Real Estate Market and Sales Study
Of
The Lower Rio Grande Valley
To Support the Proposed Border Wall Construction Project
Within Starr, Hidalgo, and Cameron Counties of Texas

Prepared For:
United States Department of Justice
Environmental and Natural Resources Division
Land Acquisition Section

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Date of Report
July 31, 2020

Effective Date of Study:
January 13, 2020

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July 31, 2020

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RE: Real Estate Market and Sales Study, in support of the Proposed Border Wall Construction Project within the Texas Counties of Starr, Hidalgo, and Cameron.

Ms. Wilson:

In fulfillment of your request, the firms of Robinson, Duffy & Barnard, LLP, Bierschwale Land Company, LLC, and Southwest Valuation, LLC have collectively prepared a Real Estate Market and Sales Study of the Lower Rio Grande Valley of Texas, with an effective date of January 13, 2020.

The purpose of this study is to support the Border Wall Construction Project in the Lower Rio Grande Valley of Texas by:

- identifying the study area and sub areas of the Lower Rio Grande Valley;
- identifying land use categories for real property within the study area;
- evaluating the characteristics of real property that influence market value; and
- collecting, confirming, and verifying sales and listings of real property data.

The data has clearly demonstrated several characteristics that impact overall value. As a result, while many appraisers and/or data analysts generate value indications by simply dividing the total price of a transaction by gross acres, results of our analysis into the Lower Rio Grande Valley (LRGV) rural market indicates this method would be in error.

Our findings and conclusions are reflected in the attached report and land sale book addendum.

Respectfully submitted,

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Certification Statement

I certify that, to the best of my knowledge and belief, ...

the statements of fact contained in this report are true and correct.

the reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, opinions, and conclusions.

I have no present or prospective interest in the properties or areas under study and no personal interest or bias with respect to the parties involved. The analysts did not base their analysis or conclusions on the race, color, religion, national origin, marital or familial status, gender, income level, age, health or handicap of the present or prospective owners, occupants or users of the properties or participants in the study area.

the compensation is not contingent on an action or event resulting from the analyses, opinions, or conclusions in, or the use of, this report.

the reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the *Code of Professional Ethics and the Standards of Professional Appraisal Practice* of the Appraisal Institute, the *Uniform Standards of Professional Appraisal Practice*, and the *Uniform Appraisal Standards for Federal Land Acquisitions.*

the use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

as of the date of this report, Steve Robinson, Justin Bierschwale and Rick Muenks have completed the continuing education program for designated members of the Appraisal Institute.

Steve Robinson has made a personal inspection of the Texas Counties of Starr, Hidalgo, and Cameron along the existing and anticipated alignment of the Border Wall Construction Project.

Justin Bierschwale has made a personal inspection of the Texas Counties of Starr, Hidalgo, and Cameron along the existing and anticipated alignment of the Border Wall Construction Project.

Rick Muenks has made a personal inspection of the Texas Counties of Starr, Hidalgo, and Cameron along the existing and anticipated alignment of the Border Wall Construction Project.

no one other than the following referenced staff provided significant professional assistance to the persons signing this report: Drew Robinson - Research.

Steve Robinson

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Table of Contents

List of Tables

Preamble

The *Real Estate Market and Sales Study of the Lower Rio Grande Valley* was undertaken for the purpose of providing insight into the real estate market in the Lower Rio Grande Valley of Texas. Specifically, it focuses on the area along the route of the Border Wall along the Rio Grande in Cameron, Hidalgo, and Starr Counties of Texas.

Since construction of the first border wall segments in Cameron and Hidalgo Counties in 2008 – 2010, real estate practitioners have been involved in the valuation of lands along the river for eminent domain proceedings. The purpose of this study is to not only provide a common background to inform appraisers about the unique border region of the State and Country, but to also enlighten and educate practitioners on the nuances of appraising property in Cameron, Hidalgo, and Starr Counties. It is the intent of this study to provide guidance that will enable appraisers to draw educated and well-informed conclusions concerning valuation issues along the Border Wall in the Lower Rio Grande Valley of Texas.

Included in this study (under separate cover) are three data books, which present the sales collected and analyzed. The overwhelming majority of valuation assignments created by the Border Wall Project are anticipated to be in relation to agricultural properties that may or may not have some influence from nearby development. Data Book A contains the primary sales utilized in the analysis of production agricultural properties and are utilized to analyze those sales that have sold with water rights and/or sales with the Border Wall as a component of the sale. The sales in this group were verified to the requirements of the *Uniform Appraisal Standards for Federal Land Acquisitions* (UASFLA); however, practitioners who choose to utilize the data should complete their own verifications if called upon to testify in a court proceeding.

Users of the *Real Estate Market and Sales Study of the Lower Rio Grande Valley* should be aware of the requirements of USPAP and UASFLA for relying on the reports of others. Reference is made to Section 1.13 on pages 53-54 of the *Uniform Appraisal Standards for Federal Land Acquisitions 2016*, which states "*In using these opinions and reports, the appraiser cannot merely accept such consultant reports as accurate, but rather must analyze such reports and adopt them only if reasonable and adequately documented and supported.*"

In summary, anyone doing an appraisal in the Lower Rio Grande Valley is invited to utilize this study to its full extent, taking into consideration the data analyzed and the resultant conclusions therein. Potential users should be aware that this information, while detailed and conclusive, does not confer competency, geographic or otherwise, and it is not a substitute for a property specific appraisal.

Summary of Study Conclusions

This assignment addresses land sale activity in the Lower Rio Grande Valley of Texas and specifically land sale activity that would be most applicable to acquisition of land area to support the Border Wall Construction Project. The alignment of the unbuilt portions of the Border Wall and identification of land areas being acquired for the Border Wall is not specifically addressed in this study. It is recognized that there will be specific issues that might exist for individual acquisitions that are not envisioned or addressed in this study. Therefore, this study is not intended to address every question that may arise through the individual appraisal assignment, but is prepared to provide extensive confirmed sales data and analysis of that data for individual valuation assignments concerning the Border Wall Construction Project.

The study is presented in three sections. Section 1 presents a market analysis of the Lower Rio Grande Valley region and the four counties that make up the region – Cameron County, Hidalgo County, Starr County, and Willacy County. The focus of the market analysis is population growth over time along with other growth trends.

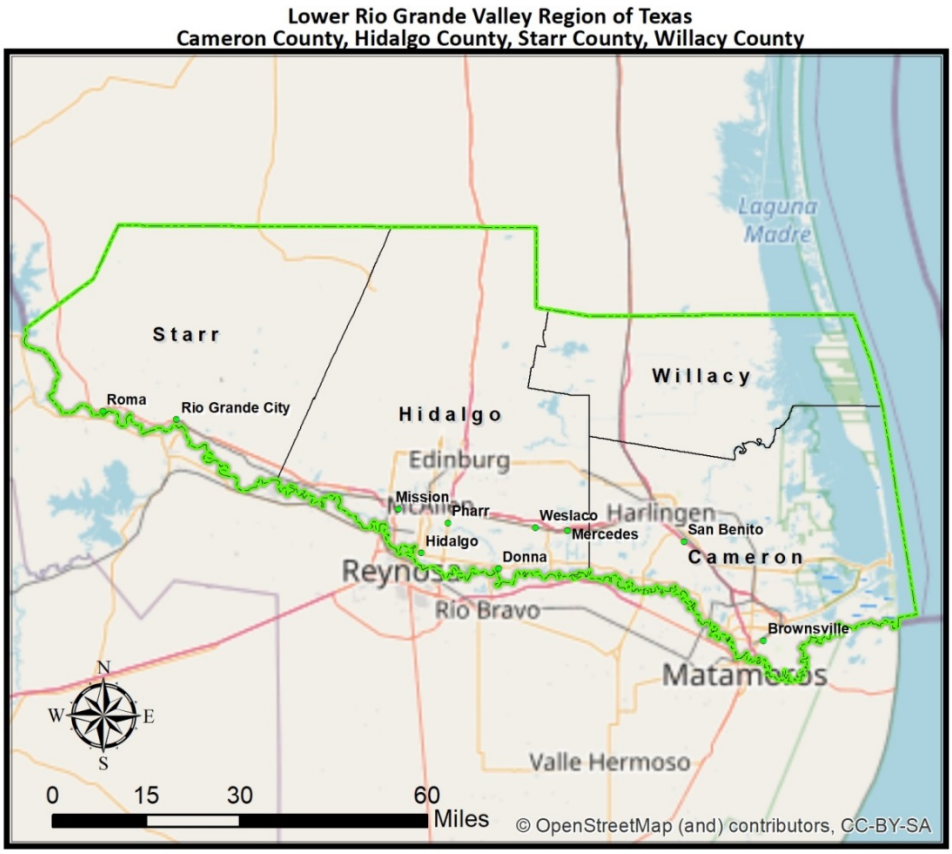
Section 2 identifies the submarkets for the southern portion of the Lower Rio Grande Valley region and presents the sale activity in those submarkets that have been collected as part of this assignment. Section 2 compares population growth in the submarket Pre-Border Wall and Post-Border Wall for submarkets that have a Border Wall presently in place. Section 2 also presents a land sale comparative analysis for Cameron County/Hidalgo County and for Starr County identifying sale price variables and adjustments derived from the land sales data.

Section 3 is a farmland analysis of the Lower Rio Grande Valley region with much of the emphasis being placed on agriculture land sales in Cameron County and Hidalgo County. It is anticipated that much of the land acquisition for the Border Wall Construction Project will be from land tracts with an agriculture highest and best use; therefore, Section 3 focuses on the farmland use.

Finally, it is recognized that there are multiple ways to analyze data, and we make no claim that the roadmap laid out in this study is the only way. We recommend that practitioners make some attempt at identifying the components impacting value for these property types, determine a method to quantify those components, and uniformly apply them to the data sets with which they intend to derive indicated values for subject properties. <u>While a practitioner may choose a different path, the data is clear that simply dividing a sale price by gross acres will lead to erroneous value indications, particularly within the production agriculture market.</u>

Study Area

This study concerns a broad area located at the southern tip of Texas in a region known as the Lower Rio Grande Valley, or the Rio Grande Valley, ("the Valley"), which is generally recognized to extend across the four counties of Cameron, Hidalgo, Starr, and Willacy. The Valley has a unique geographical location, bordering the Gulf of Mexico and the Rio Grande River, which functions as the international border between the United States of America and the Republic of Mexico.



There are three interstate corridors extending through Valley region, I-69E is a north/south freeway that begins in Brownsville and heads northward eventually terminating near Victoria where it becomes Interstate 69. For its entire length, I-69E follows the alignment of US Highway 77. I-69C is a north/south freeway that once completed will begin at Interstate 2/US 83 in Pharr and head northward terminating at I69W/US 59 near George West at I- 37. For its entire length I-69C shares an alignment with US 281, which connects with Mexican Federal Highway 97 at the international border. Interstate 2 was designated as an interstate in 2013, and begins at the intersection with US Highway 83 in Penitas and extends eastward terminating in Harlingen. For its entire length, Interstate 2 runs concurrently with US Highway 83 which extends east/west through the Valley, and then turns north in southwest Starr County at the city of Roma.

The Secure Fence Act of 2006 authorized and partially funded the construction of a wall along the United States/Mexico border. Although the international border extends some 1,954 miles from California to the mouth of the Rio Grande River in Cameron County, Texas, the Border Wall is not contiguous along that vast reach. Within the area of this study, considerable portions of the Border Wall were constructed and completed from 2008 through 2010 in Cameron County and Hidalgo County, with some sections not yet completed. No construction to date has occurred in Starr County.

Regional Population and Growth

The study area contains two metropolitan statistical areas: Brownsville-Harlingen-San Benito, (Brownsville MSA), and McAllen-Edinburg-Mission (McAllen MSA). Besides these two MSA's, the state of Texas has two other MSA's – El Paso and Laredo, that are situated along the border with the Republic of Mexico. Up until around 2018, El Paso had the highest population of the four border MSA's, but the McAllen MSA now has the greatest level of population. The border MSA's have generally shown increases

in the proportional share of state population, but since 2010 the overall relative population has declined based on the 2018 population estimates. The following table examines the growth for the international border MSA's in Texas, which are Brownsville, El Paso, Laredo, and McAllen.

1980-2018 Population Growth: Texas International Border MSA's

MSA	1980	1990	2000	2010	2018	Proportional Change
Brownsville-Harlingen-San Benito	209,727	260,120	335,227	406,220	437,967	
% of Texas	*1.47%*	*1.53%*	*1.61%*	*1.62%*	*1.51%*	*0.039%*
El Paso	479,899	591,610	679,622	804,123	874,325	
% of Texas	*3.37%*	*3.48%*	*3.26%*	*3.20%*	*3.02%*	*-0.353%*
Laredo	99,258	133,239	193,117	250,304	284,586	
% of Texas	*0.70%*	*0.78%*	*0.93%*	*1.00%*	*0.98%*	*0.285%*
McAllen-Edinburg-Mission	283,229	383,545	569,463	774,764	884,144	
% of Texas	*1.99%*	*2.26%*	*2.73%*	*3.08%*	*3.05%*	*1.063%*
State of Texas	14,229,191	16,986,335	20,851,820	25,145,561	28,954,616	14,725,425
Combined Border MSA's	1,072,113	1,368,514	1,777,429	2,235,411	2,481,022	1,408,909
% of Texas	7.53%	8.06%	8.52%	8.89%	8.57%	1.03%
Proportional Change		0.52%	0.47%	0.37%	-0.32%	

Source: Compiled from 1980, 1990, 2000, and 2010 US Census and Site to Do Business 2018 data.

Of the counties that make up the Valley, Hidalgo County is the dominate population center in the region, constituting nearly 63 percent of the population of the Valley in 2019. The population level of Hidalgo County has more than doubled since 1990 and its relative share of the Valley population has increased nearly 12 percent. Cameron County contains around 31 percent of the Valley population, but in terms of relative growth its share has declined over the past three decades. Starr and Willacy counties make up a small portion of the total Valley population and are generally rural in nature, with Starr County being the larger of the two. Starr and Willacy Counties have absolute population growth, but are not growing near the level of Hidalgo County, the dominate population center in the Valley Region.

Population Growth: Rio Grande Valley Region

County	1990	2000	2010	2019
Cameron County	260,120	335,227	406,220	438,850
% of Rio Grande Valley	37.07%	34.26%	32.14%	30.92%
Hildago County	383,345	569,463	774,769	892,240
% of Rio Grande Valley	54.63%	58.21%	61.29%	62.86%
Starr County	40,518	53,597	60,968	68,280
% of Rio Grande Valley	5.77%	5.48%	4.82%	4.81%
Willacy County	17,705	20,082	22,134	19,949
% of Rio Grande Valley	2.52%	2.05%	1.75%	1.41%
Rio Grande Valley Total	701,688	978,369	1,264,091	1,419,319

Source: Compiled from Esri data contained in Site to Do Business.

As it pertains to development activity and growth patterns in Hidalgo County, platting activity south of Interstate 2/Highway 83 has been limited and minimal compared to activity north of Interstate 2/Highway 83, with more of the platting activity occurring east of McAllen and Interstate 69C/Highway 281. There has been no identified platting activity over the period researched south of Highway 281/Military Highway within Hidalgo County. Brownsville is the largest city in Cameron County in the Valley and the growth direction of Brownsville has been to the north.

Identification of Submarkets

The Valley has various unique and differing geographical features, infrastructure, and political boundaries that are believed to influence the land use make-up of the region. As such, the study identified sub markets that might better isolate specific locational aspects of the Valley region, with emphasis placed on areas in proximity to the international border.

The urban center of Brownsville is divided by Interstate 69, which is also a major international crossing into the Republic of Mexico and therefore is believed to be a physical dividing line between the submarkets in and around the city of Brownsville. Beginning on the eastern end of the Valley region, the geographical features of the Rio Grande River, Gulf of Mexico and Port of Brownsville also create a reasonable boundary, with the boundary for another submarket being that area where the transition to urbanization occurs near Brownsville and the coastal topography that extends to the Gulf of Mexico.

The southern boundary for the submarkets is naturally the Rio Grande River and there were several potential north boundary lines including the International Boundary and Water Commission levee, which is located south of US Highway 281; US Highway 281 (aka Military Highway); and the central floodway, situated north of US Highway 281. The use of the IBWC levee as a north boundary for submarkets creates a very small area with limited transactional activity. A similar conclusion can be reached for US Highway 281. Therefore, the central floodway seems to be the more reasonable boundary for the submarkets as one extends across the extreme southern portion of the Valley. In addition, the pattern of Hidalgo County platting activity suggested that the higher concentration of urban development ends near the central floodway south of Interstate 2; therefore, the central floodway is selected as the northern boundary for many of the submarkets.

As to the various east/west boundaries extending across the Valley region, the primary urban centers of Brownsville, McAllen, and Pharr create submarkets with distinct population, employment and land use concentrations. The existence of international border crossings across the southern portion of the Valley also have some influence as the crossings create a linkage that adds to activity and influences the nature of a particular sub-market extending east/west across the Valley.

The submarkets identified in the study start with the Coastal submarket which is a sparsely populated area and highly influenced by its proximity to the coastal area of the Valley. There presently is no Border Wall constructed in this area. The city of Brownsville is the most populated city in the Valley, and two submarkets were identified in the urban areas of Brownsville – Southeast Brownsville and Southwest Brownsville. Moving in a westerly direction, submarkets were identified based on the existence of international border crossings which generally create the only significant public roadway infrastructure south of US Highway 281. These submarkets are Los Indios, Progreso, and Donna. Moving west into Hidalgo County from Cameron County, the submarkets again were identified based primarily on international border crossings and the more extensive urban development of Pharr and McAllen. These two submarkets have experienced growth and development around at the international border crossing areas. The most westerly identified submarket in Hidalgo County is Penitas, which generally transitions from the more urbanized land uses of the McAllen submarket to less dense development and land uses. The existing Border Wall and IBWC levee terminate in the Penitas submarket.

Moving westward into Starr County, the study identified five Starr County submarkets and established US Highway 83 as the north boundary, and the Rio Grande River as the south boundary.
La Grulla is the eastern most Starr County submarket and has the greatest population of the Starr County submarkets. Moving westward across the Valley, the Rio Grande City submarket is next, and has the smallest geographical size. Although the submarket is the area of Rio Grande City south of US Highway

83, and the population is limited in this area, Rio Grande City is the largest city of Starr County with most of the development and population being situated north of US Highway 83. La Rosita is the next Starr County submarket and begins just west of Rio Grande City. La Rosita is generally more rural in nature as it is situated between the urban populations of Rio Grande City to the east and Roma to the west. There are some scattered residential pockets in the La Rosita submarket, most being situated north of US Highway 83. The Roma submarket has the second greatest level of population as much of the population base is situated in the city of Roma, which has a denser population south of US Highway 83. Falcon is the final submarket identified in Starr County and is the least populated. The Falcon submarket is rural, with scattered residential uses.

Comparison of Submarket Growth: Pre-Border Wall and Post-Border Wall

The relative population of the Rio Grande Valley for both the submarket and the area south of US Highway 281 is compared over time. The change of that relative population is then compared to determine if the area south of Military Highway performed better or worse than the overall submarket. Although it is recognized that population levels are small south of US Highway 281, the comparison of relative growth trends (relative to the Rio Grande Valley population) did not suggest that the Border Wall construction deterred population growth.

Land Sale Activity by Land Use in the Study Area

Comprehensive research was conducted to identify land sales activity throughout the Rio Grande Valley region. Emphasis has been placed on land sale activity in the submarkets and various land use types were identified as part of that research. During the course of this study the need for an expanded search of farmland sales arose in order fully analyze attributes of properties location along the Rio Grande River. For this reason, emphasis was also placed on farmland sales located throughout the Valley regardless of proximity to the identified submarkets. In Starr County, land sales north of US Highway 83 were included in the analysis due to the lack of sales activity south of US Highway 83.

Cameron County and Hidalgo County - Submarket Sale Activity

Research found limited sales activity in the specific Coastal Submarket. Appraisal practitioners should be aware of the lack of significant sales activity in this submarket, which in all likelihood will prompt the appraiser to analyze sales from similar areas in other parts of eastern Cameron County. The overriding consideration in sale selection is the limitation on land use in this area due to its coastal nature.

Research in the Southeast Brownsville Submarket identified 25 land sales occurring from 1999 through 2019. One of the sales included some improvements at the time of sale and was excluded from any detailed analysis. Of the 24 remaining sales in the Southeast Brownsville Submarket, nine of the sales had commercial, industrial, subdivision potential and rural highway land uses, twelve of the sales were for rural residential land uses and three sales were for agricultural production uses. As expected, the higher use potential sales sold at a higher price per acre.

The research identified 15 land sales in the Southwest Brownsville Submarket from 2005 through 2019. Of these 15 sales, three sales were excluded from the analysis due to the existence of improvements and one sale was a finished residential lot. Most of the land sale activity in the Southwest Brownsville Submarket was for commercial, industrial uses, and subdivision potential uses, while only two of the land sales in this submarket were for rural residential use and one for agricultural uses.

The Los Indios Submarket contained 32 land sale transactions believed to be relative to the analysis. Given the more rural nature of the Los Indios Submarket, 21 of the 32 sales were for rural residential

uses and agricultural uses. These sales sold at a lower price per acre when compared to subdivision potential sales and rural highway sales.

The Progreso Submarket had a similar level of sales to the Los Indios Submarket and similar to the Los Indios Submarket, the Progreso Submarket had 23 of the 32 sales that sold and were suited for rural residential and agricultural uses.

The Donna Submarket is more rural in nature and therefore, research found only six sales in this submarket and all six of these sales were for rural residential uses and agricultural uses. As expected, the agricultural land uses sold at a lower price per acre compared to the rural residential sales.

The Pharr Submarket begins a transition back to more urbanized development and land uses. Due to the existence of international border crossings in the Pharr Submarket, much of the land activity in this submarket has commercial, industrial and subdivision potential. Of the 11 sales researched, eight were for commercial/industrial and subdivision potential uses, one was for rural residential uses and two were for agricultural uses.

Like the Pharr Submarket, the McAllen Submarket is a more urbanized submarket with active development occurring. Of the 10 sales researched in the McAllen Submarket, seven were for commercial/industrial and rural highway uses and three were for agricultural uses.

The Penitas Submarket is in the Southwest portion of Hidalgo County and the land sale activity researched in this submarket showed a transition from the more urbanized areas of McAllen and Pharr towards the more rural areas of Starr County. Of the 11 sales researched in the Penitas Submarket, seven were for rural residential uses, one sale was for agricultural uses, and three were for rural highway uses.

Starr County Submarket Land Sale Activity

The La Grulla Submarket is the eastern most submarket in Starr County and abuts Hidalgo County. Research located 21 sales in the La Grulla Submarket and as expected, more urbanized type land uses were identified in the research with six commercial land use sales, two rural highway land use sales, one bulk sale of subdivision lots, and one sale with subdivision use potential. These land uses brought considerably higher per unit prices as compared to the rural residential and agricultural land use sales that also were found in the La Grulla Submarket. The research did find several commercial use sales along US Highway 83, which were acquired by end users for strip centers, convenience stores and a retail store. The prices for these sales were considerably higher than several investor-based sales that had commercial use potential but were not being sold to end users. As it pertains to rural residential uses, the average sales price per acre was slightly above the average sale price per acre found in the Penitas Submarket; however, it should be noted that the average land size of the Penitas land sales was considerably greater than the average land tract size in the La Grulla submarket and this difference likely explains a difference in price.

The Rio Grande City Submarket is generally concentrated in the south portion of Rio Grande City, south of US Highway 83. The research found limited sale activity in the specific submarket, but considerable activity was occurring north of US Highway 83 and this data was included in the analysis to gain some insight regarding the Rio Grande City Submarket. Given the rather urbanized nature of this submarket, there was considerable activity of the 18 sales researched in this submarket, 12 of the sales consisted of residential lots, commercial lots, a rural highway sale and several subdivision potential sales. The remaining sales in the submarket were a rural residential land sale and five rural recreational land sales. As expected, the rural recreational average per unit sale prices was the lowest of the sales researched.

The La Rosita Submarket abutted the western portion of Rio Grande City and extends west along US Highway 83 to the city of Roma. Like the Rio Grande City Submarket, limited sales data existed south of US Highway 83 and therefore data was included north of US Highway 83 to gain some insight into the La Rosita Submarket. Fourteen sales were identified in the research and of these sales, nine were residential lots located in and around the various communities, three sales had subdivision potential and one sale was an agricultural sale.

Due to the scarcity of land sale activity in the Roma/Falcon areas, these submarkets were combined for purposes of presenting land sale activity and sales were considered north of US Highway 83 and west of US Highway 83 in these areas. This area is the more rural area of the Starr County submarkets and as a result, 11 of the 15 sales researched were for rural residential, rural recreational or agricultural land uses. As expected, the rural recreational land uses and agricultural land uses sold at a lower price per acre when compared to the rural residential land use sales.

Factors Influencing Land Sale Prices

Rural residential and agricultural land uses were analyzed in more detail to derive value influences from these land sales given the land use patterns around the Border Wall Construction Project in Cameron and Hidalgo County. Agricultural land uses and rural residential land uses are believed to be the most prevalent land uses type as it pertains to the Border Wall Construction Project within the Cameron County and Hidalgo County submarkets and therefore focus is placed on these land use categories. Although there may be some unique conditions of sales or financing terms to the various sales data, it is believed that those transactional factors are so unique they are not addressed specifically in this analysis. Other transactional factors or variables such as market conditions in terms of date of sale and real property rights conveyed in terms of water rights were addressed as the data suggested these factors had an influence on price. Location related price variables considered in the analysis included submarket location, county location, and border wall location. Price variables associated with physical characteristics included land size, access, land composition/soil types, % of floodway land, % irrigated land area, and % of land with development use potential. Of course, these price variables will vary depending on use type. Soil classes are believed to be critical for agricultural production land, whereas for rural recreation and rural residential land, soil class is not generally important, but access variables may be significant for those uses and not for agriculture production uses. Ultimately the desire is to arrive at some uniformity as to a range of adjustments that the data is indicating for these transactional and property adjustments.

For agricultural land uses, a regression analysis was completed on 73 sales extending through the Valley region. The following summary table shows the findings and suggested adjustments based on the regression coefficient derived from the regression analysis.

Regression Extracted Adjustments - Agriculture Production Highest and Best Use

Variable	Coefficient	Adjustment Indication
Date of Sale	-6.76	6.76 per month x 12 = $81/Year, or around 2.9% yearly based on mean sale price of $2,839/acre
Tract Size	-0.25	.25 x 100 acre difference = $25/acre, or $50/acre for each double
% Floodway	-460	Discount of $460/acre x % of floodway land
% Irrigation	648	$648/acre premium x % of land with Irrigation
Water Rights	0.12	$.12/acre foot premium for land with water rights
% Development Potential	5354.00	Premium of $5,354 to the % of land with development potential
Hidalgo County Location	$308.00	Premium of $308/acre for land in Hidalgo County

For agricultural production land sales, the border wall location and a county location outside of Hidalgo County were concluded to not have a significant influence on sale price. The conclusions concerning price influences and adjustments derived from the regression analysis for agricultural production land sales land were generally supportive of the various price variables/adjustments derived in Section 3 of the report. Section 3 applied other techniques to identify value influences and adjustments for those factors. It should be noted that the regression analysis shows a premium for Class I soils compared to Class II and Class III soils; however, it is believed that the regression coefficient results for the Class IV soil category includes value attributed to other classes and waste/outages that does not make the coefficient indications suitable to derive an adjustment indication. The regression analysis does show that the more productive class of soils is important to the ultimate value.

For rural residential land uses, the analysis concluded that there was little influence from date of sale on price. This conclusion seems to be counter to some other findings from this study as it pertains to other land use types and rural residential land uses in Starr County. The analysis of the rural residential land use sales in Cameron and Hidalgo Counties did indicate that there was a locational difference found between the rural residential land sales in the Southeast Brownsville Submarket and Southwest Brownsville Submarkets which typically sold at a premium compared to the other submarkets. The Los Indios Submarket was viewed as being the least attractive from a locational standpoint with rural residential land use sales showing a slight premium for location in the Penitas Submarket and a slightly higher premium in the Progreso Submarket and Donna/Pharr Submarket.

Generally, there is an inverse relationship between tract size and price per unit. This concept is typically referred to as size regression, and smaller tracts will generally appeal to more potential rural residential users and therefore have a higher per unit price compared to larger tracts. Both regression analysis and group pairings of varying rural residential tracts found that tract size was a significant variable determining price based on both the pairing analysis and the regression analysis, the study concludes that an appropriate tract size adjustment for rural residential land uses would range from $30/acre to $150/acre for each difference in acre, with the higher end likely being applicable for the differences between smaller size tracts and the lower end of this range being more applicable when comparing data with larger size differences.

The rural residential land sales data showed some differences in road frontage. Some of the sales had paved road frontage while other sales had dirt or caliche road frontage. The study findings supported that the paved road frontage was considered to be superior with dirt and caliche frontage roads selling at a 13% to 26% discount compared to paved road frontage holding the entire factor's constant. Overall, the regression analysis applied to the rural residential sales suggested an approximate 15% discount for dirt or caliche frontage road sales compared to sales with paved road frontage.

The Starr County submarkets are concluded to be distinct from the submarkets located in Cameron County and Hidalgo County. This conclusion was based on various observations including limited population growth, declining relative population within the Rio Grande Valley region and the lack of significant incorporated cities that limited the availability of infrastructure. The Starr County submarkets do not have levee protection along the Rio Grande River and therefore likely have a higher significant flooding potential compared to the levee protected areas in Cameron and Hidalgo Counties. The flood prone areas along the Rio Grande River in Starr County, like Cameron and Hidalgo, are subject to the regulatory control of the IBWC. The Starr County research found a much higher concentration of land sale activity east of a line extending north easterly from Rio Grande City compared to the west portion of Starr County.

The research of land sale activity in Starr County did include commercial land sales and residential lot sales. Although these sales may not be all that relevant to the acquisition areas in Starr County, some analysis of that data was completed. The greatest influence on commercial land prices seem to be the buyer type, as end user sales were selling at a significant premium above investor driven sales. Tract size was also concluded to have a significant influence on value as it pertains to the commercial land sales.

Given the proximity and inclusion of several cities within the Starr County submarkets, the land sale research did identify various residential lots sales. From a locational prospective, it was concluded that the Rio Grande City location was the most appealing in the market and although there was limited lot sales in La Grulla, La Grulla's location in proximity to Rio Grande City and in proximity to Hidalgo County suggested it would also have a similar locational premium. Based on the analysis conducted, it is concluded that residential lot sales in Rio Grande City Submarket and the La Grulla Submarket have an approximate 25% premium in price attributed to location compared to the La Rosita Submarket and Roma/Falcon Submarket location. Similar to the locational differences found in the analysis of the residential lots, land with subdivision development potential also seems to be influenced by its location with the La Grulla/ Rio Grande City locations being superior to the La Rosita location.

The research identified 9 sales that were suited for rural residential land use and the analysis of this data suggest price variances attributed to date of sale, tract size and location between the submarkets. As it pertains to date of sale, the analysis concluded an annualized adjustment for date of sale of approximately 2.25% similar to the analysis of rural residential sales in the Cameron and Hidalgo County markets. The Starr County rural residential land sales also showed price differences attributed to size with a range extending from approximately $235 per acre for larger size differences to $600 per acre for smaller size differences. As it pertains to locational difference for rural residential land sales, the analysis suggested that the La Grulla and Rio Grande City locations would support a locational premium of approximately 10% when compared to the La Rosita and Roma/Falcon Submarkets. It is recognized that this location premium is lower than the amount indicated for residential lots, location may not be as critical for lower density rural residential use when compared to residential lots.

The Starr County research identified a land use type of rural recreation that is somewhat of a default category, which would include land sales that did not have an agricultural production use and did not seem to be well suited for rural residential uses. The rural recreational land use category would include land sales that may also include sales utilized for ranch and grazing purposes. This land use category would be expected in a market like Starr County which is much more rural in nature as opposed to the Cameron County and Hidalgo County markets. The analysis of rural recreational land use sales suggest that the date of sale was the primary influencer of price and the analysis did not suggest that road frontage, tract size or location were signification variables influencing price. This may in part be due to the fact that many of the land sales were similar in size and that given the limited use potential for rural recreational tract, road frontage was not as critical. Overall, the analysis concluded, based on regression analysis and paired sales analysis, a price increase for rural recreational land in the area of 3% to 5% annualized per year.

The research did identify seven agricultural production use sales which were primarily used for crops, some of which were irrigated. Given the limited amount of sales data for agricultural production uses in Starr County, it was difficult to derive the variables that influence prices. More extensive analysis completed in Section 3 -Farmland Analysis, would be appropriate when analyzing the Starr County agricultural sales.

Farmland Analysis

Section 3 of the report focuses on production farmland primarily located in Cameron and Hidalgo Counties. This section is intended to give an alternative analysis strategy to that found in Section 2, and is designed to look further into the production agriculture market of the Lower Rio Grande Valley. To a certain extent, this section performs its analysis independent of the findings in Section 2, though when crossover in the analysis occurs, a notation is made with reference to Section 2 denoting the findings in each section. Section 3 is primarily a data analysis exercise in which sales are analyzed for price sensitivity to six particular attributes. Those attributes include:

- market conditions (time)
- size (acres)
- soil mixtures and uses
- floodway vs non-floodway (land within floodways of the LRG Flood Control Project)
- water rights
- presence of the border wall.

The total number of transactions collected during this market study exceeds 1,500 sales within the counties of Cameron, Hidalgo, Starr, and Willacy. This section primarily focuses on 79 of those sales considered to be the most beneficial for use in production agriculture valuation assignments and/or utilized to analyze those sales that have sold with water rights or sold with the Border Wall as a component of the sale. The overwhelming majority of valuation assignments created by the Border Wall Project are anticipated to be in relation to agricultural properties that may or may not have some influence from nearby development. The key findings of the Section 3 analysis are summarized below:

Market Conditions (Time)

The collected data ranges in date from 1999 through 2020. Bulk analysis, paired sales analysis, reviews of published literature (Texas A&M's Real Estate Research Center), as well as the statistical analysis presented in Section 2 all indicate that property values have changed during the time period covered by the study. When viewed in totality, the general trend in the production agriculture market is that values have steadily increased throughout the period of study at a nominal compound rate of 3.0% per year, or 0.25% per month. Section 2 of the report concluded an $81 per year price increase within the agricultural market (Table 35) based on a dataset with an average price per acre of $2,839. This equates to an annual rate of change of 2.9% ($81/$2,839). Further data analyzed in Starr County for rural recreational land uses indicated price increases of 3.16% to 4.86% annualized (Table 67). Thus, Section 3's findings are generally consistent with those found in Section 2.

Size (Acres)

A bulk analysis was conducted utilizing the 79 sales in conjunction with all sales out of the broader database containing 100 acres or more. In addition, paired sales analysis was conducted to test the results of the bulk analysis. Both versions of analysis yielded similar results with the concluded adjustment being a negative 10% adjustment for each doubling in size when comparing a smaller tract to a larger tract and a positive 12% adjustment for each doubling in size when comparing a larger tract to a smaller tract.

Section 2 of this report analyzed size within the agricultural market and concluded a $25 per acre adjustment for every 100 acres difference in size utilizing a dataset with an average price of $2,839

per acre and an average size of approximately 581 acres (Table35). Utilizing this adjustment, a property containing 1,160 acres would be expected to command $2,694 per acre, all else equal (1,160 acres – 581 acres = 579 acres difference / 100 = 5.79 x $25 = $145, $2,839 - $145 = $2,694). This would equate to a 5.1% change in price for one doubling ($145 difference / $2,839) when moving from small to large and a 5.4% change in price for one doubling when moving from large to small ($145 / $2,694). This generally supports the conclusions found within Section 3 of the report. The more sensitive smaller size range is also supported through analysis conducted in Table 39, Table 61, and Table 62 of Section 2.

Soil Mixtures and Uses

Analysis performed on soil classifications indicates that more productive soils command higher prices per acre than less productive soils. The NRCS soil survey system was utilized to measure the acres of various soil types within each property. These soil types were then combined into their productivity ratings as indicated by the soil survey system. The system outlines 8 soil classifications (a description of which is found later in this section). The data concludes price breaks between Class I and Class II soils, between Class II and Class III soils, and between Class III and Class IV-VIII soils (combined). Few farms in the LRGV contain much, if any, acreage in soils that are classified as IV or lower, thus the bottom productive soils were combined (IV through VIII). The concluded price ratios summarized in the table above are discussed in more detail in Section 3 (Table 70).

Concluded Price Ratios	
Land Classification	**Price Ratio**
Class I Soils	100%
Class II Soils	90%
Class III Soils	70%
Class IV-VIII Soils	50%
Outage	15%
Speculative Development	180%

In addition to the measurement of soil types within a property's boundaries, aerial photography was utilized to measure acreage that is not part of the tillable land for each sale. This acreage is described in this section as "outage" and references those areas that are encumbered by brush, irrigation canals, roadways, etc. Finally, some farm sales within the dataset contain portions of their acreage that are influenced by development patterns in the immediate area. These farms reflect various degrees of premiums above those sales that are found in the less developed areas of the LRGV. Aerial photography was utilized to measure the typical depth pattern of these light development activities along the paved public roadways found adjacent to the sale. The acreage was allocated as "speculative development", which commands a premium above the portion of the sale allocated to farming activities. These areas may or may not be developed in the immediate future, but the recognition of such land area impacts the consistency of the analysis. Sensitivity to soil mixture is supported by the statistical analysis performed in Section 2 (Table 35). Once all analysis was conducted regarding soil classifications, outage, and light development, a ratio system was developed in which each sale price is allocated consistently to perform further analysis.

Floodway vs Non-Floodway Values

An overview of the LRGV Flood Control Project is presented later in this section. The Project includes a complex levee system along the Rio Grande River, through the central portion of Hidalgo and Cameron Counties, and north of the City of Harlingen. This creates floodways known as the Rio Grande Floodway, the Main Floodway, Central Floodway, and North Floodway. An analysis was conducted utilizing sales found in these floodways in comparison to the dataset found outside of the floodways. The results provide strong indications that land found within the floodway does not command the same price as its identical counterpart outside of the floodway. The concluded relationship based upon the data in this report is that floodway acreage commands 80% of the price that its identical non-floodway counterpart does. That is to say, the soil and land use table presented above (Table 71, Section 3) has been expanded from the table on the preceding page (Table 70, Section 3) to account for floodway by reducing the floodway price ratio by 80% of its non-floodway counterpart. For example, Class II soils are referenced with a 90% price ratio, Class II floodway soils are referenced with a 72% price ratio (90% x 80%). Again, this conclusion is supported by the regression model contained in Table 35 of Section 2 which indicated farms with acreage above, or outside the levee system, command a premium over farms located within the floodways of the levee system.

Concluded Price Ratios in Conjunction with Floodway Areas

Land Classification	Price Ratio
Class I Soils	100%
Class I Floodway Soils	80%
Class II Soils	90%
Class II Floodway Soils	72%
Class III Soils	70%
Class III Floodway Soils	56%
Class IV-VIII Soils	50%
Class IV-VIII Floodway Soils	40%
Outage	15%
Speculative Development	180%

Water Right Contribution

Many production agriculture tracts adjacent to the Rio Grande River possess adjudicated water rights which are utilized for irrigation purposes. These water rights can be converted to a municipal use and sold to municipalities. Many people are aware of these transactions as they are public in nature. An expansive narrative is contained later in this section depicting the history of water rights in the Lower Rio Grande Valley. Common prices paid by municipalities range from $1,500 to $2,000 per acre foot giving many practitioners the false impression that these governmental acquisitions represent the market value of the water rights. Both USPAP and USFLA discuss the unit rule of appraisal methodology where components of a property should not be valued separately and added together rather, they should be measured as their contribution to the unitary whole.
Analyzing the farm sales that transferred water rights in conjunction with the purchase price indicates the true market value as a contributory component to the unitary whole is less than its stand-alone investment value to a municipality. Measured contribution varies from approximately $100 per acre foot to approximately $811 per acre foot and offers a median and average centering around $380 per acre foot. This is the concluded contribution for water rights within Section 3.

Statistical modeling presented in Section 2 offered an adjustment of $.12 per acre foot for land containing water rights (Table 35). The average acre feet of water rights transferred in the model is 1,627.466 which would equate to a water right contribution of $195 per acre foot ($.12 x 1,627.466 = $195). Again, both analyses between the two sections generally support each other. Readers and practitioners should understand that measuring contribution of a right such as those dealing with water usage involves a residual process in which surface values are deducted from a sale price. The residual amount left after performing the deduction is the market recognized contribution for the

water rights. Water rights, much like mineral rights, or even structural improvement contribution, should not be expected to have the exact same indication within each individual sale price. Rather there is a range of indications with that range typically being wider than a more uniform dataset only transferring surface rights. Regardless of the spread in indicated contribution values found in this report, or likely to be found by any practitioner's analysis, the evidence is clear that the market recognized contributory value of a water right is not commensurate with the municipal investment value reflected in the isolated purchase of water rights by municipalities.

Practitioners who begin analysis of a sale by deducting the municipal investment value of water rights ($1,500 - $2,000 per acre foot) from the sale price violate the unit rule present in both USPAP and USFLA. Such a process assumes market contribution is the same as municipal investment value of the water right independent of the surface. When this process is performed (sale price less municipal investment value of water right) the residual remaining in the sale price is so far removed from a reasonable price of farms throughout the LRGV that it should immediately indicate that the investment value is incorrect as a contributory component. Following this process will often result in surface prices that are less than even non-irrigated farms throughout the LRGV. This section will present evidence that the difference between the median price of non-irrigated tracts and the median of irrigated tracts is $819 per acre. This simple indication should highlight that the market contribution rate of water rights does not typically exceed $819, as a tract with no water rights and no ability to purchase water is, by nature, a non-irrigated tract of land. The reality is some portion of the $819 is the water right contribution, and some portion is payment for physical attributes perfected on the farm (machine leveling, underground water piping, etc.).

Impact of Border Wall

Section 3 concludes with an analysis conducted on several sales that have occurred since the 2008 Border Wall Project was announced and/or concluded and were bisected by the completed wall. Analysis is conducted on these sales to give the reader an indication as to whether the presence of the Border Wall had a clear, measurable impact on value.

It should be noted that all such sales are found in Cameron or Hidalgo counties and are farm tracts by nature. All sales have both the IBWC levee as well as the Border Wall bisecting them, which introduces a natural physical barrier restricting use. The analysis of the sales indicates no measurable impact to value for the presence of the Border Wall in these areas. This same conclusion was reached in the regression analysis completed in Section 2, along with comparison of relative population growth trends Pre-Border Wall and Post-Border Wall. This report cautions that the 2020 Border Wall Project may impact properties found in Starr County where farm tracts are minimal and the IBWC levee system is not present. Nevertheless, the market indications found within this report on the known transactions occurring after the 2008 Wall Project provide meaningful data. Any deviation from these findings should be explained and supported by practitioners involved with the appraisal of land in Starr County.

Identification of Assignment

Purpose and Intended Use of the Assignment

The purpose of this assignment is to provide support to future individual appraisal assignments of real properties being acquired as part of the proposed Border Wall Construction Project by providing users of this study with sales data, and analysis that will assist in the identification and measurement of characteristics that influence market value.

This assignment addresses land sale activity in the Lower Rio Grande Valley of Texas and specifically land sale activity that would be most applicable to acquisition of land area to support the Border Wall Construction Project. The alignment of the unbuilt portions of the Border Wall and identification of land areas being acquired for the Border Wall is not specifically addressed in this study. It is recognized that there will be specific issues that might exist for individual acquisitions that are not envisioned or addressed in this study. Therefore, this study is not intended to address every question that may arise through the individual appraisal assignment but is prepared to provide extensive confirmed sales data and analysis of that data for individual valuation assignments concerning the Border Wall Construction Project.

Intended User(s)

This study is intended for the use of the client, its agents and third parties retained to complete real estate appraisals assignments associated with the Border Wall Construction Project.

Extraordinary Assumptions

Should additional data become available, the analyst reserves the right to research and analyze such data. However, given the extent of data collected as part of this assignment, the analysts do not believe it would have a material impact on the conclusions that have been reached.

Scope of Work

According to the Uniform Standards of Professional Appraisal Practice, it is the appraiser's responsibility to determine the appropriate scope of work. USPAP defines the scope of work as:

> The amount and type of information researched and the analysis applied in an assignment. Scope of work includes, but is not limited to, the following:
>
> - the degree to which the property is inspected or identified;
> - the extent of research into physical or economic factors that could affect the property;
> - the extent of data research; and
> - the type and extent of analysis applied to arrive at opinions or conclusions.

The following information defines the Scope of Work taken by the analyst(s):

Study Type: Consulting

Report Type: Narrative Report

Inspection: The Lower Rio Grande Valley area along the existing and proposed Border Wall Construction Project was inspected on various dates in June 2019. The sales were inspected from June 2019 through January 13, 2020.

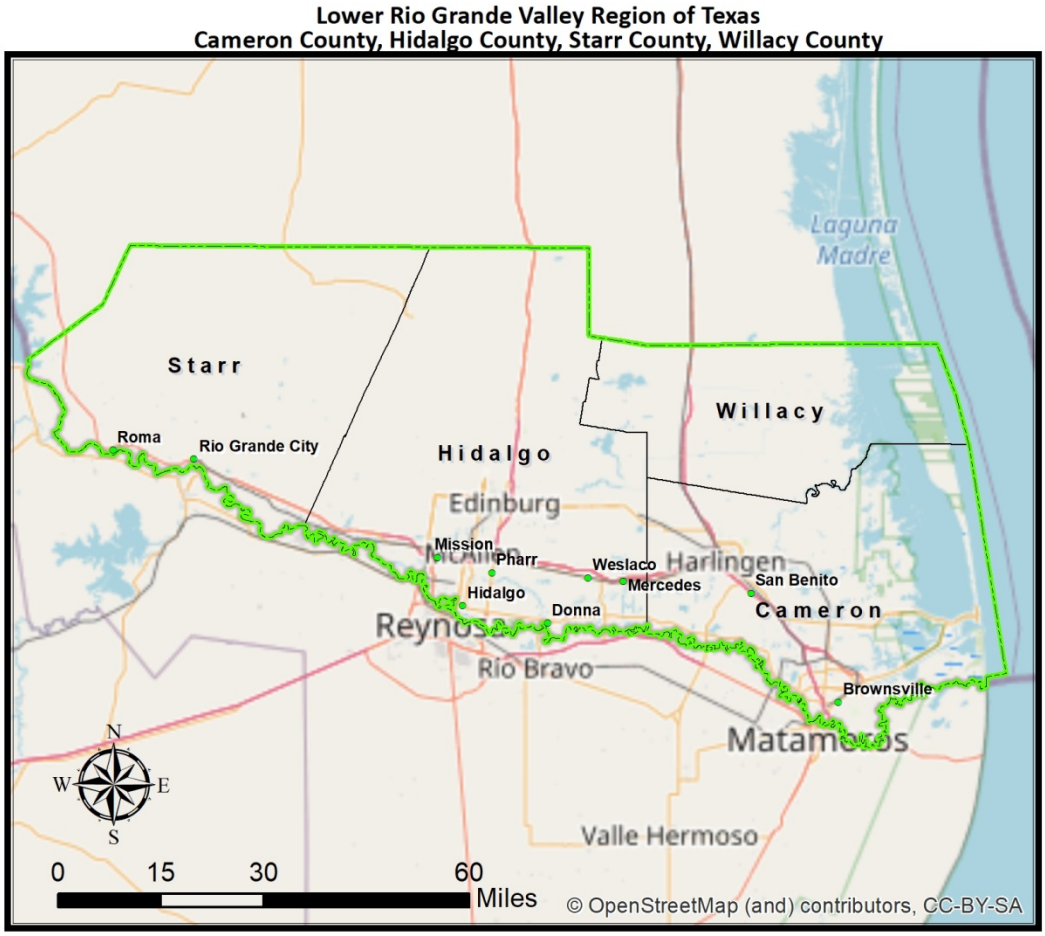
Effective Date of Analysis: This analysis is based on an Effective Date of January 13, 2020.

