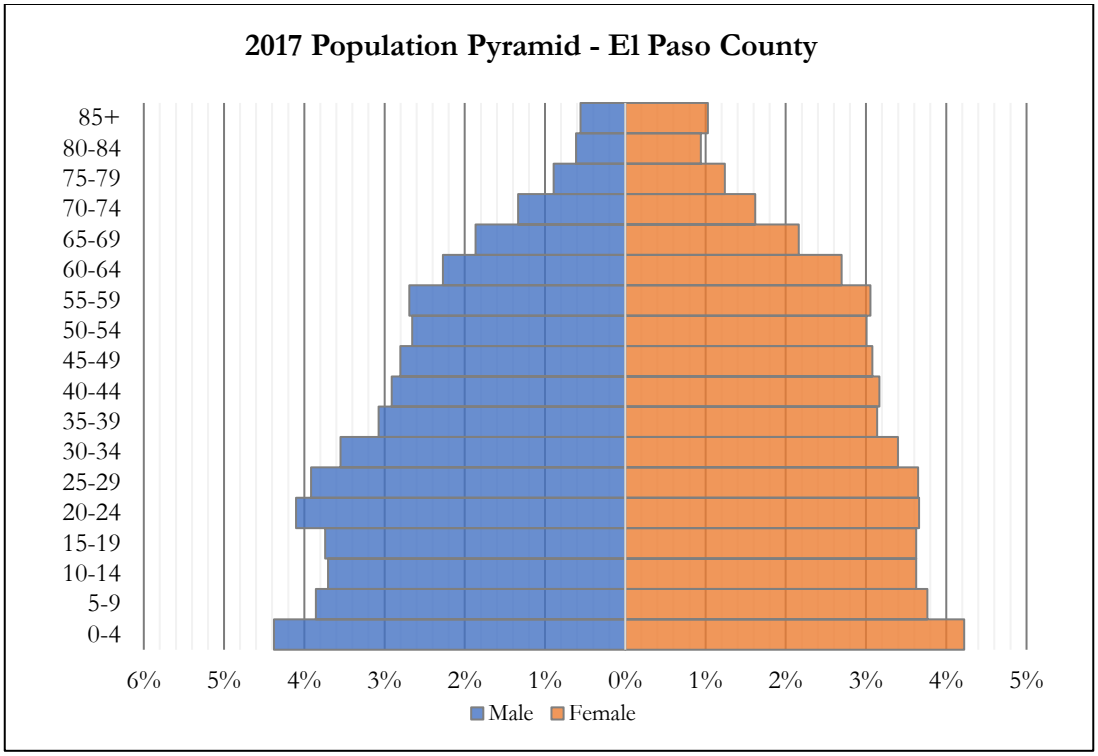
Population pyramids are used to help us understand possible the growth (or decline) of fertility, mortality, and migration. For instance, rectangular pyramids indicate low population growth; the population has a similar cohort size across age groups, as older generations are being replaced by younger generations of about the same size. The classic pyramids indicate fast population growth, because older generations are producing larger new generations. The upside-down pyramids indicate that the fertility is low and the life expectancy is high.

The shape can tell us other things as well. For instance, the pyramid can give us an idea of what the dependency ratio is. That is, the number of people working relative to the number of people dependent on that working population. Young dependents are generally those persons under 15, and elderly dependents are those 65 and over.