Data Research: This assignment combines two study components of the Lower Rio Grande Valley of Texas, commonly referred to in this study as the Rio Grande Valley or Valley throughout this report. The first component is a market study which identifies the study area, and then allocates the broad study area into various submarkets across the most southern portion of the Rio Grande Valley. In addressing the market study component, the data research utilized various population, demographic, mapping, resources including US Census data, local governmental data, International Boundary and Water Commission (IBWC) online resources, Federal Emergency Management Agency (FEMA) mapping programs, third party demographics and population data from Esri as published in Site to Do Business, data from United States Customs and Patrol, and Google Earth mapping programs. The second component of this study was extensive research of land sale activity across the Rio Grande Valley that resulted in over 1,500 sales being identified. Various resources were utilized in research and compiling these sales including county deed records, county appraisal district records, and NRCS Soil Survey records. Other data research and sources utilized in this assignment may also be found throughout the report.

Section 1 - Rio Grande Valley Broad Market Analysis

Introduction

This study concerns a broad area located at the southern tip of Texas in a region known as the Lower Rio Grande Valley ("Valley"), which is generally recognized to extend across the four counties of Cameron, Hidalgo, Starr, and Willacy. The Valley has a unique geographical location, bordering the Gulf of Mexico and the Rio Grande River, which functions as the international border between the United States of America and the Republic of Mexico.



The Rio Grande Valley is not a valley, but a fertile delta where the Rio Grande River joins the Gulf of Mexico, and the southern latitude makes for a mild, semi-tropical climate. The Gulf of Mexico forms the east side of the Valley and it serves as a physical boundary where the land mass of Texas and the continental United States terminate.

Even though the Gulf of Mexico is a barrier that prevents further expansion, it is important to the region because tourists are attracted to the beaches of South Padre Island, it supports a local fishing industry, and as part of the Gulf Intracoastal Waterway system it gives the Valley access to international commerce and shipping of agricultural commodities. The Valley is served by four seaports: the Port of Brownsville, a deep-water port serving both South Texas and Northern Mexico; Port Isabel, a harbor for part of the Valley's shrimp fleet and the bulk of the recreational fishing and boating; the Port of Harlingen, a modern

barge port connected to the Gulf Intracoastal Waterway; and Port Mansfield in Willacy County, which serves mostly sport fishermen. Of the water ports, the Port of Brownsville is considered the dominate water port in the region.

The Rio Grande is the primary source of water for agricultural and municipal uses, and the river basin is the primary drainage system for the Valley region. The bi-national status of the Rio Grande River led to the formation of the International Boundary and Water Commission (IBWC). The IBWC is relevant because of the control the IBWC has over the Rio Grande and its riparian lands. The area along either side of the river is located within the floodway of the IBWC's Lower Rio Grande Flood Control Project, and this bi-national agency has the authority to regulate what happens along the Rio Grande.

The 1848 Treaty of Guadalupe Hidalgo established the international boundary between the United States and Mexico, and it established temporary joint commissions to survey, map, and demarcate the ground landmarks of [sic.] the new United States (U.S.) – Mexico boundary.[1] Over the years, various conventions and treaties between the two countries led to the formation of what is now the International Boundary and Water Commission (IBWC).

The Water Treaty of February 3, 1944 expanded the jurisdiction and responsibilities of the International Boundary Commission and changed its name to the International Boundary and Water Commission (IBWC). The Commission's jurisdiction extends along the United States-Mexico boundary and inland into both countries where the two countries have constructed international projects. The Commission is charged with application of the boundary and water treaties and settling differences that may arise in their application. The treaties authorize the following activities:

1. *Demarcation of the land boundary*
2. *Preservation of the Rio Grande and Colorado River as the international boundary*
3. *Protection of lands along the rivers from floods by levee and floodway projects*
4. *Distribution between the two countries of the waters of the Rio Grande and the Colorado River*
5. *Regulation and conservation of the waters of the Rio Grande for their use by the two countries by joint construction, operation and maintenance of international storage dams, reservoirs, and hydroelectric generating plant*
6. *Delivery of Colorado River waters allocated to Mexico*
7. *Solution of border sanitation and other border water quality problems.*[2]

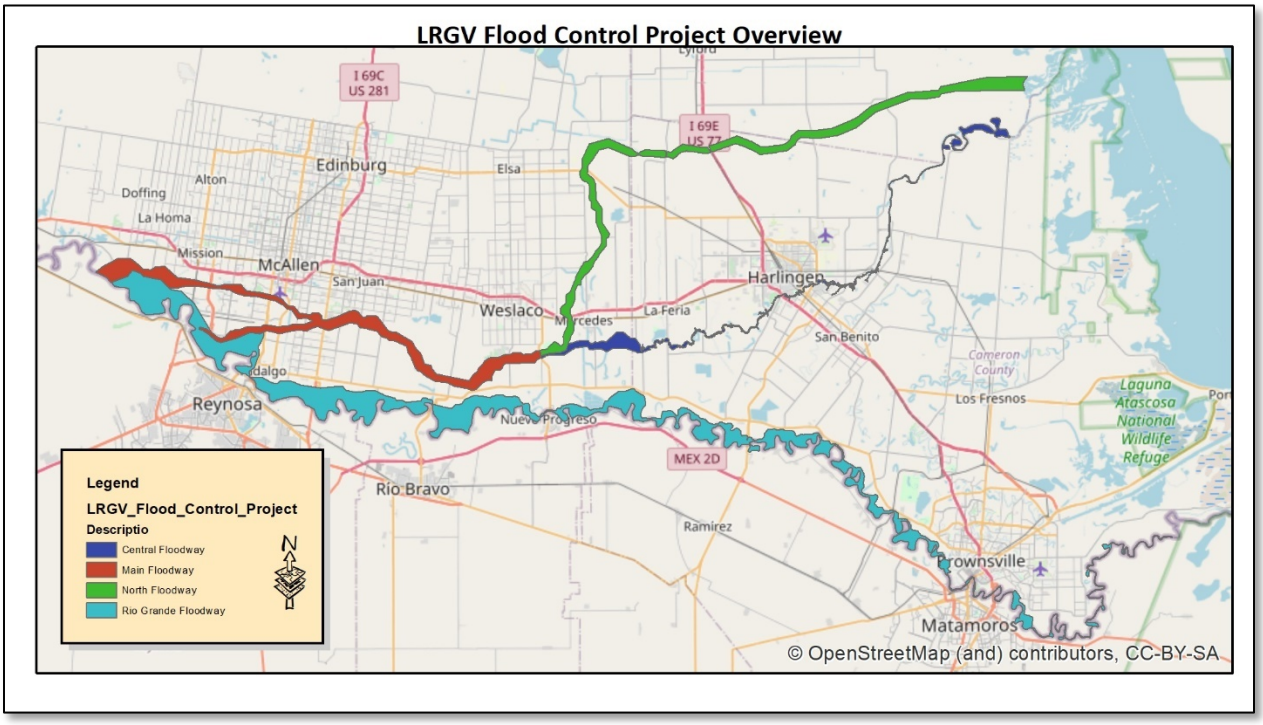
The IBWC has a broad scope of duties; however, Items 3 and 4 are germane to this market study. Item 4 will be addressed in the Irrigation section of this report, and a discussion of Item 3 – *the protection of lands along the rivers from floods by levee and floodway projects* - begins below.

The International Boundary and Water Commission operate and maintain the Lower Rio Grande Flood Control Project (LRGFCP). The LRGFCP was constructed under an agreement between the United States

[1] https://www.ibwc.gov/About_Us/history.html

[2] https://www.ibwc.gov/About_Us/synopsis.html

and Mexico concluded in 1932. Under that agreement, the two countries adopted a flood control plan for the lower Rio Grande…by which each government committed to construct river levees and off-river floodways in its territory. Major responsibilities of the IBWC…include maintaining flood control levees, removing obstructions from the floodway, maintaining and operating diversion dams, maintaining drainage and irrigations structures, and measuring flows in the Rio Grande.



The IBWC retains right of approval on all improvements, which are to pass over under, or through the walls, levees, improved channel, or floodways of the…Lower Rio Grande Flood Control Project. Any proposed uses or activities within the LRGFCP floodplains are subject to approval of USIBWC, and a license or permit is required. Under the 1970 Boundary Treaty (23 UST 371), the USIBWC is required to join the Mexican Section of the IBWC in approving any activities within the channel of the Rio Grande River or its floodplain to assure that their construction will not cause deflection or obstruction of the normal or flood flows of these international boundary rivers.

On the US side of the Rio Grande, the IBWC has constructed some 270 miles of levee and has 30,000 acres of interior floodway. The main river levee begins east of Brownsville in Cameron County (25º54'50.16"N 97º22'21.81"W) and terminates at the community of Penitas in Hidalgo County (26º13'54.60"N 98º27'13.38"W). The river levee is an earthen berm designed to prevent flooding from the Rio Grande, and its primary function is to protect the heavily populated areas of Hidalgo and Cameron Counties from flooding. The height and width vary, but it has a typical levee shape with steep sloped sides and a flat crown, and there is a caliche roadway along the crown. In some areas, ownership of the land under the levee is in fee by the government, but in other areas, ownership of the land under the levee is retained by the landowner, subject to a perpetual easement to the government. Such easements are for the purpose of *"…constructing levees, dikes, floodways, revetment works, and drainways, in and upon the land…"* Levee easements are varied, and they sometimes include other structures such as borrow pits, drainways, or revetments. In some cases, there are easements in place but have never been used since they were acquired. Such easements are often unknown unless revealed by a thorough title search and a

comprehensive survey. Even though these easements may be unused, the IBWC still has the right to utilize these areas as needed for construction, maintenance, etc.

The levee is not only a physical boundary, but it also creates a political boundary because the land between the river and levee is part of the Lower Rio Grande Flood Control Project and this area is subject to regulation by the IBWC. The IBWC publishes an annual notice advising the public of the potential of flooding of lands along the Rio Grande River below Falcon Dam. This notice is given as a public service to advise and inform that equipment and improvements in these areas, including buildings, structures, pumps, farms, and other facilities, existing or proposed, may be subject to flood. The potential for flooding and loss of property, as well as the authority of IBWC to license and permit, have restricted land usage within the floodplain.

Although the river levee terminates near Penitas, the IBWC has jurisdiction of the beds and banks of the Rio Grande River and the Arroyo Colorado, and it has regulatory authority anywhere within the floodplain of the river. In some areas, such as the community of Zapata, Texas, the IBWC has a map with a surveyed line demarcating the floodplain. Elsewhere, the IBWC does not have a map with a surveyed line for the floodplain; however, according to IBWC personnel, the FEMA flood hazard mapping program (MAP)[3] is the generally accepted basis for establishing the floodplain along the Rio Grande River.

As a result of the potential for flooding, most of the area below the levee system is agricultural in nature and land uses include farmland, pasture, sand and gravel mining, and wildlife habitat, most of which belongs to the Texas Parks and Wildlife Department or the United States Fish and Wildlife Service. Other than a few scattered farmsteads and border crossing facilities, few building structures are between the levee and river, due primarily to the potential for flooding and IBWC regulations. As a rule, the only public utility available is electricity, generally found at pumping plants for municipalities, irrigation districts, and farm diversion points. Unlike other rivers in the State, the Rio Grande River has little recreational value for fishing, swimming, camping, picnicking, etc. This is due primarily to the fact it is an international boundary with a history of illegal activities such as theft of personal property, and smuggling of humans, illegal drugs, and other contraband.

Originally conceived in the 1930's as a solution to controlling flooding on the Rio Grande River, the levee system soon became a means of access, by fiat and otherwise. IBWC personnel state that the road atop the levee is private, and the IBWC does not grant a license or issue a permit for access by adjacent landowners. Even so, landowners, farmers, irrigation districts, municipalities, hunters, sand pit operators, etc. use the levee maintenance roads to access properties on the river and below the levee. Use of the levee road is often only for the sake of convenience, but in some instances, it provides the only means of access. The levee also serves as a means of patrolling the Rio Grande River for such varied agencies such as the USDA Tick Eradication Program (stray cattle and horses), the Customs and Border Patrol (illegal immigration), and the Drug Enforcement Agency (drug smuggling).

Presently, United States Customs and Border Patrol (US CBP) is constructing a "tactical infrastructure" along certain segments of the United States side of the IBWC levee. The Border Patrol Strategy is to apprehend terrorists and terrorist weapons illegally entering the United States, deter illegal entries through improved enforcement, detect, apprehend and deter smugglers of humans, drugs and other

[3] MAP is an acronym for Risk Mapping, Assessment and Planning, which is FEMA's flood hazard mapping program. Through MAP, FEMA identifies flood hazards, assesses flood risks, and partners with states and communities to provide accurate flood hazard and risk data. (Source: https://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping)

contraband, use smart border technology, and reduce crime in border communities, improving quality of life[4].

In that regard, the Secure Fence Act of 2006 authorized and partially funded the construction of a wall along the United States/Mexico border. Although the border extends some 1,954 miles from California to the mouth of the Rio Grande River in Cameron County, Texas, the Border Wall is not contiguous along that vast reach. In Cameron and Hidalgo Counties, the wall is outside the floodway of the river because of IBWC restrictions. In Hidalgo County, construction of the wall is atop the IBWC levee, while in Cameron County the wall is on the immediate landside of the levee. Gates are located where public roads or other access points intersect the wall, and landowners, tenants, and others with need to access the riverside of the wall are granted right of entry through those gates. In some cases, the construction of the Border Wall has affected access to the adjacent lands, and in those instances, the Federal government granted landowners an access easement along the recently constructed roads adjacent to the wall. Customs and Border Patrol, the lead agency responsible for the construction design, appears to have made every effort to provide access through the wall for those with that need. The presence of the wall in the market area provides an interesting study in future land use between the wall and the river. Initial observations indicate that access to some properties may become circuitous, but still physically and legally permissible.

The location of the Valley bordering parts of the Republic of Mexico is an integral part of the Valley's economy. Citizens of Mexico come to the United States of America as tourists, for shopping, and for business purposes. Significant population centers/cities are located on the Mexico side of Brownsville (city of Matamoros), and south of McAllen (Reynosa). Reynosa is a larger border city compared to Matamoros; however, Matamoros is significant in size with an estimated 2015 population of about 520,367. Reynosa has an estimated 2015 population of 810,000 persons.

Much of the business interaction between the Republic of Mexico and the Valley region is related to the manufacturing industry generally operated utilizing the maquiladoras concept. Maquiladoras are labor intensive assembly operations that permit the inputs and the machinery used to process them to enter Mexico without payment of import tariffs. On the return to the country of origin, again most typically the United States, the shipper pays only such return import duties as are applicable to the value added by the manufacturing process in Mexico.

Texas border cities generally have reaped important benefits from their maquiladora neighbors as there is a need for transportation and customs services, distribution facilities, and various other support jobs in legal, accounting and financial sectors to support the movement of products, and manufacturing and distribution of products. A study authored by Robert Coronado, Assistant Vice President in Charge and Sr. Economist of the Federal Reserve Bank of Dallas, El Paso Branch, and dated November 22, 2013, concluded that a ten percent increase in maquiladora output will lead to a 2.2 percent increase in total employment in the Brownsville MSA, and a 6.6 percent increase in total employment in the McAllen MSA. Thus, this business and trade activity between the counties of Mexico and the United States are significant to the economy of the Valley region. Brownsville/Matamoros has 55,000 maquiladora workers, and its Foreign Trade Zone (FTZ) is the largest general-purpose trade zone in the United States. McAllen/Reynosa has about 77,000 workers, two FTZ's, and it is home to the third World Trade Center in Texas. Harlingen also has an FTZ, but it is less important because of the lack of proximity to the border and a sister city in Mexico. In Foreign Trade Zones, goods may be imported, stored, assembled, displayed for sale, labeled, altered or re-exported from the United States without payment of U.S. Customs duties.

[4] 2020 U.S. Border Patrol Strategy, www.cbd.gov/border-security/along-us-borders/strategy

Only when an item leaves the zone for sale in the United States is it subject to U.S. Customs inspection and duties. In addition, many Valley cities also have Enterprise Zones, which offer tax incentives, revenue bond financing, and other financial benefits for industry.

There continues to be growth in the level of trade between Mexico and the United Sates and the following table summarizes the trade levels over the past several decades.

Table 1
Trade Statistics – USA and Mexico

Year Period	US Exports	US Imports	Imbalance
1990-1994	$194,572.80	$185,908.70	$8,664.10
1995-1999	$340,153.70	$426,684.70	-$86,531.00
2000-2004	$518,258.70	$695,841.70	-$177,583.00
2005-2009	$669,999.60	$971,671.80	-$301,672.20
2009-2014	$1,044,790.00	$1,346,738.80	-$301,948.80
2014-2019 est.	$1,245,639.20	$1,633,843.30	-$388,204.10

Compiled for US Census Data

When the Valley began to develop in the early 1900's, the main mode of transportation was by rail, and cities and towns sprang up along the main railroad line that now parallels US 83/Interstate 2. Even though passenger service is no more, the railroad left an indelible mark on the Valley's demographics. Freight cartage by rail is still an important mode of transportation between the Valley and Northern Mexico, but today, the rail system has been supplanted in importance by the Valley's three interstate/expressway systems.

Interstate 69 was designated in December of 2011, and is planned to extend through the eastern part of Texas along the Gulf of Mexico to Victoria where it will then split into multiple segments with I-69E terminating in Brownsville, I-69C terminating in Pharr, and I-69W terminating in Laredo. I-69E is a north/south freeway that begins in Brownsville and heads northward eventually terminating near Victoria where it becomes Interstate 69. For its entire length, I-69E follows the alignment of US Highway 77. I-69C is a north/south freeway that once completed will begin at Interstate 2/US 83 in Pharr and head northward terminating at I69W/US 59 near George West at I- 37. For its entire length IH-69C shares an alignment with US 281, which connects with Mexican Federal Highway 97 at the international border. Interstate 2 is one of the more recently designated interstate highways and was designated as an interstate in 2013. It currently begins at the intersection with US Highway 83 in Penitas and extends eastward terminating in Harlingen. For its entire length, Interstate 2 runs concurrently with US Highway 83 which extends east/west through the Valley.

Aviation is also an important component of the Valley's transportation system, and commercial passenger air services are available at Valley International Airport in Harlingen, McAllen-Miller International Airport in McAllen, and Brownsville/South Padre Island Airport in Brownsville. These three airports also handle the bulk of the commercial airfreight and related private aviation services. Smaller airports are located in Rio Grande City, Edinburg, Weslaco, and Laguna Vista, and though these facilities are municipal, they are primarily utilized by private aviation.

Historically, the foundation of the Valley's economy has been agribusiness. The subtropical climate, a year-round growing season, the fertile alluvial soils, and the availability of irrigation water from the Rio Grande make the Valley one of the state's leading agricultural areas. Annual cash receipts from

agriculture average over $500 million annually, but the ripple effect of agriculture has a far-reaching effect on the local economy. Valley farmers produce more than 40 crops, but the traditional cash crops are cotton, grain sorghum, sugar cane, vegetables, melons, and citrus. Cabbage, onions, okra, and peppers are mainstay vegetable crops. Watermelons, cantaloupes, and honeydews are the primary melon crops. A freeze in 1989 dealt a blow to the citrus industry; and many groves were not replanted; however, there are still approximately 24,800 acres of citrus, most of which is concentrated in Central Hidalgo County, with scattered orchards in Cameron and Willacy Counties. Grapefruit and oranges are the primary cash crop, but tangerines, lemons, limes and tangelos are also grown commercially. Several large commercial operations grow, harvest, pack and ship fruit for the consumer market, and the gift fruit business and juice production are still an important and viable part of the industry. Specialty products such as plant nurseries, palm tree farms, and aloe vera are also grown in the Valley, and shrimp aquaculture is another nontraditional farm crop.

Texas Metropolitan Statistical Area (MSA) Growth Trends

The Valley contains two Metropolitan Statistical Areas ("MSA"). The Brownsville-Harlingen-San Benito MSA includes all of Cameron County and the McAllen-Edinburg-Mission MSA includes all of Hidalgo County. Starr County and Willacy County are not considered to be located in a MSA and therefore not reflected in the MSA data.

As reflected in Table 2, the five fastest growing MSA's in terms of relative share of statewide growth over a nearly 40-year period are: Dallas, Houston, Austin, San Antonio, and McAllen. The Brownsville MSA also had positive absolute growth with a slight increase in its relative share over this period. Therefore, the Valley metropolitan regions have had positive relative growth over the past four decades, but statewide growth in Texas has continued to shift to the state's four major metropolitan areas, which as of 2018, accounted for approximately 66% of the Texas state population. The Valley accounts for approximately 4.56% of the Texas population as of 2018, and this share has remained relatively stable over the past two decades. In addition to the Brownsville and McAllen MSAs, El Paso and Laredo are the other two MSA's that border the Republic of Mexico. The following table examines the growth for the international border MSA's in Texas, which are Brownsville, El Paso, Laredo, and McAllen.

Table 2
Population Growth: Texas International Border MSA's

MSA	1980	1990	2000	2010	2018	Proportional Change
Brownsville-Harlingen-San Benito	209,727	260,120	335,227	406,220	437,967	
% of Texas	*1.47%*	*1.53%*	*1.61%*	*1.62%*	*1.51%*	*0.039%*
El Paso	479,899	591,610	679,622	804,123	874,325	
% of Texas	*3.37%*	*3.48%*	*3.26%*	*3.20%*	*3.02%*	*-0.353%*
Laredo	99,258	133,239	193,117	250,304	284,586	
% of Texas	*0.70%*	*0.78%*	*0.93%*	*1.00%*	*0.98%*	*0.285%*
McAllen-Edinburg-Mission	283,229	383,545	569,463	774,764	884,144	
% of Texas	*1.99%*	*2.26%*	*2.73%*	*3.08%*	*3.05%*	*1.063%*
State of Texas	14,229,191	16,986,335	20,851,820	25,145,561	28,954,616	14,725,425
Combined Border MSA's	1,072,113	1,368,514	1,777,429	2,235,411	2,481,022	1,408,909
% of Texas	7.53%	8.06%	8.52%	8.89%	8.57%	1.03%
Proportional Change		0.52%	0.47%	0.37%	-0.32%	

Source: Compiled from US Census and Site to Do Business data.

The international border cities of Texas have incurred positive absolute growth over the past four decades. By 2018, McAllen MSA surpassed the El Paso MSA as the highest populated border MSA in Texas. In terms of growth relative to the state of Texas, the international border MSA's have incurred positive growth over the four-decade period increasing their combined share by around 1%, with McAllen generating most of that increase. However, since 2010, the relative growth of the border MSA's have declined, with all four international border MSA's growing at a slower rate compared to the rest of Texas as in 2010, the international border MSA's has 8.89% of the Texas population and in 2018, the estimated population is 8.57% of the Texas population.

The population of the border regions in Texas has more than doubled over nearly four decades. Growth relative to Texas population growth has been positive over this four decade period; however, growth in the past decades seems to have slowed for all border regions and have seen some declines relative to other population growth in the state of Texas.

Table 3 – Texas MSA Historical Population Growth

#	MSA	1980	1990	2000	2010	2018	Proportional Change
	United Sates	226,500,000	249,600,000	282,200,000	309,300,000	326,766,748	
	State of Texas	14,229,191	16,986,335	20,851,820	25,145,561	28,954,616	
1	Abilene	139,192	119,655	126,555	165,252	174,841	
	% of Texas	*0.98%*	*0.70%*	*0.61%*	*0.66%*	*0.60%*	*-0.374%*
2	Amarillo	173,669	187,547	217,858	251,933	271,627	
	% of Texas	*1.22%*	*1.10%*	*1.04%*	*1.00%*	*0.94%*	*-0.282%*
3	Austin-Round Rock-SanMarcos	536,668	781,572	1,249,763	1,716,289	2,163,711	
	% of Texas	*3.77%*	*4.60%*	*5.99%*	*6.83%*	*7.47%*	*3.701%*
4	Beaumont-Port Arthur	375,497	361,266	385,090	403,190	417,334	
	% of Texas	*2.64%*	*2.13%*	*1.85%*	*1.60%*	*1.44%*	*-1.198%*
5	**Brownsville-Harlingen-San Benito**	**209,727**	**260,120**	**335,227**	**406,220**	**437,967**	
	% of Texas	***1.47%***	***1.53%***	***1.61%***	***1.62%***	***1.51%***	***0.039%***
6	College Station-Bryan	N/A	N/A	N/A	228,660	267,906	
	% of Texas	*N/A*	*N/A*	*N/A*	*0.91%*	*0.93%*	*N/A*
7	Corpus Christi	326,228	349,894	380,783	428,185	472,422	
	% of Texas	*2.29%*	*2.06%*	*1.83%*	*1.70%*	*1.63%*	*-0.661%*
8	Dallas-Ft. Worth-Arlington	2,947,805	3,885,415	5,221,801	6,426,214	7,516,037	
	% of Texas	*20.72%*	*22.87%*	*25.04%*	*25.56%*	*25.96%*	*5.241%*
9	El Paso	479,899	591,610	679,622	804,123	874,325	
	% of Texas	*3.37%*	*3.48%*	*3.26%*	*3.20%*	*3.02%*	*-0.353%*
10	Houston-Sugarland-Baytown-Galveston-Brazoria	2,905,353	3,711,043	4,669,571	5,920,416	7,050,107	
	% of Texas	*20.42%*	*21.85%*	*22.39%*	*23.54%*	*24.35%*	*3.931%*
11	Kileen-Temple-Ft. Hood	214,656	255,301	312,952	405,300	456,769	
	% of Texas	*1.51%*	*1.50%*	*1.50%*	*1.61%*	*1.58%*	*0.069%*
12	Laredo	99,258	133,239	193,117	250,304	284,586	
	% of Texas	*0.70%*	*0.78%*	*0.93%*	*1.00%*	*0.98%*	*0.285%*
13	Longview-Marshall	151,752	162,431	208,780	214,369	224,592	
	% of Texas	*1.07%*	*0.96%*	*1.00%*	*0.85%*	*0.78%*	*-0.291%*
14	Lubbock	211,651	222,636	242,628	290,805	329,003	
	% of Texas	*1.49%*	*1.31%*	*1.16%*	*1.16%*	*1.14%*	*-0.351%*
15	**McAllen-Edinburg-Mission**	**283,229**	**383,545**	**569,463**	**774,764**	**884,144**	
	% of Texas	***1.99%***	***2.26%***	***2.73%***	***3.08%***	***3.05%***	***1.063%***
16	Midland-Odessa*	82,636	106,611	237,132	278,801	338,412	
	% of Texas	*0.58%*	*0.63%*	*1.14%*	*1.11%*	*1.17%*	*0.588%*
17	San Angelo	84,784	98,458	104,010	111,823	123,193	
	% of Texas	*0.60%*	*0.58%*	*0.50%*	*0.44%*	*0.43%*	*-0.170%*
18	San Antonio	1,071,954	1,302,099	1,592,383	2,142,508	2,511,792	
	% of Texas	*7.53%*	*7.67%*	*7.64%*	*8.52%*	*8.67%*	*1.141%*
19	Sherman-Denison	89,796	95,021	110,595	120,877	132,520	
	% of Texas	*0.63%*	*0.56%*	*0.53%*	*0.48%*	*0.46%*	*-0.173%*
20	Tyler	127,395	151,304	174,706	209,714	230,922	
	% of Texas	*0.90%*	*0.89%*	*0.84%*	*0.83%*	*0.80%*	*-0.098%*
22	Victoria	68,807	74,361	84,088	94,003	104,042	
	% of Texas	*0.48%*	*0.44%*	*0.40%*	*0.37%*	*0.36%*	*-0.124%*
23	Waco	170,755	189,123	213,517	252,772	274,518	
	% of Texas	*1.20%*	*1.11%*	*1.02%*	*1.01%*	*0.95%*	*-0.252%*
24	Wichita Falls	130,644	122,378	140,518	151,306	153,673	
	% of Texas	*0.92%*	*0.72%*	*0.67%*	*0.60%*	*0.53%*	*-0.387%*

Source: U.S. Census Figures & Population Estimates and Site to Do Business

* Note: in 1980 & 1990 Midland-Odessa MSA did not include Odessa. As a result, the avg. growth rate for this MSA is overstated to some degree.

Rio Grande Valley County and City Population Growth Trends

The Rio Grande Valley is generally recognized as consisting of four counties: Cameron, Hidalgo, Starr, and Willacy. The current and past population level of these counties is summarized on the following table.

Table 4
Rio Grande Valley County Population Levels

County	1990	2000	2010	2019
Cameron County	260,120	335,227	406,220	438,850
% of Rio Grande Valley	37.07%	34.26%	32.14%	30.92%
Hildago County	383,345	569,463	774,769	892,240
% of Rio Grande Valley	54.63%	58.21%	61.29%	62.86%
Starr County	40,518	53,597	60,968	68,280
% of Rio Grande Valley	5.77%	5.48%	4.82%	4.81%
Willacy County	17,705	20,082	22,134	19,949
% of Rio Grande Valley	2.52%	2.05%	1.75%	1.41%
Rio Grande Valley Total	701,688	978,369	1,264,091	1,419,319

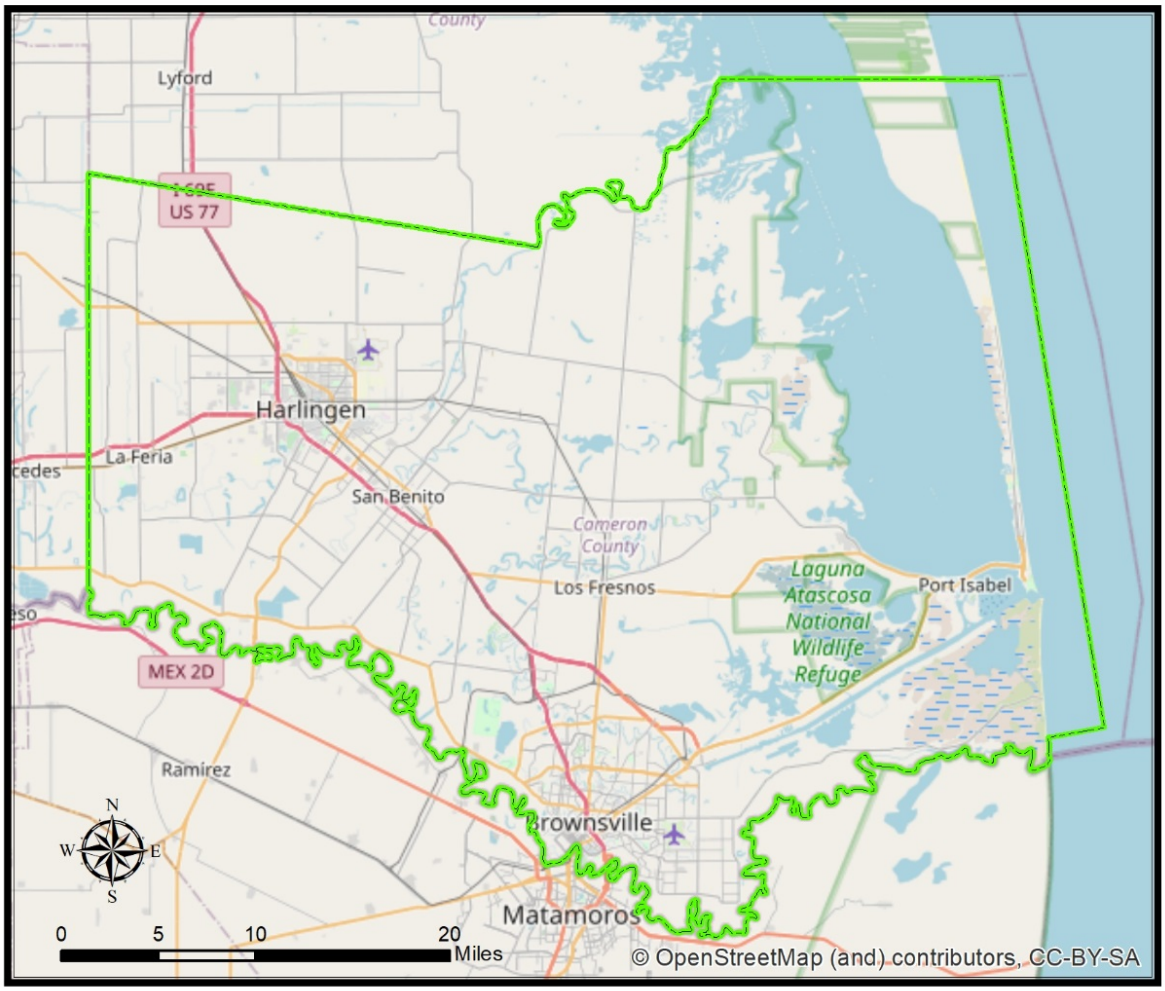
Source: Compiled from Esri data contained in Site to Do Business.

Hidalgo County is the dominate population center in the Valley region, constituting nearly 63 percent of the population of the Valley in 2019. The population level of Hidalgo County has more than doubled since 1990 and its relative share of the Valley population has increased nearly 12 percent. Cameron County contains around 31 percent of the Valley population, but in terms of relative growth its share has declined over the past three decades. Starr and Willacy counties make up a small portion of the total Valley population and are generally rural in nature, with Starr County being the larger of the two. Starr and Willacy Counties have absolute population growth, but are not growing near the level of Hidalgo County, the dominate population center in the Valley Region. The population trends for each county and the incorporated areas that make up that county are presented next.

Cameron County

Cameron County is situated in southeast portion of the Rio Grande Valley. Cameron County abuts the Gulf of Mexico to the east, the international border between the United States of America and the Republic of Mexico to the south, Willacy County to the north, and Hidalgo County to the west.

Cameron County, Texas



Brownsville dominates the city population of the Cameron County cities as its 2019 population is around 57 percent of the county total, and this is an increase from 2000. Harlingen ranks second in population followed by San Benito. These three cities combined make up around 65 percent of the Cameron County population. The three leading population centers in the county are located on Interstate 69E/US 77, (Brownsville and San Benito) and Interstate 2 (Harlingen), which allows access to McAllen. The remaining incorporated areas in Cameron County are relatively small. Overall, the incorporated areas of Cameron County have lost relative population share in the county to the unincorporated areas as the share of county population in the incorporated areas declined from 79.14 percent in 2000 to 75.46 percent in 2019. The following Table 5 summarizes the population levels and growth trends for Cameron County and the various incorporated areas in Cameron County.

Table 5 – Cameron County City Populations Trends

City	2000 Population	2010 Population	2019 Population
Bayview	**301**	**383**	**406**
% of County	0.09%	0.09%	0.09%
% of Rio Grande Valley Total	0.03%	0.03%	0.03%
Brownsville	**143,107**	**175,052**	**190,261**
% of County	42.69%	43.09%	43.35%
% of Rio Grande Valley Total	14.63%	13.85%	13.41%
Combes	**2,540**	**2,895**	**3,061**
% of County	0.76%	0.71%	0.70%
% of Rio Grande Valley Total	0.26%	0.23%	0.22%
Harlingen	**60,216**	**64,846**	**69,263**
% of County	17.96%	15.96%	15.78%
% of Rio Grande Valley Total	6.15%	5.13%	4.88%
Indian Lake	**509**	**640**	**679**
% of County	0.15%	0.16%	0.15%
% of Rio Grande Valley Total	0.05%	0.05%	0.05%
La Feria	**6,586**	**7,009**	**6,959**
% of County	1.96%	1.73%	1.59%
% of Rio Grande Valley Total	0.67%	0.55%	0.49%
Laguna Vista	**2,817**	**3,603**	**3,750**
% of County	0.84%	0.89%	0.85%
% of Rio Grande Valley Total	0.288%	0.285%	0.264%
Los Fresnos	**5,095**	**6,043**	**6,828**
% of County	1.52%	1.49%	1.56%
% of Rio Grande Valley Total	0.52%	0.48%	0.48%
Los Indios	**985**	**1,083**	**1,138**
% of County	0.29%	0.27%	0.26%
% of Rio Grande Valley Total	0.10%	0.09%	0.08%
Palm Valley	**1,055**	**1,304**	**1,347**
% of County	0.31%	0.32%	0.31%
% of Rio Grande Valley Total	0.11%	0.10%	0.09%
Port Isabel	**4,997**	**5,006**	**5,692**
% of County	1.49%	1.23%	1.30%
% of Rio Grande Valley Total	0.51%	0.40%	0.40%
Primera	**3,531**	**4,124**	**4,292**
% of County	1.05%	1.02%	0.98%
% of Rio Grande Valley Total	0.36%	0.33%	0.30%
Rancho Viejo	**1,855**	**2,437**	**2,903**
% of County	0.55%	0.60%	0.66%
% of Rio Grande Valley Total	0.19%	0.19%	0.20%
Rangerville	**220**	**289**	**301**
% of County	0.07%	0.07%	0.07%
% of Rio Grande Valley Total	0.02%	0.02%	0.02%
Rio Hondo	**1,970**	**2,356**	**2,454**
% of County	0.59%	0.58%	0.56%
% of Rio Grande Valley Total	0.20%	0.19%	0.17%
San Benito	**24,080**	**24,250**	**25,951**
% of County	7.18%	5.97%	5.91%
% of Rio Grande Valley Total	2.46%	1.92%	1.83%
Santa Rosa	**2,688**	**2,873**	**2,939**
% of County	0.80%	0.71%	0.67%
% of Rio Grande Valley Total	0.27%	0.23%	0.21%
South Padre Island Town	**2,751**	**2,818**	**2,919**
% of County	0.82%	0.69%	0.67%
% of Rio Grande Valley Total	0.28%	0.22%	0.21%
Total Incorporated Areas	**265,303**	**307,011**	**331,143**
% of County Total	79.14%	75.58%	75.46%
Total County	**335,227**	**406,220**	**438,850**
% of Rio Grande Valley Total	34.26%	32.14%	30.92%
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**

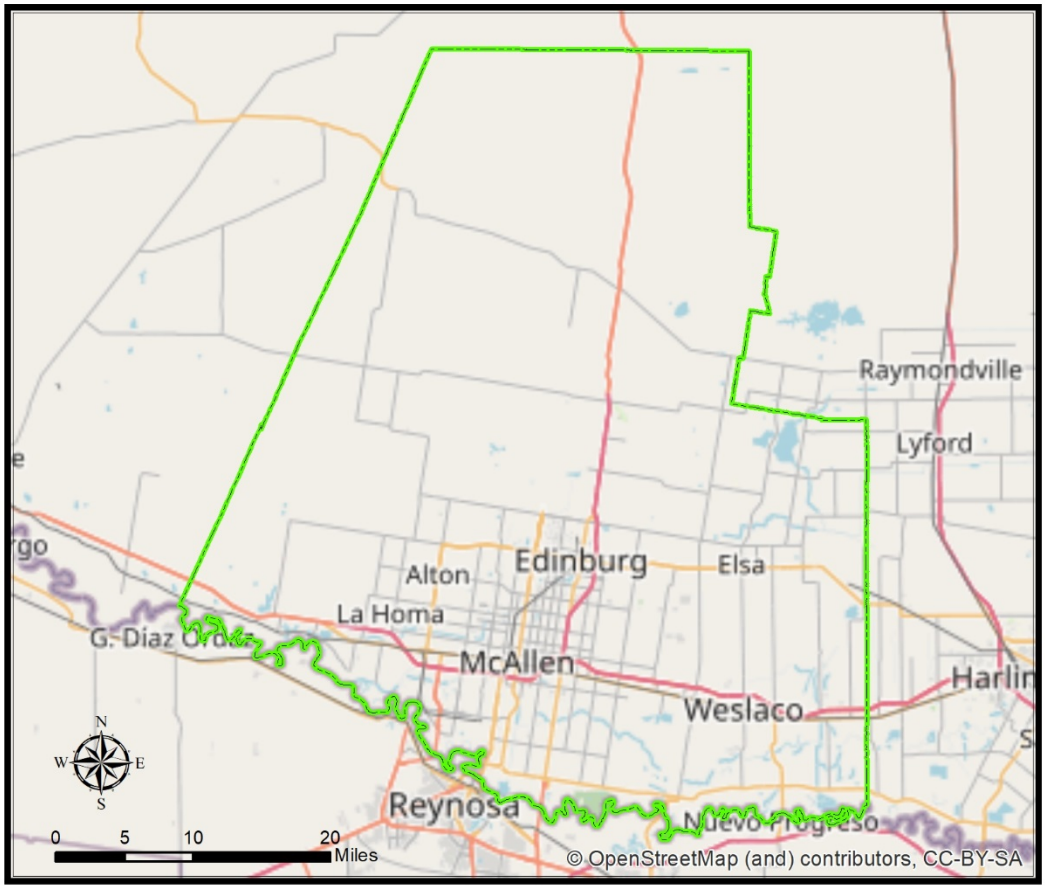
Source: Compiled from Esri data contained in Site to Do Business

Hidalgo County

Hidalgo County is situated west of Cameron/Willacy County, east of Starr County, and abuts the international border/Rio Grande River at the south boundary. Interstate 2 extends east/west through the southern portion of the county connecting McAllen to Harlingen. US Highway 83 then extends west in the alignment of Interstate 2 allowing access through the southwestern portion of Hidalgo County and then into Starr County.

Various incorporated jurisdictions are located along and near Interstate 2, which ends west of McAllen. US Highway 281 is the primary north/south corridor and is the same alignment as Interstate Highway 69 C, which extends north from McAllen to Edinburg.

Hidalgo County, Texas



The population trends for Hidalgo County incorporated areas are presented in Table 6 on the following page. McAllen is the most populated city in Hidalgo County followed by Edinburg and then Mission. These three cities account for approximately 37 percent of the county population.

Table 6 – Hidalgo County City Population Trends

City	2000 Population	2010 Population	2019 Population
Alamo City	**15,493**	**18,672**	**20,149**
% of County	2.72%	2.41%	2.26%
% of Rio Grande Valley Total	1.58%	1.48%	1.42%
Alton	**10,937**	**13,633**	**15,957**
% of County	1.92%	1.76%	1.79%
% of Rio Grande Valley Total	1.12%	1.08%	1.12%
Donna	**15,176**	**15,798**	**17,080**
% of County	2.66%	2.04%	1.91%
% of Rio Grande Valley Total	1.55%	1.25%	1.20%
Edcouch	**2,904**	**3,161**	**3,479**
% of County	0.51%	0.41%	0.39%
% of Rio Grande Valley Total	0.30%	0.25%	0.25%
Edinburg	**55,214**	**82,111**	**96,571**
% of County	9.70%	10.60%	10.82%
% of Rio Grande Valley Total	5.64%	6.50%	6.80%
Elsa	**5,613**	**6,056**	**6,535**
% of County	0.99%	0.78%	0.73%
% of Rio Grande Valley Total	0.57%	0.48%	0.46%
Granjeno	**120**	**293**	**392**
% of County	0.02%	0.04%	0.04%
% of Rio Grande Valley Total	0.012%	0.023%	0.028%
Hidalgo City	**7,900**	**11,965**	**13,611**
% of County	1.39%	1.54%	1.53%
% of Rio Grande Valley Total	0.81%	0.95%	0.96%
La Joya	**3,457**	**3,985**	**4,419**
% of County	0.61%	0.51%	0.50%
% of Rio Grande Valley Total	0.35%	0.32%	0.31%
La Villa	**997**	**1,439**	**1,508**
% of County	0.18%	0.19%	0.17%
% of Rio Grande Valley Total	0.10%	0.11%	0.11%
McAllen	**107,511**	**131,480**	**147,688**
% of County	18.88%	16.97%	16.55%
% of Rio Grande Valley Total	10.99%	10.40%	10.41%
Mercedes	**14,400**	**15,714**	**17,032**
% of County	2.53%	2.03%	1.91%
% of Rio Grande Valley Total	1.47%	1.24%	1.20%
Mission City	**49,609**	**77,740**	**89,666**
% of County	8.71%	10.03%	10.05%
% of Rio Grande Valley Total	5.07%	6.15%	6.32%
Palmhurst	**1,851**	**2,607**	**2,933**
% of County	0.33%	0.34%	0.33%
% of Rio Grande Valley Total	0.19%	0.21%	0.21%
Palmview	**4,821**	**5,460**	**5,925**
% of County	0.85%	0.70%	0.66%
% of Rio Grande Valley Total	0.49%	0.43%	0.42%
Penitas	**2,105**	**4,403**	**4,933**
% of County	0.37%	0.57%	0.55%
% of Rio Grande Valley Total	0.22%	0.35%	0.35%
Pharr	**47,369**	**69,930**	**78,338**
% of County	8.32%	9.03%	8.78%
% of Rio Grande Valley Total	4.84%	5.53%	5.52%
Progreso	**4,511**	**5,507**	**6,013**
% of County	0.79%	0.71%	0.67%
% of Rio Grande Valley Total	0.46%	0.44%	0.42%
Progreso Lakes	**156**	**240**	**251**
% of County	0.03%	0.03%	0.03%
% of Rio Grande Valley Total	0.016%	0.019%	0.018%
San Juan	**26,555**	**33,889**	**37,796**
% of County	4.66%	4.37%	4.24%
% of Rio Grande Valley Total	2.71%	2.68%	2.66%
Sullivan City	**4,015**	**4,002**	**4,381**
% of County	0.71%	0.52%	0.49%
% of Rio Grande Valley Total	0.41%	0.32%	0.31%
Weslaco	**30,793**	**36,973**	**41,869**
% of County	5.41%	4.77%	4.69%
% of Rio Grande Valley Total	3.15%	2.92%	2.95%
Total Incorporated Areas	**411,507**	**545,058**	**616,526**
% of County Total	72.26%	70.35%	69.10%
Total County	**569,463**	**774,769**	**892,240**
% of Rio Grande Valley Total	58.21%	61.29%	62.86%
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**

Source: Compiled from Esri data contained in Site to Do Business

Hidalgo County Subdivision Development Trends

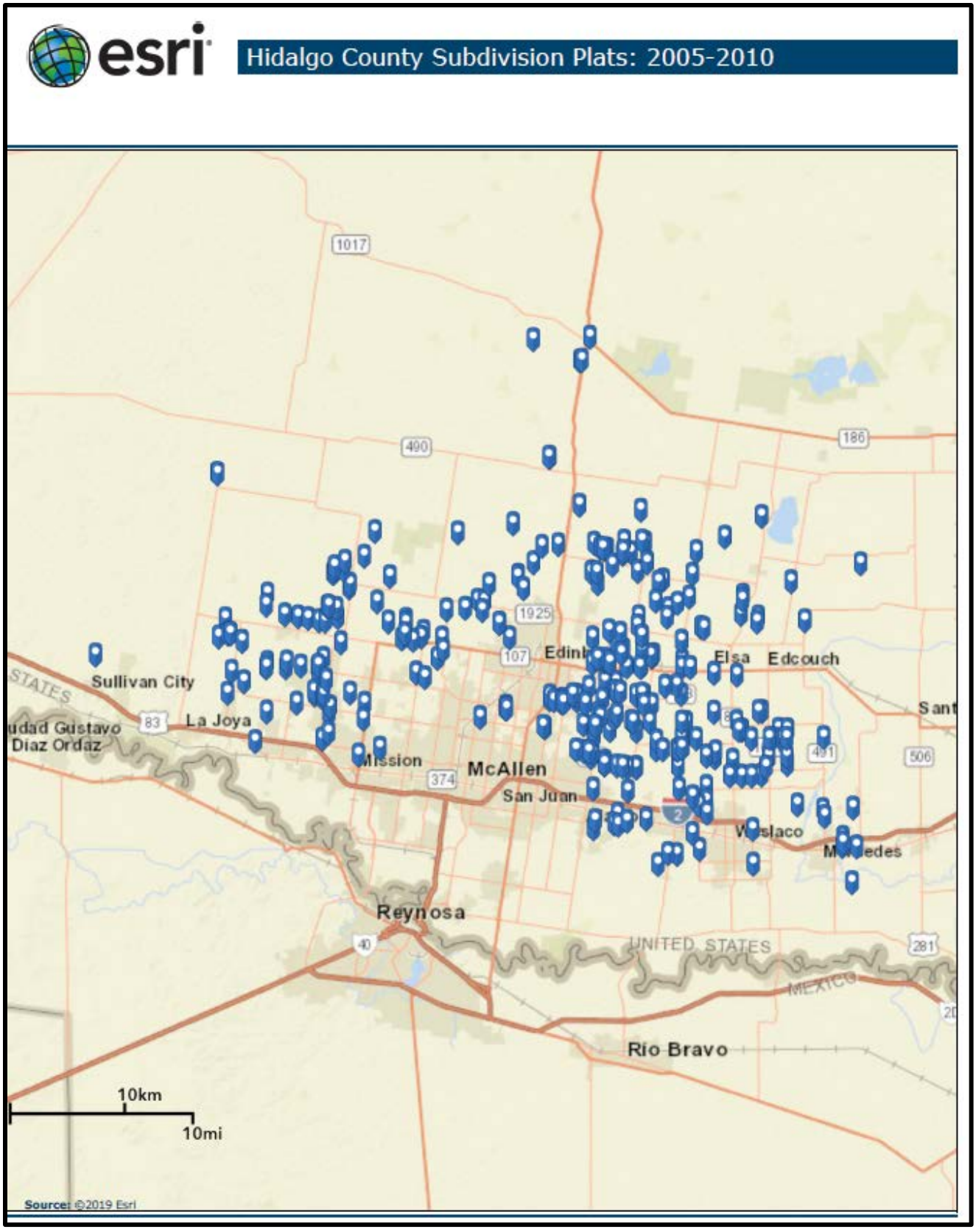
As reflected in the city population trends, the unincorporated areas of Hidalgo County are growing at a higher pace than the incorporated areas. Since Hidalgo County has been the dominate growth center in the region, research was made of subdivision platting trends by requesting final plats that have been approved by Hidalgo County over the past several decades. These approved final platted subdivisions of land were then placed on a map for the time frames researched. Table 7 summarizes the platting trends for unincorporated Hidalgo County.

Table 7
2005-2019 Platting Activity Summary – Hidalgo County

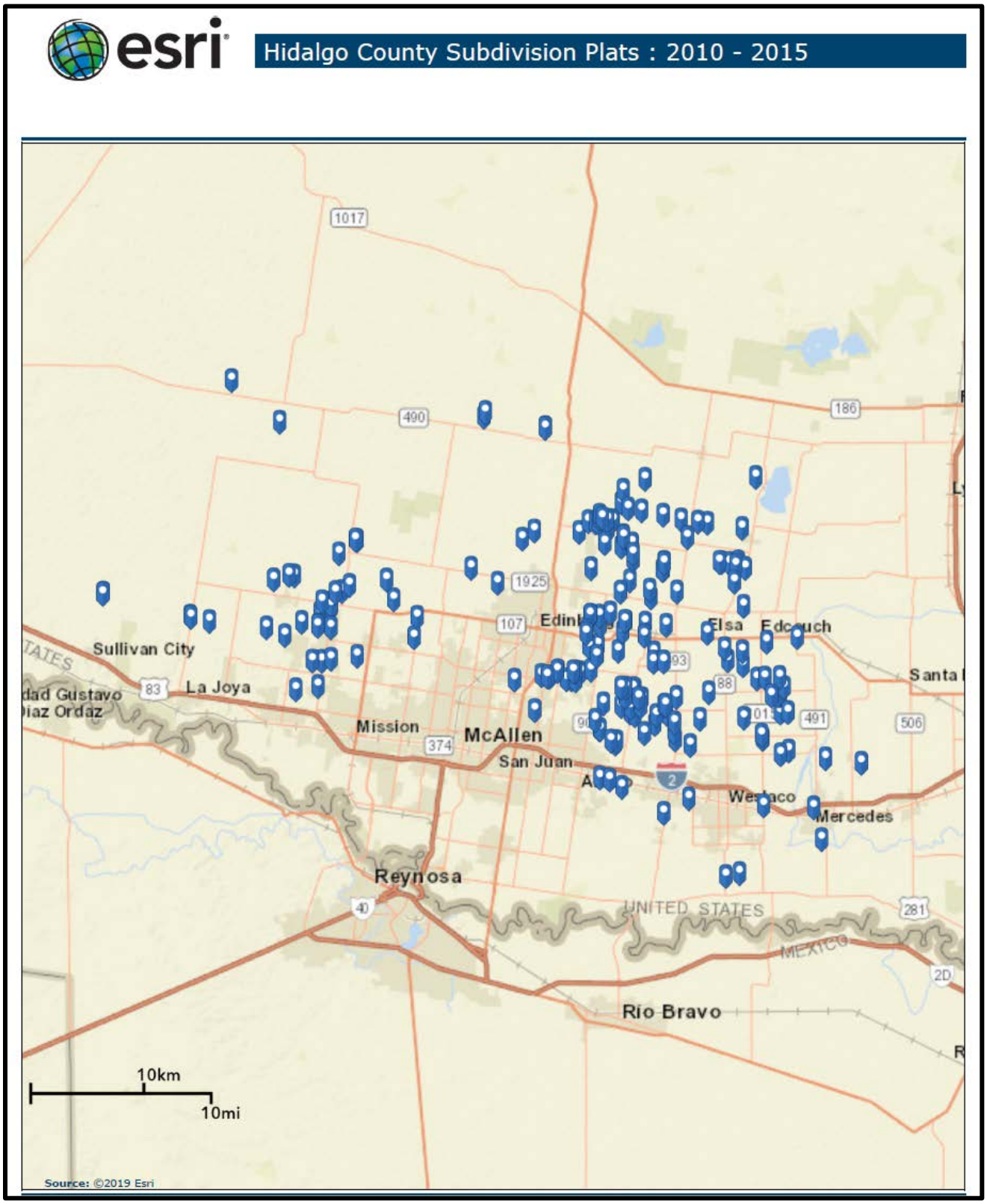
Area	2005-2009	2010-2014	2015-July 2019
Total Final Plats	315	232	191
South of IH 2/US 83	19	10	12
% of Total	6.03%	4.31%	6.28%
South of Highway 281 (Military Highway)	0	0	0
% of Total	0%	0%	0%

Source: Compiled from data obtained from Hidalgo County Planning Department

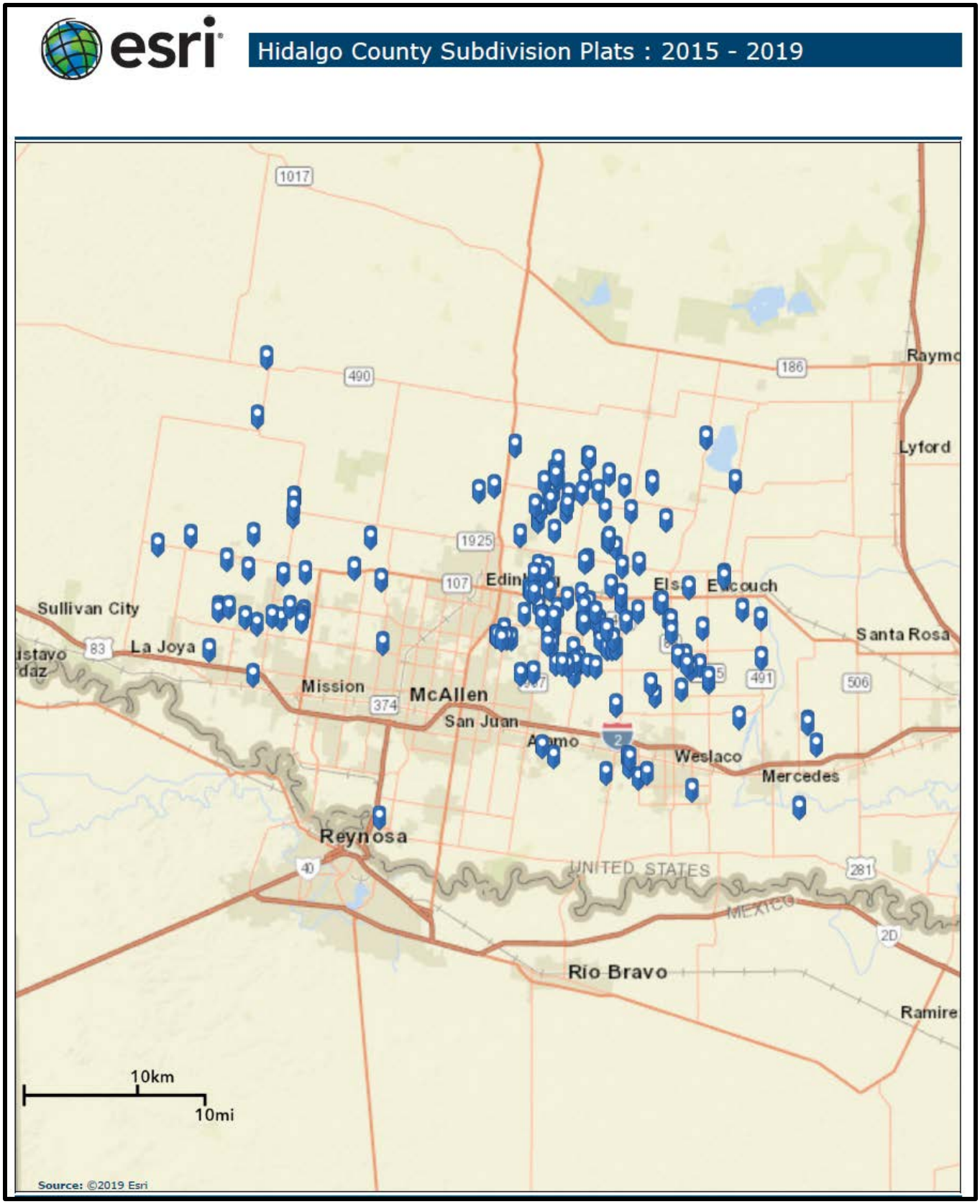
As shown in Table 7, platting activity was more active during the housing bubble period of 2005-2009, and had declined to more consistent levels since 2010. Platting activity south of Interstate 2/Highway 83 has been limited and minimal compared to activity north of Interstate 2/Highway 83, with more of the activity occurring east of McAllen and Interstate 69C/Highway 281. There has been no identified platting activity over the period researched south of US Highway 281/Military Highway within Hidalgo County. The following maps present the location of platting activity in Hidalgo County over the time periods researched.



Source: Compiled from Hidalgo County Planning Department Data.



Source: Compiled from Hidalgo County Planning Department Data.



Source: Compiled from Hidalgo County Planning Department Data Records.

Starr County

Starr County is situated in the western portion of the Rio Grande Valley region and borders Hidalgo County to the east, Zapata County to the northwest, Jim Hogg County to the north, Brooks County to the northeast, and the international border with Mexico to the south and southwest. Much of Starr County is rural in nature, as only around 48 percent of the population is located in incorporated areas, and this trend has been declining similar to the rest of the Valley region. Rio Grande City, the county seat, is the most populated incorporated area in Starr County, followed by Roma. However, Roma has been declining in relative population of the county while Rio Grande City is experiencing some relative growth. The cities in Starr County are located in the southern portion of the county along U.S. Highway 83.

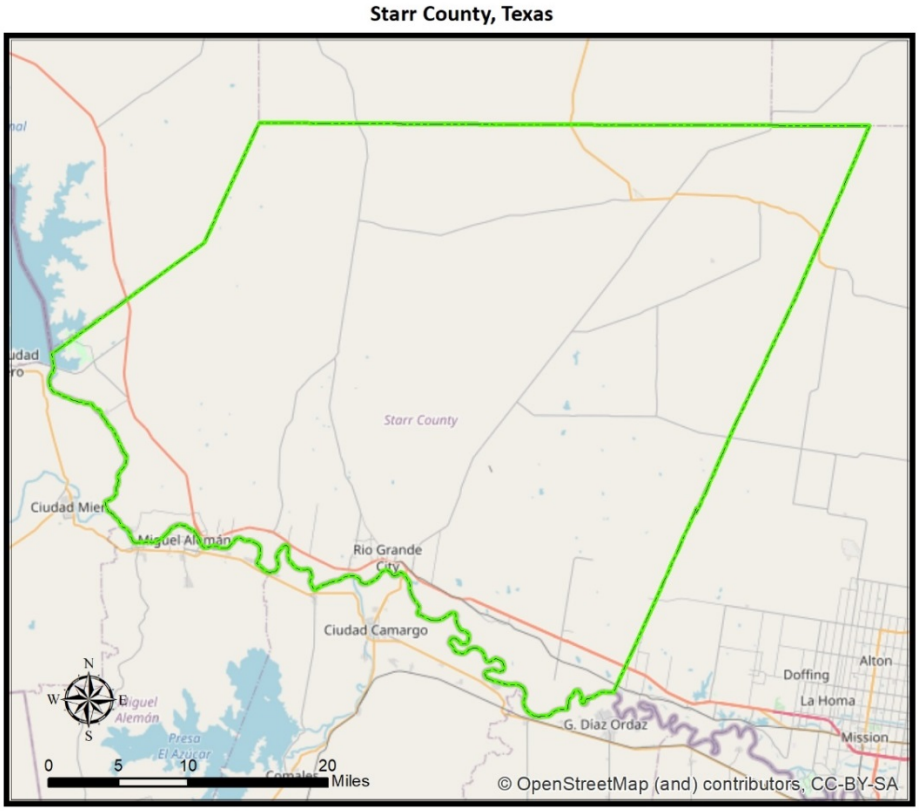


Table 8 – Starr County Population Trends

City	2000 Population	2010 Population	2019 Population
Escobares	**2,049**	**2,336**	**2,708**
% of County Total	3.82%	3.83%	3.97%
% of Rio Grande Valley Total	0.21%	0.18%	0.19%
La Grulla	**1,609**	**1,622**	**1,685**
% of County Total	3.00%	2.66%	2.47%
% of Rio Grande Valley Total	0.16%	0.13%	0.12%
Rio Grande City	**12,218**	**13,834**	**15,735**
% of County Total	22.80%	22.69%	23.04%
% of Rio Grande Valley Total	1.25%	1.09%	1.11%
Roma	**11,039**	**11,408**	**12,770**
% of County Total	20.60%	18.71%	18.70%
% of Rio Grande Valley Total	1.13%	0.90%	0.90%
Total Incorporated Areas	**26,915**	**29,200**	**32,898**
% of County Total	50.22%	47.89%	48.18%
Total County	**53,597**	**60,968**	**68,280**
% of Rio Grande Valley Total	5.48%	4.82%	4.81%
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**

Source: Compiled from data contained in Site to Do Business

Willacy County

Willacy County is situated in the eastern portion of the Valley. Willacy County borders the Gulf of Mexico to the east, Cameron County to the south, Hidalgo County to the west, and Kenedy County to the north. Willacy County is rural in nature and has experienced slight declines in population over the past several decades. Of the three incorporated cities and towns in Willacy County, the City of Raymondville (the county seat) leads the county in total population, but it has decreased in regional share of the Rio Grande Valley approximately 0.45 percent since 2000.

Table 9 – Willacy County Population Trends

City	2000 Population	2010 Population	2019 Population
Lyford	**2,546**	**2,611**	**2,725**
% of Total Incorporated Areas	19.03%	18.05%	23.49%
% of Rio Grande Valley Total	0.26%	0.21%	0.19%
Raymondville	**10,043**	**11,284**	**8,281**
% of Total Incorporated Areas	75.08%	77.99%	71.39%
% of Rio Grande Valley Total	1.03%	0.89%	0.58%
San Perlita	**787**	**573**	**594**
% of Total Incorporated Areas	5.88%	3.96%	5.12%
% of Rio Grande Valley Total	0.08%	0.05%	0.04%
Total Incorporated Areas	**13,376**	**14,468**	**11,600**
% of County Total	66.61%	65.37%	58.15%
Total County	**20,082**	**22,134**	**19,949**
% of Rio Grande Valley Total	2.05%	1.75%	1.41%
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**

Source: Compiled from data contained in Site to Do Business

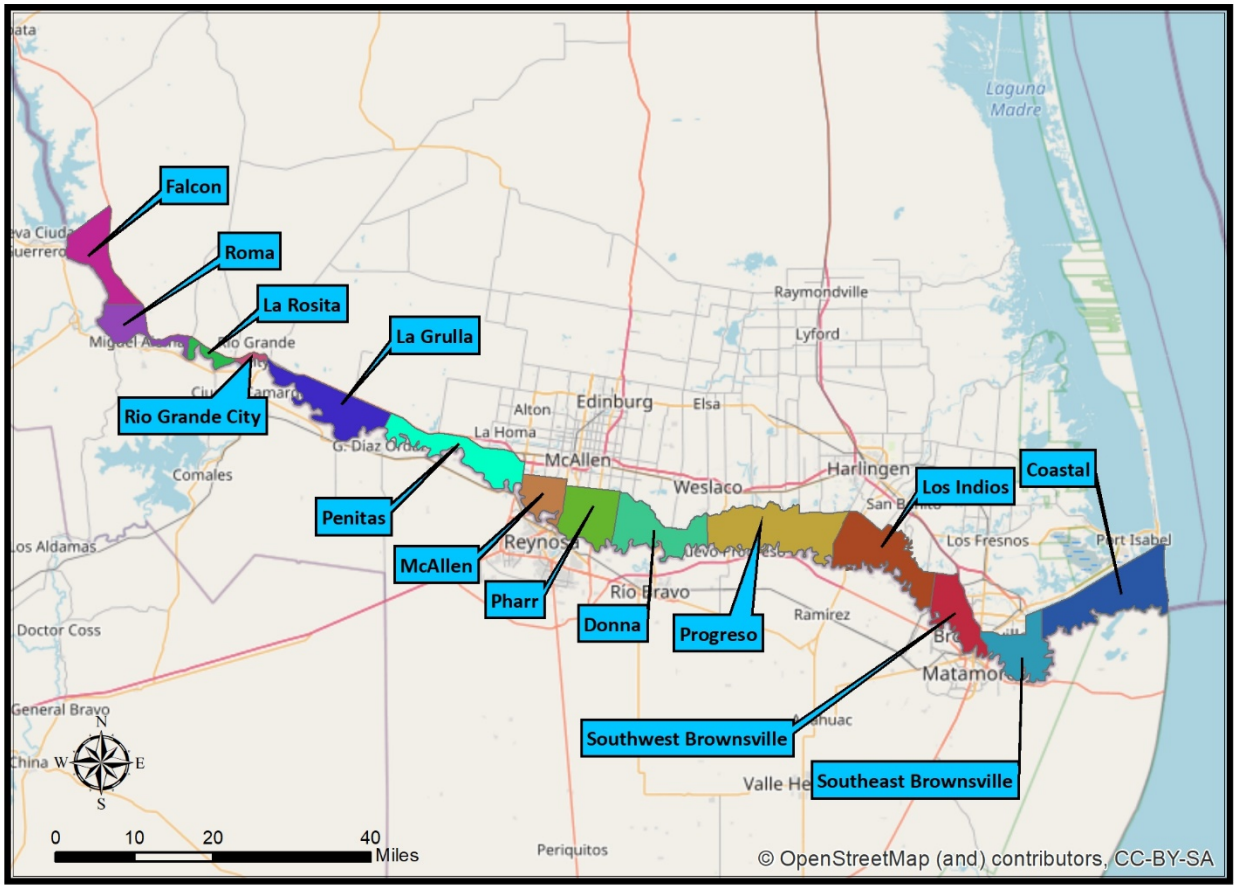
Section 2 - Rio Grande Valley Land Sale Activity by Border Submarket

Identification of Border Submarkets

To this point, the growth trends of the Valley region have shown that Hidalgo County is the primary generator of growth activity in the Valley. Willacy County and Starr County are rural in nature and make up a small share of the Valley population. Cameron County is also a growing and large population center for the region, but Cameron County has not experienced the growth of Hidalgo County. The Valley has various unique and differing geographical features, infrastructure, and political boundaries that are believed to influence the land use make-up of the region. As such, this study will consider and develop sub markets to better identify more specific locational aspects of the Valley region. Because this study is being utilized to support land acquisition for the Border Wall Construction Project, emphasis is placed on areas in proximity to the existing and proposed Border Wall.

A physical inspection of the area impacted by the Border Wall Project from Boca Chica Beach to Falcon Dam led to the initial reasoning behind the identified submarkets presented below.

Identified Lower Rio Grande Valley Submarkets



The primary reasoning behind the initial identification centered around observed land uses which naturally increase in intensity near the international bridge crossings found throughout the area. These identified submarket areas are further explained in the following narrative.

Beginning on the eastern end of the Valley region, the geographical features of the Rio Grande River, Gulf of Mexico and Port of Brownsville also create a reasonable boundary, with the west boundary being that area where the transition to urbanization occurs near Brownsville and the coastal topography ends. The urban center of Brownsville is divided by Interstate 69, which is also a major international crossing into the Republic of Mexico and therefore is believed to be a physical dividing line between the submarkets in and around the city of Brownsville.

The southern boundary for the submarkets is naturally the Rio Grande River and there are several potential north boundary lines including the IBWC levee, US Highway 281 (Military Highway) and the Central Floodway. The use of the IBWC levee as north boundary creates a small area with limited transactional activity. A similar conclusion can be reached for US Highway 281 being a north boundary. The Central Floodway seems to be the more reasonable boundary for the submarkets as one extends across the extreme southern portion of the Valley. In addition, the Hidalgo County platting activity patterns presently previously suggest that the higher concentration of urban development ends near the Central Floodway south of Interstate 2; therefore, the Central Floodway seems to be a natural northern boundary for many of the submarkets.

It is recognized that the IBWC levee extending across portions of Cameron and Hidalgo Counties might create a submarket in and of itself due to the physical nature of the levee and the existence of flood zones between the Rio Grande River and the levee within much of this area. To test this possible position, separate submarket land sales data was analyzed. The following Table 10 shows the raw data of mean average tract size, mean average price per acre and the coefficient of variance (COV) of the combined Cameron/Hidalgo County submarkets compared to those same measurements of the land sale activity found south of the IBWC levee. Coefficient of variance is a measurement of relative variation. It is calculated by dividing the standard deviation by the mean of the data set.

Table 10 - Comparison of Land Sale Activity

Area	# of Land Sales	Average Tract Size/Acre	Average $/Acre	Standard Deviation	COV
Cameron/Hidalgo Submarkets	110	47.79	$15,787	$21,456	135.9%
South of IBWC Levee	20	374.89	$6,549	$12,670	193.5%
Partial South of IBWC Levee	7	318.97	$3,305	$941	28.5%
Within other Floodways	6	140.73	$2,313	$1,086	47.0%

Table 10 indicates that the sale prices south of the IBWC levee is high similar to the high variance found in the entire combined Hidalgo/Cameron County data set. Therefore, this would seem to suggest that the sales south of the IBWC levee are not in and of itself a separate submarket as the comparison of COV's suggest that there's no material difference in the price variance between the sales prices in the broad study data. However, the sales south of the IBWC levee include several sales in the Madero area that are influenced by commercial use potential due to the recreational use on the Rio Grande River. When excluding those sales from the data set, the variance is reduced significantly. To some degree this same reduction would likely occur when the higher density land uses are removed from the Cameron/Hidalgo data set, and which suggests that the variance in the data is highly influenced by land use, which is later established in the analysis.

In addition to analysis of the raw data, regression analysis was also completed on agricultural tracts located south of the IBWC levee and agricultural tracts situated in the entire Cameron/Hidalgo market. Regression is a method to determine an association between two or more variables. Location was not

included as a variable in the regression but physical factors such as date of sale, size, and physical factors were applied consistently for the data sets. The following Table 11 summarizes the output statistics from these two regression models.

Table 11 –
Comparison of Regression Outputs – Agriculture Tracts

Regression Output	South of IBWC Levee	Cameron & Hidalgo Submarkets
Observations	13	38
R Square	0.17	0.165
Standard Error	1,040	1,054
Predicted Mean Price/Acre	$2,318	$2,677
COV	44.87%	39.37%

Similar to the broad sales data statistics, the regression models of the broad market and the area south of the IBWC levee also have similar results with very low R Square indicators and high standard errors relative to the mean price per acre as reflected by the COV. The sale data in the area south of the IBWC levee seems to be acting like the rest of the broad market and does not seem to recognize that south of the IBWC levee is a more homogeneous submarket as the output from the regression model was similar to the boarder market outputs. Therefore, based on the methods applied, segmenting the data into an area south of the IBWC levee does not better explain the variance compared to the broader market and does not suggest a locational factor that is any different than the broad area. However, when dividing the agricultural land sales into various submarkets extending east/west across the extreme southern portion of the Valley, the following regression outputs result.

Table 12 - Comparison of Regression Outputs – Agriculture Tracts by Submarket

Regression Output	South of IBWC Levee	Cameron/Hidalgo Submarkets	Los Indios Submarket	Progreso Submarket	Pharr/McAllen and Penitas
Observations	13	38	10	13	8
R Square	0.17	0.165	0.83	0.68	0.52
Standard Error	1,040	1,054	763	881	1792
Mean Price/Acre	$2,318	$2,677	$2,860	$2,479	$2,635
COV	44.87%	39.37%	26.68%	35.54%	68.01%

As shown in Table 12, the regression output statistics are generally better in terms of explaining variance as shown by the R Square statistics once the agricultural land sales are segmented by locational submarkets. The Pharr/McAllen/Penitas area results are influenced by one sale that may not be properly classified and the output is not as strong from this submarket in terms of the standard error.

As to the various east/west boundaries extending across the region, the primary urban centers of Brownsville McAllen and Pharr create submarkets with distinct population, employment and land use concentrations. The existence of international border crossings across the southern portion of the Valley also have some influence as the crossings create a linkage that adds to activity and may influence the nature of a particular sub-market extending east/west across the Valley.

Given the above considerations, the submarkets have been identified with consideration of physical boundaries including the Gulf of Mexico, Rio Grande River, major roadways and floodway channels. Incorporated cities, international crossing points, county boundaries, and established regional growth

patterns as identified in this study are also utilized to identify sub markets. Table 13 presents the historical growth and other demographics of the submarkets that are identified as part of this study.

Table 13 – Submarket Demographics

Submarkets	2000 Population	2010 Population	2019 Population	2000 Total Housing Units	2010 Total Housing Units	2019 Total Housing Units	2019 Per Capita Income	2019 Total Employees
Coastal	**81**	**66**	**66**	**119**	**108**	**109**	**$12,670.00**	**143**
% of Total Submarket	0.04%	0.03%	0.03%	0.22%	0.16%	0.14%		
% of Rio Grande Valley Total	0.0083%	0.005%	0.0047%	0.012%	0.009%	0.008%		
SE Brownsville	**47,321**	**50,705**	**52,188**	**12,575**	**14,059**	**14,781**	**$10,199.00**	**9,060**
% of Total Submarket	25.99%	21.75%	20.44%	23.15%	20.24%	19.22%		
% of Rio Grande Valley Total	4.84%	4.01%	3.68%	1.29%	1.11%	1.04%		
SW Brownsville	**47,664**	**57,377**	**62,429**	**15,520**	**18,888**	**20,671**	**$14,599.00**	**19,842**
% of Total Submarket	26.18%	24.62%	24.45%	28.57%	27.19%	26.87%		
% of Rio Grande Valley Total	4.87%	4.54%	4.40%	1.59%	1.49%	1.46%		
Los Indios	**10,124**	**16,149**	**17,975**	**2,733**	**4,291**	**4,784**	**$11,790.00**	**850**
% of Total Submarket	5.56%	6.93%	7.04%	5.03%	6.18%	6.22%		
% of Rio Grande Valley Total	1.03%	1.28%	1.27%	0.28%	0.34%	0.34%		
Progreso	**9,303**	**11,749**	**12,705**	**2,384**	**3,214**	**3,510**	**$12,956.00**	**1,067**
% of Total Submarket	5.11%	5.04%	4.98%	4.39%	4.63%	4.56%		
% of Rio Grande Valley Total	0.95%	0.93%	0.90%	0.24%	0.25%	0.25%		
Donna	**564**	**802**	**827**	**157**	**243**	**244**	**$14,814.00**	**185**
% of Total Submarket	0.31%	0.34%	0.32%	0.29%	0.35%	0.32%		
% of Rio Grande Valley Total	0.06%	0.06%	0.06%	0.02%	0.02%	0.02%		
Pharr	**22,734**	**37,969**	**42,645**	**5,406**	**9,519**	**10,851**	**$10,857.00**	**8,116**
% of Total Submarket	12.49%	16.29%	16.70%	9.95%	13.70%	14.11%		
% of Rio Grande Valley Total	2.32%	3.00%	3.00%	0.55%	0.75%	0.76%		
McAllen	**8,536**	**17,041**	**19,945**	**2,291**	**5,051**	**5,868**	**$19,927.00**	**7,138**
% of Total Submarket	4.69%	7.31%	7.81%	4.22%	7.27%	7.63%		
% of Rio Grande Valley Total	0.87%	1.35%	1.41%	0.23%	0.40%	0.41%		
Penitas	**17,132**	**21,921**	**25,744**	**6,883**	**7,576**	**8,971**	**$13,758.00**	**1,855**
% of Total Submarket	9.41%	9.41%	10.08%	12.67%	10.90%	11.66%		
% of Rio Grande Valley Total	1.75%	1.73%	1.81%	0.70%	0.60%	0.63%		
La Grulla	**7,616**	**8,165**	**8,799**	**2,406**	**2,592**	**2,810**	**$11,177.00**	**1,374**
% of Total Submarket	4.18%	3.50%	3.45%	4.43%	3.73%	3.65%		
% of Rio Grande Valley Total	0.78%	0.65%	0.62%	0.25%	0.21%	0.20%		
Rio Grande City	**1,555**	**1,363**	**1,409**	**550**	**465**	**502**	**$19,704.00**	**1,008**
% of Total Submarket	0.85%	0.58%	0.55%	1.01%	0.67%	0.65%		
% of Rio Grande Valley Total	0.16%	0.11%	0.10%	0.06%	0.04%	0.04%		
La Rosita	**1,067**	**1,270**	**1,474**	**384**	**462**	**540**	**$14,584.00**	**87**
% of Total Submarket	0.59%	0.54%	0.58%	0.71%	0.66%	0.70%		
% of Rio Grande Valley Total	0.11%	0.10%	0.10%	0.04%	0.04%	0.04%		
Roma	**7,068**	**7,151**	**7,742**	**2,339**	**2,447**	**2,686**	**$9,868.00**	**1,024**
% of Total Submarket	3.88%	3.07%	3.03%	4.31%	3.52%	3.49%		
% of Rio Grande Valley Total	0.72%	0.57%	0.55%	0.24%	0.19%	0.19%		
Falcon	**1,300**	**1,348**	**1,400**	**572**	**562**	**589**	**$14,556.00**	**147**
% of Total Submarket	0.71%	0.58%	0.55%	1.05%	0.81%	0.77%		
% of Rio Grande Valley Total	0.13%	0.11%	0.10%	0.06%	0.04%	0.04%		
Total Submarket	**182,065**	**233,076**	**255,348**	**54,319**	**69,477**	**76,916**	**$12,893.36**	**51,896**
% of Rio Grande Valley Total	18.61%	18.44%	17.99%					
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**					

Source: Compiled from Esri data contained in Site to Do Business

Combined, the submarkets have had absolute growth, but the submarkets sum total population share of Rio Grande Valley population has declined slightly over the past several decades. This trend is consistent with other trends identified in prior broad market analysis that showed growth seems to be greater north of Interstate 2 across the Valley region. As noted, the submarkets being identified in this study consider proximity to the existing Border Wall and the anticipated general alignment of the Border Wall expansion. To date, no Border Wall exists in Starr County, but the alignment is anticipated to be in proximity to the international border/Rio Grande River; therefore, the northern boundary of the submarkets in Starr County generally follow US Highway 83.

Comparison of Growth – Pre-Border Wall and Post-Border Wall

The Mexico - United States Border/Barrier ("Border Wall") began construction around 2008 in the Rio Grande Valley region starting in Hidalgo County. Construction of the wall began around 2009 in Cameron County and for the most part, construction was completed by 2010 on all wall projects in the Rio Grande Valley. The exception was various gates that were not completed at that time.

As it relates to the study area, the Border Wall currently begins in the eastern portion of the Rio Grande Valley at the termination of the International Boundary Water Commission (" IBWC") levee, southeast of Boca Chica Boulevard and the intersection with Oklahoma Avenue. The Border Wall then generally extends along the IBWC levee to the Veterans International Bridge and is for the most part completed within the entire Southeast Brownsville Submarket. The wall then generally follows the IBWC levee through potions of the Southwest Brownsville Submarket, Los Indios Submarket, Progreso Submarket, Donna Submarket, Pharr Submarket, McAllen Submarket and Penitas Submarket. The existing Border Wall terminates at the end of the IBWC levee near Penitas, and as noted does not presently extend into Starr County.

The following Table 14 provides population growth levels for those areas south of US Highway 281 for periods prior to the Border Wall construction (pre 2010) and for periods after the Border Wall construction (post 2010). Because the Border Wall is south of US Highway 281, it is believed that study of the population growth in this area compared to the broader submarket would be one way to determine if the location is impacted by the existence of the Border Wall. Table 15 then compares the population growth trend for the area south of US Highway 281 to the overall submarket (as shown and taken from Table 13). In doing so, the relative population of the Rio Grande Valley for both the submarket and the area south of US Highway 281 is compared over time. The change of that relative population is then compared to determine if the area south of Military Highway performed better or worse than the overall submarket. Although it is recognized that population levels are small south of US Highway 281, the comparison of relative growth trends (relative to the Rio Grande Valley population) does not suggest that the Border Wall construction deterred population growth.

Table 14 – Population Growth Trends South of US Highway 281

Submarket	2000 Population	2010 Population	2019 Population
SE Brownsville, FM 1419, Southmost and South of International Boulevard	**11,528**	**11,198**	**11,456**
% of Rio Grande Valley Total	1.18%	0.89%	0.81%
SW Brownsville (West of former rail line, south of Hwy 281	**4,917**	**5,913**	**5,950**
% of Rio Grande Valley Total	0.50%	0.47%	0.42%
Los Indios	**2,231**	**2,638**	**2,937**
% of Rio Grande Valley Total	0.23%	0.21%	0.21%
Progreso	**1,079**	**1,446**	**1,501**
% of Rio Grande Valley Total	0.11%	0.11%	0.11%
Donna	**133**	**207**	**215**
% of Rio Grande Valley Total	0.01%	0.02%	0.02%
Pharr	**3,890**	**5,743**	**6,453**
% of Rio Grande Valley Total	0.40%	0.45%	0.45%
McAllen	**226**	**473**	**690**
% of Rio Grande Valley Total	0.02%	0.04%	0.05%
Rio Grande Valley Total	**978,369**	**1,264,091**	**1,419,319**

In addition, the comparison of the aerials pre-Border Wall and post-Border Wall are presented in the analysis of each submarket and these comparisons do not suggest the Border Wall construction materially changed land uses in the areas where Border Wall construction occurred.

Table 15
Comparative Growth of Border Wall Submarkets
% of Rio Grande Valley Population
Overall Submarket vs. South of US Highway 281

Submarket	2000	2010	Change - Pre Wall	2019	Change - Post Wall	Post Wall Trend Comparison
***SE Brownsville**	4.84%	4.01%	Decline	3.68%	Decline	
South/East Portion	1.18%	1%	Decline	0.81%	Decline	Similar
SW Brownsville	4.87%	4.54%	Decline	4.40%	Decline	
South of Highway 281	0.50%	0.47%	Decline	0.42%	Decline	Similar
Los Indios	1.03%	1.28%	Increase	1.27%	Stable	
South of Highway 281	0.23%	0.21%	Decline	0.21%	Stable	Better
Progreso	0.95%	0.93%	Decline	0.90%	Decline	
South of Highway 281	0.11%	0.11%	Stable	0.11%	Stable	Better
Donna	0.06%	0.06%	Stable	0.06%	Stable	
South of Highway 281	0.01%	0.01%	Stable	0.02%	Increase	Better
Pharr	2.32%	3.00%	Increase	3.00%	Stable	
South of Highway 281	0.40%	0.40%	Stable	0.40%	Stable	Better
McAllen	0.87%	1.35%	Increase	1.41%	Increase	
South of Highway 281	0.02%	0.04%	Increase	0.05%	Increase	Similar

Source: Compiled from Esri data contained in Site to do Business. *SE Brownsville submarket is not bisected by US Highway 281. For purposes of establishing an area in proximity to the Border Wall, that submarket is segmented by FM 1419 and International Boulevard.

International Border Crossing Activity

As noted, the existence of international border crossings throughout the Valley influence land uses and for the most part create the only significant roadway infrastructure south of the US Highway 281. The international border crossings vary significantly in terms of their use and functions, and this is described in more detailed within each submarket discussion. The following tables summarize the international crossing activity for 2017 and 2018 across the Rio Grande Valley.

Table 16
2017 International Border Crossings – Entry to United States

Crossing	Sub market	Total Trucks	Vehicles	Total Rail Cars	Pedestrians
Los Tomates Bridge	SW Brownsville	0	1,402,382	0	90,265
Los Tomates Import Lot	SW Brownsville	202,607	0	0	0
Gateway Bridge	SW Brownsville	0	1,292,050	0	2,154,953
B & M Bridge	SW Brownsville	0	166,789	86,792	484,799
TOTAL		**202,607**	**2,861,221**	**86,792**	**2,730,017**
% of Grand Total		**21.42%**	**28.07%**	**100.00%**	**44.37%**
Los Indios	Los Indios	25,581	508,128	0	31,802
TOTAL		**25,581**	**508,128**	**0**	**31,802**
% of Grand Total		**2.70%**	**4.99%**	**0.00%**	**0.52%**
Progreso	Progreso	52,516	562,899	0	899,201
TOTAL		**52,516**	**562,899**	**0**	**899,201**
% of Grand Total		**5.55%**	**5.52%**	**0.00%**	**14.61%**
Donna	Donna	0	654,779	0	0
TOTAL		**0**	**654,779**	**0**	**0**
% of Grand Total		**0.00%**	**6.42%**	**0.00%**	**0.00%**
Pharr	Pharr	620,236	1,143,683	0	0
TOTAL		**620,236**	**1,143,683**	**0**	**0**
% of Grand Total		**65.56%**	**11.22%**	**0.00%**	**0.00%**
Anzalduas	McAllen	0	1,032,539	0	0
Hidalgo	McAllen	0	2,224,845	0	2,185,335
TOTAL		**0**	**3,257,384**	**0**	**2,185,335**
% of Grand Total		**0.00%**	**31.96%**	**0.00%**	**35.52%**
Los Ebanos	Penitas	0	29,558	0	30,220
TOTAL		**0**	**29,558**	**0**	**30,220**
% of Grand Total		**0.00%**	**0.29%**	**0.00%**	**0.49%**
Rio Grande City	Rio Grande City	37,521	371,459	0	30,429
TOTAL		**37,521**	**371,459**	**0**	**30,429**
% of Grand Total		**3.97%**	**3.64%**	**0.00%**	**0.49%**
Roma	Roma	7,608	705,462	0	245,594
TOTAL		**7,608**	**705,462**		**245,594**
% of Grand Total		0.80%	6.92%	0.00%	3.99%
Falcon Dam	Falcon	0	98,340	0	0
TOTAL		**0**	**98,340**	**0**	**0**
% of Grand Total		**0.00%**	**0.96%**	**0.00%**	**0.00%**
GRAND TOTAL		**946,069**	**10,192,913**	**86,792**	**6,152,598**

Source: Compiled from International Border crossing data obtained from the US Customs and Border Patrol

Table 17
2018 International Border Crossings – Entry to United States

Crossing	Sub market	Total Trucks	Vehicles	Total Rail Cars	Pedestrians
Los Tomates Bridge	SW Brownsville	0	1,482,299	0	99,993
Los Tomates Import Lot	SW Brownsville	217,706	0	0	0
Gateway Bridge	SW Brownsville	0	1,183,560	0	2,125,471
B & M Bridge	SW Brownsville	0	1,533,443	93,399	638,301
TOTAL		**217,706**	**4,199,302**	**93,399**	**2,863,765**
% of Grand Total		**21.79%**	**43.71%**	**100.00%**	**44.83%**
Los Indios	Los Indios	37,463	543,053	0	29,690
TOTAL		**37,463**	**543,053**	**0**	**29,690**
% of Grand Total		**3.75%**	**5.65%**	**0.00%**	**0.46%**
Progreso	Progreso	50,795	589,654	0	1,034,129
TOTAL		**50,795**	**589,654**	**0**	**1,034,129**
% of Grand Total		**5.08%**	**6.14%**	**0.00%**	**16.19%**
Donna	Donna	0	685,403	0	0
TOTAL		**0**	**685,403**	**0**	**0**
% of Grand Total		**0.00%**	**7.13%**	**0.00%**	**0.00%**
Pharr	Pharr	647,157	1,137,100	0	0
TOTAL		**647,157**	**1,137,100**	**0**	**0**
% of Grand Total		**64.76%**	**11.84%**	**0.00%**	**0.00%**
Anzalduas	McAllen	0	1,022,657	0	0
Hidalgo	McAllen	0	226,752	0	2,170,334
TOTAL		**0**	**1,249,409**	**0**	**2,170,334**
% of Grand Total		**0.00%**	**13.01%**	**0.00%**	**33.97%**
Los Ebanos	Penitas	0	30,525	0	32,953
TOTAL		**0**	**30,525**	**0**	**32,953**
% of Grand Total		**0.00%**	**0.32%**	**0.00%**	**0.52%**
Rio Grande City	Rio Grande City	38,094	395,162	0	28,318
TOTAL		**38,094**	**395,162**	**0**	**28,318**
% of Grand Total		**3.81%**	**4.11%**	**0.00%**	**0.44%**
Roma	Roma	8,111	679,172	**0**	229,267
TOTAL		**8,111**	**679,172**	**0**	**229,267**
% of Grand Total		0.81%	**7.07%**	**0.00%**	**3.59%**
Falcon Dam	Falcon	0	93,588	0	0
TOTAL		**0**	**98,340**	**0**	**0**
% of Grand Total		**0**	**1.02%**	**0**	**0**
GRAND TOTAL		**999,326**	**9,607,120**	**93,399**	**6,388,456**

Source: Compiled from International Border crossing data obtained from the US Customs and Border Patrol

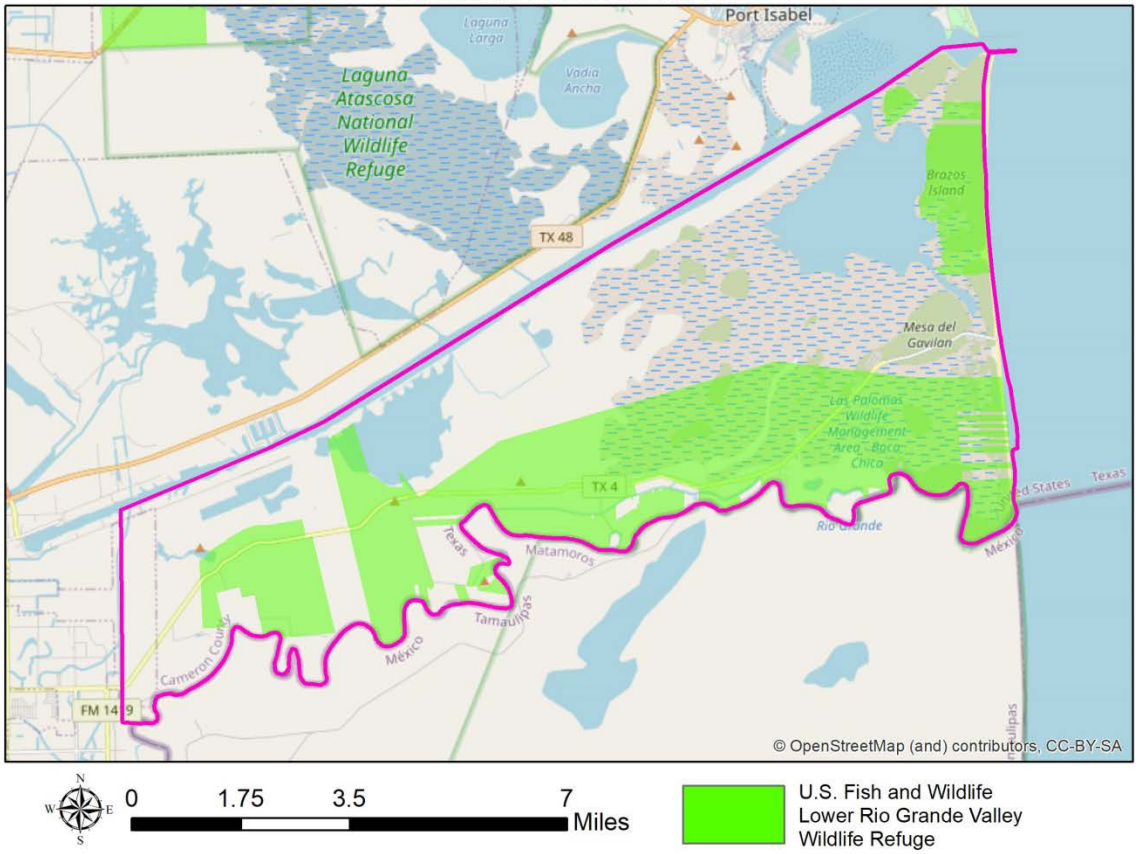
Coastal Submarket

As the name implies, the Coastal Submarket is situated along the coastal area of the Valley. The east border is the Gulf of Mexico, the north boundary is the Brownsville Port shipping channel, the south boundary is the Rio Grande River and the west boundary is Oklahoma Avenue, which begins a transition into Southeast Brownsville Submarket and more urbanized land uses.

The Coastal Submarket has the lowest population of the 14 submarkets under study, with a population estimate of only 66 persons. Housing units exceed the number of persons living in the area suggesting some 2nd home residential units, but given the limited number of units, this use is sparse. Population growth is declining, and employment exceeds population, but is also generally sparse. The SpaceX facility is located in this submarket. The Coastal Submarket has no international border crossings, and no Border Wall exists within this submarket, except on the extreme west and near Oklahoma Avenue.

Boca Chica Highway (State Highway 4) is the primary roadway in the Coastal Submarket. Boca Chica is a paved two-lane highway that extends east/west from Brownsville to the Gulf of Mexico. There does exist some older platted subdivisions in the coastal submarket, but these platted areas lack any significant roadway infrastructure, potable water or sewer services and have sparse building improvements, with most being "paper lots" and little physical distinction of being a separate parcel of property. There does exists several gravel/dirt topped public roadways that intersect with Boca Chica Highway and allow access to separate parcels and scattered residences near the Rio Grande River. These roadways terminate near the Rio Grande River. Overall, the roadway infrastructure is limited in this submarket.