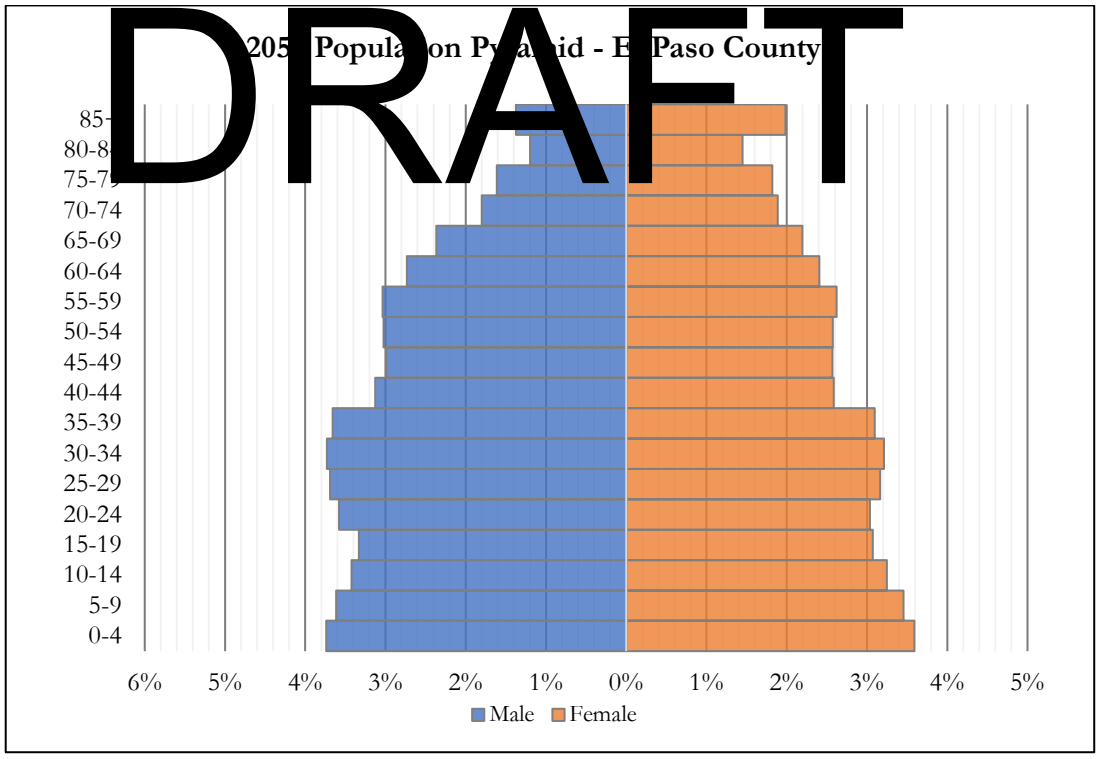
With respect to El Paso County in 2017, it is generally shaped like a pyramid with a wide base and some bulges in the middle. The population 20 to 34 stands out with another outcrop in the mid 50's (55-59). By 2050, the population pyramid still looks like a pyramid although with a greater percentage of persons between 20 and 49 than other age groups. The elderly cohorts will expand further by 2050 as indicated by the higher percentages for both male and female 70 years and older.

Reviewing the Doña Ana County pyramid in 2017, it is generally shaped like a pyramid with a larger number of persons in the age cohorts representing the 20-24 year olds. By 2050, the age pyramid begins to look somewhat like a rectangle although with a greater percentage of persons between 45 and 54 than other age groups. Rectangular shaped pyramids tend to have the same population size over time. This typically indicates low death rate, low population growth and low birth rate.

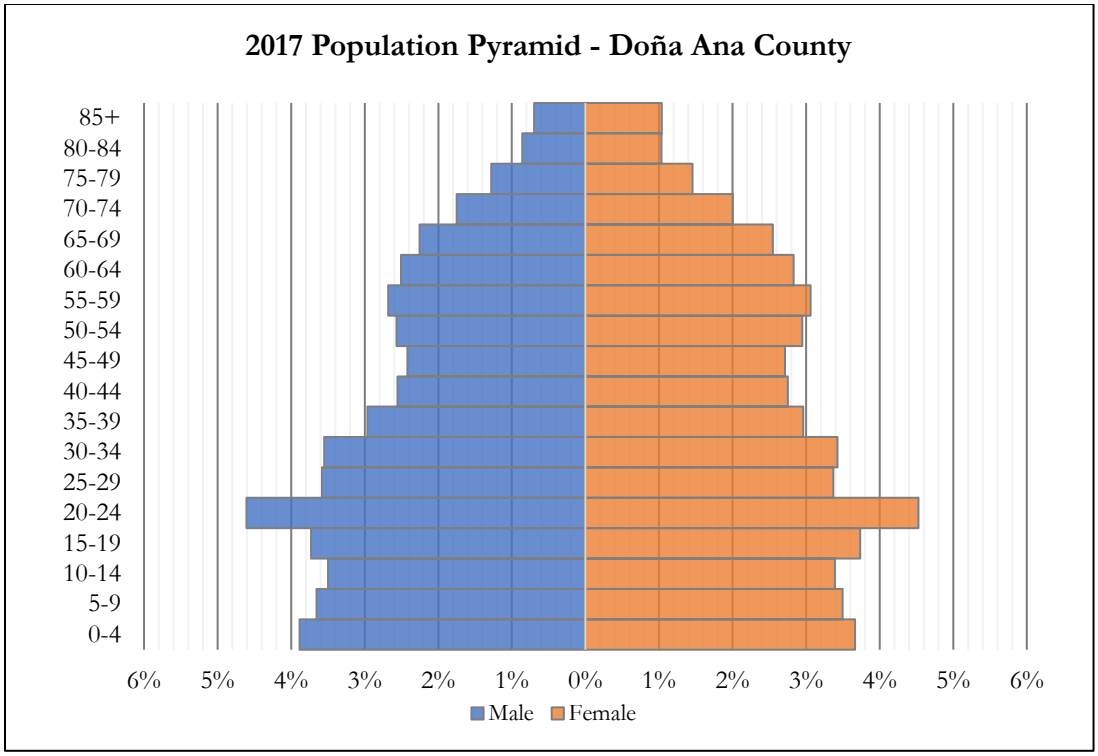
Regarding the Otero County pyramid in 2017, it is generally shaped like a rectangle although with a greater percentage of males between 20 and 34 than other age groups. By 2050, the age pyramid still looks like a rectangle although with a greater percentage of persons between 30 and 34 as well as between 50 and 54 than other age groups. Similar to the Doña Ana pyramid in 2050, low population growth and low birth rate are typically considered to be associated with the rectangular shape, as shown by the Otero pyramid in 2050.