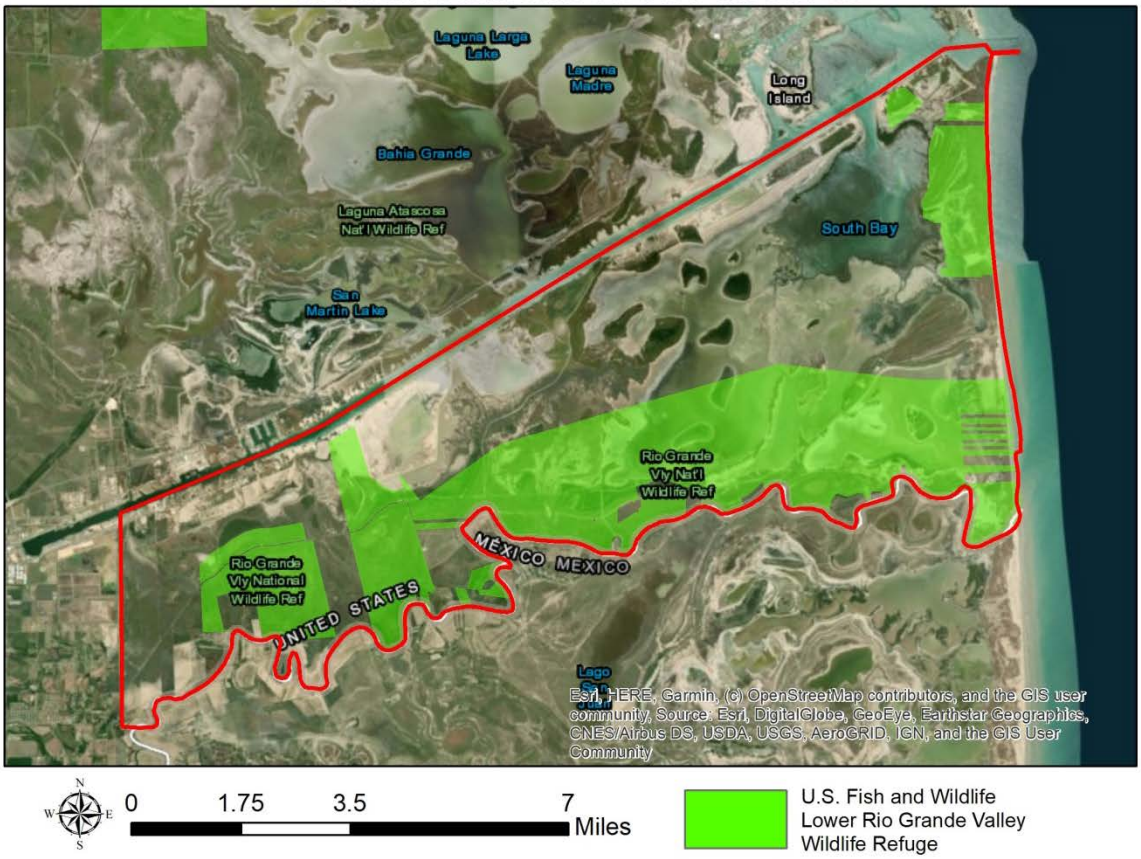
Coastal Submarket



Land Sale Activity

No land sales were located within the defined boundary of the Coastal Submarket. Appraisal practitioners should be aware of the lack of significant sales activity in this submarket, which in all likelihood will prompt the appraiser to analyze sales from similar areas in other parts of eastern Cameron County. The overriding consideration in sale selection is the limitation on land use in this area due to its coastal nature.

Coastal Submarket Area Sales

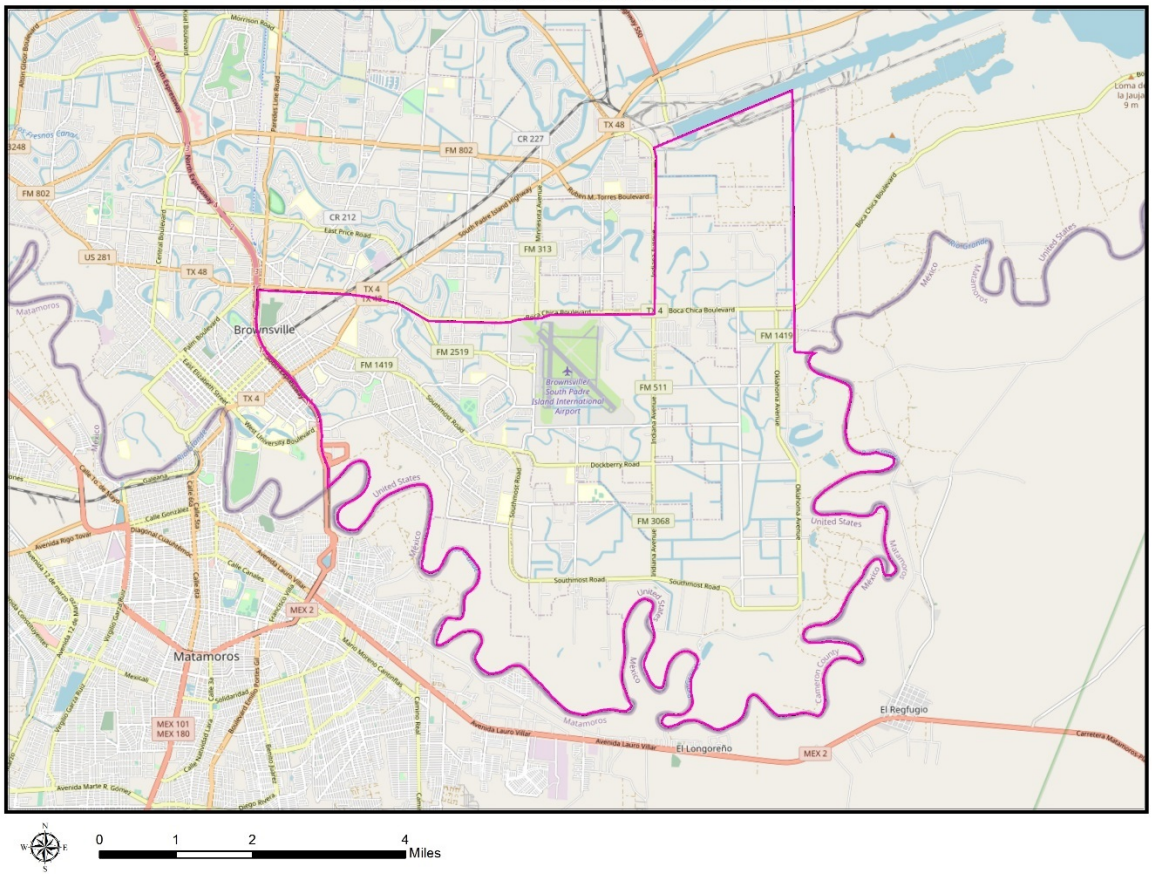


Southeast Brownsville Submarket

The Southeast Brownsville Submarket is primarily located in the incorporated area of Brownsville and peripheral areas south and east of the city boundary, but also includes some more urbanized areas south of Boco Chica as this is a primary thoroughfare creating a consistent boundary to Interstate 69E. The north boundary of the submarket generally abuts Boca Chica Boulevard, and a portion bordering the Brownsville port channel. The south and east boundary abuts the Rio Grande River and the west boundary is Interstate 69E, as this roadway creates a consistent boundary and division through Brownsville.

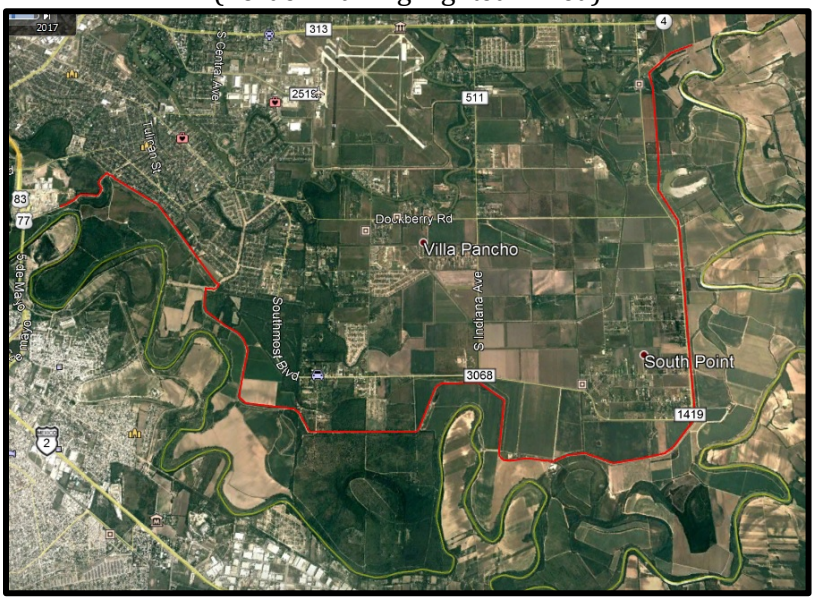
The Southeast Brownsville Submarket has the 2nd highest population of the 14 submarkets, with a 2019 population estimate of 52,188 persons. Population growth has been positive in absolute levels, but this submarket has declined in population levels relative to the Rio Grande Valley as a whole. Income levels as measured by per capita income are low compared to other submarkets. The Southeast Brownsville Submarket does have a high average household size compared to the other submarkets, but even when accounting for this factor, the income levels are lower than the adjacent Southwest Brownsville Submarket. Employment levels are the 2nd highest of the submarkets, but well below the leading employment area of the submarkets which is Southwest Brownsville. The Southeast Brownsville Submarket has no international border crossings but abuts one on its western boundary. The Brownsville/ South Padre International Airport is located in the Southeast Brownsville Submarket. The Border Wall has been constructed throughout the entire Southeast Brownsville Submarket, and much of this submarket has more concentrated urban development. However, development extends to the IBWC levee, and then the land use below, or south of the levee to the Rio Grande River is agricultural uses and open space uses, and limited public roadway infrastructure exist in these areas.

Southeast Brownsville Submarket



As shown on Table 13, the Southeast Brownsville Submarket has declined in relative population of the Rio Grande Valley over the past two decades, both prior to the wall construction and after the wall construction. The immediate area along the border and including the Border Wall has declined in relative population similar to the overall submarket and the relative decline occurred both before and after Border Wall construction. As reflected on Table 14, the southeast portions of the submarket in closer proximity to the Border Wall had absolute growth from2010 to 2019, which is a reversal from the prior decade. Comparing the aerials before and after Border Wall construction does not suggest any material changes in the land use patterns in this submarket.

2005 Aerial Southeast Brownsville Submarket
(Border Wall highlighted in Red)



2017 Aerial Southeast Brownsville Submarket
(Border Wall highlighted in Red)

Land Sale Activity

The Southeast Brownsville Submarket has an active transaction market with 25 sales from 1999 through 2019. There is considerable variance from the mean sale price, and much of this variance is likely attributed to the differences in highest and best use, as the commercial and subdivision land sales are generally on the high end of the price range, and the agriculture sales are on the low end of the price range.

Table 18 – Southeast Brownsville Submarket Land Sale Summary

Sale	City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGV36	Brownsville	4/28/2011	$82,000	5.34	$15,356	Paved	Rural Highway	Fallow
RGV359	Brownsville	12/14/2017	$190,000	22.43	$8,471	Paved	Rural Residential	Hay/Pasture
RGV191	Brownsville	10/7/2015	$210,000	21	$10,000	Paved	Subdivision Potential	Cropland
RGV306	Brownsville	4/27/2017	$140,000	11.97	$11,696	Paved	Subdivision Potential	Cropland
RGV404	Brownsville	7/13/2018	$160,000	20	$8,000	Paved	Rural Residential	Cropland
RGV190	Brownsville	9/30/2015	$68,200	6	$11,367	Paved	Rural Residential	Fallow
RGV96	Brownsville	4/17/2013	$104,000	10	$10,400	Paved	Subdivision Potential	Brush
RGV474	Brownsville	3/20/2019	$55,000	5.002	$10,996	Paved	Rural Residential	Cropland
RGV173	Brownsville	6/17/2015	$35,000	24.5	$1,429	Dirt	Agriculture	Wetlands
RGV99	Brownsville	6/5/2013	$75,000	5.56	$13,489	Paved	Rural Residential	Fallow
RGV205	Brownsville	2/26/2016	$70,000	5.33	$13,133	Paved	Rural Residential	Developed
RGV489	Brownsville	5/6/2019	$157,500	21.1	$7,464	Paved	Rural Residential	Cropland
611245	Brownsville	7/31/2012	$407,500	19.21	$21,213	Paved	Subdivision Potential	Cropland
611221	Brownsville	6/22/2012	$75,000	10.13	$7,404	Paved	Rural Residential	Cropland
611223	Brownsville	4/26/2012	$70,000	10.7	$6,542	Paved	Rural Residential	Cropland
611233	Brownsville	4/2/2012	$80,000	10.27	$7,790	Paved	Rural Residential	Cropland
611323	Brownsville	6/14/2013	$174,000	29.25	$5,949	Dirt	Rural Residential	Cropland
RGV600	Brownsville	5/21/2003	$471,008	235.504	$2,000	Dirt	Agriculture	Irrigated Crop
RGV622	Brownsville	3/4/2005	$264,000	24.21	$10,905	Paved	Subdivision Potential	Brush
RGV649	Brownsville	11/15/1999	$1,283,216	754.833	$1,700	Paved	Agriculture	Irrigated Crop
RGV624	Brownsville	1/11/2006	$306,000	19.768	$15,480	Paved	Commercial	Cropland
RGV633	Brownsville	4/20/2017	$70,000	5.728	$12,221	Paved	Subdivision Potential	Brush
RGV639	Brownsville	3/11/2005	$121,400	8.73	$13,906	Paved	Subdivision Potential	Cropland
RGV642	Brownsville	3/8/2018	$80,000	5.28	$15,152	Paved	Rural Residential	Hay/Pasture
RGV648	Brownsville	11/7/2007	$18,000	2	$9,000	Dirt/Gravel	Rural Residential	Cropland
			Median	10.70	$10,400			
			Average	51.75	$10,043			
			SD	153.26	$4,655			
			COV	296.13%	46.35%			

The sales researched in the Southeast Brownsville Submarket are further segmented by highest and best use; however, there are several sales excluded from the more detailed analysis due to individual uniqueness that reduces the utilization of the sale. RGV 99 has some improvements at time of sale. After this exclusion, the sales were segmented by highest and best resulting in the mean sale price indications found on Table 19.

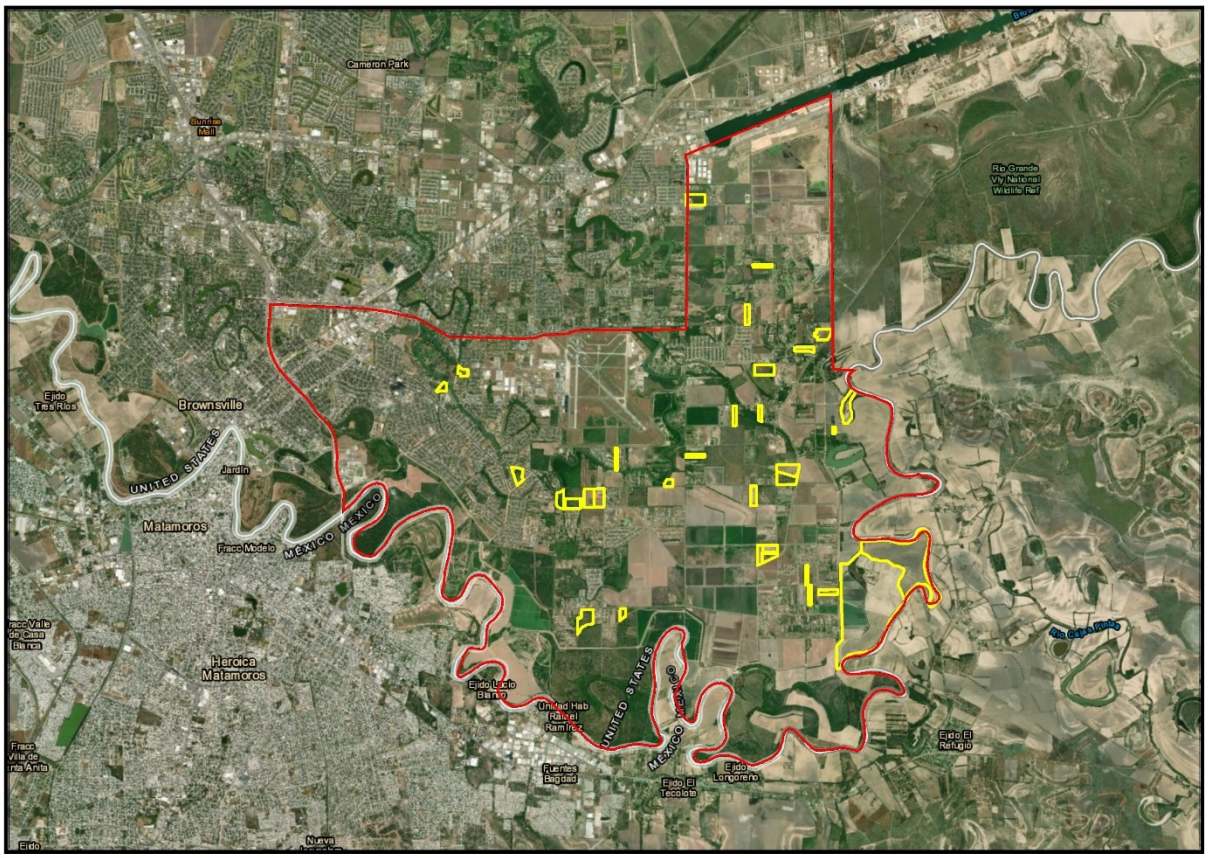
Table 19
Use Segmentation of Land Sale Activity – Southeast Brownsville Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Southeast Brownsville	**24**	**53.68**	**$9,899**	**47.46%**
Commercial/Industrial	1	19.768	$15,480	0.00%
Subdivision Potential	7	14.41	$12,906	30.12%
Rural Highway	1	5.34	$8,471	0.00%
Rural Residential	12	12.29	$9,272	30.26%
Agriculture	3	338.28	$1,710	16.71%

As shown on Table 19, the Coefficient of Variance (COV) a standard measurement of variance calculated by the standard deviation divided by the mean price for the data set as measured from the mean sale

price is reduced to 16.71% and 30.26%, once the sales are segmented by highest and best use. Thus, land use explains a considerable amount of the initial variance found in the land sales.

Southeast Brownsville Submarket Area Sales



0 1 2 4 Miles

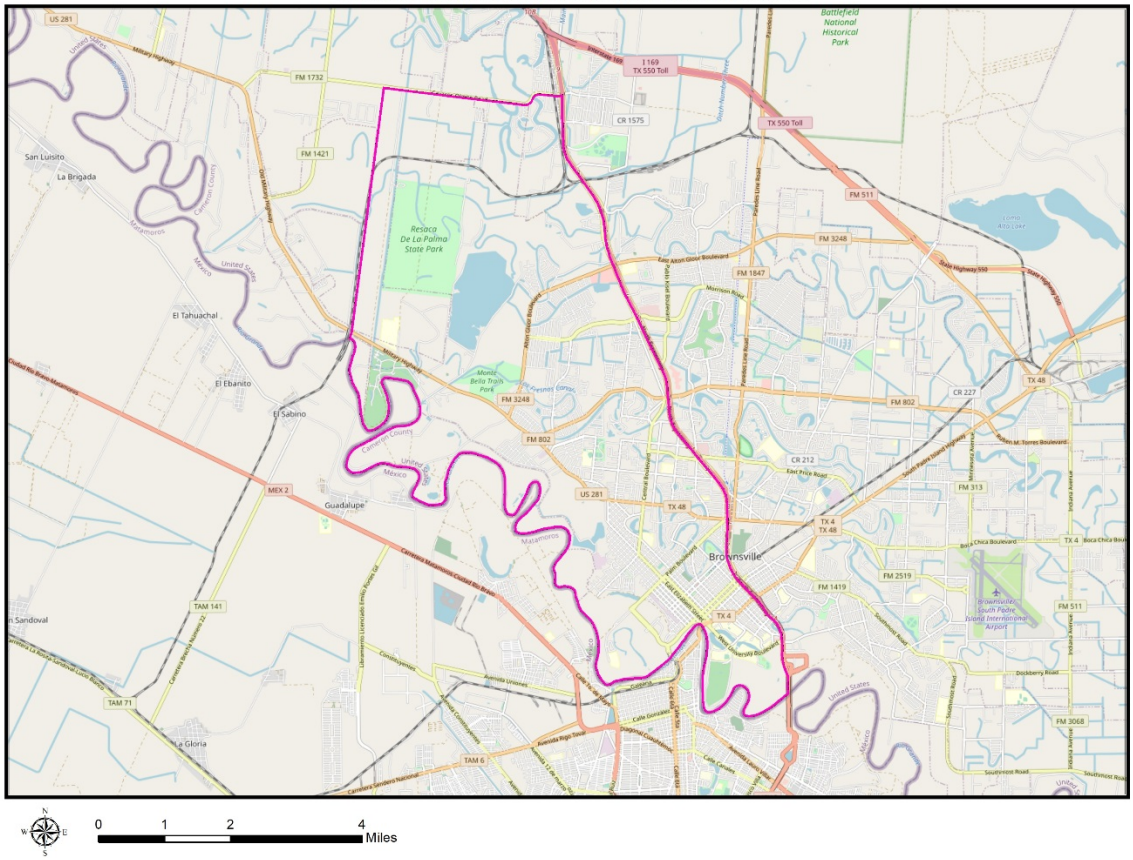
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Southwest Brownsville Submarket

The Southwest Brownsville Submarket is located in the incorporated area of Brownsville and peripheral areas south and west of the city boundary. The north boundary of the submarket abuts FM 1732 to create a consistent north boundary, the west boundary is the railroad line, the south boundary abuts the Rio Grande and the east boundary is Interstate 69E/US 77.

Southwest Brownsville has the highest population of the 14 submarkets with a 2019 population estimate of 62,429 persons. Population growth has been positive in absolute levels, but this submarket has declined slightly in population levels relative to the overall Rio Grande Valley. Income levels as measured by per capita income are mid to upper when compared to the other submarkets under study. Employment levels are also the highest of the submarkets under study. The Southwest Brownsville Submarket has four international crossings, and the Border Wall extends through a considerable portion of the Southwest Brownsville Submarket.

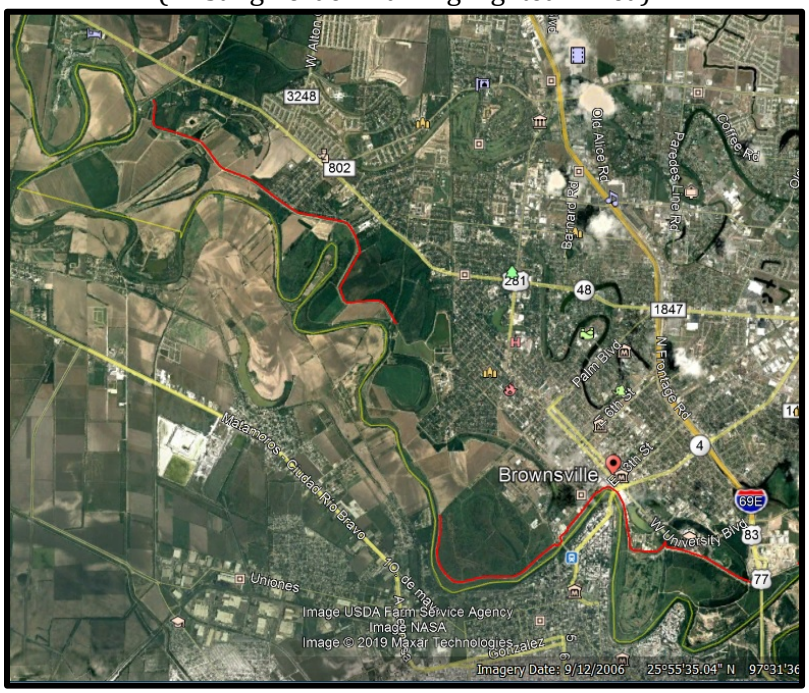
Southwest Brownsville Submarket



As shown on Table 14, the area south of US Highway 281, which is the area in which the Border Wall is situated, has also declined in relative population. The aerials before and after the wall construction show little change in the land uses in the areas surrounding the Border Wall. The roadway infrastructure in these areas are limited. Besides the University Park development, the areas south of the IBWC levee have limited public roadway access. Flor De Mayo Road, Torres Road and Villanueva Road are small public gravel top roads that terminate near the Rio Grande River. The Riverbend County Club is situated near the west boundary of the Southwest Brownsville Submarket and is developed with a golf course, RV sites and residential units, which are on the river side of the IBWC levee.

The Southwest Brownsville Submarket has four international border crossings. As shown on Table 16 and Table 17, the crossing activity is significant in this submarket and crossing activity is expanding and accounts for around 45% of the pedestrian crossings, 44% of the vehicle crossings, and nearly 22% of truck crossings in the Rio Grande Valley.

2006 Aerial of Southwest Submarket
(Existing Border Wall Highlighted in Red)



2017 Aerial of Southwest Submarket
(Existing Border Wall Highlighted in Red)

Land Sale Activity

The research found the Southwest Brownsville Submarket to have 15 land sales from 2005 through 2019. There is great variance from the mean sale price due to a small residential sale and several commercial sales in the data set.

Table 20 – Southwest Brownsville Submarket Land Sale Summary

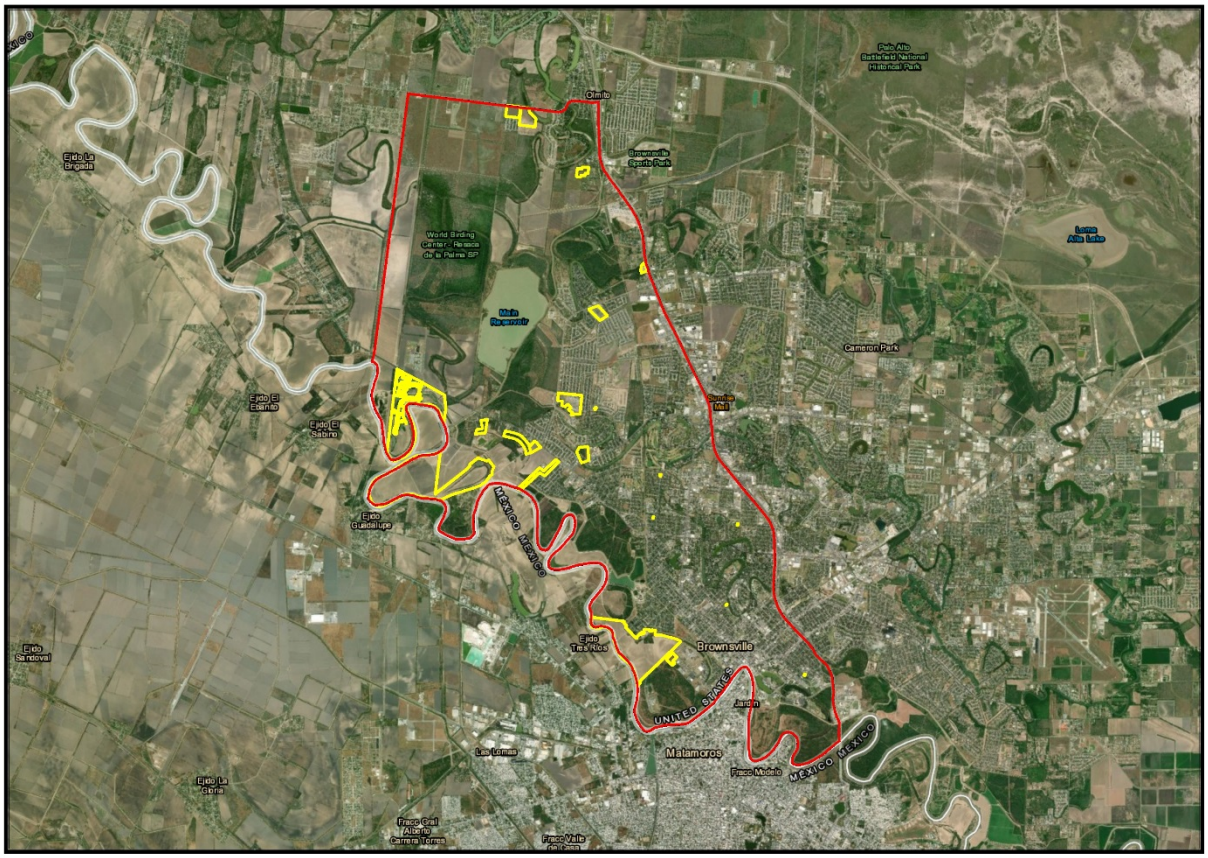
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGV164	Brownsville	4/1/2015	$180,000	11.11	$16,202	Paved	Subdivision Potential	Fallow
RGV449	Brownsville	12/10/2018	$1,000,000	5.23	$191,205	Paved	Commercial	Fallow
RGV305	Brownsville	4/24/2017	$24,000	0.137741	$174,240	Paved	Residential	Developed
RGV473	Brownsville	3/19/2019	$350,000	8	$43,750	Paved	Industrial	Fallow
611321	Brownsville	2/7/2013	$80,000	10.39	$7,700	Dirt/Gravel	Rural Highway	Brush
611240	Brownsville	2/7/2012	$410,000	18	$22,778	Paved	Subdivision Potential	Developed
611250	Brownsville	11/15/2012	$175,000	23.08	$7,582	Paved	Rural Residential	Brush
RGV425	Brownsville	9/27/2018	$420,000	30.223	$13,897	Paved	Subdivision Potential	Cropland
RGV483	Brownsville	4/9/2019	$271,329	18.93	$14,333	Paved	Subdivision Potential	Cropland
611518	Brownsville	2/5/2015	$1,200,000	251.39	$4,773	Paved	Rural Highway	Developed
RGV603	Brownsville	9/27/2013	$2,000,000	669.668	$2,987	Dirt	Agriculture	Irrigated Crop
RGV606	Brownsville	9/27/2005	$522,500	24.94	$20,950	Paved	Subdivision Potential	Cropland
RGV616	Brownsville	2/1/2007	$1,958,000	43.483	$45,029	Paved	Commercial	Brush
RGV617	Brownsville	5/26/2006	$1,159,785	18.252	$63,543	Paved	Subdivision Potential	Cropland
RGV618	Brownsville	12/27/2005	$1,113,000	8.84	$125,905	Paved	Commercial	Cropland
			Median	18.25	$20,950			
			Average	76.11	$50,325			
			SD	175.28	$62,409			
			COV	230.30%	124.01%			

The sales researched in the Southwest Brownsville Submarket are further segmented by highest and best use; however, several sales are excluded from the more detailed analysis due to individual uniqueness that reduces the utilization of the sale. Sale 611321 has improvements, Sale 611518 also has improvements, and RGV305 is a finished residential lot. The sales were segmented by highest and best use resulting in the mean sale price indications found on Table 21.

Table 21
Use Segmentation of Land Sale Activity – Southwest Brownsville Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Southwest Brownsville	**12**	**73.31**	**$47,347**	**119.44%**
Commercial/Industrial	4	16.39	$101,472	70.07%
Subdivision Potential	6	20.24	$25,284	75.48%
Rural Highway	0	0	$0	0.00%
Rural Residential	1	23.08	$7,582	0.00%
Agriculture	1	669.668	$2,987	0.00%

Southwest Brownsville Submarket Area Sales



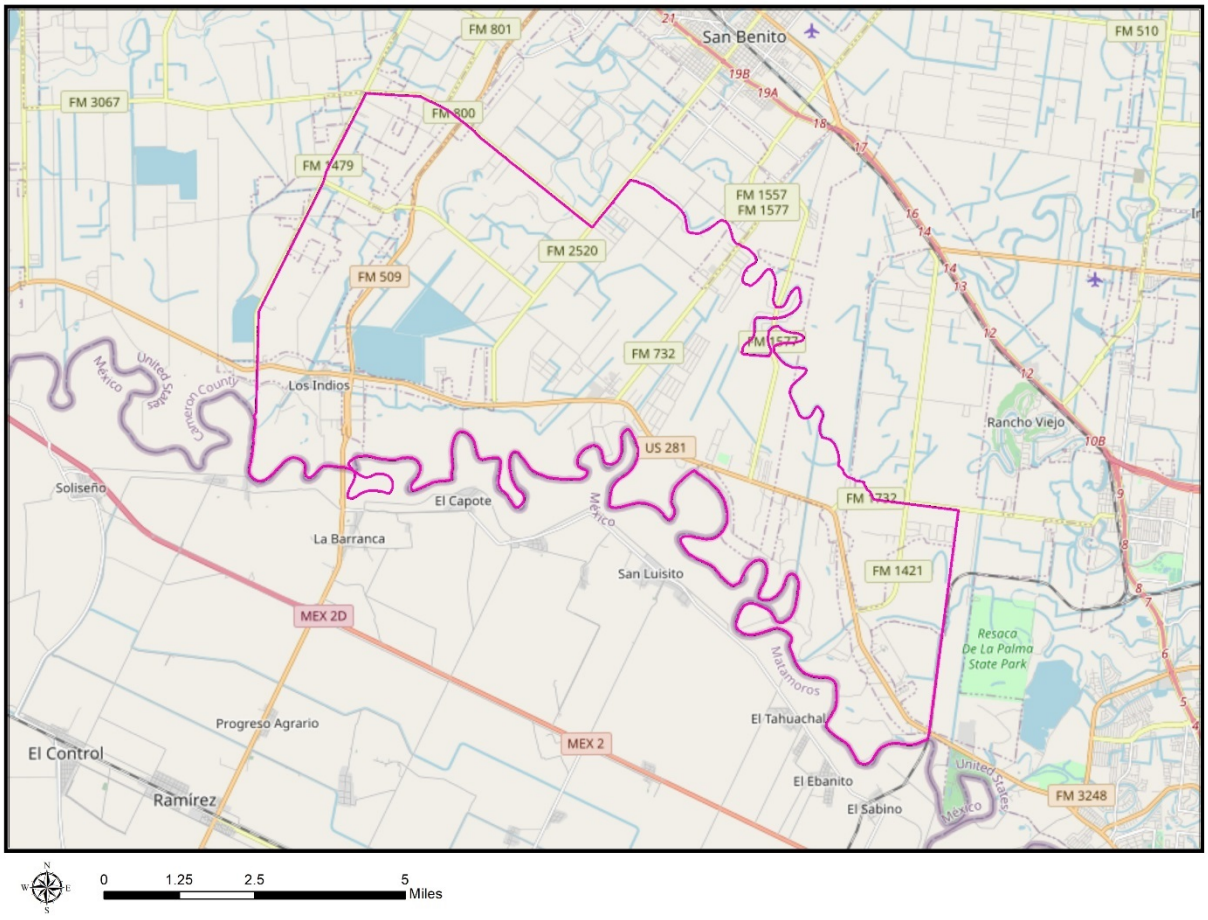
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Los Indios Submarket

The Los Indios Submarket is in Cameron County and is generally bordered on the north by the Arroyo Colorado channel and FM 801; on the west by Rangerville Road/FM 800/801, on the south by the Rio Grande River and on the east by the railroad line. The rail line creates a consistent boundary and is near the transition from the more developed areas of Brownsville that is located to the east. The Los Indios submarket includes several small communities including Los Indios, Rangerville, and La Paloma.

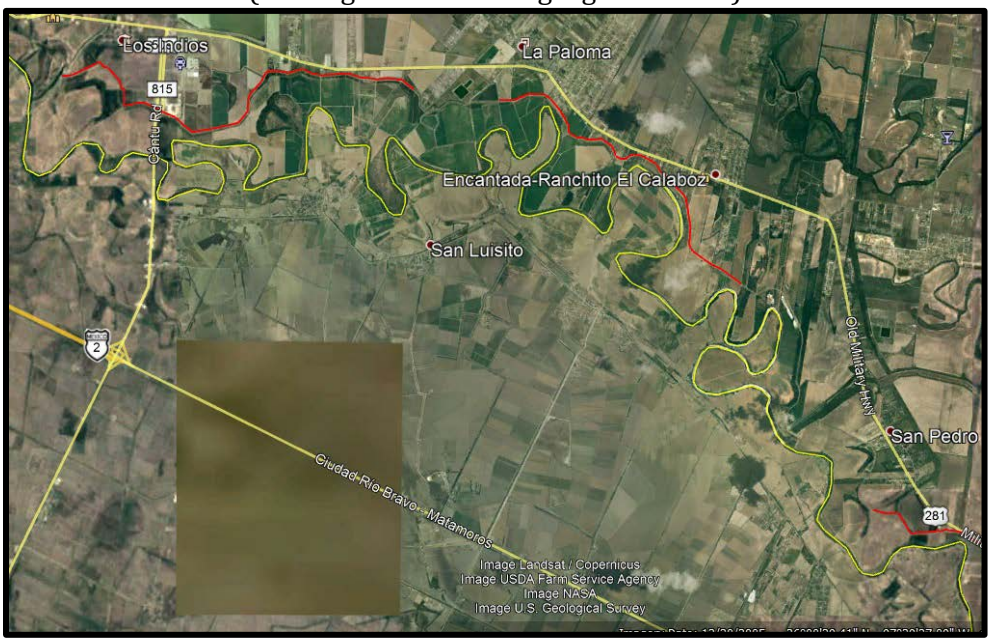
The Los Indios Submarket has had positive population growth over the past several decades, with a relative increase of the Valley population. The population level for this submarket in 2019 was estimated at 17,975 persons, with a household size of 3.75 persons. Per capita income is at the mid to lower range, but when considering household size, household incomes are generally above the other submarkets. Employment levels are not high when compared to population levels. The Los Indios Submarket has one international crossing. As shown on Table 13, the population growth has slowed in the submarket in the last decade, and the share has been stable in both the submarket and the south portion (see Table 14), which includes the area where the Border Wall exists. The crossing activity in the submarket is relatively minor compared to activity at other crossings in the region (See Table 16 and Table 17). Post-Border Wall relative growth south of US Highway 281 has been stable (See Table 15).

Los Indios Submarket

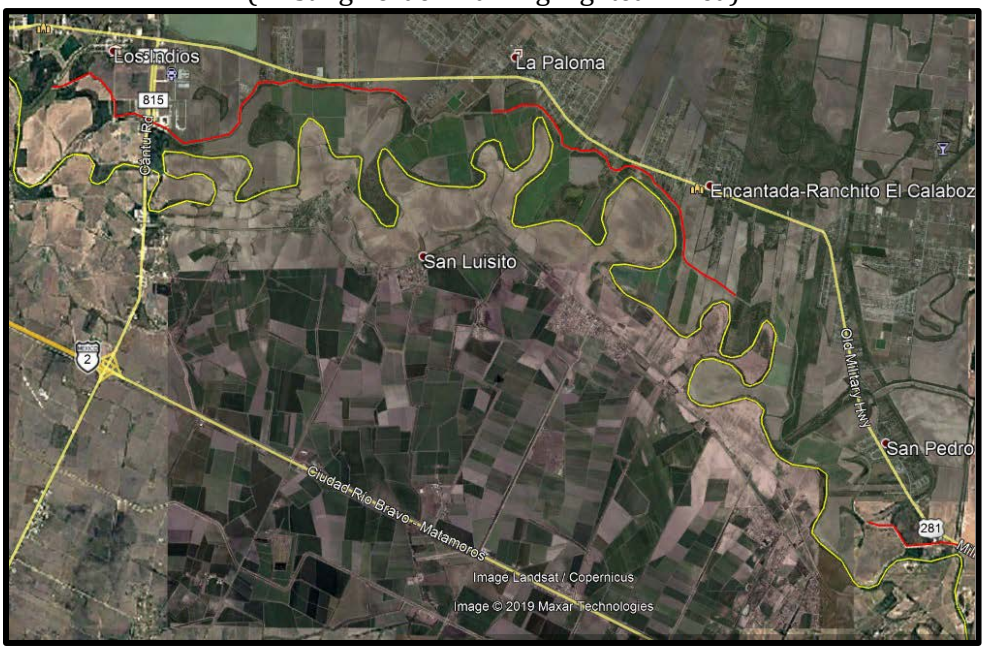


As shown by comparing aerials, the land use has been similar before and after the Border Wall construction. However there appears to be some expansion of uses along the international crossing roadway, south of Military Highway. There is limited roadway infrastructure south of US Highway 281, besides several subdivision roads that allow access to specific subdivisions abutting the highway. There are several Farm-to-Market Roads that extend north and terminate at US Highway 281, and these include FM 2520, FM 732, FM 509, FM 1577, FM 1732, and FM 1421. These roadways are paved and allow access to Interstate 69E and the cities of San Benito and Harlingen.

2005 Aerial of Los Indios Submarket
(Existing Border Wall Highlighted in Red)



2017 Aerial of Los Indios Submarket
(Existing Border Wall Highlighted in Red)



Land Sale Activity

The Los Indios Submarket had the most land sale transaction activity, with a sale date range from 2003 to 2019. There is also considerable variance in the mean sale prices, as rural highway land sales and subdivision land sales were at the high end of the price range.

Table 22 – Los Indios Submarket Land Sale Summary

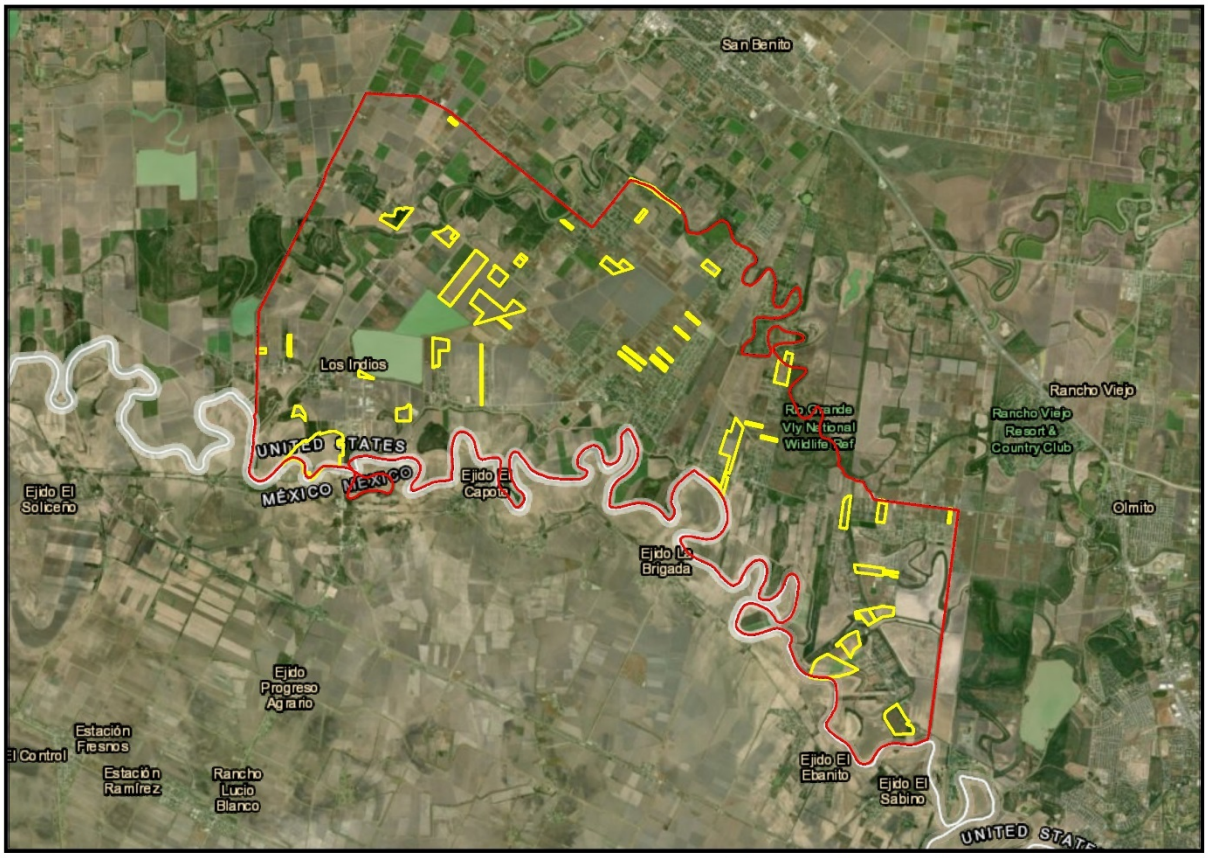
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGV504	Brownsville	7/25/2017	$329,266	33.35	$9,873	Paved	Rural Highway	Cropland
RGV358	San Benito	12/6/2017	$380,000	156.74	$2,424	Dirt/Gravel	Agriculture	Cropland
RGV298	San Benito	3/27/2017	$48,000	11.03	$4,352	Paved	Rural Residential	Hay/Pasture
RGV82	San Benito	8/9/2012	$45,000	6.874	$6,546	Paved	Rural Residential	Hay/Pasture
RGV321	San Benito	6/20/2017	$65,000	7.791	$8,343	Paved	Rural Residential	Hay/Pasture
RGV258	San Benito	9/23/2016	$45,000	7.043	$6,389	Paved	Rural Residential	Hay/Pasture
RGV335	San Benito	8/25/2017	$65,000	7.746	$8,391	Paved	Rural Residential	Hay/Pasture
RGV426	San Benito	10/4/2018	$195,000	57.74	$3,377	Paved	Rural Residential	Cropland
RGV8	San Benito	6/24/2009	$200,000	20	$10,000	Paved	Subdivision Potential	Cropland
RGV197	San Benito	11/6/2015	$90,000	5	$18,000	Paved	Rural Highway	Cropland
RGV261	San Benito	10/10/2016	$50,000	9.65	$5,181	Paved	Rural Residential	Brush
RGV414	San Benito	8/27/2018	$85,000	5	$17,000	Paved	Rural Highway	Cropland
RGV446	San Benito	11/21/2018	$75,000	18.99	$3,949	Paved	Rural Residential	Wetlands
RGV485	San Benito	4/26/2019	$122,499	45.96	$2,665	Paved	Agriculture	Hay/Pasture
RGV207	San Benito	2/19/2016	$75,000	13.3	$5,639	Paved	Rural Residential	Cropland
RGV60	San Benito	12/14/2011	$100,000	7.189	$13,910	Paved	Rural Residential	Cropland
RGV434	San Benito	10/26/2018	$299,000	26	$11,500	Paved	Subdivision Potential	Hay/Pasture
RGV217	San Benito	3/11/2016	$155,000	8.82	$17,574	Paved	Rural Highway	Developed
RGV429	San Benito	10/15/2018	$130,000	31.25	$4,160	Paved	Rural Residential	Hay/Pasture
RGV409	San Benito	8/3/2018	$145,000	40.25	$3,602	Paved	Rural Residential	Cropland
RGV397	San Benito	6/15/2018	$75,000	15	$5,000	Paved	Rural Residential	Cropland
611235	San Benito	8/6/2012	$25,000	10.34	$2,418	Paved	Agriculture	Hay/Pasture
611201	San Benito	8/29/2012	$131,035	35.921	$3,648	Paved	Rural Residential	Cropland
611345	San Benito	10/16/2013	$655,350	131.07	$5,000	Paved	Rural Residential	Cropland
RGV275	San Benito	11/21/2016	$60,000	10	$6,000	Paved	Rural Residential	Hay/Pasture
RGV351	San Benito	11/1/2017	$54,000	12.06	$4,478	Paved	Rural Highway	Developed
RGV601	Brownsville	7/17/2003	$253,904	126.952	$2,000	Dirt	Agriculture	Irrigated Crop
RGV602	San Benito	12/15/2003	$231,600	227.588	$1,018	Dirt	Agriculture	Irrigated Crop
RGV604	San Benito	6/27/2007	$492,225	135.04	$3,645	Paved	Subdivision Potential	Cropland
RGV605	Brownsville	9/20/2005	$686,363	91.515	$7,500	Paved	Rural Residential	Brush
RGV607	Brownsville	3/24/2006	$614,789	49.607	$12,393	Paved	Subdivision Potential	Cropland
RGV609	San Benito	7/21/2008	$542,000	33.012	$16,418	Paved	Subdivision Potential	Brush
RGV614	Brownsville	6/1/2007	$263,840	32.98	$8,000	Paved	Agriculture	Cropland
RGV615	San Benito	11/14/2007	$351,500	36.735	$9,569	Paved	Subdivision Potential	Brush
RGV620	San Benito	9/17/2007	$238,500	30.8	$7,744	Dirt/Gravel	Agriculture	Cropland
RGV638	San Benito	5/29/2009	$25,000	8.81	$2,838	Dirt/Gravel	Agriculture	Cropland
			Median	23.00	$5,820			
			Average	41.87	$7,237			
			SD	51.67	$4,713			
			COV	123.41%	65.12%			

The sales researched in the Los Indios Submarket are segmented based on highest and best use; however, several sales are excluded from the more detailed analysis due to individual uniqueness that reduces the utilization of the sale. RGV 351 is a long narrow tract, RGV 604 had mixed uses, RGV 426 may have physical characteristics not accounted for, and RGV 446 is wetlands and more of a recreational tract. After this exclusion, the sales were segmented by highest and best resulting in the mean sale price indications found on Table 23.

Table 23
Use Segmentation of Land Sale Activity – Los Indios Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Los Indios	**32**	**40.1**	**$7,659**	**63.16%**
Subdivision Potential	5	33.07	$11,976	22.80%
Rural Highway	6	25.15	$13,976	31.52%
Rural Residential	10	11.97	$6,000	24.57%
Agriculture	11	77.04	$3,760	60.46%

Los Indios Submarket Area Sales



Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Progreso Submarket

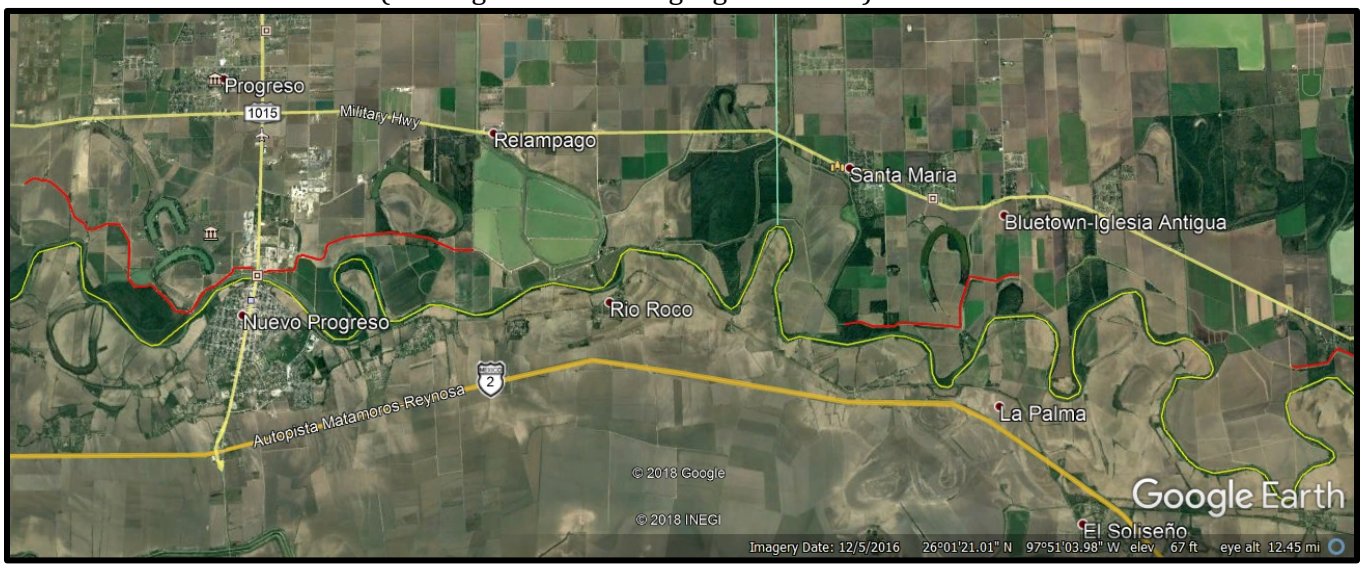
The Progreso Submarket is located in both Cameron County and Hidalgo County and is generally bordered on the north by the Arroyo Colorado channel/Central Floodway and FM 801, on the east by Rangerville Road/FM 800/801, on the south by the Rio Grande River and on the west by FM 493. The Progreso Submarket includes the small communities of Progreso, Progreso Lakes, and Santa Maria.

The Progreso Submarket has had positive population growth over the past several decades, but not to the level of the Valley region as its relative share of population has declined slightly. The decline has occurred both before and after Border Wall construction (See Table 13). The population level for this submarket in 2019 was estimated at 12,705 persons, with a household size of 3.61 persons. Per capita income is at the mid to lower range, but when considering household size, household incomes are generally above the other submarkets. Employment levels are not high when compared to population levels. The Progreso Submarket has one international crossing. The crossing activity has increased and there is a significant pedestrian crossing relative to vehicles and trucks (See Table 16 and Table 17). This is likely due to the proximity to a sister city of Nuevo Progreso, Mexico. The overall population of the Progreso Submarket has declined in relative terms, but the portion south of US Highway 281 has been relatively stable both before and after Border Wall construction as summarized on Table 14 and Table 15. There also appears to have been some expansion of land use along and near the international border crossing roadway south of US Highway 281. Besides the international crossing roadway (FM 1015), there is limited public roadway infrastructure south of Highway 281. Meanwhile, FM 88, FM 1015, FM 491, FM 2556 and FM 506 all extend north of US Highway 281, allowing access to Interstate 2 and the cities of Weslaco, Mercedes, and La Feria.

Progreso Submarket

2005 Aerial of Progreso Submarket
(Existing Border Wall Highlighted in Red)

2016 Aerial of Progreso Submarket
(Existing Border Wall Highlighted in Red)



As shown by the pre-wall aerial, compared to the post-wall aerial, there has been some development activity around the international bridge crossing and corridor south of US Highway 281 along FM 1015.

Land Sale Activity

The Progreso Submarket also had an active land sale market similar to the activity in the Los Indios Submarket. The sale dates range from 2008 to 2019. There is also considerable variance in the mean sale prices, with a mix of highest and best uses ranging from agriculture tracts to industrial, and a significant group of tracts fronting the Rio Grande.

Table 24 – Progreso Submarket Land Sale Summary

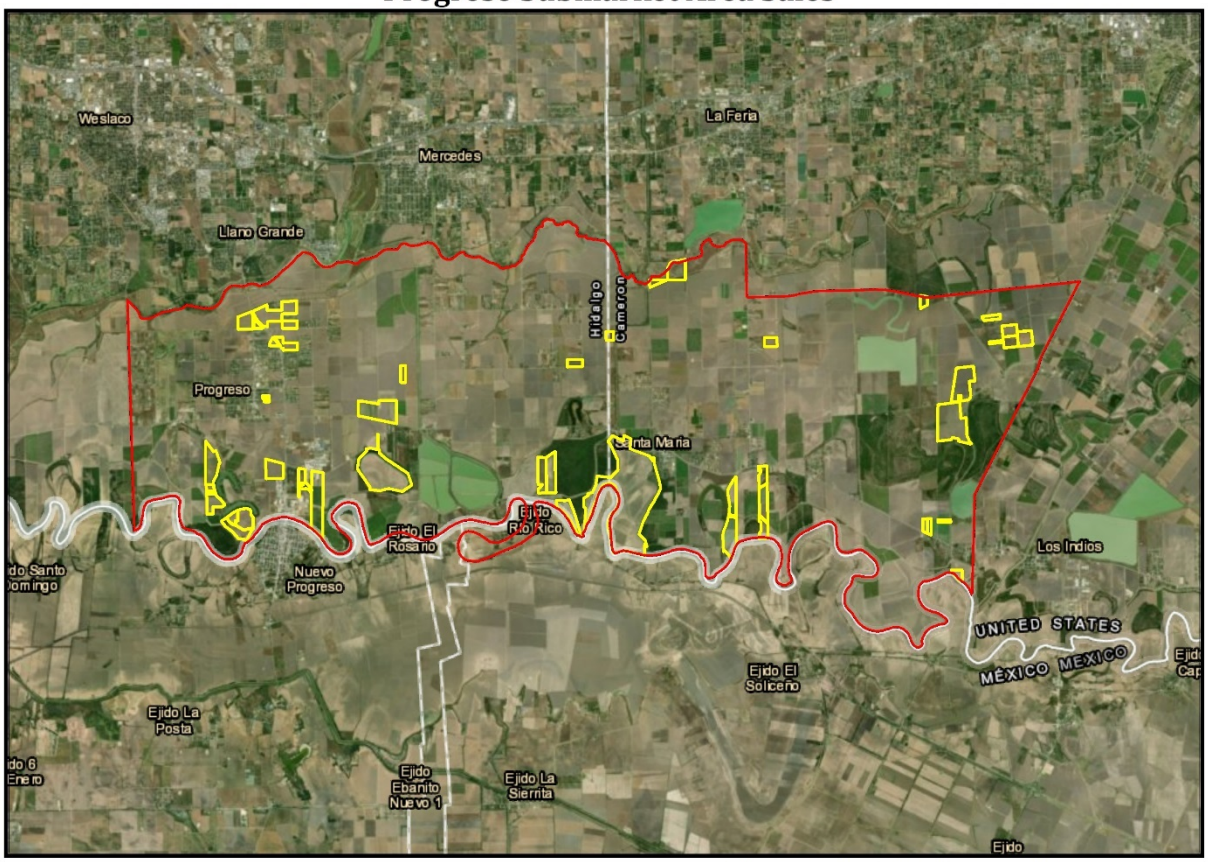
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGVH358	Mercedes	9/21/2018	$185,000	30.26	$6,114	Dirt/Gravel	Industrial	Fallow
RGVH40	Mercedes	6/17/2016	$140,000	20	$7,000	Dirt/Gravel	Rural Residential	Cropland
RGVH304	Mercedes	5/4/2018	$37,500	15	$2,500	Dirt	Agriculture	Cropland
RGVH513	Mercedes	5/7/2015	$392,000	112.68	$3,479	Dirt/Gravel	Subdivision Potential	Cropland
RGVH516	Mercedes	3/4/2015	$162,000	53.12	$3,050	Dirt	Rural Residential	Cropland
RGVH519	Mercedes	4/1/2010	$1,493,433	853.39	$1,750	Paved	Agriculture	Irrigated Crop
RGVH521	Mercedes	8/28/2014	$959,950	128.55	$7,468	Paved	Rural Highway	Irrigated Crop
RGVH522	Mercedes	3/31/2014	$1,221,480	203.58	$6,000	Paved	Subdivision Potential	Irrigated Crop
RGVH523	Weslaco	1/22/2014	$280,000	40.92	$6,843	Paved	Rural Residential	Cropland
RGVH525	Mercedes	2/1/2013	$812,400	56.16	$14,466	Paved	Industrial	Irrigated Crop
RGVH536	Mercedes	12/4/2014	$1,493,433	853.39	$1,750	Paved	Agriculture	Irrigated Crop
RGVH537	Mercedes	1/30/2008	$1,043,205	924.08	$1,129	Paved	Agriculture	Irrigated Crop
RGVH544	Weslaco	3/25/2008	$150,000	9.88	$15,182	Paved	Rural Residential	Cropland
RGVH545	Mercedes	1/18/2008	$500,000	131.18	$3,812	Dirt/Gravel	Industrial/Agriculture	Irrigated Crop
RGV500	Harlingen	2/26/2010	$132,000	30	$4,400	Dirt/Gravel	Rural Residential	Cropland
RGV502	Mercedes	6/12/2009	$226,600	119.218	$1,901	Dirt/Gravel	Agriculture	Irrigated Crop
RGV503	Mercedes	12/10/2012	$247,200	77.26	$3,200	Dirt	Agriculture	Irrigated Crop
RGV505	Mercedes	7/9/2015	$404,686	119.025	$3,400	Dirt/Gravel	Agriculture	Irrigated Crop
RGV456	Mercedes	1/8/2019	$60,000	11.551	$5,194	Dirt	Rural Residential	Brush
RGV105	Harlingen	9/19/2013	$30,000	5	$6,000	Dirt/Gravel	Rural Residential	Hay/Pasture
RGV245	Harlingen	7/29/2016	$156,000	37.58	$4,151	Dirt/Gravel	Rural Residential	Cropland
RGV54	San Benito	11/9/2011	$19,750	6.6	$2,992	Dirt/Gravel	Agriculture	Cropland
RGV430	San Benito	10/15/2018	$92,000	10.01	$9,191	Paved	Rural Highway	Cropland
RGV292	San Benito	2/28/2017	$18,000	12.17	$1,479	Dirt	Agriculture	Cropland
RGV267	Mercedes	10/28/2016	$245,000	28.91	$8,475	Paved	Rural Highway	Cropland
611213	Harlingen	6/28/2012	$360,000	60	$6,000	Dirt/Gravel	Rural Residential	Cropland
611413	Mercedes	5/14/2014	$95,000	72.76	$1,306	Paved	Agriculture	Brush
RGVH60	Mercedes	9/14/2016	$85,000	5.64	$15,071	Paved	Rural Residential	Irrigated Crop
RGVH517	Weslaco	2/20/2015	$250,000	75.3	$3,320	Dirt/Gravel	Rural Residential	Cropland
RGV623	Mercedes	2/12/2008	$108,180	21.64	$4,999	Dirt	Agriculture	Cropland
RGVH612	Weslaco	4/29/2008	$3,038,070	1295	$2,346	Dirt	Agriculture	Irrigated Crop
RGV631	Harlingen	7/17/2017	$97,000	14.5	$6,690	Paved	Rural Residential	Cropland
			Median	47.02	$4,276			
			Average	169.82	$5,333			
			SD	322.04	$3,800			
			COV	189.63%	71.26%			

The sales researched in the Progreso Submarket are segmented based on highest and best use. The segmentation by use reduces the variance in the sale price as shown on Table 25.

Table 25
Use Segmentation of Land Sale Activity – Progeso Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Progreso	**32**	**169.82**	**$5,333**	**71.26%**
Commercial/Industrial	3	72.53	$8,131	68.95%
Subdivision Potential	3	73.03	$12,084	43.61%
Rural Highway	3	55.82	$8,378	10.33%
Rural Residential	10	34.8	$5,265	27.81%
Agriculture	13	344.79	$2,479	44.48%

Progreso Submarket Area Sales



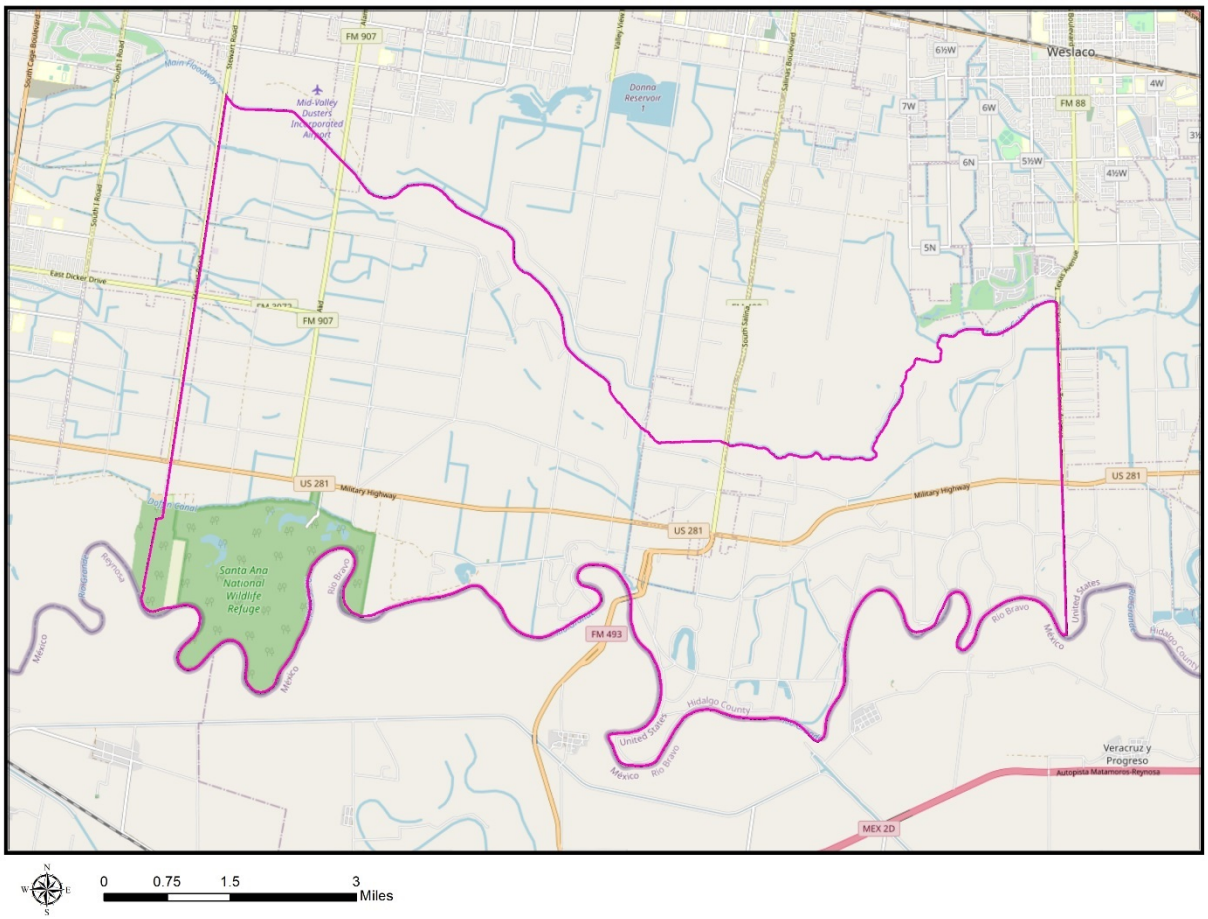
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Donna Submarket

The Donna Submarket is located in Hidalgo County, and is generally bordered on the north by the Central Floodway, on the east by FM 493, on the south by the Rio Grande River and on the west by South Stewart Road. The Donna Submarket is generally rural in nature with much of the land being utilized for agricultural purposes.

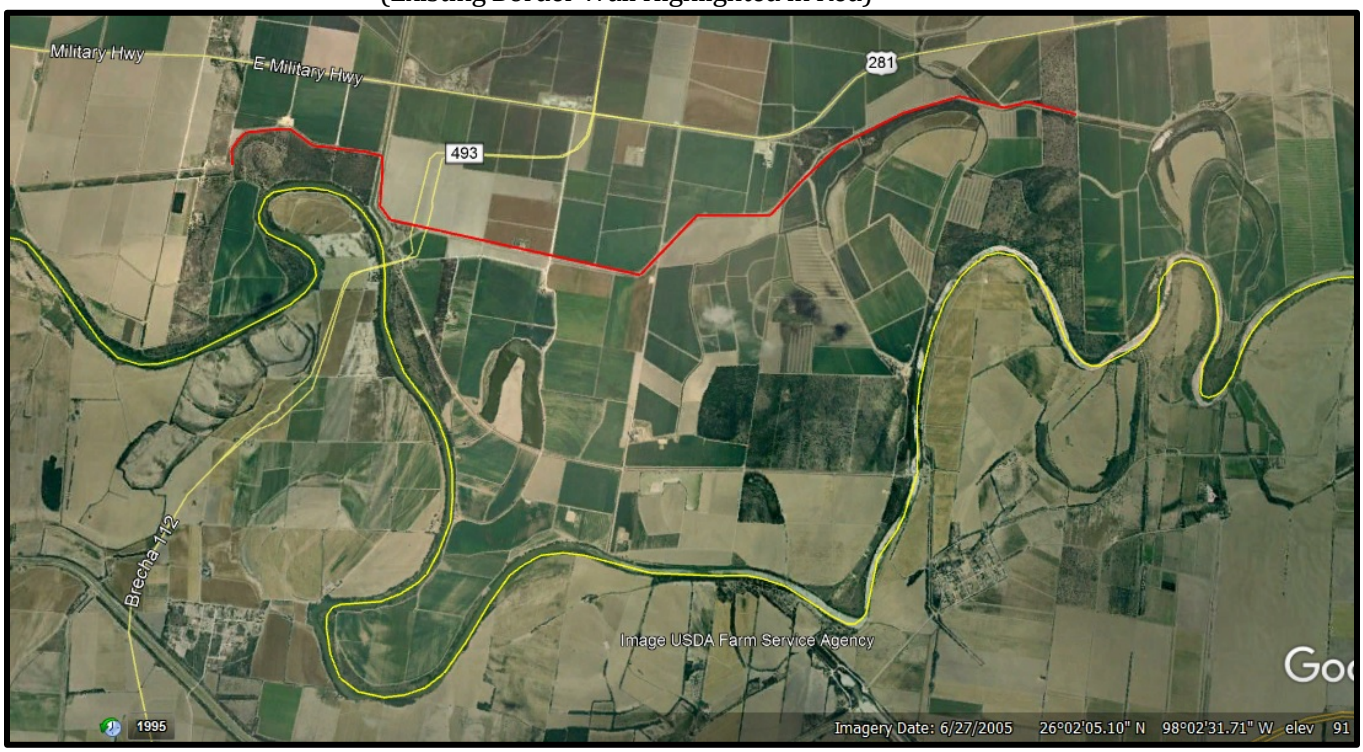
The Donna Submarket had a population of 827 persons in 2019. The subject market has had limited growth over the past several decades, and also has minimal employment levels. The Donna Submarket has one international crossing. The international crossing has no commercial truck or rail crossing and accounts for a relatively small portion of crossing activity compared to the Rio Grande Valley market (See Table 16 and Table 17). The international crossing road is FM 493 and this is the only paved public roadway extending south of US Highway 281. Population levels south of US Highway 281 are small, but have reportedly grown since 2010, with a slight relative increase (See Table 15).

Donna Submarket



As reflected on the following aerial maps, development activity pre-Border Wall compared to post-Border Wall has been minimal, as this submarket remains rural in nature.

2005 Aerial of Donna Submarket
(Existing Border Wall Highlighted in Red)



2017 Aerial of Donna Submarket
(Existing Border Wall Highlighted in Red)

Land Sale Activity

The Donna Submarket is more rural in nature and less developed, and that is reflected in the lower number of sale transactions and larger land size. The variance in the data seems to be attributed to the highest and best use between agricultural land sales and rural residential land sales. The sales also ranged significantly in terms of date of sale from 2008 to 2018.

Table 26 – Donna Submarket Land Sale Summary

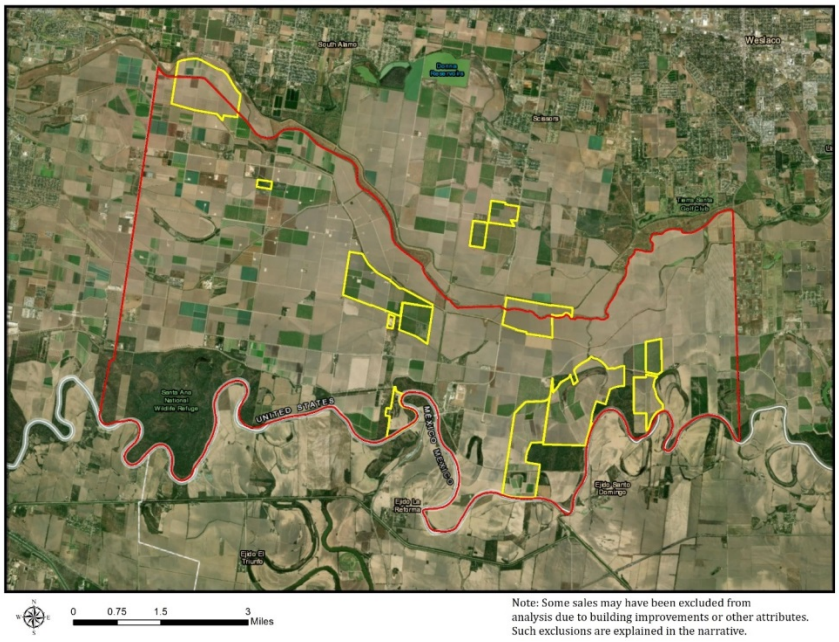
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGVH292	Donna	3/26/2018	$106,000	15.13	$7,006	Dirt/Gravel	Rural Residential	Hay/Pasture
RGVH501	Alamo	1/10/2008	$160,000	20	$8,000	Dirt/Gravel	Rural Residential	Brush
RGVH540	Donna	8/8/2008	$2,058,668	535.89	$3,842	Dirt/Gravel	Agriculture	Irrigated Crop
RGVH541	Donna	6/25/2008	$2,206,176	531.8	$4,149	Dirt/Gravel	Agriculture	Irrigated Crop
RGVH539	Donna	9/30/2008	$439,225	175.69	$2,500	Paved	Agriculture	Cropland
RGVH600	Donna	10/16/2008	$577,374	137.7	$4,193	Dirt/Gravel	Agriculture	Cropland
			Median	156.70	$4,171			
			Average	236.04	$4,948			
			SD	239.24	$2,096			
			COV	101.36%	42.37%			

The sales researched in the Donna Submarket are segmented based on highest and best use, and the variance in sale prices is reduced as shown on Table 27.

Table 27 -
Use Segmentation of Land Sale Activity – Donna Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Donna	**6**	**236.04**	**$4,948**	**42.37%**
Commercial/Industrial	0	0	$0	0.00%
Subdivision Potential	0	0	$0	0.00%
Rural Highway	0	0	$0	0.00%
Rural Residential	2	17.57	$7,503	9.73%
Agriculture	4	345.27	$3,671	21.69%

Donna Submarket Area Sales



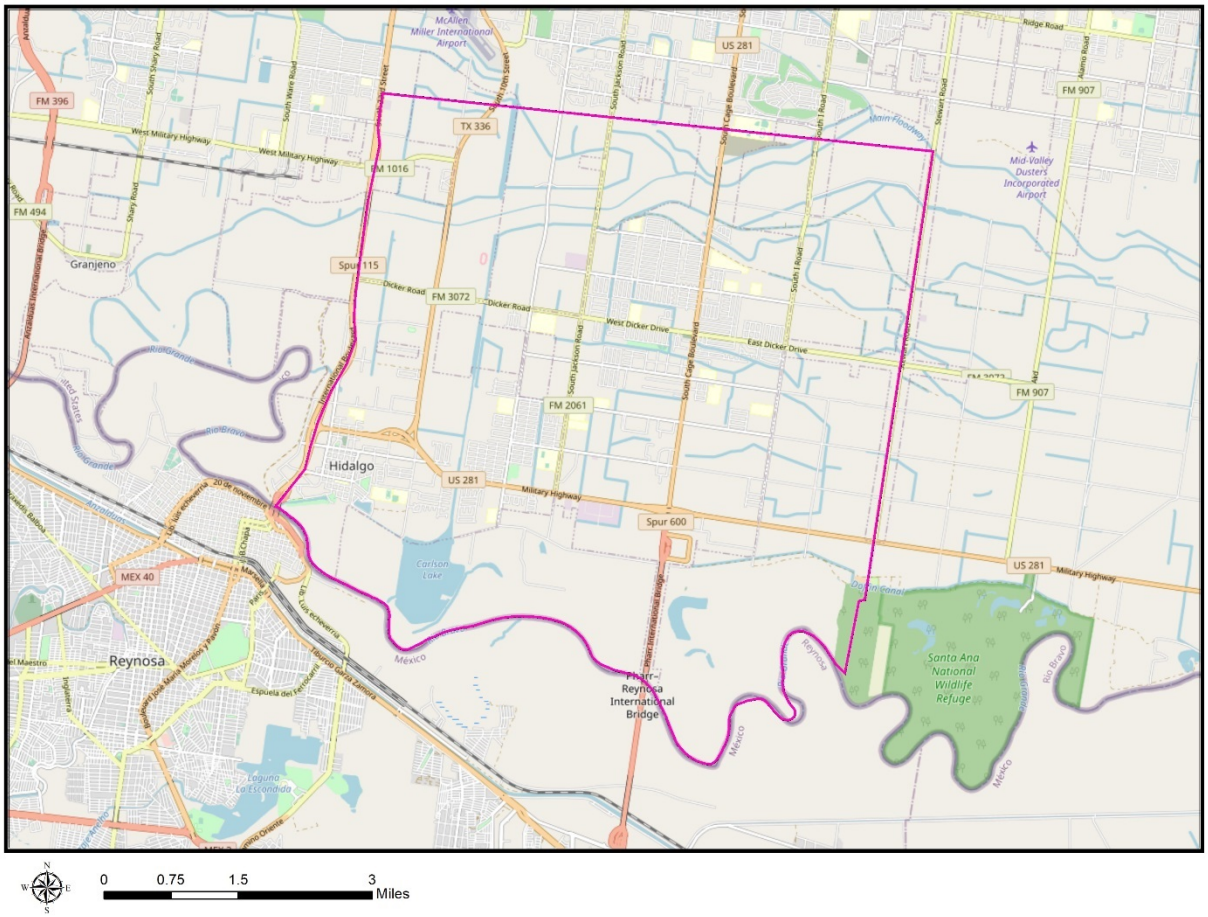
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Pharr Submarket

The Pharr Submarket is located in Hidalgo County, and it is generally bordered on the north by the Central Floodway and FM 1016, on the east by FM 493, on the south by the Rio Grande River, and on the west by International Boulevard/23rd Street, which leads to the international crossing serving the city of McAllen, so this thoroughfare is considered an appropriate boundary. The Pharr Submarket includes the incorporated areas of Hidalgo and the southern portions of the city of Pharr.

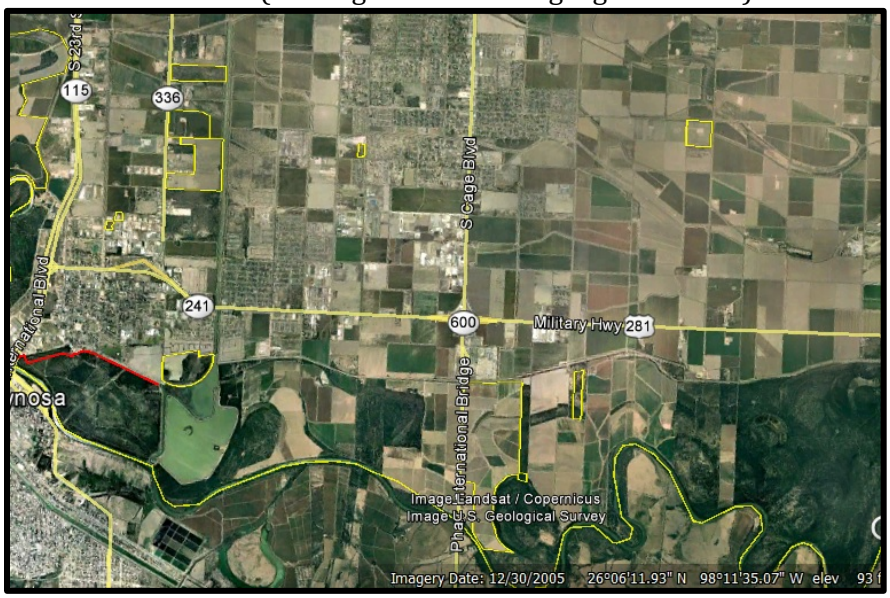
The Pharr Submarket has had positive population growth over the past several decades, and has grown at a rate higher than the overall Rio Grande Valley, as the relative share of population has increased about 0.7% since 2000. Population in this submarket has nearly doubled since 2000. The population level for this submarket in 2019 was estimated at 42,645 persons, with a household size of 3.93 persons. Per capita income is at the mid to lower range, but when considering household size, household incomes are generally above the other submarkets. The Pharr Submarket has one international crossing and adjoins a second one at it west boundary. As reflected in the population growth, Pharr is considered to be a growth corridor along the international border. The commercial development along the border crossing is obvious, particularly as one heads north of FM 1016. The border crossing data confirms this to be the case, as approximately 65% of the commercial truck crossings occur at Pharr and nearly 10% of the vehicle crossings in the Rio Grande Valley occur at Pharr. The area south of US Highway 281 in the Pharr Submarket has also incurred positive population growth both in absolute terms and relative terms (See Table 14). When comparing growth levels pre-Border Wall to post-Border Wall, the area south of Highway 281 has performed better than the overall Pharr Submarket (See Table 15).

Pharr Submarket



As shown in the aerials, the Pharr Submarket has incurred considerable growth along US Highway 281/Military Highway, particularly around the area of the international bridge crossing. This submarket contains more roadway infrastructure south of US Highway 281. In addition, housing development begins south of US Highway 281 and west of FM 2061, and extends to and includes the city of Hidalgo in the southwest portion of the Pharr Submarket. The Pharr Submarket south of US Highway 281 has been the best performing area south of US Highway 281, and this is likely due to the international crossing activity in this submarket and the availability of road infrastructure.

2005 Aerial of Pharr Submarket
(Existing Border Wall Highlighted in Red)



2017 Aerial of Pharr Submarket
(Existing Border Wall Highlighted in Red)

Land Sale Activity

Land sales in the Pharr Submarket has been dominated by sales for industrial/commercial uses resulting in a relatively high price per acre level, which is then off set by some significantly lower agriculture sales. The sale date ranges from 2006 to 2018.

Table 28 – Pharr Submarket Land Sale Summary

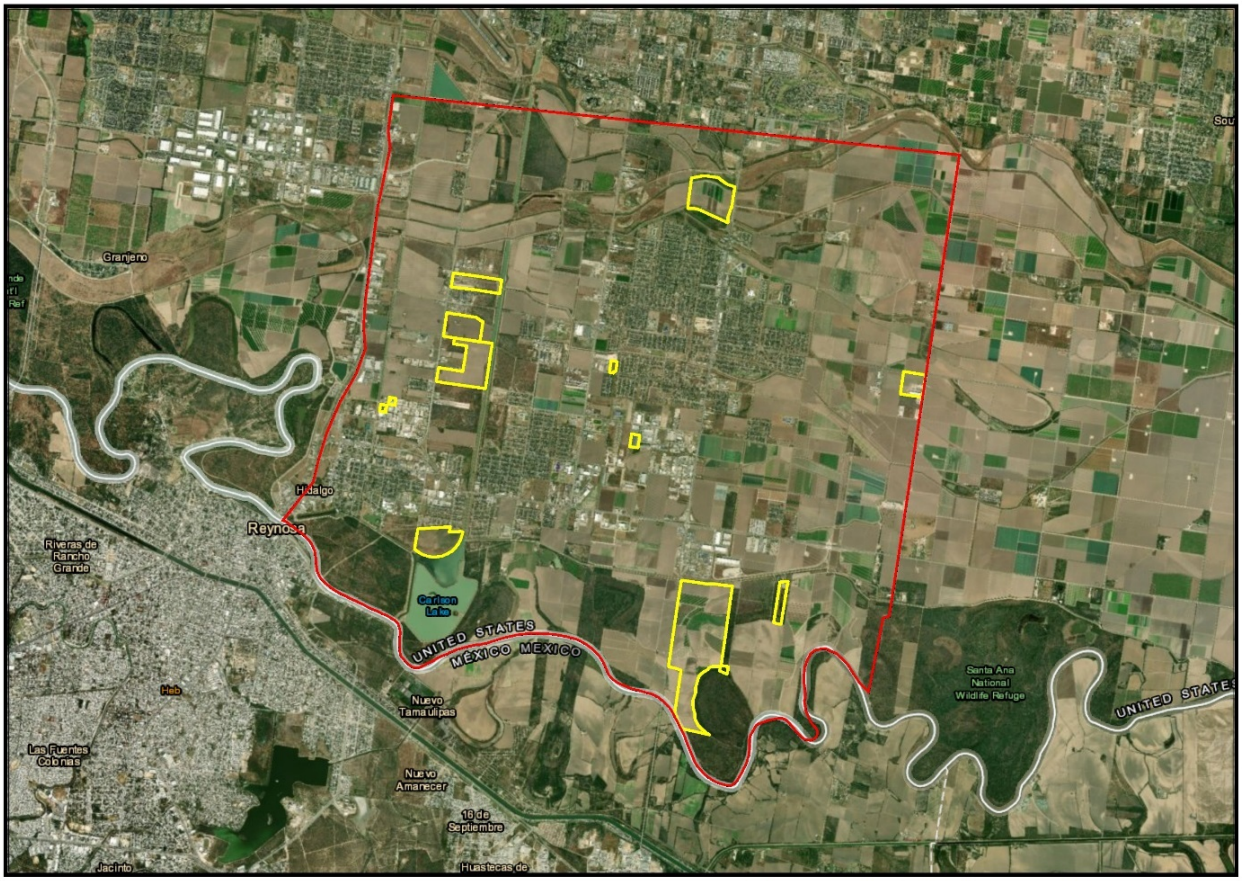
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGVH26	Pharr	4/20/2016	$200,000	116.28	$1,720	Paved	Agriculture	Irrigated Crop
RGVH312	Hidalgo	5/7/2018	$600,000	5.1185	$117,222	Paved	Commercial	Brush
RGVH503	Hidalgo	1/24/2017	$140,000	3.3	$42,424	Paved	Industrial	Hay/Pasture
RGVH504	Hidalgo	11/2/2010	$200,000	3.3	$60,606	Paved	Industrial	Hay/Pasture
RGVH507	Hidalgo	8/19/2016	$600,000	80.25	$7,477	Paved	Subdivision Potential	Hay/Pasture
RGVH514	Hidalgo	5/6/2015	$1,675,000	48.77	$34,345	Paved	Industrial	Hay/Pasture
RGVH515	Hidalgo	4/15/2015	$141,000	25.4	$5,551	Dirt/Gravel	Rural Residential	Cropland
RGVH520	San Juan	12/1/2014	$1,000,000	38.17	$26,199	Paved	Industrial	Cropland
RGVH542	Hidalgo	5/21/2008	$4,450,000	111.45	$39,928	Paved	Industrial	Irrigated Crop
RGVH543	Hidalgo	3/10/2008	$3,900,000	64.84	$60,148	Paved	Industrial	Irrigated Crop
RGVH617	Hidalgo	10/23/2006	$1,000,000	429.1384	$2,330	Dirt/Gravel	Agriculture	Irrigated Crop
			Median	48.77	$34,345			
			Average	84.18	$36,177			
			SD	121.38	$34,627			
			COV	144.18%	95.71%			

The sales researched in the Pharr Submarket are segmented based on highest and best use and the variance in sale price is reduced as shown on Table 29.

Table 29
Use Segmentation of Land Sale Activity – Pharr Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Pharr	**11**	**84.18**	**$36,177**	**95.71%**
Commercial/Industrial	7	39.28	$54,410	55.99%
Subdivision Potential	1	80.25	$7,477	0.00%
Rural Highway	0	0	$0	0.00%
Rural Residential	1	25.4	$5,551	0.00%
Agriculture	2	272.71	$2,025	21.31%

Pharr Submarket Area Sales



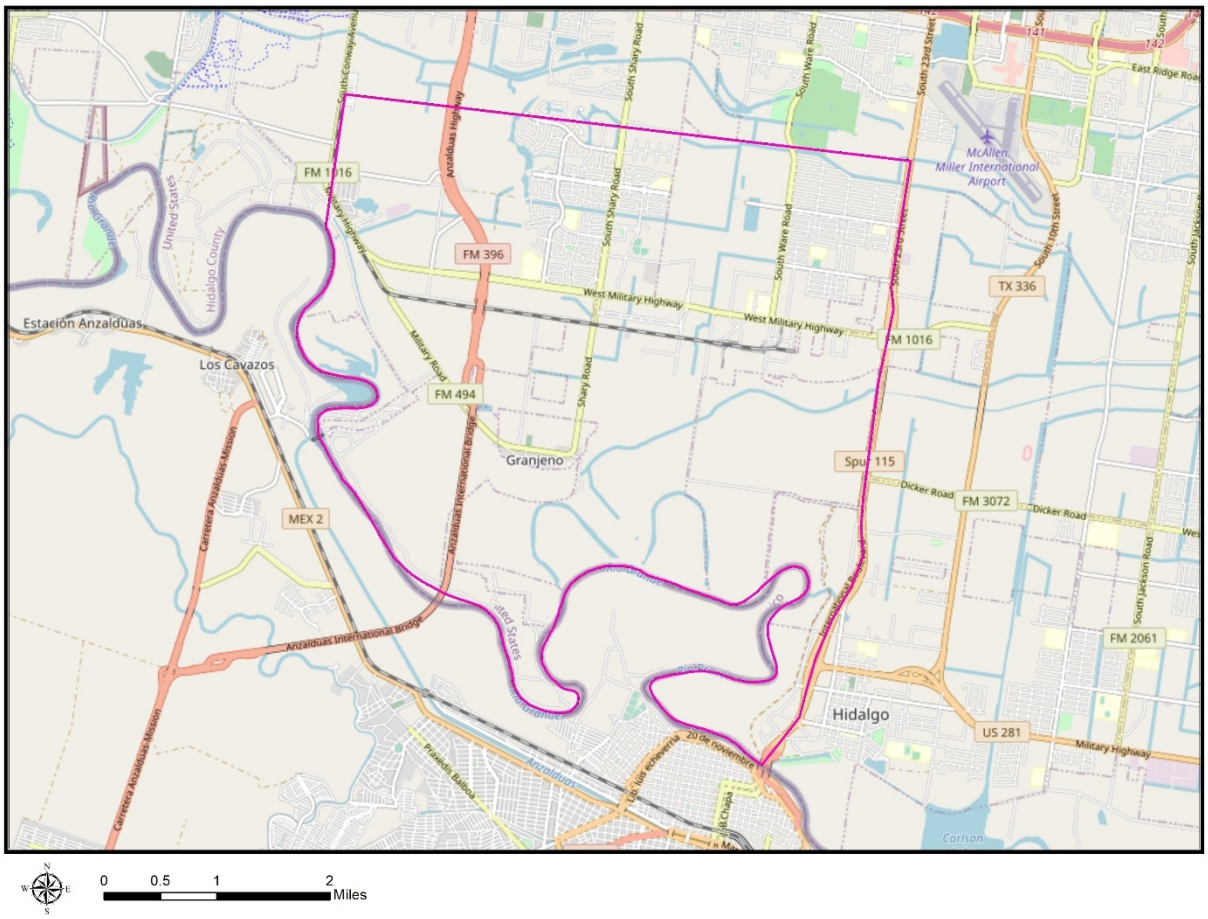
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

McAllen Submarket

The McAllen Submarket is generally bordered on the north by the central floodway, on the east by International Boulevard/ 23rd Street, on the south by the Rio Grande and on the west by South Conway Avenue. The McAllen Submarket includes the southern portion of the incorporated area of McAllen and the community of Granjeno.

The McAllen Submarket has had positive population growth over the past several decades, and has grown at a rate higher than the overall Valley, as the relative share of population has increased about 0.54% since 2000. Population in this submarket has doubled since 2000. The population level for this submarket in 2019 was estimated at 19,945 persons, with a household size of 3.40 persons. Per capita income is at the high end of the range, as is the household income. The McAllen Submarket has two international crossings with significant crossing activity of both vehicles and pedestrians (See Table 16 and Table 17).

McAllen Submarket



Military Highway intersects with International Parkway/ South 23rd Street, but then further north will extend west again as West Military Highway/ FM 1016 and extends through the Sharyland Plantation master planned development. The Sharyland Plantation development is a primary driver of development activity and growth in the McAllen Submarket. Relative growth both north and south of Military Highway has been positive in this submarket. In the extreme southwest portion of the McAllen Submarket and just south of the community of Madero, there exists one of the few recreational/development uses on the Rio Grande. This area is shown in the aerial on the following page.

Aerial of Recreational Uses on Rio Grande

2005 Aerial of McAllen Submarket
(Existing Border Wall Highlighted in Red)

2017 Aerial of McAllen Submarket
(Existing Border Wall Highlighted in Red)

SHARYLAND PLANTATION

MISSION & McALLEN, TEXAS

- EXISTING RESIDENTIAL
- PROPOSED RESIDENTIAL
- EXISTING BUSINESS PARK
- PROPOSED BUSINESS PARK
- EXISTING COMMERCIAL
- PROPOSED COMMERCIAL
- OPEN SPACE/ PARKS/ DETENTION
- ELECTRICAL SUBSTATION
- 1 Visitor, HOA, and Community Center
- 2 Ruben Hinojosa Elementary School
- 3 Harry Shimotsu Elementary School
- 4 B.L. Gray Junior High School
- 5 Catholic Church Site
- 6 Proposed Hospital
- 7 The Grove
- 8 Sharyland Sports Park
- 9 Sharyland Business Park
- 10 Anzalduas International Port of Entry
- 11 Fire and Police Stations
- 12 Future Juan Diego Catholic High School

Hunt Valley Development I, LLC

TBG

January 20, 2011

The information shown is based on the best information available and is subject to change without notice.

Land Sale Activity

The McAllen Submarket, similar to the Pharr Submarket, is dominated by sales for industrial/commercial uses resulting in a relatively high price per acre level, also then off set by some significantly lower agriculture sales. The sale dates range from 1999 to 2016.

Table 30 – McAllen Submarket Land Sale Summary

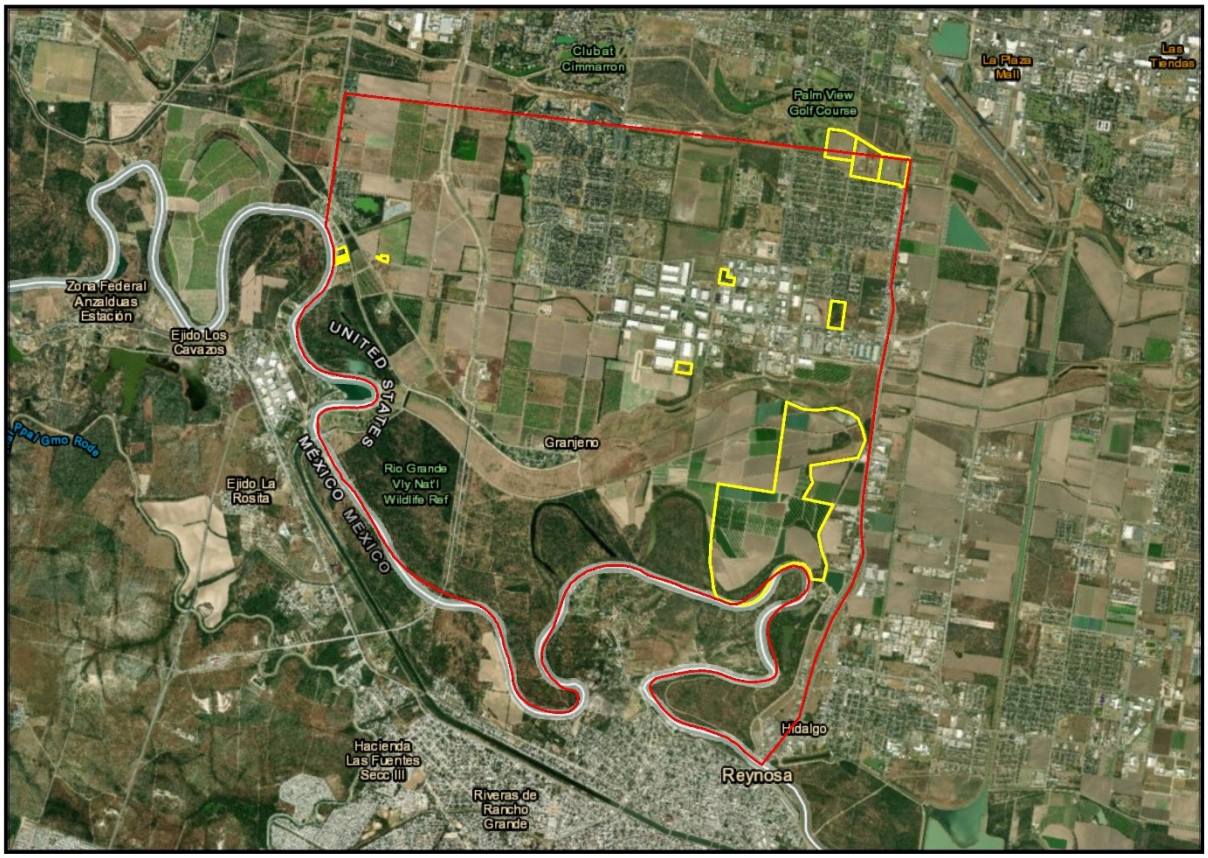
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGVH505	Hidalgo	10/25/2016	$595,900	7.6	$78,408	Paved	Industrial	Hay/Pasture
RGVH509	Mission	9/14/2015	$106,000	2.44	$43,443	Dirt/Gravel	Commercial	Hay/Pasture
RGVH510	Mission	9/8/2015	$106,000	2.44	$43,443	Dirt/Gravel	Commercial	Hay/Pasture
RGVH511	Mission	7/10/2013	$200,000	4.56	$43,860	Dirt/Gravel	Commercial	Hay/Pasture
RGVH527	McAllen	12/20/2012	$140,000	32.43	$4,317	Paved	Agriculture	Cropland
RGVH528	McAllen	3/24/2011	$70,000	42	$1,667	Paved	Agriculture	Cropland
RGVH531	Hidalgo	11/28/2012	$700,000	7.86	$89,059	Paved	Industrial	Brush
RGVH532	Hidalgo	1/31/2012	$1,150,000	20	$57,500	Paved	Commercial	Brush
RGVH538	Mission	3/25/2009	$120,000	2.12	$56,604	Paved	Rural Highway	Brush
RGVH618	Hidalgo	11/11/1999	$1,285,489	813.07	$1,581	Dirt/Gravel	Agriculture	Irrigated Crop
			Median	7.73	$43,652			
			Average	93.45	$41,988			
			SD	253.23	$31,059			
			COV	270.97%	73.97%			

The sales researched in the McAllen Submarket are segmented based on highest and best use, and the variance in the land sale price is reduced as shown on Table 31.