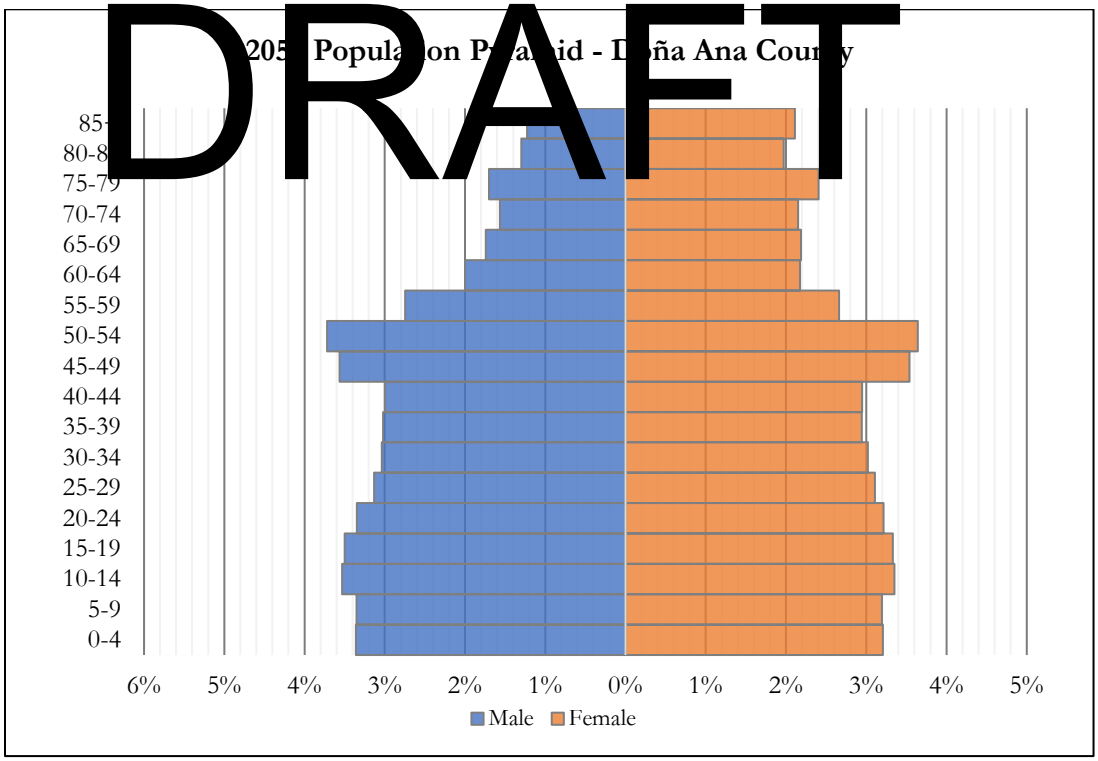
Source: Texas Demographic Center, 2018



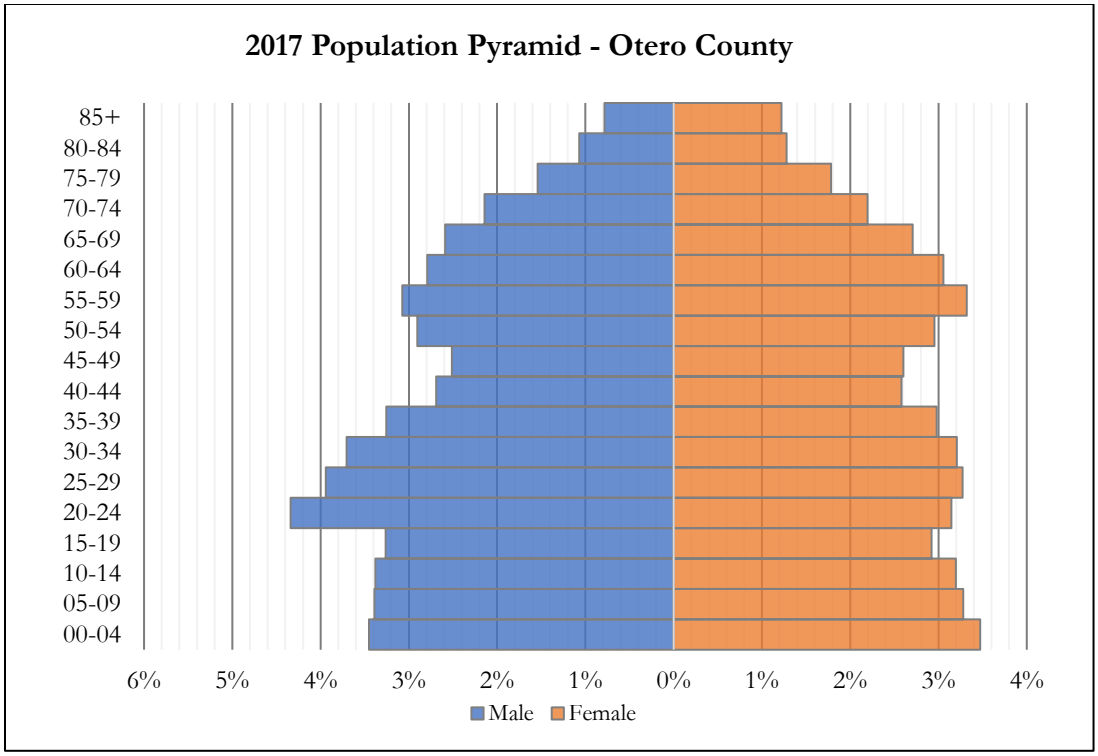
Source: Texas Demographic Center, 2018



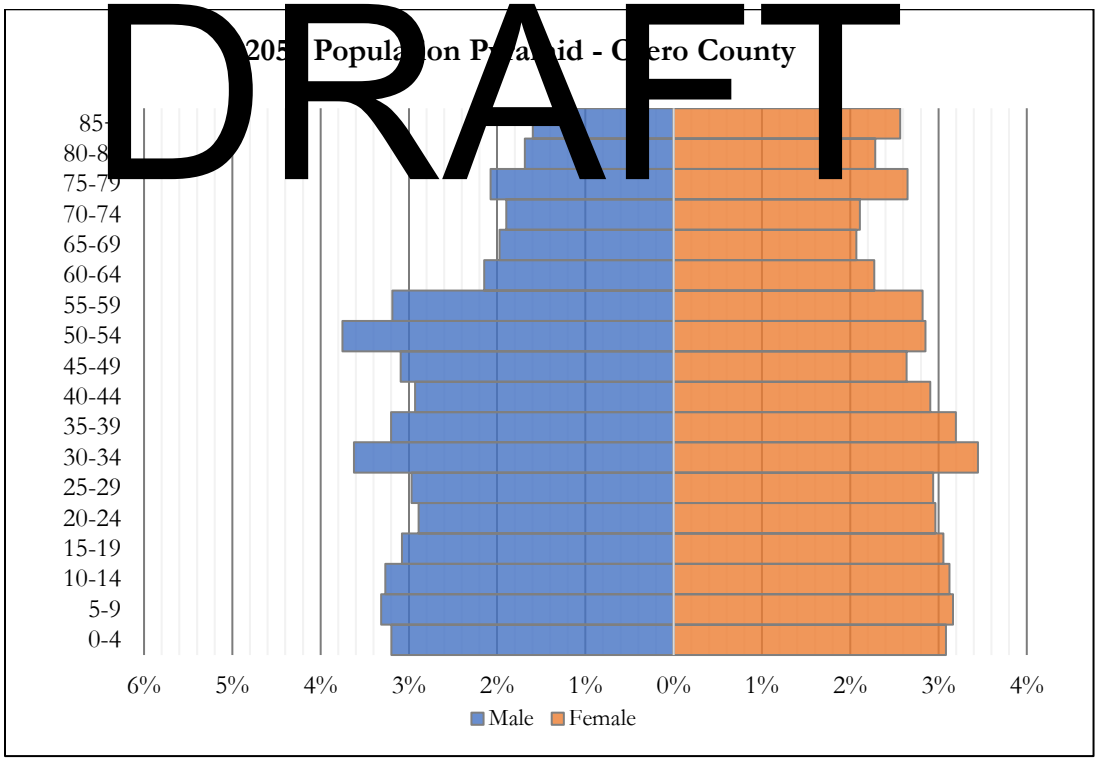
Source: University of New Mexico Geospatial & Population Studies, 2015



Source: University of New Mexico Geospatial & Population Studies, 2015



Source: University of New Mexico Geospatial & Population Studies, 2015



Source: University of New Mexico Geospatial & Population Studies, 2015