Table 31
Use Segmentation of Land Sale Activity – McAllen Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
McAllen	**10**	**93.45**	**$41,988**	**73.97%**
Commercial/Industrial	6	7.48	$1.37/ SF	33.69%
Subdivision Potential	0	0	$0	0.00%
Rural Highway	1	2.12	$56,604	0.00%
Rural Residential	0	0	$0	0.00%
Agriculture	3	295.83	$2,522	61.68%

McAllen Submarket Area Sales



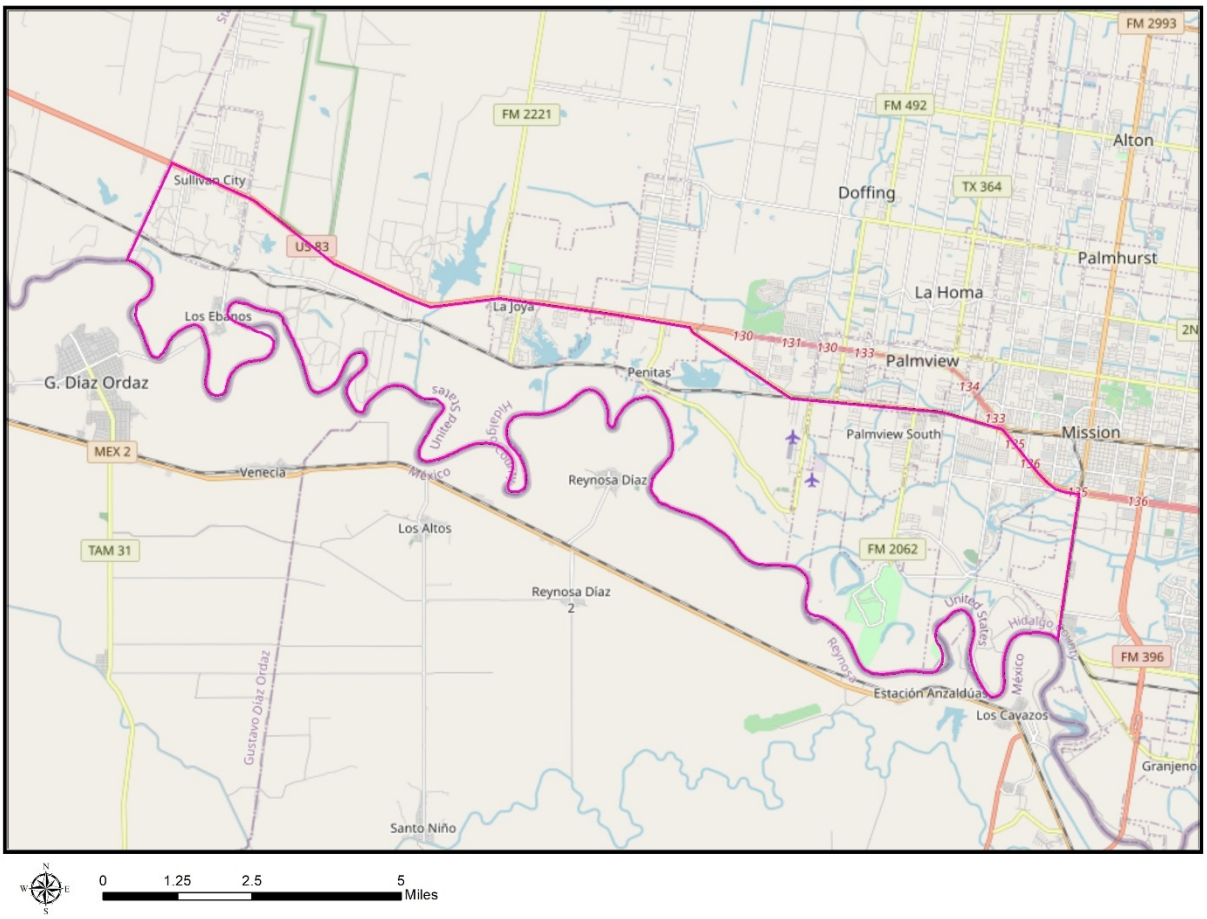
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Penitas Submarket

The Penitas Submarket extends to the Starr County line and includes the extreme southwest portion of Hidalgo County. The submarket is generally bordered on the north by Military Highway/US Highway 83, on the east by South Conway Avenue, on the south by the Rio Grande, and on the west by Starr/Hidalgo County line. Penitas Submarket includes the incorporated areas of Mission, Palmview, Penitas, and Sullivan City and the community of Los Ebanos near the Rio Grande.

The Penitas Submarket has had positive population growth over the past several decades, and has grown at a rate slightly higher than the overall Rio Grande Valley, as the relative share of population has increased about 0.67% since 2000. The population level for this submarket in 2019 was estimated at 25,744 persons, with a household size of 2.87 persons. Per capita income is at the mid to high end of the range, as is the household income. The Penitas Submarket has one international crossing, but crossing activity at Los Ebanos is minimal due to the fact the crossing has a hand-drawn ferry rather than a bridge.

Penitas Submarket



The Penitas Submarket has a high concentration of single-family land uses south of Interstate 2 in the Mission/ Palmview South and La Joya area; however, land use activity becomes more rural west of Penitas/La Joya.

2005 Aerial of Penitas Submarket
(Existing Border Wall Highlighted in Red)

2017 Aerial of Penitas Submarket
(Existing Border Wall Highlighted in Red)

Land Sale Activity

The Penitas Submarket is at the southwest portion of Hidalgo County and it transitions from the more urbanized areas toward the rural areas of Starr County. The variance in the mean sale prices is due to mix of rural highway and subdivision potential sales and agricultural sales. The sale date ranges from 2007 to 2019.

Table 32 – Penitas Submarket Land Sale Summary

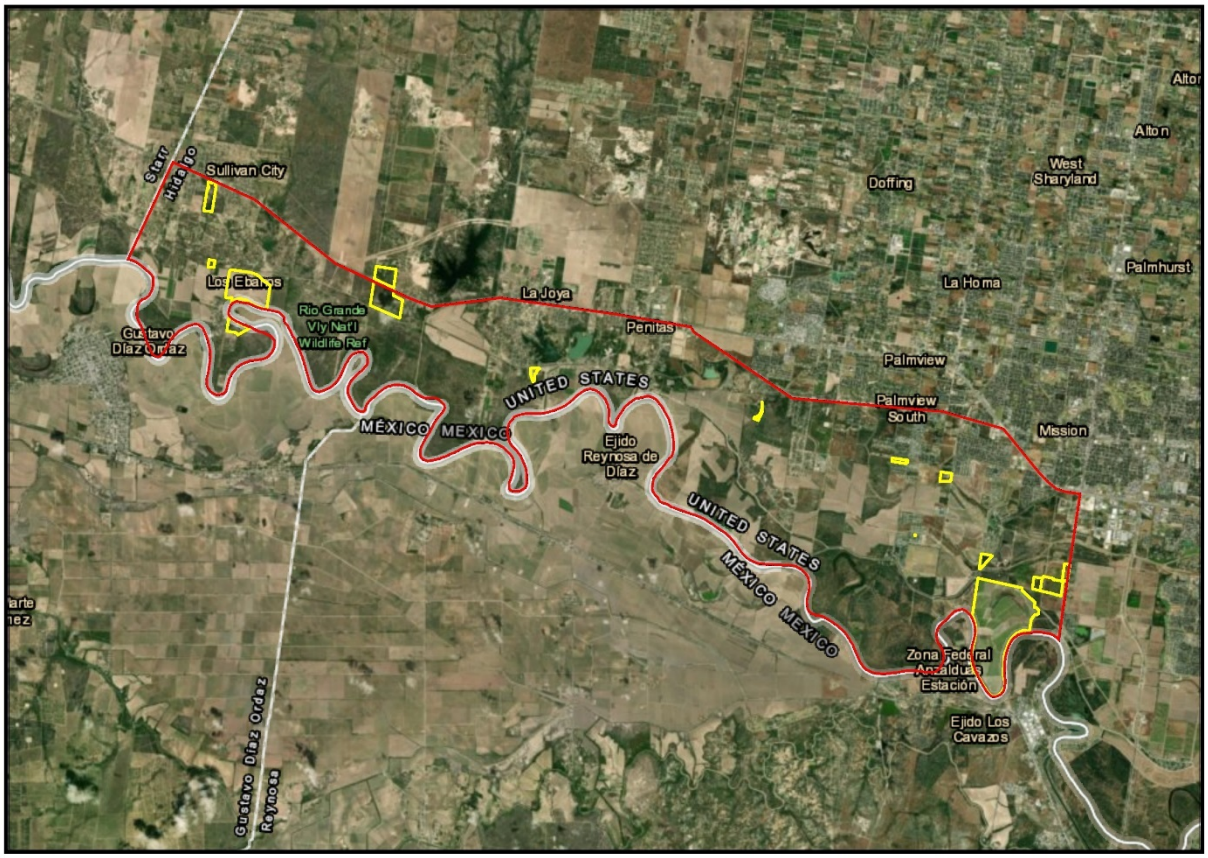
Sale	Nearest City	Sale Date	Sale Price	Acreage	PPA	Access	HBU	Land Cover
RGVH448	Mission	4/9/2019	$549,300	183.274	$2,997	Paved	Rural Highway	Brush
RGVH406	Mission	12/31/2018	$80,000	40.6393	$1,969	Paved	Rural Highway	Brush
RGVH265	Mission	1/1/2018	$45,000	5	$9,000	Dirt/Gravel	Rural Residential	Brush
RGVH437	Mission	3/15/2019	$725,000	145	$5,000	Paved	Rural Residential	Brush
RGVH3	Mission	1/6/2016	$135,000	9.08	$14,868	Paved	Subdivision Potential	Hay/Pasture
RGVH500	Mission	5/12/2015	$633,060	210.18	$3,012	Paved	Agriculture	Cropland
RGVH506	Mission	9/28/2016	$2,585,600	807.73	$3,201	Paved	Agriculture	Irrigated Crop
RGVH512	Mission	8/10/2015	$874,718	69.98	$12,500	Paved	Rural Highway	Hay/Pasture
RGVH524	Mission	6/17/2013	$380,000	17.69	$21,481	Paved	Rural Highway	Brush
RGVH508	Mission	4/27/2016	$65,000	11.38	$5,712	Paved	Rural Residential	Brush
RGVH605	Mission	9/20/2007	$108,550	33.4	$3,250	Dirt/Gravel	Agriculture	Brush
			Median	40.64	$5,000			
			Average	139.40	$7,545			
			SD	233.60	$6,277			
			COV	167.58%	83.20%			

The sales researched in the Penitas Submarket are segmented based on highest and best use, and the variance in land sale price is reduced as shown on Table 33.

Table 33
Use Segmentation of Land Sale Activity – Penitas Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Acre	Coefficient of Variance
Penitas	**11**	**139.4**	**$7,545**	**83.20%**
Subdivision Potential	1	9.08	$14,868	0.00%
Rural Highway	3	90.31	$12,326	74.99%
Rural Residential	4	50.5	$5,420	53.25%
Agriculture	3	350.44	$3,154	3.98%

Penitas Submarket Area Sales



Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Cameron County and Hidalgo County Land Sale Comparative Analysis

The land sale comparative analysis identifies the various factors or elements of comparison that help explain the variance in land sale prices, the purpose of which is to assist in the analysis that applies to the sales comparison approach.

The sales comparison approach is defined as "the process of deriving a value indication for a subject property by comparing similar properties that have recently sold with the property being appraised, identifying appropriate units of comparison, and making adjustments to the sale prices (or unit prices) of the comparable properties based on relevant, market derived elements of comparison."[5] In many ways, this process attempts to explain the variance in the data set of the selected unit of comparison as compared to the subject. "Comparative analysis of properties and transaction focuses on similarities and differences that affect value, called elements of comparison, which may include variations in property rights, financing terms, market conditions, and physical characteristics, among others. Appraisers examine market evidence using paired data analysis, trend analysis, statistics and other techniques to identify which elements of comparison within the data set of comparable sales are responsible for value differences."[6]

The "elements of comparison are the characteristics of properties and transactions that help explain the variances in the prices paid for real property. When properly identified, the elements of comparison describe the factors that are associated with the prices paid for competing properties." [7]

The sequence in which adjustments are applied to the comparable sales is determined by the market data and the appraiser's analysis of that data. Typically, the first five elements of comparison which include the real property rights conveyed, financing terms, conditions of sale, expenditures made immediately after the purchase, and market conditions are viewed as transactional adjustments. Adjustments such as location, physical characteristics, economic characteristics, legal characteristics and non-realty components of value are generally viewed as property adjustments and correspond to the criteria of highest and best use.

This section identifies those factors that influence the price in the Rio Grande Valley market, particularly the extreme southern portion of the Rio Grande Valley market. Although there may be some unique conditions of sales or financing terms to the various sales data, it is believed that those factors are so unique they are not addressed specifically in this analysis. Market conditions in terms of date of sale and real property rights conveyed in terms of water rights will be addressed in this analysis. Price variables and adjustments being considered will include location, physical characteristics of land size and access, and land composition/soil types. Of course, these price variables will vary depending on use type. Soil classes are believed to be critical for agricultural production land, whereas for rural recreation and rural residential land, soil class is not generally important, but access variables may be significant for those uses and not for agriculture production uses. Ultimately the desire is to arrive at some uniformity as to a range of adjustments that the data is indicating for these transactional and property adjustments.

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[5] *The Appraisal of Real Estate*, 14th Addition, Appraisal Institute, page 377.

[6] *Ibid,* page 378.

[7] *Ibid,* page 390.

Unit of Comparison
As indicated in the prior presentation of the sales data in the various submarkets under study, the market generally considers the price per acre as the recognized unit of comparison for rural residential, rural recreational and agricultural use. Commercial, industrial and residential lot sales are typically reported on a SF basis.

Agricultural Highest and Best Use
Given the amount of agricultural sales data in Valley region, the statistical method of regression analysis is utilized in this section. The results can be compared to those found in Section 3 which applies an alternative, non-statistical, analysis on the same dataset. The results of each method are generally consistent and supportive of one another. Regression analysis is a method to determine the association or relationship between two or more variables. The method can be applied to identify variables that may influence the price of real estate, given a particular set of data derived from market activity. Regression analysis is commonly done by the least square method, which is a series of mathematical calculations that creates algebraic coefficients resulting in an equally placed line that best fits a plot of data. The least squares approach uses the mathematical square of the differences to the plotted or regression line. Squares are used because they have a positive number and they simplify mathematical relationships.

As applied in commercial real estate valuation, regression is generally utilized to assist in determining variables that influence price and the adjustment amount for that variable. Although the modeling process can be used to predict value, this application is less widely used in commercial property use types as compared to homogenous property types like residential neighborhoods.

Once the sales data is input into the regression statistical computing program, output statistics, including the regression coefficient for each independent variable (price being the dependent variable) are derived. The output statistics are typically useful in testing whether the fit of the model is good based on some range of acceptability and include the R Square (R2) and Standard Error of the regression (S). The R Square also known as the coefficient of determination will range from 0 to 1.00, with the higher amount being more desired as the price of a particular sale is being explained by the variables being used in the model. The R Square measures the amount of total variation explained by the regression model. The utility of the R Square in estimating point values in real estate valuation is sometimes considered less useful than output statistics that measure average error such as the coefficient of variation or COV. The COV measures relative variation, and is calculated by the ratio of the standard error (the square root of the sum of deviations from the mean squared for sample set of data which is the absolute difference between the observation and the regression line). Therefore, the COV normalizes or standardizes the variance comparison between data sets.

Another output statistic that has some relevance is the t-test and p-value. These output statistics are useful in determining the significance of a variable. The t-test is calculated by dividing the coefficient value by the standard error of that value for an individual variable. The program then compares that value with the value derived from the entire model's t-distribution to arrive at the p-value which would range from 0.0 to 1.0. The p-value refers to the probability of the relationship between the dependent variable (in this case price per acre) and the independent variable is due to random chance. The lower the p-value, the lower probability the relationship is due to chance and thus the significance of the variable can be measured. What makes for an acceptable p-value depends on the nature of a relationship being studied. Obviously for scientific and engineering applications and testing there would be a need for a very low tolerance, generally below .05. However, for behavioral science, in which the study of real estate markets are typically considered to be part of, higher tolerances are acceptable, although there is

no set rule, it seems that p-values under .20 would normally confirm a relationship between price and the independent variable. [8]

Sales Applied in the Regression Model

In sum, 78 agricultural sales were considered and 74 were selected from the Rio Grande Valley sales research and applied in a regression analysis. Several sales were excluded due to differences in highest and best as they offered more immediate development potential for other uses besides agriculture use.

Data Book A contains the primary sales utilized in the analysis of production agricultural properties and/or utilized to analyze those sales that have sold with water rights and/or sales with the Border Wall as a component of the sale. The sales in this group were verified to the requirements of the *Uniform Appraisal Standards for Federal Land Acquisitions* (UASFLA); however, practitioners who choose to utilize the data should complete their own verifications if called upon to testify in a court proceeding.

The regression analysis for land with an agricultural highest and best ranged considerably in date of sale with the most recent sale occurring in March of 2020, and the oldest sale occurring in November of 1999. Some of the sales included water rights, while a number of the sales did not include water rights. The sales had a wide range of land sizes from under 30.26 acres to 3, 099 acres. The sales also had a range of soil types from Class I soils to Class IV soils, development potential uses, floodways, irrigation, existing border wall location, and differing county locations. A stepped up regression approach was applied by starting with variables of date of sale as expressed by months from the date of sale to January 13, 2020, and then other variables were then added to arrive the best fitting model given the data set, and also to check the importance of the variable on the overall model. The following table summarizes the outputs for each variable once added to the regression model.

Table 34
Regression Output Statistics – Price/Acre Variables

Variable	R Square	Standard Error	Mean Sale Price/Acre	COV
Date of Sale/Months	0.18	1,029	$2,839	36.25%
Water Rights/Acre Feet	0.18	1,036	$2,839	36.49%
Tract Size/Acres	0.19	1038	$2,839	36.56%
% Floodway	0.22	1031	$2,839	36.32%
% Irrigation	0.4	908	$2,839	31.98%
% Development Potential	0.71	637	$2,839	22.44%
% Class I Soils	0.74	608	$2,839	21.42%
% Class II Soils	0.75	597	$2,839	21.03%
% Class III Soils	0.77	584	$2,839	20.57%
% Class IV Soils	0.77	587	$2,839	20.68%
Border Wall Location	0.77	591	$2,839	20.82%
Hidalgo County Location	0.78	583	$2,839	20.54%
Cameron County Location	0.78	584	$2,839	20.57%
Starr County Location	0.78	589	$2,839	20.75%
Willacy County Location	0.78	589	$2,839	20.75%
Remove BW, Cameron, Starr and Willacy Co.	0.78	579	$2,839	20.39%

[8] Taken from "A Guide to Appraisal Valuation Modeling" Linne, Kaneand Dell, Appraisal Institute, 2000.

As reflected in Table 34, date of sale was a significant and important variable in explaining price of agricultural land in the Rio Grande Valley market. Once added, tract size and water rights/acre feet are marginally important; however, once other variables were added, the significance of this variable increased. The % of Floodway and % Irrigation were important to the model results and are also significant to price, as one would expect. A significant factor is also % of Development Potential, as this factor increases the price due to higher use potential on portions of the agricultural land use. The % of soil class, particularly Class I soils, is also critical to price per acre. Border Wall location did not improve the model results and increased the COV. This finding is consistent with the prior analysis concerning the impact of the Border Wall on development trends and is consistent with the findings in the following Section 3. County location only seemed to be important for a Hidalgo County location and this is consistent with Hidalgo County being the primary generator of growth in the region and the inclusion of various agricultural land sales in central and north Hidalgo County that likely have ultimate higher use potential, as those tracts are typically not encumbered with floodway. Based on the regression analysis the following adjustments can be extracted from the regression model.

Table 35
Regression Extracted Adjustments - Agriculture Highest and Best Use

Variable	Coefficient	Adjustment Indication
Date of Sale	-6.76	6.76 per month x 12 = $81/Year, or around 2.9% yearly based on mean sale price of $2,839/acre
Tract Size	-0.25	.25 x 100 acre difference = $25/acre, or $50/acre for each double
% Floodway	-460	Discount of $460/acre x % of floodway land
% Irrigation	648	$648/acre premium x % of land with Irrigation
Water Rights	0.12	$.12/acre foot premium for land with water rights
% Development Potential	5354.00	Premium of $5,354 to the % of land with development potential
Hidalgo County Location	$308.00	Premium of $308/acre for land in Hidalgo County

The above adjustments are generally supportive of the various price variables/adjustments derived in Section 3 of the report which applies other techniques to identify value influences and adjustments for those factors. It should be noted that the regression analysis shows premium for Class I soils compared to Class II and Class III soils, however it is believed that the Class IV includes value attributed to other classes and waste/outages that does not make the coefficient indications suitable to derive an adjustment indication, but does support a finding that the higher class of soils is important to the ultimate value.

Table 36
Regression Output/Input Table – Agricultural Land Sales

Regression Statistics	
Multiple R	0.88
R Square	0.78
Adjusted R Square	0.74
Standard Error	579
Observations	74

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2377.457	859.435	2.766	0.007462
Months	-6.760	1.333	-5.070	0.000004
Water Rights/Acre Ft.	0.116	0.126	0.918	0.362358
Acreage Size	-0.255	0.114	-2.229	0.029472
% Floodway	-460.450	211.624	-2.176	0.033391
% Irrigation Potential	648.312	168.892	3.839	0.000293
% Dev. Potential	5354.215	1035.582	5.170	0.000003
% Class I Soils	1159.856	942.258	1.231	0.222997
% Class II Soils	628.991	902.034	0.697	0.488220
% Class III Soils	-350.119	916.706	-0.382	0.703818
% Class IV Soils	616.932	931.060	0.663	0.510035
Hidalgo	308.334	182.492	1.690	0.096132

Continued Table 36
Regression Input Table

Sale	Total Price	Price/Acre	Months	Water Rights/ Acre Ft.	Acreage Size	% Floodway	% Irrigation Potential	% Dev. Potential	% Class I Soils	% Class II Soils	% Class III Soils	% Class IV Soils	Hidalgo
RGVS135	$5,113,251	$1,650	170	4859	3098.91	100%	76%	0%	48%	32%	0%	3%	0
RGVS81	$3,476,250	$3,724	47	2308	933.54	100%	107%	0%	66%	20%	0%	6%	0
RGVH537	$1,043,205	$1,129	146	0	924.08	100%	0%	0%	0%	52%	20%	10%	1
RGVH506	$2,585,600	$3,201	40	2565	807.73	100%	150%	0%	36%	45%	1%	2%	1
RGVH618	$1,285,489	$1,581	246	1821	813.07	100%	113%	0%	40%	27%	3%	9%	1
RGVH625	$1,221,075	$2,250	78	0	542.7	100%	100%	0%	0%	0%	89%	8%	1
RGVH540	$2,206,176	$4,117	139	1325	535.887	100%	106%	0%	55%	29%	9%	0%	1
RGVH617	$1,000,000	$2,330	161	703	429.138	100%	74%	0%	40%	39%	3%	6%	1
RGV602	$231,600	$958	196	25	241.82	100%	5%	0%	24%	60%	0%	0%	0
RGVS118	$480,000	$1,768	7	250	271.51	100%	50%	0%	0%	31%	31%	13%	0
RGVH500	$756,648	$3,600	57	451	210.18	100%	92%	0%	69%	21%	0%	2%	1
RGV600	$471,008	$2,000	203	175	235.504	100%	38%	0%	21%	55%	0%	2%	0
RGV601	$253,904	$2,000	201	250	126.952	100%	160%	0%	34%	46%	0%	12%	0
RGVH530	$232,800	$2,514	138	0	92.61	100%	0%	0%	0%	0%	0%	100%	1
RGVH26	$200,000	$1,720	45	0	116.28	100%	50%	0%	0%	19%	55%	0%	1
RGVH528	$70,000	$1,667	107	0	42	100%	100%	0%	0%	83%	0%	0%	1
RGVH529	$100,000	$2,618	94	0	38.19	100%	100%	0%	0%	89%	0%	0%	1
RGVH527	$140,000	$4,317	86	0	32.43	100%	100%	0%	0%	65%	0%	0%	1
RGVH519	$1,493,433	$1,750	119	0	853.39	99%	0%	1%	0%	49%	20%	11%	1
RGVH536	$1,493,433	$1,750	62	0	853.39	99%	0%	1%	0%	49%	20%	11%	1
RGV603	$2,000,000	$2,987	77	1496	669.668	99%	117%	1%	21%	54%	0%	2%	0
RGV674	$1,200,000	$4,773	60	0	251.39	80%	0%	75%	0%	1%	24%	0%	0
RGVH612	$3,039,600	$2,413	143	710	1259.5	78%	100%	2%	43%	35%	5%	1%	1
RGVH621	$1,000,000	$3,633	-2	350	275.251	65%	52%	12%	32%	31%	21%	2%	1
RGV502	$226,600	$1,901	129	0	119.218	65%	100%	0%	27%	62%	0%	2%	0
RGV505	$404,686	$3,400	55	0	119.025	65%	100%	0%	27%	62%	0%	2%	0
RGVH545	$500,000	$3,812	146	312	131.18	44%	152%	23%	13%	45%	5%	0%	1
RGV664	$1,001,893	$1,940	151	0	516.44	37%	0%	0%	18%	72%	1%	3%	0
RGV503	$247,200	$3,200	86	0	77.26	35%	100%	0%	71%	8%	0%	6%	0
RGVH619	$2,669,590	$2,750	25	0	970.76	33%	100%	18%	0%	4%	71%	0%	1
RGV650	$1,566,270	$3,004	87	0	521.42	3%	100%	0%	37%	60%	0%	0%	0
RGV657	$2,556,478	$3,023	86	0	845.603	0%	100%	15%	0%	16%	53%	13%	0
RGVH521	$959,950	$7,468	65	0	128.55	0%	100%	62%	0%	0%	38%	0%	1
RGV655	$1,034,618	$2,650	22	0	390.422	0%	0%	0%	40%	54%	1%	5%	0
RGV662	$1,782,000	$2,824	150	0	630.968	0%	100%	15%	0%	36%	24%	18%	0
RGV671	$1,120,878	$3,300	88	0	339.66	0%	100%	0%	86%	12%	1%	0%	0
RGVH626	$2,000,000	$1,982	115	0	1008.97	0%	100%	14%	16%	5%	56%	0%	1
RGVW4	$956,269	$2,350	109	0	406.923	0%	0%	0%	10%	90%	0%	0%	0
RGVH620	$5,970,000	$3,211	37	0	1859.49	0%	100%	0%	54%	20%	2%	2%	1
RGV658	$2,552,445	$3,897	37	0	654.9	0%	100%	15%	22%	45%	13%	5%	0
RGVH358	$185,000	$6,114	16	0	30.26	0%	0%	58%	0%	0%	0%	0%	1
RGV52	$2,748,735	$3,300	100	0	832.95	0%	100%	3%	18%	79%	0%	0%	0
RGV665	$706,973	$2,500	135	0	282.789	0%	100%	0%	4%	45%	48%	0%	0
RGV670	$2,015,435	$3,250	93	0	620.13	0%	100%	0%	39%	42%	4%	14%	0
RGV673	$655,350	$5,000	76	0	131.07	0%	100%	37%	0%	0%	63%	0%	0
RGVH539	$439,225	$2,500	137	0	175.69	0%	100%	0%	5%	35%	57%	0%	1
RGVH614	$2,100,000	$4,200	86	0	500	0%	100%	28%	12%	0%	14%	39%	1
RGVH615	$2,100,000	$4,784	76	0	439	0%	100%	0%	60%	30%	1%	0%	1
RGVH616	$4,800,000	$3,736	76	0	1284.87	0%	100%	33%	16%	32%	0%	4%	1
RGVH623	$19,220,000	$4,000	10	0	4805	0%	100%	20%	25%	12%	28%	3%	1
RGVH624	$1,143,744	$4,200	10	0	272.32	0%	100%	0%	49%	32%	0%	0%	1
RGV358	$380,000	$2,424	26	0	156.74	0%	0%	3%	0%	0%	93%	0%	0
RGV373	$500,000	$3,571	24	0	140	0%	0%	0%	4%	96%	0%	0%	0
RGV475	$402,433	$2,900	10	0	138.77	0%	0%	0%	13%	87%	0%	0%	0
RGV651	$3,208,171	$2,781	73	0	1153.7	0%	0%	0%	16%	82%	0%	1%	0
RGV652	$1,255,110	$3,000	70	0	418.373	0%	0%	19%	0%	70%	11%	0%	0
RGV653	$962,500	$2,499	34	0	385.09	0%	0%	0%	32%	65%	0%	0%	0
RGV654	$1,400,000	$2,807	33	0	498.712	0%	0%	0%	12%	77%	0%	0%	0
RGV656	$605,000	$2,750	11	0	220	0%	0%	0%	2%	98%	0%	0%	0
RGV659	$746,750	$1,494	162	0	500	0%	0%	0%	7%	93%	0%	0%	0
RGV660	$1,075,000	$1,736	167	0	619.25	0%	0%	0%	3%	95%	1%	1%	0
RGV661	$1,686,000	$2,000	162	0	843	0%	0%	15%	0%	20%	36%	11%	0
RGV663	$1,600,000	$1,594	160	0	1003.7	0%	0%	0%	0%	80%	0%	0%	0
RGV666	$1,548,125	$2,500	106	0	619.25	0%	0%	0%	3%	95%	1%	1%	0
RGV668	$1,390,420	$2,000	89	0	695.21	0%	0%	0%	25%	65%	0%	7%	0
RGV669	$1,250,000	$2,500	89	0	500	0%	0%	0%	17%	83%	0%	0%	0
RGV672	$552,204	$1,545	91	0	357.32	0%	0%	0%	34%	62%	1%	1%	0
RGV676	$749,780	$2,000	149	132	374.89	0%	15.50%	0%	0%	58%	29%	3%	0
RGVS16	$920,000	$1,539	19	0	597.98	0%	0%	0%	0%	0%	78%	1%	0
RGVW1	$1,858,765	$2,753	14	0	675.06	0%	0%	0%	31%	49%	14%	0%	0
RGVW2	$872,499	$2,350	13	0	371.34	0%	0%	0%	14%	44%	36%	0%	0
RGVW3	$1,436,688	$1,807	123	0	795.23	0%	0%	0%	12%	65%	1%	17%	0
RGVH513	$392,000	$3,479	57	0	112.68	0%	100%	16%	53%	6%	0%	13%	1
RGVH517	$250,000	$3,320	60	0	75.3	0%	100%	4%	12%	27%	2%	49%	1
Mean		$2,839			581.10								

Rural Residential Land Use

The land sales identified approximately 42 sales that were suited for a rural residential land use. A near majority of these sales is situated in submarkets located between Brownsville and Pharr/McAllen. There is also a concentration of rural residential sales in the southeast Brownsville submarket. Market conditions/date of sale, location, tract size, road access (paved or unpaved frontage), and flood plain were factors that were considered in the analysis of the land sale data.

Market Conditions/Date of Sale Adjustment

The rural residential land sales range in sale date from November 2007 to May 2019, but most of the sales data collected tended to be from around 2012 to the present. The following table summarizes the unadjusted land sale prices in the more active submarkets of Los Indios and Progreso from 2012 to 2019.

Table 37
Rural Residential
Land Sale Price by Year
Los Indios/Progreso Submarkets

Year	Sales	Mean Price Per Acre	Tract Size/Acres
2012	2	$6,273	33.44
2013	1	$6,000	5
2014	1	$6,843	40.92
2015	2	$3,185	64.21
2016	6	$5,727	16.26
2017	4	$6,944	10.27
2018	2	$4,580	23.13
2019	1	$5,194	11.55

As reflected in the table, no established trend of a price increase appears in the data. In addition, a regression model run on all rural residential land sales that include sale date, or months from December 31, 2019, as a price factor or independent variable did not suggest date of sale to be a significant factor, and when date of sale was removed as a variable, the output results from the model are similar suggesting that there is no date of sale variable in the rural residential sale data. For this reason, the sales data is not supporting an adjustment for market conditions/date of sale.

Location Adjustment

The land sales have been presented by the submarkets identified in this study. The following table summarizes the rural residential land sales by each submarket based on an unadjusted price and an adjusted price based on a proxy tract size of 10 acres and paved road frontage adjustments that are provided later.

Table 38
Location Adjustments Cameron/Hidalgo Submarkets

Submarket	Unadjusted Mean Price/Acre	Adjusted Mean Price/Acre	Adjusted to Los Indios
SE/SW Brownsville	$9,142	$9,591	-36%
Los Indios	$6,000	$6,138	0%
Progreso	$5,265	$7,663	-20%
Donna/Pharr	$6,852	$8,935	-31%
Penitas	$5,420	$6,791	-10%

Tract Size Adjustment

Generally, there is an inverse relationship between tract size and price per unit. Smaller tracts will generally appeal to more potential rural residential uses and therefore have a higher per unit price compared to larger tracts. The regression analysis that was completed for the entire rural residential sales in Cameron and Hidalgo counties found tract size to be a significant variable, with a coefficient of -$70 per acre difference, thus as size increase per acre, the price is reduced $70. Besides the regression coefficient findings, several groups of paired sales were completed as follows:

Table 39
Rural Residential Tract Size Pairings

Sale	PPA	Size		Sale	PPA	Size
RGV298	$4,352	11.03		RGV429	$4,160	31.25
RGV82	$6,546	6.874		RGVH523	$6,843	40.92
RGV321	$8,343	7.791	**vs**	611213	$6,000	60
RGV258	$6,389	7.043				
RGV335	$8,391	7.746				
Avg.	$6,804	8.10		Avg.	$5,668	44.06

Price Difference	$1,137	acre
Size Difference	35.96	acres
	$ 31.61	per acre difference

The pairing of sales in the Los Indios and Progreso submarkets includes sales with similar characteristics but for size. This pairing suggests an adjustment of $32/acre for differences in size. The regression analysis completed in various submarkets found regression coefficients indicating $40/acre; $150/acre and $254/acre with the high end being influenced by a tighter range of size in its data set. Based on the pairings presented and the regression analysis completed, the appropriate tract size adjustment rural residential uses would range from $30/acre to $150/acre for each difference in acre, with the relationship between price and tract size being an inverse one.

Road Frontage Adjustment

Most of the rural residential sales presented have paved road frontage; however, some of the sales have dirt or caliche road frontage. The paved road frontage is considered to be superior to dirt or caliche frontage for rural residential uses. Paired sales was applied to several sets of rural residential sales and after minor adjustment for size differences the pairings provide a range of upward adjustment from 14% to 34%, and a range of downward adjustment from -13% to -26%. In addition, the regression analysis that was applied to all rural residential sales indicated a downward adjustment to an unpaved sale with a coefficient at -1,087. Applying this coefficient to mean predicted sale price of $7,000/acre indicates a 16% upward adjustment and a 15% downward adjustment which falls within the paired data

indications. The following Table 40 shows the paired sales utilized to derive the road frontage adjustment.

Table 40
Road Frontage Pairings

Sale	Frontage	Size/Acres	Price/Acre	Size Adj Price
RGV 489	Paved	21.1	$7,464	$7,464
611323	Dirt	29.25	$5,949	$6,519
Upward Adjustment				14%
Downward Adjustment				-13%
RGV 631	Paved	14.5	$6,690	$6,690
RGV 456	Dirt	11.55	$5,194	$4,984
Upward Adjustment				34%
Downward Adjustment				-26%
RGV 631	Paved	14.5	$6,640	$6,690
RGV 500	Dirt	30	$4,400	$5,485
Upward Adjustment				22%
Downward Adjustment				-18%

Conclusions

1. The highest and best use of the land sale is critical to price and explains a considerable amount of the variation in the sales prices as presented. The variance, as measured by the Coefficient of Variance (COV), is reduced when the sales data is classified by highest and best use. Since one focus is to identify variables that influence land sale price, the COV is considered to be an appropriate way to compare the variance between data sets as it reflects a standardized measurement of variance or dispersion by deriving the standard deviation in that data set and dividing the standard deviation by the mean average for that data set. [9] The standard deviation and the standard error are the same statistic, with the difference being that the standard error is applied to a sample and standard deviation is applied to the population.

2. The land sale data shows variation in the concentration of land uses and land price per acre extending across the extreme southern portions of the Valley. The Valley has two major urban centers (Brownsville and McAllen), and as expected, land sales reflecting urbanized highest and best uses are situated in closer proximity to these urban centers. Urbanized highest and best uses such as industrial, commercial and subdivision potential dominate the submarkets that are part of, or in close proximity to, these urbanized concentrations and this suggest location differences across the extreme southern portion of the Valley. This locational factor is confirmed when comparing the variance as measured by the COV between the combined market and the selected submarkets, as the variance as measured by the COV for the combined market does not consider the location of the sales and indicates higher variance than the variance reflected when the data is segmented by submarket, thereby considering location as a price variable.

[9] *An Introduction to Statistics for Appraisers,* Appraisal Institute 2009, page 85.

Table 41
Variance in Land Sale Prices by Highest and Best Use
Cameron and Hidalgo County

Highest and Best Use	Combined Market Variance	Average Variance by Submarkets	Spread
Commercial/Industrial	85.29%	66.56%	18.73%
Subdivision Potential	70.89%	43.00%	27.89%
Rural Highway	86.00%	38.95%	47.05%
Rural Residential	55.18%	36.91%	18.27%
Agriculture	51.66%	33.68%	17.98%

3. Besides the comparison of variance by use of the COV after use segmentation, a regression analysis was completed on all rural residential land sales across the extreme southern portion of the region. Time and physical factors were included but no locational factor was identified in the regression model. The regression resulted in the following output statistics:

R Square	.34
Standard Error	$2,213
Mean Price	$7,001/Acre
COV	31.6%

This same model was then run on rural residential land sales in several of the identified geographical submarkets, which would then include location as a price variable with the following output results.

	SE Brownsville	Los Indios	Progreso
R Square	.79	.93	.73
Standard Error	1,630	600	1,024
Mean Price	$9,272	$6,000	$5,265
COV	17.6%	10%	19.4%

As reflected in the output results, the sales when considering submarkets location, reduce the variance in the data sets as measured by the coefficient of determination (also shown as R Square) and also has measured by the COV. A higher R Square will typically indicate that the regression model is explaining more variance. In the above output comparison, the submarket regression models have higher R Squares compared to the combined market and lower COV's when compared to the combined market, and these output statistics from the regression models would support that location is a price factor across the broader Rio Grande Valley region.

Table 42
Regression Output/Input Table – Rural Residential All Submarkets

Regression Statistics	
Multiple R	0.585558742
R Square	0.342879041
Adjusted R Square	0.25808924
Standard Error	2212.767567
Observations	36

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	7527.824963	1184.504506	6.3552523	4.48371E-07
Months	8.158856657	11.53021431	0.7076067	0.48447583
Acreage	-70.005936	23.87684176	-2.9319596	0.006279166
Paved	1086.698515	878.445829	1.2370695	0.225350822
Fld_Perc	-11.2891984	10.65646223	-1.0593758	0.297613566

Sale	PPA	Months	Acreage	Paved	Fld_Perc
RGV359	$8,471	22.9	22.43	1.00	0
RGV404	$8,000	15.86667	20	1.00	0
RGV190	$11,367	49.76667	6	1.00	0
RGV474	$10,996	7.533333	5.002	1.00	0
RGV205	$13,133	44.8	5.33	1.00	0
RGV489	$7,464	5.966667	21.1	1.00	0
611221	$7,404	89.6	10.13	1.00	95.16
611223	$6,542	91.5	10.7	1.00	99.07
611233	$7,790	92.3	10.27	1.00	96.01
611323	$5,949	77.7	29.25	0.00	11.21
RGV642	$15,152	20.1	5.28	1.00	1.1
RGV648	$9,000	145.9	2	0.00	0
611250	$7,582	84.73333	23.08	1.00	62.31
RGV298	$4,352	31.63333	11.03	1.00	0
RGV82	$6,546	88	6.874	1.00	0
RGV321	$8,343	28.8	7.791	1.00	0
RGV258	$6,389	37.8	7.043	1.00	0
RGV335	$8,391	26.6	7.746	1.00	0
RGV261	$5,181	37.23333	9.65	1.00	93.68
RGV207	$5,639	45.03333	13.3	1.00	0
RGV429	$4,160	12.73333	31.25	1.00	0
RGV397	$5,000	16.8	15	1.00	0
RGV275	$6,000	35.83333	10	1.00	0
RGVH40	$7,000	41.06667	20	0.00	0
RGVH516	$3,050	56.76667	53.12	0.00	29.97
RGVH523	$6,843	70.3	40.92	1.00	2.61
RGV500	$4,400	117.8333	30	0.00	39.77
RGV456	$5,194	9.9	11.551	0.00	0
RGV105	$6,000	74.46667	5	0.00	97.6
RGV245	$4,151	39.66667	37.58	0.00	53.65
611213	$6,000	89.4	60	1.00	68.88
RGVH517	$3,320	57.16667	75.3	0.00	35.82
RGV631	$6,690	27.9	14.5	1.00	0
RGVH292	$7,006	19.5	15.13	0.00	93.72
RGVH501	$8,000	143.7667	20	0.00	61.45
RGVH515	$5,551	55.36667	25.4	0.00	95.35

Table 43
Regression Output/Input Table – Rural Residential Southeast Brownsville

Regression Statistics	
Multiple R	0.87421873
R Square	0.76425839
Adjusted R Square	0.67585529
Standard Error	1597.7105
Observations	12

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	10855.0779	1435.25099	7.563191	6.52667E-05
Acreage	-202.67214	56.28232677	-3.600991	0.006972258
Paved	2244.15902	1283.659056	1.748252	0.118547666
Fld_Perc	-38.149081	11.41060207	-3.343301	0.010181092

Sale	PPA	Acreage	Paved	UnPaved	Flood %	Months
RGV359	$8,471	22.43	1	0	0	22.90
RGV404	$8,000	20	1	0	0	15.87
RGV190	$11,367	6	1	0	0	49.77
RGV474	$10,996	5.002	1	0	0	7.53
RGV205	$13,133	5.33	1	0	0	44.80
RGV489	$7,464	21.1	1	0	0	5.97
611221	$7,404	10.13	1	0	95.16	89.60
611223	$6,542	10.7	1	0	99.07	91.50
611233	$7,790	10.27	1	0	96.01	92.30
611323	$5,949	29.25	0	1	11.21	77.70
RGV642	$15,152	5.28	1	0	1.1	20.10
RGV648	$9,000	2	0	1	0	145.90

Table 44
Regression Output/Input Table – Rural Residential Los Indios

Regression Statistics	
Multiple R	0.87421873
R Square	0.76425839
Adjusted R Square	0.67585529
Standard Error	1597.7105
Observations	12

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	10855.0779	1435.25099	7.563191	6.52667E-05
Acreage	-202.67214	56.28232677	-3.600991	0.006972258

Sale	**PPA**	**Months**	**Acreage**	**Paved**	**UnPaved**	**Fld_Perc**
RGV298	$4,352	31.63	11.03	1	0	0
RGV82	$6,546	88.00	6.874	1	0	0
RGV321	$8,343	28.80	7.791	1	0	0
RGV258	$6,389	37.80	7.043	1	0	0
RGV335	$8,391	26.60	7.746	1	0	0
RGV261	$5,181	37.23	9.65	1	0	93.68
RGV207	$5,639	45.03	13.3	1	0	0
RGV429	$4,160	12.73	31.25	1	0	0
RGV397	$5,000	16.80	15	1	0	0
RGV275	$6,000	35.83	10	1	0	0

Table 45
Regression Output/Input Table – Rural Residential Progreso

Regression Statistics	
Multiple R	0.85329519
R Square	0.728112681
Adjusted R Square	0.510602826
Standard Error	1024.308296
Observations	10

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	5993.292393	803.4063962	7.459851	0.000683
Months	3.701892261	13.6493813	0.271213	0.797068
Acreage	-40.18294981	15.68288695	-2.56222	0.05051
Paved	1921.511655	740.2219598	2.595859	0.048492
Fld_Perc	-3.748371291	12.45127555	-0.30104	0.775498

Sale	**PPA**	**Months**	**Acreage**	**Paved**	**Unpaved**	**Flood %**
RGVH40	$7,000	41.07	20	0	1	0.00
RGVH516	$3,050	56.77	53.12	0	1	29.97
RGVH523	$6,843	70.30	40.92	1	0	2.61
RGV500	$4,400	117.83	30	0	1	39.77
RGV456	$5,194	9.90	11.551	0	1	0.00
RGV105	$6,000	74.47	5	0	1	97.60
RGV245	$4,151	39.67	37.58	0	1	53.65
611213	$6,000	89.40	60	1	0	68.88
RGVH517	$3,320	57.17	75.3	0	1	35.82
RGV631	$6,690	27.90	14.5	1	0	0.00

Starr County Submarkets

Starr County is distinct in various ways from the previously presented submarkets of the Valley that are located in Cameron County and Hidalgo County. This conclusion is reached based on the following observations:

- Limited population growth and a declining relative growth of the Rio Grande Valley region.

- Limited incorporated areas as there are only four incorporated cities in Starr County including Escobares, La Grulla, Rio Grande City and Roma. As identified in the prior analysis, Rio Grande City is the only city which is experiencing some relative growth compared to the total Rio Grande Valley Market. However, all of the cities, if compared to the 2000 population, have declining growth relative to the rest of the Rio Grande Valley market.

- Limited utility services besides the various city incorporated areas and the peripheral areas. Starr County has limited public water districts to serve the needs of any population movement in the county.

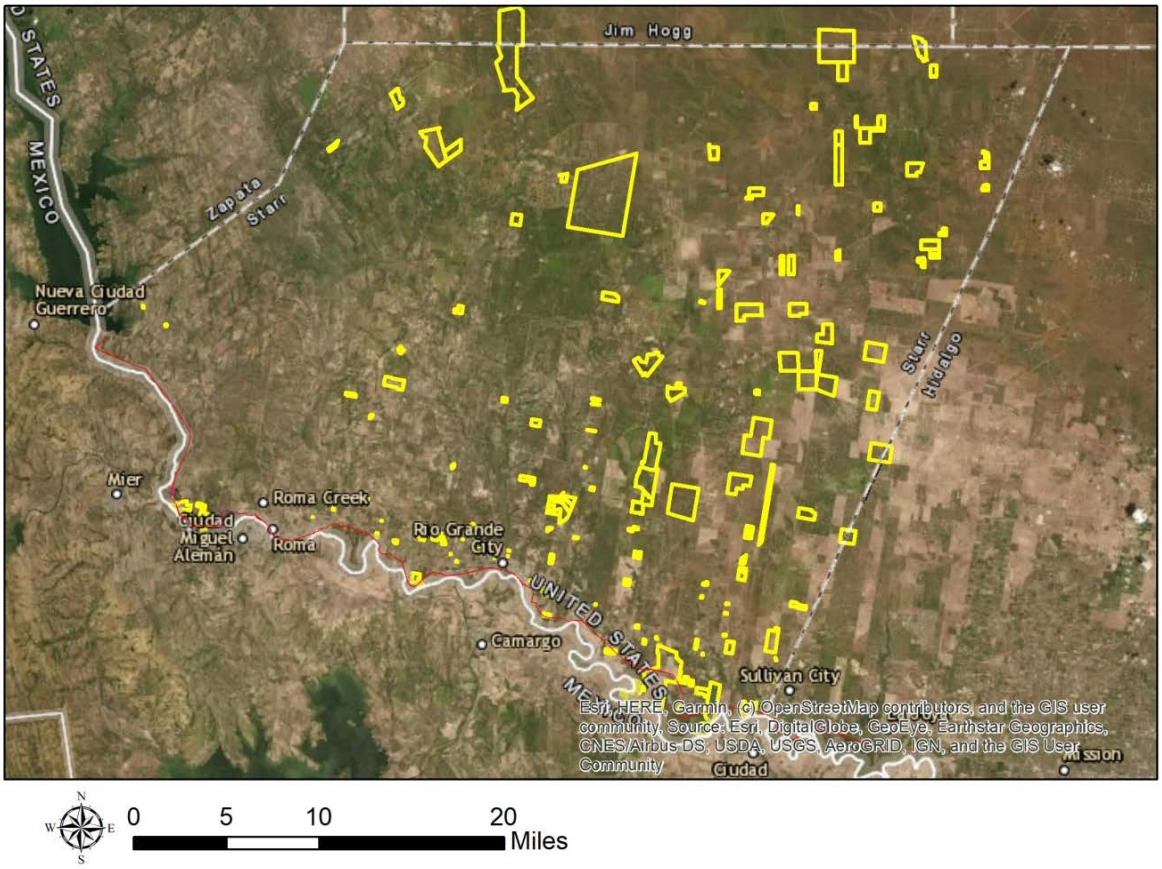
- The soils and composition of the land begins to change once one moves into Starr County from Hidalgo County, as the land is better suited for grazing and recreational uses and not productive agricultural uses compared to many of the land tracts situated in Hidalgo and Cameron Counties.

- There is no levee protection along the Rio Grande. The IBWC levee terminates near Penitas in Hidalgo County and the areas in Starr County that front the Rio Grande are not levee protected and therefore, these areas have significant flooding potential. Much of the areas south of US Highway 83 are located in the 100-year flood zone.

- Because the cities in Starr County are relatively near the anticipated Border Wall alignment, the focus of this study has been in submarkets that are situated south of US Highway 83 and also west of US Highway 83 once it turns northwest at Roma toward Falcon Lake. Therefore, the actual incorporated cities are in closer proximity to the anticipated Border Wall and as such, our research included residential lot sales as this property type might be more relevant in Starr County where it was not as relevant in the Hidalgo and Cameron Counties research.

- Within Starr County, the land sales activity is much more concentrated within the east portion of the county, generally from a line extending northeast from Rio Grande City. This is likely due to Rio Grande City serving as the primary urban city for Starr County and the proximity to Hidalgo County to the east, which has been established as the primary growth center in the Rio Grande Valley. The following aerial depicts the land sale activity in Starr County based on the research completed in this study and a bold red line northwest from Rio Grande City depicts the concentration of real estate sales in the eastern half of the county.

Aerial of Starr County Land Sales
(Anticipated Border Wall Alignment shown in red south of Highway 83)

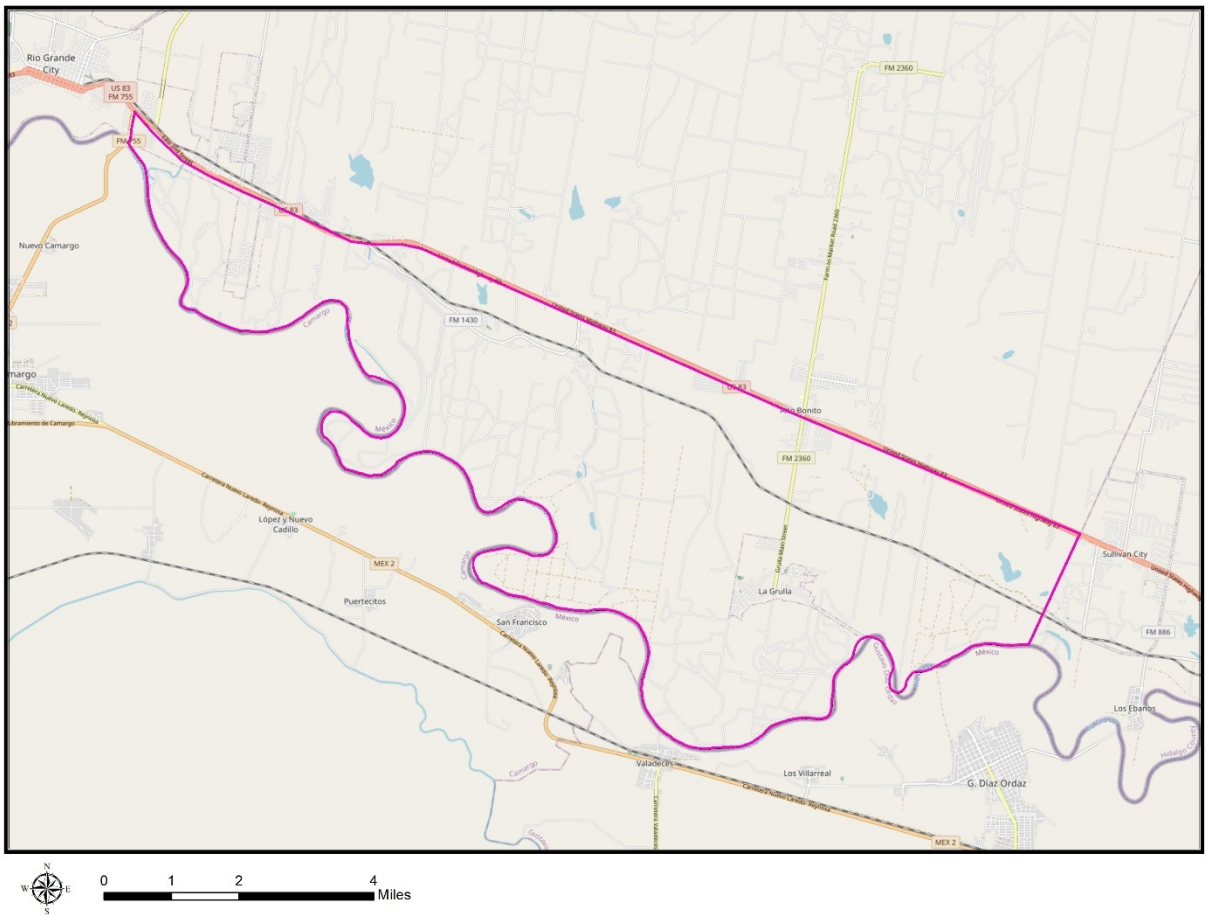


La Grulla Submarket

The La Grulla Submarket is generally bordered on the north by Military Highway/US 83, on the east by the Starr/Hidalgo County line, on the south by the Rio Grande River, and on the west by the city limits of Rio Grande City. The La Grulla Submarket includes the incorporated area of La Grulla and is in the southeastern most portion of Starr County.

The La Grulla Submarket has had positive population growth over the past several decades, but has grown at a rate below the overall Rio Grande Valley, as the relative share of population has decreased about .073% since 2000. The population level for this submarket in 2019 was estimated at 8,799 persons, and the submarket is considered to be rural in nature. Per capita income is at the low to mid end of the range. The La Grulla Submarket does not have an international crossing.

La Grulla Submarket



Land Sale Summary

The La Grulla Submarket is situated in the southeast portion of Starr County, and is adjacent to Hidalgo County. Research of sales data found sales in the submarket which is situated south of US Highway 83, the primary corridor extending through the south portion of Starr County. The following Table 46 presents the land sales included in the La Grulla Submarket.

Table 46 – La Grulla Submarket Land Sale Summary

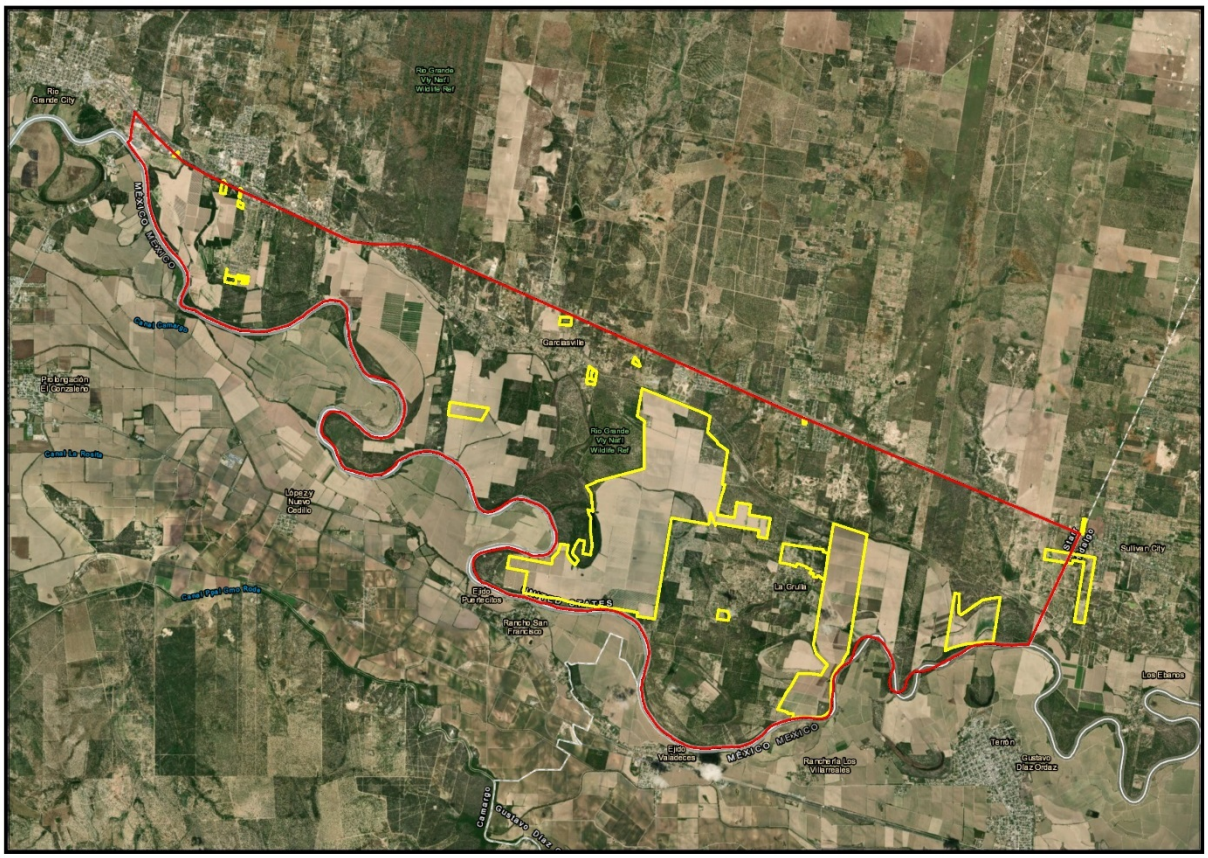
Sale Index	Sale Date	Acres	Price	PPUnit	Unit	HBU	Legal Access	Access	Land Cover
RGVS95	6/2/2017	1.14	$250,000	$5.03	SF	Commercial	Public	Paved	Brush
RGVS207	12/14/2017	1.68	$259,900	$3.55	SF	Commercial	Public	Paved	Vacant
RGVS10	1/17/2018	13.2	$668,000	$1.16	SF	Commercial	Public	Paved	Brush
RGVS197	12/14/2012	6.626	$725,000	$2.51	SF	Commercial	Public	Paved	Vacant
RGVS166	11/14/2018	3.9	$145,000	$0.85	SF	Commercial	Public	Paved	Vacant
RGVS198	9/15/2017	0.89	$190,000	$4.90	SF	Commercial	Public	Paved	Vacant
Mean		**4.573**		**$3.00**	**SF**				
Standard D.				**$1.80**	**SF**				
RGVS171	2/23/2018	4.96	$160,000	$0.74	SF	Rural Highway	Public	Paved	Brush
RGVS82	3/15/2016	35.65	$250,000	$7,013	Acre	Rural Highway	Public	Paved	Brush
RGVS195	8/8/2017	6.8	$950,000	$21,591	Lot	44 Subdivision Lots	Public	Paved	Vacant
RGVS18	12/7/2018	11.13	$137,500	$12,354	Acre	Subdivision Potential	Public	Paved	Hay/Pasture
RGVS12	3/1/2018	6.35	$52,500	$8,268	Acre	Rural Residential	Public	Dirt/Gravel	Brush
RGVS191	8/21/2019	15.16	$55,000	$3,628	Acre	Rural Residential	Public	Dirt/Gravel	Brush
RGVS186	5/13/2015	6	$45,000	$7,500	Acre	Rural Residential	Public	Paved	Brush
RGVS185	11/13/2014	12.35	$43,000	$3,482	Acre	Rural Residential	Public	Paved	Brush
Mean		**9.965**		**$5,719**	**Acre**				
Standard D.				**$2,520**	**Acre**				
RGVS50	9/7/2010	66	$183,000	$2,753	Acre	Agriculture	Easement	Dirt	Cropland
RGVS81	3/18/2016	934	$3,476,250	$3,724	Acre	Agriculture	Public	Dirt/Gravel	Irrigated Crop
RGVS135	1/26/2006	3099	$5,113,251	$1,650	Acre	Agriculture	Public	Dirt/Gravel	Irrigated Crop
RGVS140	10/13/2015	146	$181,125	$1,238	Acre	Agriculture	Public	Paved	Fallow
RGVS118	6/13/2019	272	$480,000	$1,768	Acre	Agriculture	Easement	Dirt	Brush
Mean		**903**		**$2,226**	**Acre**				
SD				**$1,005**	**Acre**				
RGVS194	7/13/2016	68	$173,872	$2,557	Acre	Rural Recreational	Public	Paved	Hay/Pasture
RGVS21	3/28/2019	147.16	$257,513	$1,750	Acre	Rural Recreational	Public	Dirt/Gravel	Brush
Mean		**108**		**$2,153**	**Acre**				
SD				**$403**	**Acre**				

The sales researched in the La Grulla Submarket resulted in various land use types. The commercial sales are situated along or near US Highway 83. The upper end of these sales, namely RGVS 95, RGVS 207, RGVS 197, and RGVS 198 were end user purchases for strip centers, convenience stores and a Dollar General store. These sales reflect a considerable spread in price as compared to the remaining commercial sales, which were generally larger sized, investor-based sales and not end user. As expected, the sales with subdivision potential and the bulk residential lot sale (RGVS195) reflected higher sale prices as compared to the rural residential sales, with agriculture sales and rural recreation use sales indicating the lowest per unit sale prices in this submarket. The following Table 47 segments the sales based on highest and best use.

Table 47
Use Segmentation of Land Sale Activity – La Grulla Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acres	Mean Price/Unit	Coefficient of Variance
La Grulla	**21**	**231**	**$48,272**	**150.00%**
Commercial	6	4.57	$3.00	60.00%
Rural Highway	2	20.31	$0.45	91.00%
Subdivision Lots	1	44	$21,591	0.00%
Subdivision Potential	1	11.13	$12,354	0.00%
Rural Residential	4	9.965	$5,719	44.00%
Agriculture	5	903	$2,226	45.00%

La Grulla Submarket Area Sales



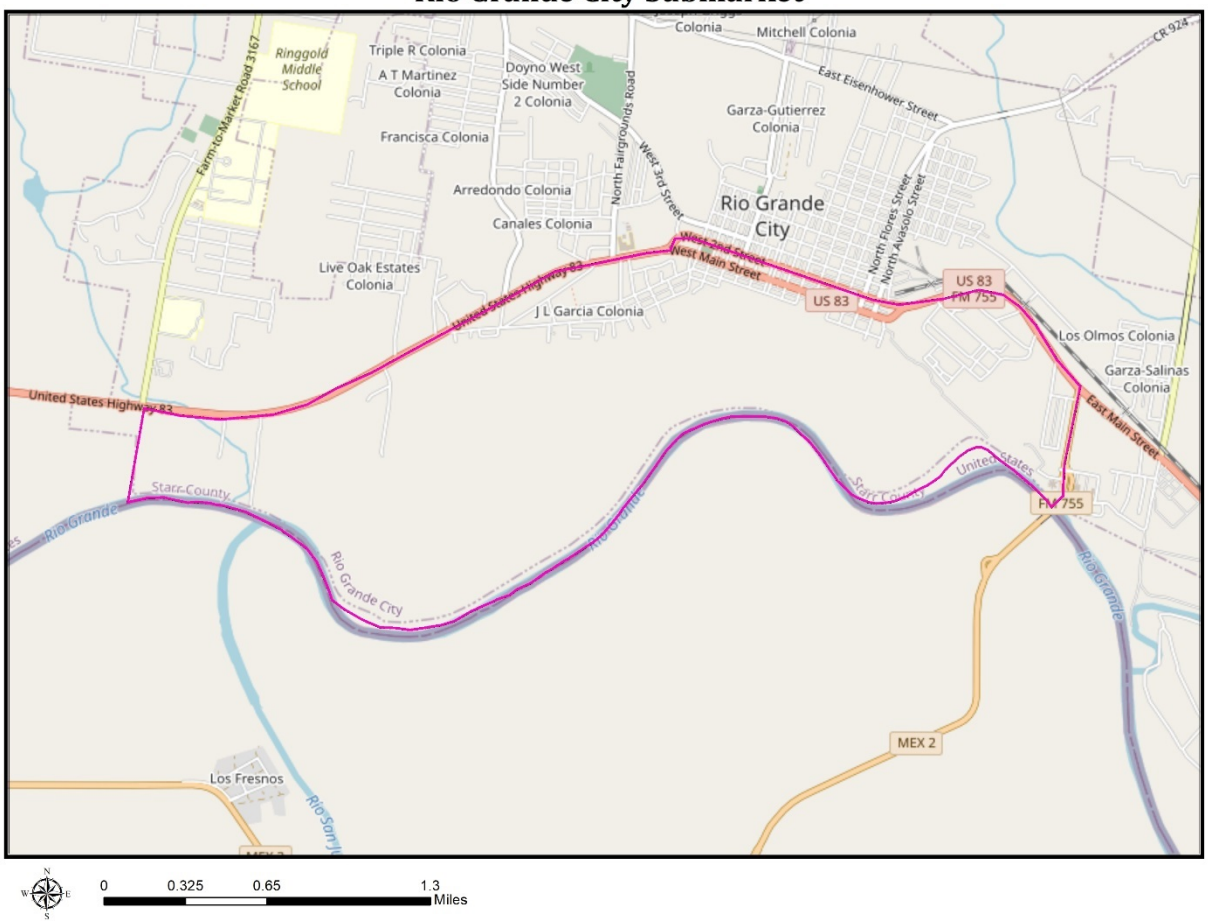
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Rio Grande City Submarket

The Rio Grande City Submarket is generally bordered on the north by US Highway 83, on the east by Pete Diaz Avenue, on the south by the Rio Grande River and on the west by Farm to Market Road 3167. The area is generally the Rio Grande City area south of US Highway 83 to the Rio Grande River, and includes the southern incorporated area of Rio Grande City.

The Rio Grande City Submarket has incurred a decline in population levels over the past several decades. The population level for this submarket in 2019 was estimated at 1,409 persons. However, it is noted that the area of Rio Grande City north of US Highway 83 and outside the specific submarket are growing in population, and Rio Grande City overall seems to be outperforming other Starr County areas in terms of growth. Per capita income is at the high end of the range, but household size is generally smaller, but household incomes are still high. The Rio Grande City Submarket has one international crossing, and the bridge at Rio Grande City is the primary truck crossing center for Starr County.

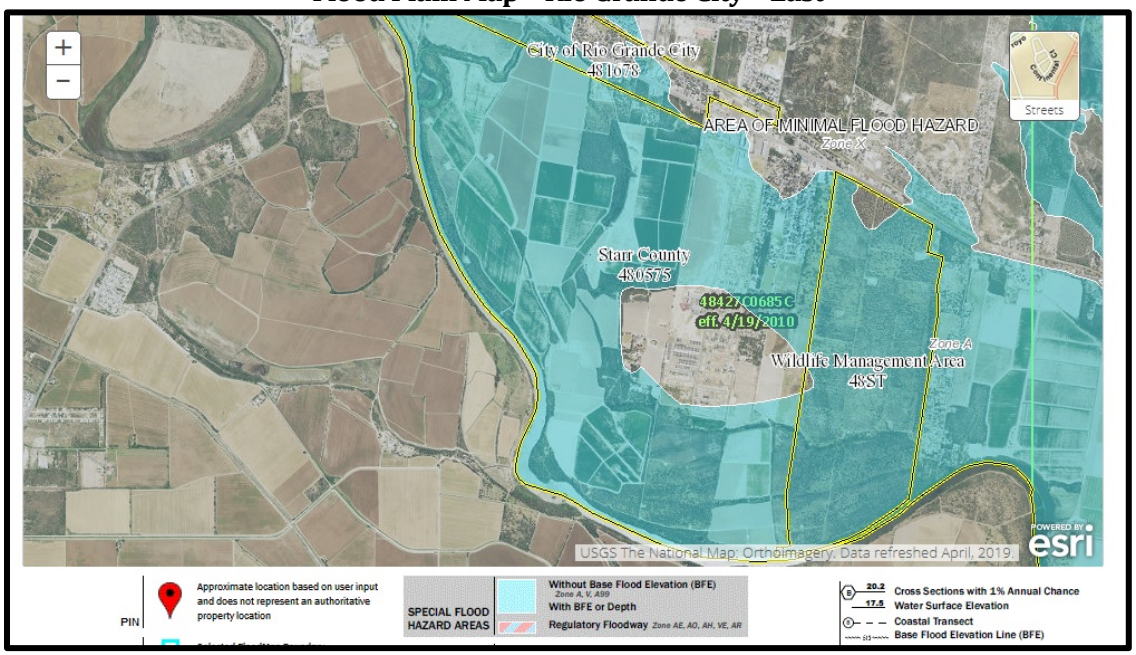
Rio Grande City Submarket



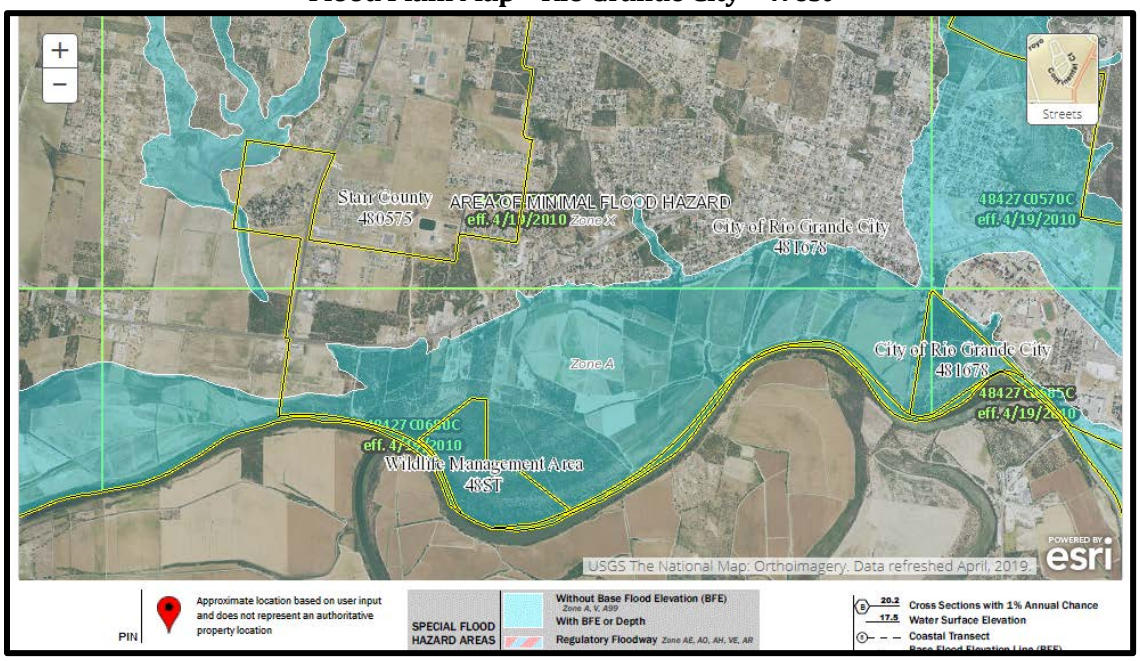
Land Sales Summary

The Rio Grande City Submarket is situated south of US Highway 83 in and around the immediate Rio Grande City incorporated area. Research of sales in the defined submarket (south of US Highway 83) did not locate any sale activity as this area is limited in physical size, and also due to its proximity to the Rio Grande, which presents physical limitations to development due to flood plain as reflected on the following flood plain maps.

Flood Plain Map – Rio Grande City – East



Flood Plain Map – Rio Grande City – West



Given these physical characteristics of the Rio Grande City Submarket, and the anticipated Border Wall alignment, it is likely that agriculture and rural recreational land uses will be the most likely applicable land sales for this submarket. However, in order to gain some understanding of land sale activity in the immediate Rio Grande City area, the sales north of US Highway 83 are presented, even though such sales may not be applicable to Border Wall acquisitions further south of US Highway 83 in the Rio Grande City Submarket being identified in this study. The following Table 48 presents the land sales activity in and around Rio Grande City and north of US Highway 83.

Table 48 – Rio Grande City Land Sale Summary

Sale	Sale Date	Acres	Price	PPUnit	Unit	HBU	Legal Access	Access	Land Cover
RGVS184	5/30/2014	0.44	$42,500	$2.22	SF	Residential	Public	Paved	Brush
RGVS179	2/17/2016	0.09	$5,000	$1.28	SF	Residential	Public	Paved	Brush
RGVS202	11/13/2015	0.1109	$15,000	$3.11	SF	Residential	Public	Paved	Vacant
RGVS143	5/15/2017	0.2087	$21,000	$2.31	SF	Residential	Public	Paved	Vacant
RGVS146	5/10/2019	0.165	$25,000	$3.48	SF	Residential	Public	Paved	Vacant
Mean		**0.20292**		**$2.48**	**SF**				
Standard D.				**$0.86**					
RGVS199	11/1/2018	0.4436	$155,000	$8.02	SF	Commercial	Public	Paved	Vacant
RGVS172	7/19/2019	0.28	$38,000	$3.12	SF	Commercial/Residential	Public	Paved	Brush
RGVS173	4/11/2016	0.55	$185,000	$7.72	SF	Commercial	Public	Paved	Brush
RGVS168	10/18/2019	0.94	$163,736	$4.00	SF	Commercial	Public	Paved	Brush
RGVS167	6/7/2006	0.94	$163,736	$4.00	SF	Commercial	Public	Dirt/Gravel	Hay/Pasture
Mean		**0.63072**		**$5.37**	**SF**				
Standard D.				**$2.31**					
RGVS	4/25/2014	17.414	$139,200	$7,994	Acre	Rural Highway	Public	Paved	Brush
RGVS3	9/14/2016	5.3	$37,500	$7,081	Acre	Subdivision Potential	Public	Paved	Hay/Pasture
RGVS94	6/2/2017	35.5	$245,000	$6,901	Acre	Rural Residential	Public	Paved	Brush
RGVS116	3/22/2019	378.05	$1,134,150	$3,000	Acre	Rural Recreation	Public	Paved	Brush
RGVS83	6/22/2015	129.6	$280,000	$2,160	Acre	Rural Recreation	Easement	Dirt	Brush
RGVS160	11/6/2013	189.07	$275,000	$1,454	Acre	Rural Recreation	Public	Paved	Brush
RGVS137	11/13/2014	107.713	$150,798	$1,400	Acre	Rural Recreation	Easement	Dirt	Brush
RGVS161	6/3/2014	189.07	$350,000	$1,851	Acre	Rural Recreation	Public	Paved	Brush
Mean		**198.70**		**$1,973**	**Acre**				
Standard D.				**$652**					

The sales researched in the Rio Grande City Submarket are segmented based on highest and best use, and as expected, the variance in the sales data is reduced when the data is compared by use as shown below in Table 49.

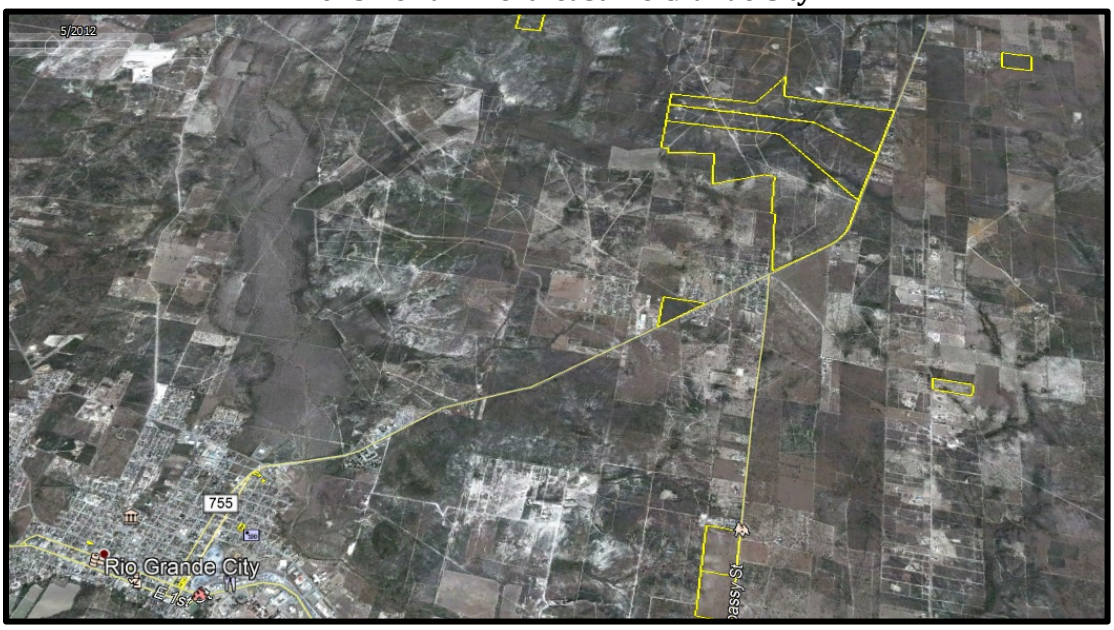
Table 49
Use Segmentation of Land Sale Activity – Rio Grande City

Submarket/HBU	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Coefficient of Variance
Rio Grande City	**18**	**58.66**	**$96,778**	**114.98%**
Residential	5	0.203	$2.48	34.70%
Commerical	5	0.63	$5.37	43.00%
Rural Highway	1	17.414	$7,994	0.00%
Subdivision Potential	1	5.3	$7,081	0.00%
Rural Residential	1	35.5	$6,901	0.00%
Rural Recreation	5	198.7	$1,973	33.10%

As expected, the sales data surrounding Rio Grande City shows land tracts that are small residential city lots and commercial lots have considerable higher unit prices. As noted, these sales may not be applicable to anticipated Border Wall acquisitions, depending on the ultimate Border Wall alignment in relation to the flood plain. The more applicable sales would seem to be the rural recreation sales which have the lowest price per unit of the other sales. It should also be noted, that the Rio Grande City High School campus was constructed over the past several years along FM 755 northeast of the city limits, and it appears this construction has influenced a direction of growth toward that area, which has included the expansion of urban infrastructure in this area and new roadway infrastructure extending north from US

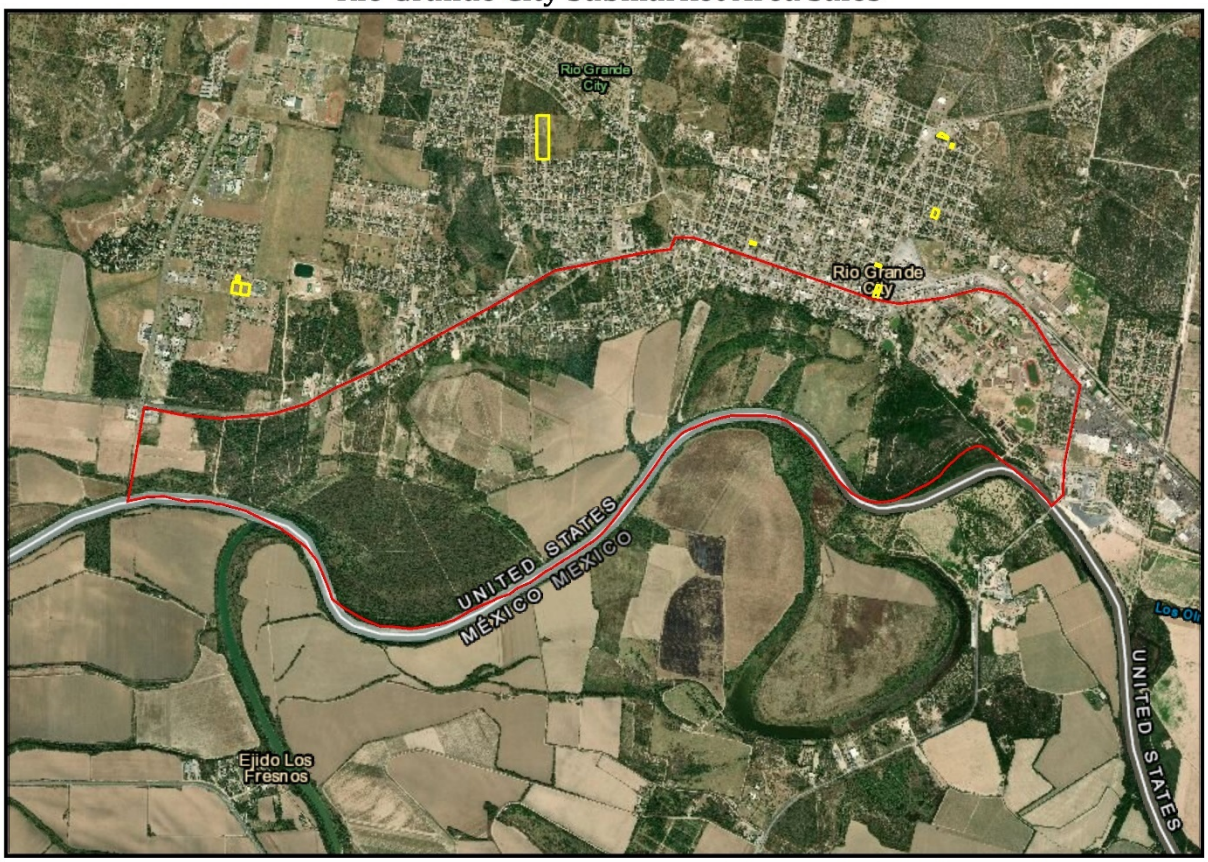
Highway 83. The following aerials seem to show this change in roadway infrastructure by comparing a 2013 aerial to a 2017 aerial.

2013 Aerial – Northeast Rio Grande City



2017 Aerial – Northeast Rio Grande City

Rio Grande City Submarket Area Sales



0 0.325 0.65 1.3 Miles

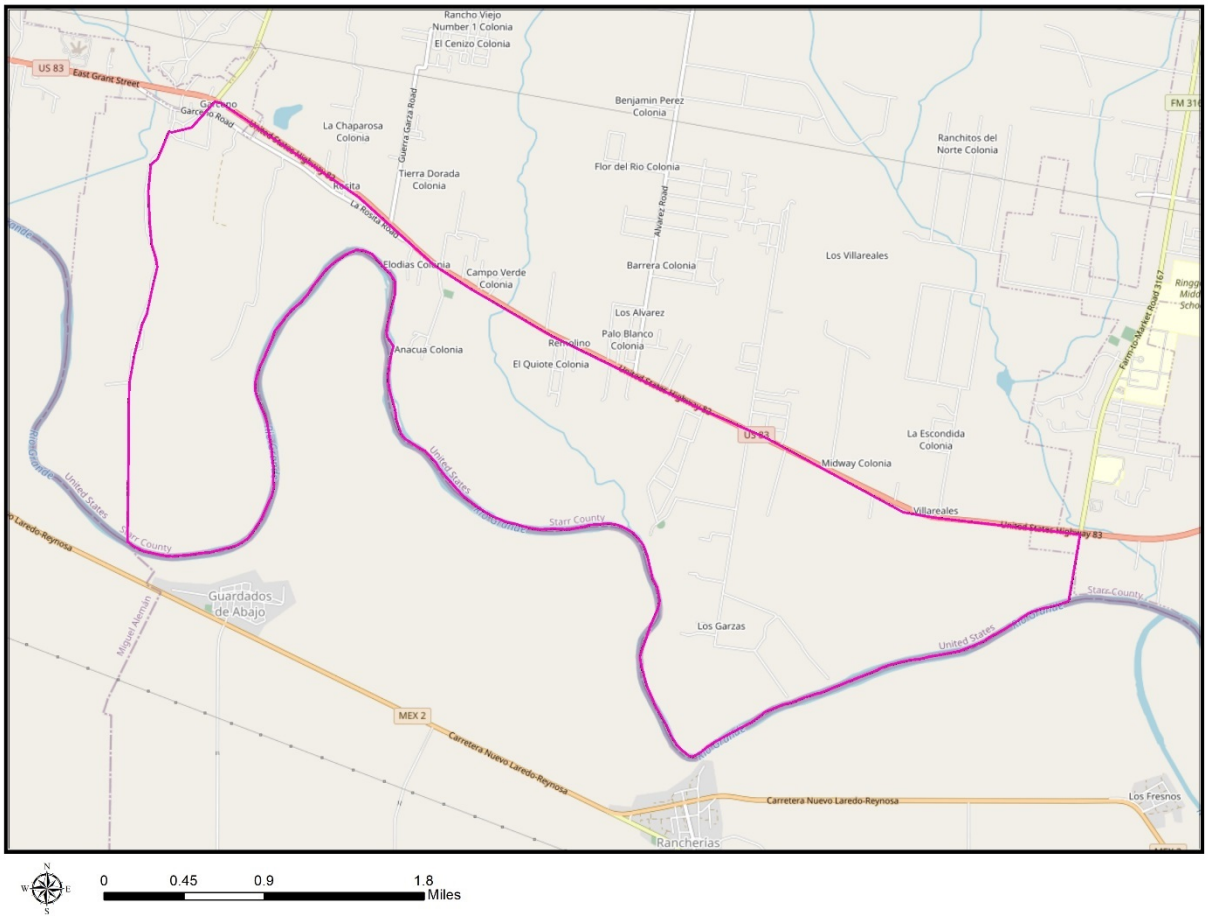
Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

La Rosita Submarket

The La Rosita Submarket is generally bordered on the north by US Highway 83, on the east by Farm to Market Road 3167, on the south by the Rio Grande River, and on the west by Bazan Lane. The submarket extends between Rio Grande City and Roma south of US Highway 83 to the Rio Grande River.

The La Rosita Submarket has incurred an increase in population levels over the past several decades, but the submarket is rural in nature as the population level for this submarket in 2019 was estimated at 1,474 persons. The La Rosita Submarket does not have an international crossing.

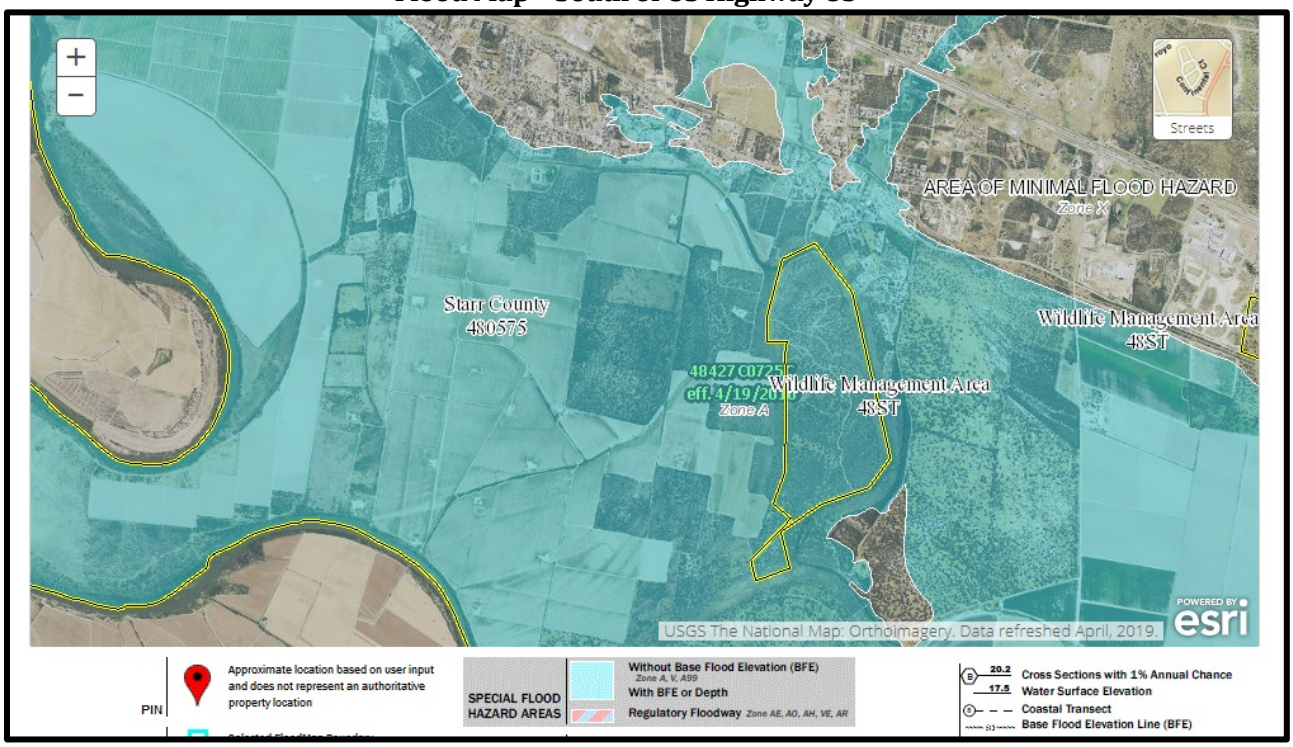
La Rosita Submarket



Land Sale Summary

The La Rosita Submarket begins just west of the Rio Grande City limits and includes the peripheral area west of Rio Grande City, various unincorporated communities including Los Villareales and La Rosita. The area is primarily served by the Roma School District, but the Rio Grande City School District serves the east portion. The submarket is situated south of US Highway 83, but research of land sales found few sales south of US Highway 83, and significant portions of this area are in the flood plain as shown on the following map.

Flood Map – South of US Highway 83



Due to the lack of activity south of US Highway 83, sales data to the north, but in general proximity to the US Highway 83 alignment, is presented for this submarket. Table 50 summarizes the sale data.

Table 50 – La Rosita Submarket Land Sale Summary

Sale	Date	Acres	Price	PPUnit	Unit	HBU	Legal Access	Access	Land Cover
RGVS112	9/20/2019	4.15	$53,000	$0.29	SF	Residential	Public	Paved	Vacant
RGVS114	1/2/2019	5	$65,000	$0.30	SF	Residential	Public	Paved	Vacant
RGVS113	11/22/2018	5	$65,000	$0.30	SF	Residential	Public	Paved	Vacant
RGVS115	11/14/2018	4.97	$65,000	$0.30	SF	Residential	Public	Paved	Vacant
RGVS110	10/30/2018	4.89	$55,000	$0.26	SF	Residential	Public	Paved	Vacant
RGVS109	10/26/2018	4.97	$65,000	$0.30	SF	Residential	Public	Paved	Vacant
RGVS108	10/24/2018	5	$65,000	$0.30	SF	Residential	Public	Paved	Vacant
RGVS144	7/27/2017	0.540	$45,000	$1.91	SF	Residential	Public	Paved	Vacant
RGVS181	6/10/2014	0.2	$16,000	$1.84	SF	Residential	Public	Paved	Brush
Mean		**3.86**		**$0.64**	**SF**				
SD				**$0.70**					
RGVS200	4/9/2014	12.52	$650,000	$1.19	SF	Commercial	Public	Paved	Brush
RGVS22	5/2/2019	32.67	$160,000	$4,897	Acre	Subdivision Potential	Public	Paved	Brush
RGVS107	8/24/2018	17.67	$70,000	$3,962	Acre	Subdivision Potential	Public	Dirt/Gravel	Hay/Pasture
RGVS52	12/22/2010	89.15	$300,000	$3,365	Acre	Subdivision Potential	Public	Dirt/Gravel	Brush
Mean		**46.497**		**$4,075**	**Acre**				
SD				**$772**					
RGVS46	4/26/2010	167.17	$377,500	$2,258	Acre	Agriculture	Public	Paved	Hay/Pasture

The sales researched in the La Rosita Submarket are segmented based on highest and best use. The majority of the activity involved residential sales. A number of the sales are larger residential tracts (5 acres) but reportedly included utilities and completed road infrastructure. As such, these sales are considered more similar to a residential lot as compared to a rural residential tract. However, the per

unit prices on a square foot basis is lower than the typical residential lot due to the land size factor, as several smaller residential lots sales are more in line (slightly lower) with the residential lot sale prices found in the Rio Grande City area. The land sales in the La Rosita Submarket are broken out by highest and best use and shown on Table 51.

Table 51
Use Segmentation of Land Sale Activity – La Rosita Submarket

Submarket/HBU	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Coefficient of Variance
La Rosita	**14**	**25.28**	**$22,784**	**122.00%**
Residential	9	3.86	$0.64	109.00%
Commerical	1	12.52	$1.19	0.00%
Subdivision Potential	3	46.5	$4,075	18.90%
Agriculture	1	167.17	$2,258	0.00%

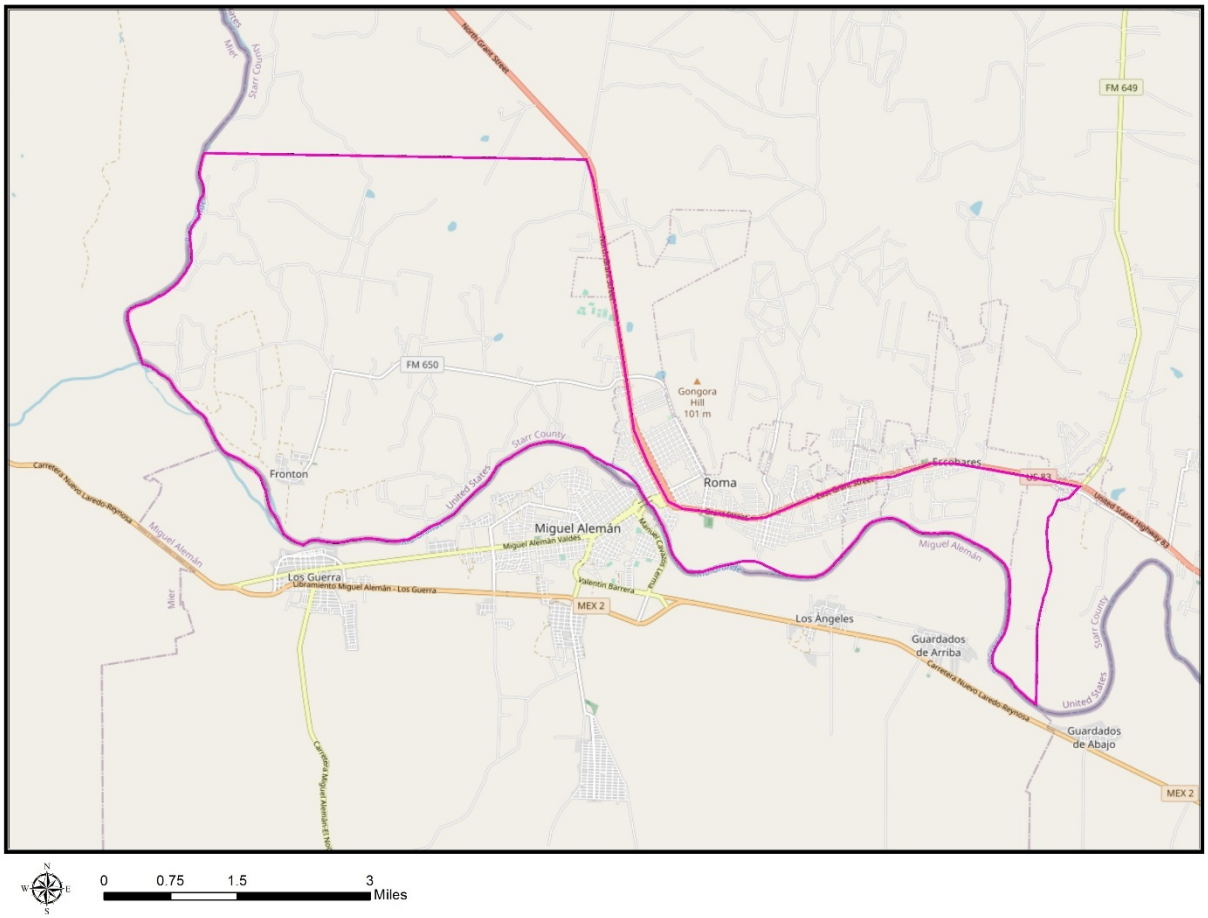
La Rosita Submarket Aerial of Land Sales

Roma Submarket

The Roma Submarket is generally bordered on the north by US Highway 83, on the east by Bazan Lane, on the south by the Rio Grande, and on the west at the intersection of US Highway 83 and Loma Blanca Road. The submarket includes the incorporated areas of Roma and Escobares.

The Roma Submarket has incurred an increase in population levels over the past several decades, but the area has not grown at the rate of the overall Rio Grande Valley, as the submarket has declined in relative share by 0.17 %. The population level for this submarket in 2019 was estimated at 7,742 persons. Per capita income is at the low end of the range. The Roma Submarket has one international crossing, with minimal truck crossing activity but greater vehicle and pedestrian activity.

Roma Submarket

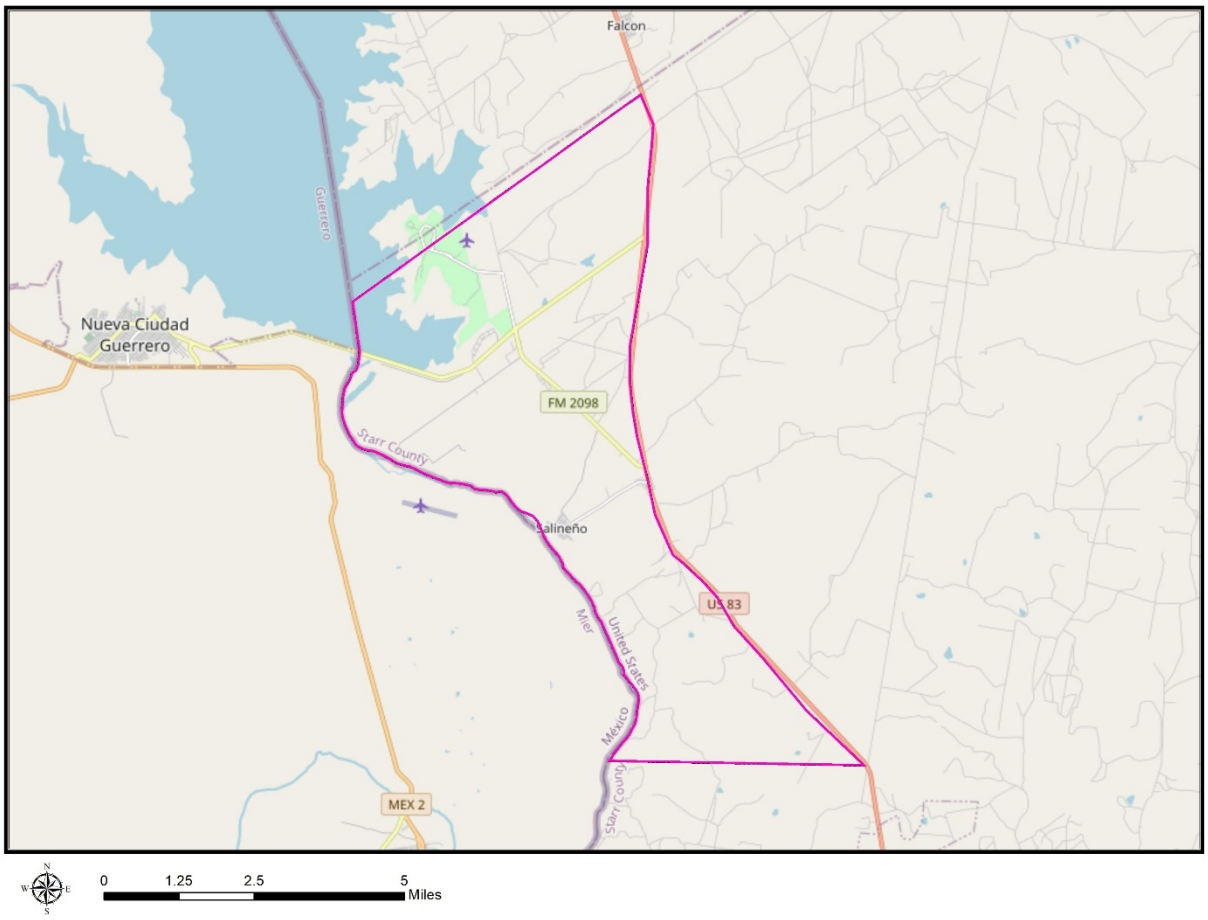


Falcon Submarket

The Falcon Submarket is generally bordered on the north by Falcon Lake, on the east by US Highway 83, on the west by the Rio Grande and on the south at the intersection of US Highway 83 and Loma Blanca Road. The area is rural in nature and is generally located in the area south of Falcon Lake, a manmade lake formed by Falcon Dam on the Rio Grande.

The Falcon Submarket has incurred a slight increase in population levels over the past several decades, but the area has not grown at the rate of the overall Rio Grande Valley. The population level for this submarket in 2019 was estimated at 1,400 persons. Per capita income is at the high end of the range. The Falcon submarket has one international crossing at Falcon Dam, and crossing activity is minimal compared to the other crossings in the Rio Grande Valley.

Falcon Submarket



Land Sale Summary - Roma/ Falcon Submarket

The Roma and Falcon Submarkets are combined as there is a lack of sales data in this area to merit separate analysis. Similar to the La Rosita Submarket, the research found limited sale activity south and west of US Highway 83. As such, sales further north and east are being presented as a way to gauge some understanding of the Roma and Falcon Submarket. Table 52 summarizes the sale data.

Table 52 – Roma/Falcon Submarket Land Sale Summary

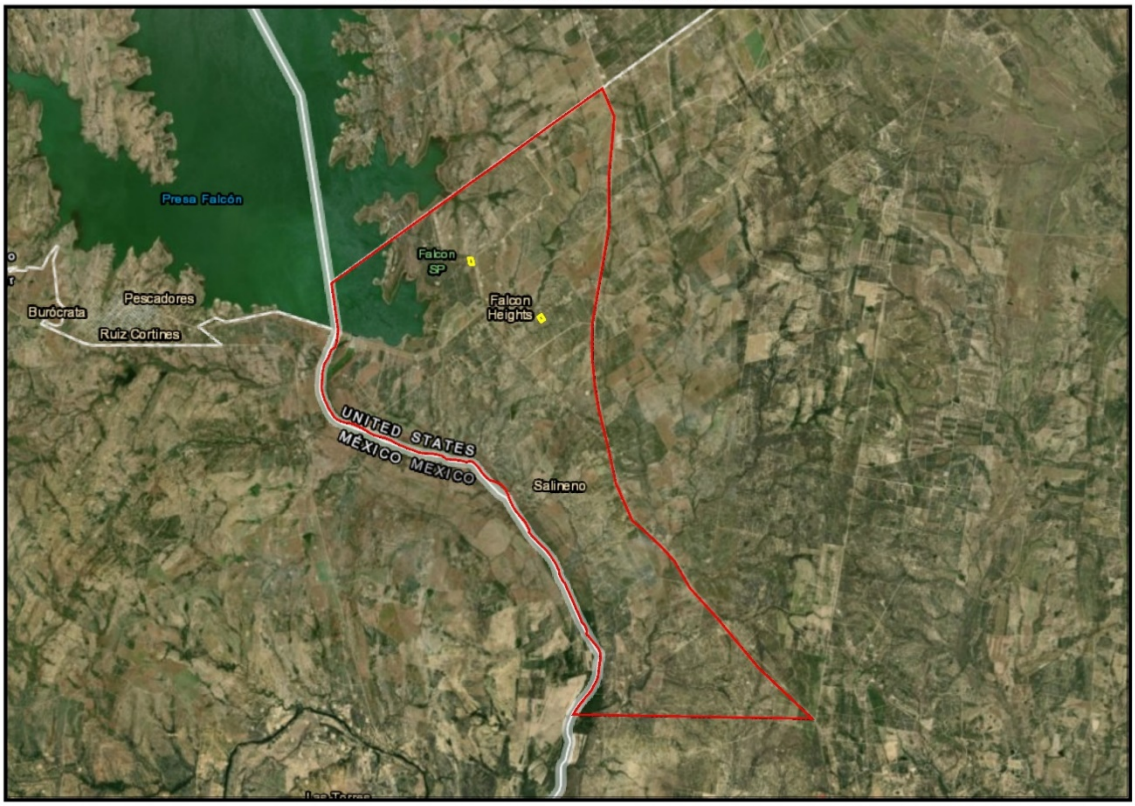
Sale	Sale Date	Acres	Price	PPUnit	Unit	HBU	Legal Access	Access	Land Cover
RGVS190	6/23/2015	0.3166	$16,000	$1.16	SF	Residential	Public	Paved	Brush
RGVS183	2/27/2015	0.1736	$17,500	$2.31	SF	Residential	Public	Paved	Brush
RGVS182	1/19/2015	0.1983	$17,000	$1.97	SF	Residential	Public	Paved	Brush
Mean		**0.2295**		**$1.81**	**SF**				
SD				**$0.59**					
RGVS98	9/6/2017	5.01	$37,920	$7,569	Acre	Rural Residential	Public	Dirt/Gravel	Brush
RGVS121	8/30/2019	35.92	$120,000	$3,341	Acre	Rural Residential	Public	Paved	Brush
RGVS104	6/8/2018	10.36	$36,260	$3,500	Acre	Rural Residential	Public	Paved	Hay/Pasture
RGVS177	12/13/2013	29.22	$67,197	$2,300	Acre	Rural Residential	Public	Paved	Brush
Mean		**20.1275**		**$4,177**	**Acre**				
SD				**$2,323**					
RGVS180	1/28/2014	5.52	$70,000	$1,944	Lot	36 Subdivision Lots	Public	Paved	Brush
RGVS128	5/24/2013	54.05	$108,000	$1,998	Acre	Rural Recreation	Public	Dirt/Gravel	Brush
RGVS103	6/1/2018	317.2	$904,020	$2,850	Acre	Rural Recreation	Public	Paved	Brush
RGVS111	11/5/2018	55.18	$110,000	$1,993	Acre	Rural Recreation	Public	Dirt/Gravel	Brush
RGVS32	6/18/2008	231	$346,500	$1,500	Acre	Rural Recreation	Public	Dirt/Gravel	Brush
RGVS73	6/18/2014	972.59	$2,200,000	$2,262	Acre	Rural Recreation	Easement	Dirt/Gravel	Brush
RGVS24	10/10/2007	300	$269,900	$900	Acre	Rural Recreation	Easement	Dirt	Brush
Mean		**321.67**		**$1,917**	**Acre**				
SD				**$665**					
RGVS16	6/22/2018	597.98	$920,000	$1,539	Acre	Agriculture	Public	Dirt/Gravel	Cropland

The sales in the Roma/Falcon area include residential lots, rural residential, subdivision land, rural recreation, and agriculture land uses. The prices found in the residential lots are generally similar to those found in the other submarkets. The dominate land use type in the Roma/Falcon area is rural recreation, as much of the land uses besides the areas located near the Rio Grande, northwest of Roma, generally do not support agriculture production uses. The following table shows the land sales by the highest and best use.

Table 53
Use Segmentation of Land Sale Activity – Roma/Falcon Submarket

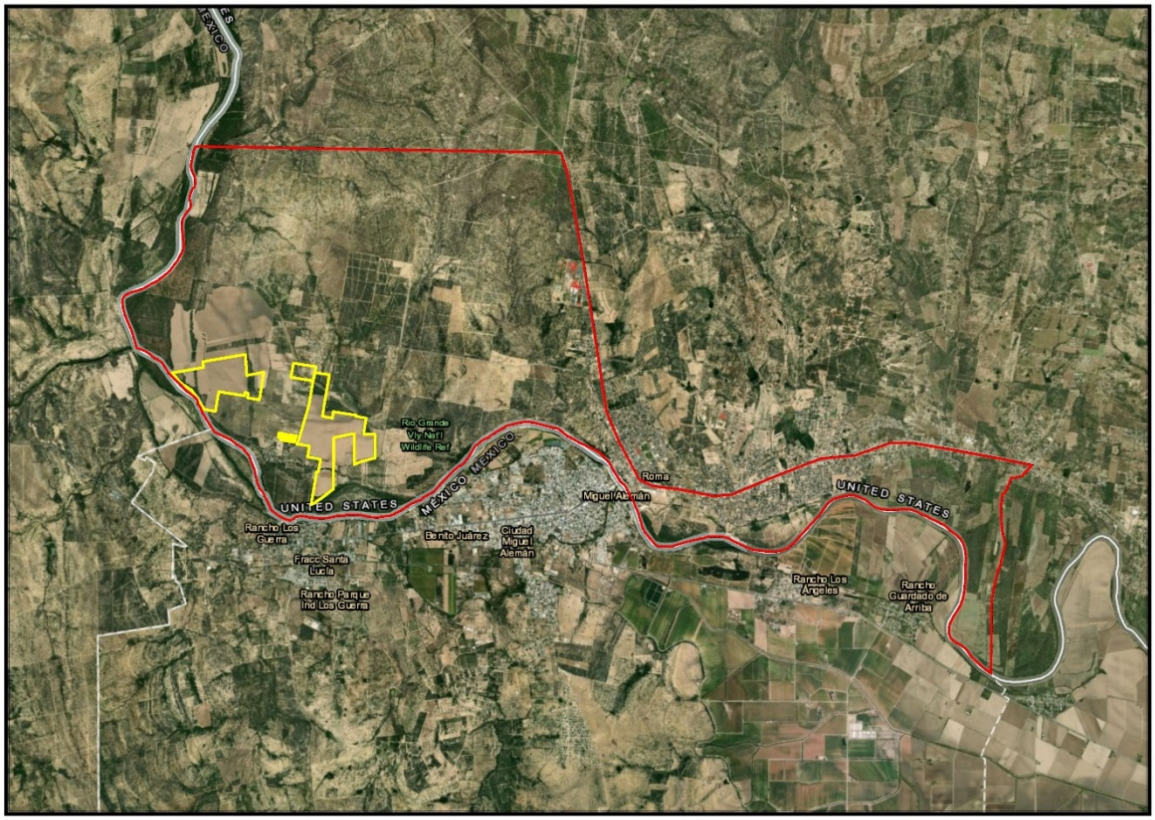
Submarket/HBU	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Coefficient of Variance
Roma/Falcon	**15**	**174.31**	**$18,627**	**176.00%**
Residential	3	0.2295	$1.81/SF	32.60%
Subdivision	1	5.52	$1,944/Lot	0.00%
Rural Residential	4	20.13	$4,177	55.60%
Rural Recreation	6	321.67	$1,917	34.68%
Agriculture	1	597.98	$1,539	0.00%

Falcon Submarket Area Sales



Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Roma Submarket Area Sales



Note: Some sales may have been excluded from analysis due to building improvements or other attributes. Such exclusions are explained in the narrative.

Starr County Land Sale Comparative Analysis

Based on the research of land sales that has been completed, it is believed that the rural residential, rural recreation and agriculture sales will be most applicable to the Border Wall acquisition, as the anticipated Border Wall alignment generally follows the international border alignment, south and west of US Highway 83. There are areas around Rio Grande City and Roma where the anticipated Border Wall alignment will be in proximity to US Highway 83; therefore, a brief summary of the commercial and residential sales is also presented, in the event these uses become relevant to a specific valuation.

Starr County Commercial Land Sales Summary

The Starr County commercial land sales are primarily concentrated in the La Grulla Submarket and in Rio Grande City. The Rio Grande City location had the highest unit prices, but also had the smallest size on average when compared to La Grulla. The following Table 54 summarizes the commercial sales activity by submarket.

Table 54
Summary of Commercial Land Sales by Starr County Submarket

Submarket	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Rank
La Grulla	6	4.57	$3.00	2
Rio Grande City	5	0.63	$5.37	1
La Rosita	1	12.52	$1.19	3
Roma/Falcon	0	0	$0.00	

Buyer Type (Investor v. End User)

Besides tract size, the most distinguishing variable in the commercial land prices seem to be associated with buyer type, as end user (sales acquired for an actual use as opposed to an investment/speculation) brought a higher price as compared to the investor or speculative purchases. This comparison is presented in the following table and suggests a 75% discount in price to investor sales compared to end user sales, after consideration for tract size.

Table 55
Pairing of Buyer Type
Starr County Commercial Land Sales

Sale	Price/SF	Size		Sale	Price/SF	Size
RGVS 95	$5.03	1.14		RGVS 5	$0.77	7.5
RGVS 207	$3.55	1.68		RGVS171	$0.74	4.6
RGVS 197	$2.51	6.26	**vs**	RGVS166	$0.85	3.9
RGVS 198	$4.90	0.89				
Avg.	$4.00	2.49		Avg.	$0.79	5.33
Size Adjusted	$3.12				$0.79	
Investor Sale		75.00% Discount				

Tract Size

As to size adjustment for the commercial sales, the investor sales generally do not show much price variance due to size, but some size adjustment could be derived from the end user sales. Sale RGVS 197, after a 10% date of sale adjustment, would indicate a time adjusted price of $2.76/SF ($2.51/SF x 1.10 =

$2.76/SF). The pairing in Table 56 indicates an adjustment of $.000007/SF. When adjusting the end user commercial sales to the investor buyer sales, a 75% discount is suggested for investor commercial tracts when compared to end user commercial tracts.

Table 56
Pairing of Size – Starr County Commercial Land Sales

Sale	PPSF	Size/SF		Sale	PPSF	Size/SF
RGVS95	$5.03	49,658		RGVS197	$2.76	288,629
RGVS207	$3.55	71,438				
RGVS198	$4.90	38,768	**vs**			
Avg.	$4.49	53,288		Avg.	$2.76	288,629

Price Difference	$1.73	SF
Size Difference	235341	SF
$	0.000007	per SF difference

Starr County Residential Lot Sales Summary

The residential lots sales were concentrated in Rio Grande City and La Rosita Submarkets. The Rio Grande City lots brought the highest price per unit and this indication is consistent with expectations as Rio Grande City is the most populated incorporated area in Starr County and seems to serve as the hub of commercial activity in much of Starr County. Although La Grulla did not contain any single lot sale transactions, that location is viewed as being similar to the Rio Grande City location due to the proximity to Rio Grande City on the west and Hidalgo County on the east.

Table 57
Summary of Residential Lot Sales
by Starr County Submarket

Submarket	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Rank
La Grulla	0	0	$0	
Rio Grande City	5	0.203	$2.48	1
La Rosita	9	3.86	$0.64	3
Roma/Falcon	3	0.2295	$1.81	2

Location

The lots in Roma have sold at a 27% lower price when compared to the lots in Rio Grande City, ($1.81 SF/$2.48 SF, = 73%-100% = 27%). The lots in La Rosita are considerably lower in price, but this is influenced by a group of larger sized lots that reduced the overall average. Disregarding the larger lot sizes in La Rosita, the two smaller lots in La Rosita brought an average sale price $1.88 SF, with a similar size to the Rio Grande City lots. This pairing would suggest a location adjustment when comparing the La Rosita submarket to the Rio Grande City Submarket of 24%, ($1.88/$2.48 = 76%-100% = 24%). Therefore, a location adjustment for the residential sales between the submarkets would seem to fall in the area of a 25% downward adjustment to the Rio Grande City sales when compared to La Rosita and Roma/Falcon locations.

Additional evidence of the superior location of La Grulla and Rio Grande City would be the pairing of bulk residential lot sales. RGVS 195 is a 44-lot bulk sale of finished lots in the La Grulla Submarket, but also

located approximately four miles southeast of Rio Grande City and in the Rio Grande City school district. RGVS 195 sold for $21,591 per lot. RGVS 180 was a 36-lot bulk sale situated north of the small community of Fronton in the Roma Submarket. RGVS 180 sold for $1,944/lot. It is recognized that this pairing may not be appropriate for individual lot sales as it probably also reflects a difference in physical conditions at the subdivisions and difference in new housing demands, but it does confirm that there exists location differences between La Grulla and Rio Grande City compared to the Roma/Falcon submarkets as it pertains to the residential use type.

Starr County Subdivision Development Land Sales Summary

The sales research identified five sales of land suitable for possible subdivision development. The indications from the sales suggest a similar conclusion to location difference between the submarkets. Table 58 summaries these sales.

Table 58
Summary of Subdivision Development Land Sales
by Starr County Submarket

Submarket	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Rank
La Grulla	1	11.13	$12,354	1
Rio Grande City	1	5.3	$7,083	2
La Rosita	3	46.5	$4,075	3
Roma/Falcon	0	0	$0	0

The sales show that La Grulla has the highest price, followed by Rio Grande City. However, the Rio Grande City sale is on the west side of Rio Grande City, whereas the growth trend for Rio Grande City seems to be toward the east. There is some size difference between the La Rosita sales, the La Grulla and Rio Grande City sales, but even with some consideration for size difference, a location difference would still be apparent when comparing the La Rosita location to the Rio Grande City and La Grulla location.

Starr County Rural Residential Land Sales Summary

The research identified nine sales that were suited for a rural residential land use. The average sale price by submarket follows the indications that have been identified in the other land use types. La Grulla and Rio Grande City Submarkets have a higher price which seems to be attributed to a superior location. The following table summarizes the rural residential tract sales by submarket.

Table 59
Summary of Rural Residential Tract Sales
by Starr County Submarket

Submarket	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Rank
La Grulla	4	9.965	$5,719	2
Rio Grande City	1	35.5	$6,901	1
La Rosita	0	0	$0	0
Roma/Falcon	4	20.13	$4,177	3

The sales data shows some variance in date of sale, tract size, and location between the submarkets based on prior analysis of the residential lot sales. The following addresses these price factors for rural residential land uses.

Date of Sale

Several pairings are available to derive a date of sale adjustment. The following table presents these pairings.

Table 60
Rural Residential Tract Sale Pairings – Date of Sale

Sale	Sale Date	Size/Acres	PPA
RGVS185	11/13/2014	12.35	$3,482
RGVS191	8/21/2019	15.16	$3,628
Price Change			4.20%
Months			58
Price Change Per Month			0.072%
RGVS186	5/13/2015	6	$7,500
RGVS12	3/1/2018	6.35	$8,268
Price Change			10.24%
Months			34
Price Change Per Month			0.301%

The two sets of pairings show price increases over the past several years with a range from .074% per month, or .89% annualized, to .301% per month or 3.6% annualized. On average these two parings would suggest .1875% or 2.25% percent annualized which is near typical inflation levels. For purposes of deriving a size adjustment and location adjustment, a date of sale adjustment of .1875% per month is utilized.

Tract Size

The sale price of land generally regresses as the tract size increases. Because it is believed some location factor likely exists in the data, a size adjustment is derived based on pairings of differing sized sales within the La Grulla and Roma/Falcon submarket. The sale prices used in the group pairings are adjusted for date of sale based on a rate of .1875% per month. The La Grulla sales are adjusted to the most recent sale date in the group. La Grulla sales are adjusted to August 21, 2019 and the Roma/Falcon sales are adjusted to August 30, 2019, which is the most recent sale date in that group of sales.

The following tables derive the price/tract size relationship after adjustment for date of sale.

Table 61
Paired Sales for Tract Size - Rural Residential Tracts
La Grulla Submarket

Sale	PPA	Size		Sale	PPA	Size
RGVS12	$8,552	6.35		RGVS191	$3,628	15.16
RTVS186	$8,267	6	**vs**	RGVS185	$3,882	12.35
Avg.	$8,410	6.18		Avg.	$3,755	13.76

Price Difference	$4,655	acre
Size Difference	7.58	acres
	$ 614.12	per acre difference

Table 62
Paired Sales for Tract Size - Rural Residential Tracts
Roma/Falcon Submarket

Sale	PPA	Size		Sale	PPA	Size
RGVS98	$7,910	5.01		RGVS121	$3,341	35.92
			vs	RGVS104	$3,592	10.36
				RGVS177	$2,593	29.22
Avg.	$7,910	5.01		Avg.	$3,175	25.17

Price Difference	$4,735	acre
Size Difference	20.16	acres
	$234.89	per acre difference

Location

Location differences will be determined based on direct pairings of the data and group pairings of the sales data after adjustment for date of sale and tract size. The following is a direct pairing between RGVS 12 which is a 6.35 acre rural residential tract sale with caliche road frontage and RGVS 98 which is a 5.01 acre tract sale similar in all regards to RGVS12 except for location, and a slight date of sale adjustment to the most recent sale date in the group

Table 63 - Direct Sale Pairing for Location

Sale	Sale Date	Size/Acres	PPA	Submarket
RGVS12	3/1/2018	6.35	$8,268	La Grulla
RGVS98	9/6/2017	5.01	$7,569	Roma/Falcon
Difference			8.45%	

Another direct pairing useful to derive a location adjustment for the Starr County submarkets would be RGVS 94 paired to RGVS 121 after time adjustment to RGVS94.

Table 64 - Direct Sale Pairing for Location

Sale	Sale Date	Size/Acres	PPA	Submarket
RGVS94	6/2/2017	35.5	$7,237	Rio Grande City
RGVS121	8/30/2019	35.92	$3,341	Roma/Falcon
Difference			-53.8%	

A final method to derive location differences is by group pairing. The date of sale adjustment and size adjustments derived previously are applied to the sales to isolate the group pairing for location differences. The following Table 65 derives this pairing for location differences. The pairing of the mean adjusted sale prices between a La Grulla location and Roma/Falcon location suggests a 10% premium for the La Grulla location, ($8,311 acre/$7,531 acre = 1.104 - 1.00 = 10.4%). This amount is similar to the direct pairing between La Grulla and Roma/Falcon locations. Although this adjustment amount is lower than the Rio Grande City to Roma/Falcon pairing in Table 65, it seems that the consensus of the data would support a location premium in the area of 10% for La Grulla and Rio Grande City locations compared to Roma, Falcon, and La Rosita locations, as it pertains to rural residential land uses.

Table 65 - Group Sale Pairing for Location

Sale	Sale Date	Size/Acres	PPA	Sale Date	Adj. PPA	Size Adj.	Adj. PPA
RGVS12	3/1/2018	6.35	$8,268	3.19%	$8,531		$8,531
RGVS191	8/21/2019	15.16	$3,628	0%	$3,628	$5,286	$8,914
RGVS186	5/13/2015	6	$7,500	8.44%	$8,133		$8,133
RGVS185	11/13/2014	12.35	$3,482	10.69%	$3,854	$3,810	$7,664
Adjusted Mean La Grulla							$8,311

Sale	Sale Date	Size/Acres	PPA	Sale Date	Adj. PPA	Size	Adj. PPA
RGVS98	9/6/2017	5.01	$7,569	4.50%	$7,909		$7,909
RGVS121	8/30/2019	35.92	$3,341	0%	$3,341	$4,637	$7,978
RGVS104	6/8/2018	10.36	$3,500	2.63%	$3,592	$3,210	$6,802
RGVS177	12/13/2013	29.22	$2,300	12.75%	$2,593	$4,842	$7,435
Adjusted Mean Roma/Falcon							$7,531

Starr County Rural Recreation Land Use Sales Summary

The research identified 13 sales that were suited for a rural recreation land use. This use category is somewhat of a default category and groups land sales that did not have agriculture production use, and was not suited for rural residential uses. The rural recreation land sales show little price difference between the submarket locations. This conclusion seems to be a reasonable conclusion in that location for this land use is probably not considered as important as residential uses. The following table summarizes the mean average sale price by submarket.

Table 66
Summary of Rural Recreation Land Sales
by Starr County Submarket

Submarket	# of Sales	Mean Land Size-Acre	Mean Price/Unit	Rank
La Grulla	2	108	$2,153	1
Rio Grande City	5	198.7	$1,973	2
La Rosita	0	0	$0	0
Roma/Falcon	6	321.67	$1,917	3

Given the number of sales in this category, regression analysis is applied to assist in determining those variables that are significant and contribute to the explanation of variance. The various regression model runs included a number of variables including date of sale, tract size, location, paved road frontage, and public road or easement access. The results of the regression models suggest that date of sale is the only significant variable explaining price. Road frontage on a paved road was considered as a variable, but the regression did not suggest that the variable was significant and it made little improvement to the fit of the model.

Market Conditions/Date of Sale

The date of sale is the most significant variable when applied in all varying regression models and the regression coefficient for size generally falls around -$8 per acre per month. This equates to a price reduction going back in time. At a rate of -$8 per month, a yearly change in price would equate to -$96/acre, from year end 2019. Based on the average sale price of the 13 sales of $1,975/acre, this equates to a monthly price change of .00405% or 4.86% per year.

This date of sale adjustment amount is higher than what has been indicated for other land use types in the market, and above the typical inflation rates during the time period. The date of sale period extends from October 2007 to 2019. There is one 2007 sale and one 2008 sale, both of which are at the low end of the price range. There are two 2019 sales, one of which, RGVS116, sets the high end of the price range, and this sale does exhibit some higher use potential given its location across from the Rio Grande City high school, and the existence of this sale as being the most recent sale likely influences the date of sale coefficient to some degree.

RGVS32 is a June 2008 sale with no paved road frontage located in the Roma/Falcon submarket. RGVS111 is a November 2018 sale also with no paved road frontage in the Roma/Falcon submarket. The following table completes a pairing of these to sales to derive a date of sale adjustment.

Table 67
Rural Recreation Tract Sale Pairing – Date of Sale

Sale	Sale Date	Size/Acres	PPA
RGVS32	6/18/2008	140.43	$1,500
RGVS111	11/5/2018	55.18	$1,993
Price Change			32.86%
Months			126
Price Change Per Month			0.261%

The above pairing for date of sale shows a lower date of sale adjustment over a similar overall time frame. This pairing equates to a yearly price growth rate of around 3.13% for rural recreational land, which seems to fall more in line with the other land use types in the Starr County market.

Starr County Agricultural Land Use Sale Summary

The research identified seven sales that were suited for agricultural use. The uses were primarily for crops and two of the sales were irrigated, with the remaining five being non-irrigated. Regression analysis completed on the seven sales resulted in size and irrigation being significant variables. Due to the lack of significant sale activity in Starr County for agricultural production sales, the price factors derived in the Section 3 Farmland Analysis are believed to be most applicable to the Starr County agricultural sales.

Table 68
Starr County Agricultural Land Use Sales

Sale	Submarket	Farm Type	Deeded Acres	Sale Date	Sale Price	$/Deeded Acre	% Class I	% Class II	% Class III
RGVS135	La Grulla	Irrigated	3098.91	1/26/2006	$5,113,251	$1,650	48.73%	31.62%	0.00%
RGVS81	La Grulla	Irrigated	933.54	3/18/2016	$3,476,250	$3,724	66.95%	20.35%	0.00%
RGVS118	La Grulla	Non-Irrigated	271.51	6/13/2019	$480,000	$1,768	0.00%	29.46%	31.31%
RGVS45	Starr	Non-Irrigated	421.06	12/22/2009	$1,462,250	$3,473	0.00%	5.94%	85.50%
RGVS50	Starr	Non-Irrigated	66.48	9/7/2010	$183,000	$2,753	0.00%	60.17%	30.08%
RGVS46	La Rosita	Non-Irrigated	167.17	4/26/2010	$377,500	$2,258	0.00%	5.98%	71.78%
RGVS16	Roma	Non-Irrigated	597.98	6/22/2018	$920,000	$1,539	0.00%	0.00%	75.25%

Section 3 – Farmland Analysis

Introduction

Section 2 of the report presented data analysis utilizing statistical modeling and reconciled general adjustments with selected paired sales. These results are contained in Section 2 under the headings of *Cameron County and Hidalgo County Land Sale Comparative Analysis* and *Starr County Land Sale Comparative Analysis*. Those sections presented broad findings for agriculture and rural residential land uses as it pertains to Hidalgo and Cameron County and in addition, findings concerning rural recreation, residential lots, and commercial land uses in Starr County.

Section 3 of the report focuses on production farmland primarily located in Cameron and Hidalgo Counties. This section is intended to give an alternative analysis strategy to that found in Section 2, and is designed to look further into the production agriculture market of the Lower Rio Grande Valley. To a certain extent, this section performs its analysis independent of the findings in Section 2, though when crossover in the analysis occurs, a notation is made with reference to Section 2 denoting the findings in each section. Section 3 is primarily a data analysis exercise in which sales are analyzed for price sensitivity to six particular attributes. Those attributes include:

- market conditions (time)
- size (acres)
- soil mixtures and uses
- floodway vs non-floodway (land within floodways of the LRG Flood Control Project)
- water rights
- presence of the border wall.

Section 2 of the report presented data analysis regarding the first two items for this section, market conditions and size. The remainder of Section 3 adds to and continues with the analysis to a deeper level specifically regarding farmland throughout the study area. The total number of transactions collected during this market study exceeds 1,500 sales within the counties of Cameron, Hidalgo, Starr, and Willacy. This section primarily focuses on 79 of those sales considered to be the most beneficial for use in production agriculture valuation assignments and/or utilized to analyze those sales that have sold with water rights or sold with the Border Wall as a component of the sale. The overwhelming majority of valuation assignments created by the Border Wall Project are anticipated to be in relation to agricultural properties that may or may not have some influence from nearby development.

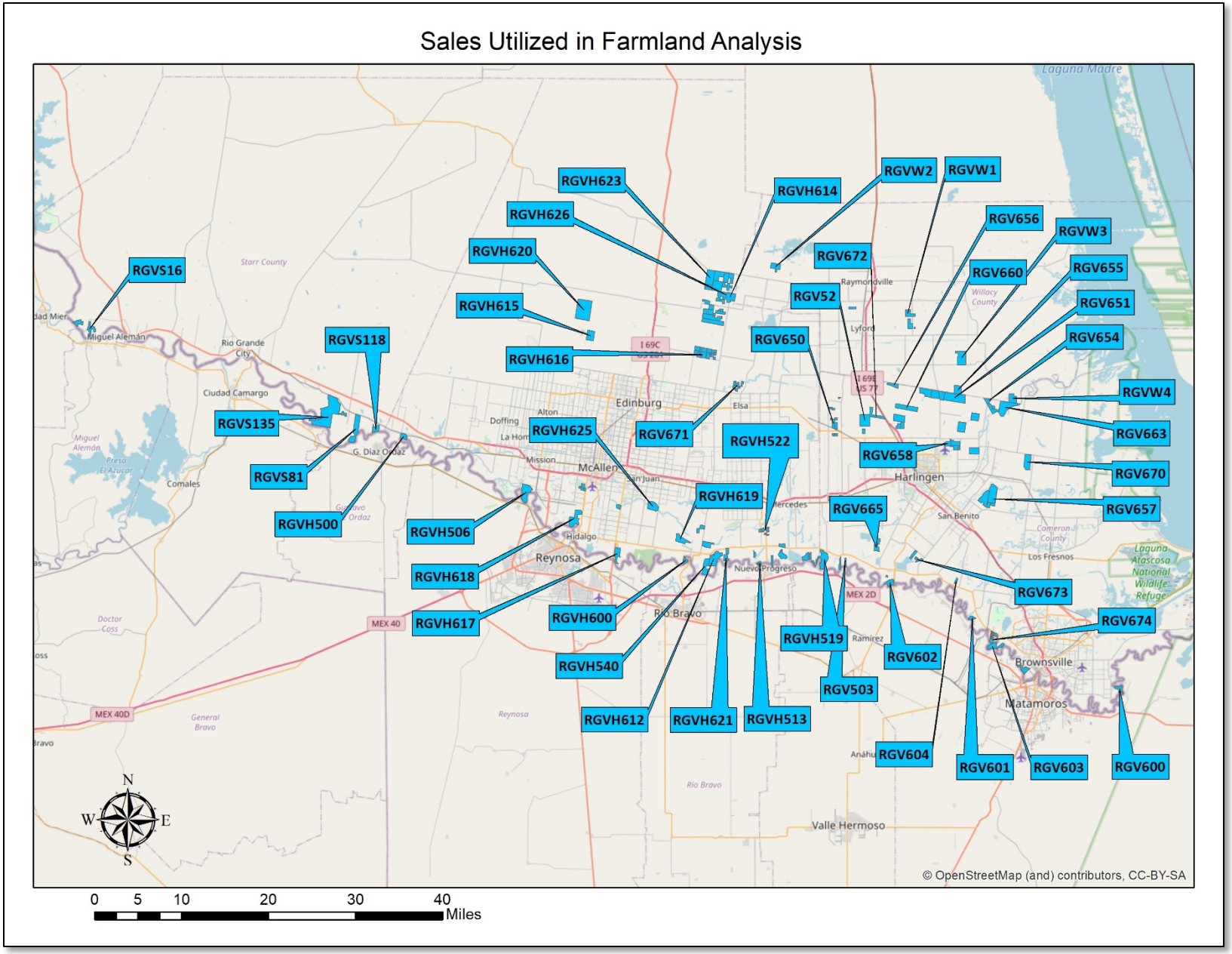
This section will outline the methodology applied to the data resulting in the market-based conclusions. It is recognized that there are multiple ways to analyze data, and we make no claim that the roadmap laid out on the following pages is the only way. We recommend that practitioners apply some attempt at identifying the components impacting value for these property types, determine a way to quantify those components, and uniformly apply them to the data sets with which they intend to derive indicated values for subject properties. While a practitioner may choose a different path, the data is clear that simply dividing a sale price by gross acres will lead to erroneous value indications, particularly within the production agriculture market of the LRGV. The following two pages present an overview of the data utilized in the analysis contained within this section. Due to size constraints, every sale was unable to be labeled on the overview map. Identifying additional sales without labels requires a review of the report's associated data books.

Table 69

Primary Data Set for Section 3								
Index	Grantor	Grantee	Date	Price	Acres	$/Ac.	AF of Water Rights	Border Fence
RGV358	Byron Driscoll, Exec of Estate of Mary Lee Rabke	Red Grain LLC	12/6/2017	$380,000	156.74	$2,424	0	No
RGV373	Ishvarlal & Chandanben Patel	Roy Rentals LP	1/16/2018	$500,000	140	$3,571	0	No
RGV475	3BU Family LTD Partnership	El Gato Rentals LLC	3/22/2019	$402,433	138.77	$2,900	0	No
RGV502	Betty L. Morgan	Ricardo De La Cruz and Norma De La Cruz	6/12/2009	$226,600	119.218	$1,901	0	Yes
RGV503	Jean Shimotsu Barrus, et al	Steve Bauer and Mary Elen Bauer, Co-Trustees of the	12/10/2012	$247,200	77.26	$3,200	0	No
RGV505	Ricardo De La Cruz and Norma L. De La Cruz	The S.D. & M.E. Bauer Living Trust, UTD July 23, 1999	7/9/2015	$404,686	119.0254	$3,400	0	Yes
RGV52	Artedian Investment Holdings, LP	Rio Farms Inc.	10/28/2011	$2,748,735	832.95	$3,300	0	No
RGV600	L & L Farms, a Texas General Partnership	Borzynski Brothers Properties, a General Partnership	5/21/2003	$471,008	235.504	$2,000	175	No
RGV601	Raul A. Cavazos Farms, Inc	Leal Farms, Inc.	7/17/2003	$253,904	126.952	$2,000	250	No
RGV602	Norman D. Flados, et. al.	Alan Johnson and Elizabeth Johnson.	12/15/2003	$231,600	241.82	$958	25	No
RGV603	Mathers Brothers Farms, Inc	Edward Mathers Farms, LP	9/27/2013	$2,000,000	669.668	$2,987	1496.25	Yes (Partial)
RGV604	Tract I: Celina Z. de Oliveira and Sylvia Z. de Cantu; Tract II: Ca	La Cuesta Sol Development, Ltd., a Texas Limited Part	6/27/2007	$492,225	135.04	$3,645	100	No
RGV650	Rojas Farms & Sajor Investments	J.P.O. Enterprises	11/11/2012	$1,566,270	521.42	$3,004	0	No
RGV651	Byron Vassberg/Wadi Musa, LLC	Rio Farms, Inc.	1/27/2014	$3,208,171	1153.7	$2,781	0	No
RGV652	John A. Abbott, II	Dwain M. Estes and Rebecca J. Estes, Trustees	4/22/2014	$1,255,110	418.373	$3,000	0	No
RGV653	Stephen Scoggins/Kesco Interests, LLC	Levi T. Burns and Wife, Brooke	4/5/2017	$962,500	385.09	$2,499	0	No
RGV654	Mark L. Abbott and wife, Molly S. Abbott	Campbell A. Patton	4/28/2017	$1,400,000	498.712	$2,807	0	No
RGV655	V & C Family Farms, Ltd	Rio Farms, Inc.	4/3/2018	$1,034,618	390.422	$2,650	0	No
RGV656	Klostermann Farms, a Texas general partnership	Rio Farms Inc., a Texas corporation	2/4/2019	$605,000	220	$2,750	0	No
RGV657	Kallion Group Management Company, LLC	Red Grain, LLC	12/26/2012	$2,556,478	845.603	$3,023	0	No
RGV658	Phoenix Farms, LTD.	Stone Brothers	12/16/2016	$2,552,445	654.9	$3,897	0	No
RGV659	James H. McDanie, etal	Sparks Family Ptrs.	10/5/2006	$746,750	500	$1,494	0	No
RGV660	C.J. McKinzie, etux	FM Properties Prts.	4/17/2006	$1,075,000	619.25	$1,736	0	No
RGV661	Barios & Yslas	Viper Ranches	9/25/2006	$1,686,000	843	$2,000	0	No
RGV662	Carricitos Farm	SB Carricitos Farms, LLC	9/13/2007	$1,782,000	630.968	$2,824	0	No
RGV663	Charles L. Shofner	S. Regan Stone, etal	12/6/2006	$1,600,000	1003.7	$1,594	0	No
RGV664	Evely E. Haynes	Rio Farms	8/16/2007	$1,001,893	516.44	$1,940	0	No
RGV665	Betty L. Morgan	Leonard P. Simmons, etux	12/8/2008	$706,973	282.789	$2,500	0	No
RGV666	FM Farms	Sparks Family Ltd. Ptrs.	5/3/2011	$1,548,125	619.25	$2,500	0	No
RGV668	Joe C. Ballenger, etux	Stone Brothers	10/5/2012	$1,390,420	695.21	$2,000	0	No
RGV669	Lane & Brown	Wadi Musa, LLC	9/12/2012	$1,250,000	500	$2,500	0	No
RGV670	J & I Partners, Ltd.	Eldorado Cattle Co.	5/12/2012	$2,015,435	620.13	$3,250	0	No
RGV671	M.L. Rhodes, Ltd.	Nowell W. Borders, etal	10/19/2012	$1,120,878	339.66	$3,300	0	No
RGV672	Gail M. Doran ETAL	McElwrath Farms, LLC	7/26/2012	$552,204	357.32	$1,545	0	No
RGV673	Garner F. Klein & Nancy S. Klein	Carlos A. Cavasos	10/16/2013	$655,350	131.07	$5,000	0	No
RGV674	Riverbend Resort Inc.	M & J Devlopment, LLC	2/5/2015	$1,200,000	251.39	$4,773	0	No
RGV676	Charles Shofner, Trustee	Robert Duncan	10/12/2007	$749,780	374.89	$2,000	131.7	No
RGVH26	Jose Perez & Paula Alcantar	Frank Schuster Farms Inc.	4/20/2016	$200,000	116.28	$1,720	0	No

Table 69 (continued)

Primary Data Set for Section 3								
Index	Grantor	Grantee	Date	Price	Acres	$/Ac.	AF of Water Rights	Border Fence
RGVH358	Aaron M. Fernandez	CAN Agriproducts LLC	9/21/2018	$185,000	30.26	$6,114	0	No
RGVH500	Jimmie Jean Arnold	Nico Investment Properties, LLC	5/12/2015	$756,648	210.18	$3,600	450.82	No
RGVH506	Charles E. Pratt, III, as Trustee of the Charles Pratt Family Tru	Neuhaus & Sons	9/28/2016	$2,585,600	807.73	$3,201	2565.235	No
RGVH513	Moore & Redding Rental & Supply Co.	Francisco Velasquez and Robert Mejia	5/7/2015	$392,000	112.68	$3,479	0	No
RGVH517	Moore & Redding Rental & Supply Co.	Rodolfo J. Garza Pena	2/20/2015	$250,000	75.3	$3,320	0	No
RGVH519	Arturo Ortega and spouse, Sonja Margot Ortega	Washington Springs, Ltd.	4/1/2010	$1,493,433	853.39	$1,750	0	No
RGVH521	O.D. Emery, Jr., et al	Valley Grass Farms, Inc.	8/28/2014	$959,950	128.55	$7,468	0	No
RGVH522	Mary Clay Harren, Richard Mason Harren, and Joe Thomas Ha	D.K.C.J. LLC	3/31/2014	$1,221,480	203.58	$6,000	0	No
RGVH523	Depot Insurance Agency, Inc.	Rigoberto Omar Rivera and Alix L. Rivera	1/22/2014	$280,000	40.92	$6,843	0	No
RGVH525	O. D. Emery, Jr., et al	PSG Products, L.L.C.	2/1/2013	$812,400	56.16	$14,466	0	No
RGVH527	Jerry Lee Wiesehan	Baudelio Trevino	12/20/2012	$140,000	32.43	$4,317	0	No
RGVH528	Debra Wiesehan Brant	Wide Vision Venstures, LLC - Blue Cactus Series	3/24/2011	$70,000	42	$1,667	0	No
RGVH529	George M. Wiesehan, Jr.	Baudelio Trevino	4/18/2012	$100,000	38.19	$2,618	0	No
RGVH530	Sue Bakhaus Bentivogli	Francisco De Alba and wife, Ana T. De Alba, and Jorge	9/17/2008	$232,800	92.61	$2,514	0	No
RGVH536	Washington Springs, Ltd.	D.K.C.J., LLC	12/4/2014	$1,493,433	853.39	$1,750	0	No
RGVH537	ML Rhodes, Ltd. Successor by Merger to Bentsen Palm, Ltd.	Arturo Ortega	1/30/2008	$1,043,205	924.08	$1,129	0	No
RGVH539	Lois Nell Carpenter and husband, Kenneth Carpenter	Jessica & Dustin Dickerson Ltd LLP	9/30/2008	$439,225	175.69	$2,500	0	No
RGVH540	John L. Lackey, Lissa Hartley, and Mindy Kaase	J & D Produce, Inc.	8/8/2008	$2,206,176	535.887	$4,117	1325	Yes
RGVH545	Patricia M. Mayers, Trustee	Garcia Balli, Ltd.	1/18/2008	$500,000	131.18	$3,812	311.62	Yes
RGVH600	Kitayama Family Trust	Eberle Investments, LTD	10/16/2008	$577,374	137.7	$4,193	0	No
RGVH612	Arthur E. Beckwith	Neuhaus & Sons	4/29/2008	$3,039,600	1259.5	$2,413	710.45	Yes (Partial)
RGVH614	D&M Finance Co., LLC, a Texas limited liability company	Micro-Tech, LLC, a North Carolina limited liability co	12/14/2012	$2,100,000	500	$4,200	0	No
RGVH615	Brush Country Investments LLC	Paramount Citrus II, LLC	10/18/2013	$2,100,000	439	$4,784	0	No
RGVH616	Bennard S. Rowland, II and spouse, Barbara Hatch Rowland	Nowell Borders and spouse, Ranell Borders	10/25/2013	$4,800,000	1284.865	$3,736	0	No
RGVH617	Randall Lance Barnes, a single individual	Jimmie Dean Dreibelbis and Marlene Dreibelbis, husb	10/23/2006	$1,000,000	429.1384	$2,330	702.8	No
RGVH618	Elsie S. Kawahata, Anne Etchison, et. al.	James L. Pawlik and wife Holly Pawlik; John E. Pawlik	11/11/1999	$1,285,489	813.07	$1,581	1821.225	No
RGVH619	Hardwicke, Hardwicke & Hardwicke, Ltd.	Skalitsky Brothers Farm	12/22/2017	$2,669,590	970.76	$2,750	0	No
RGVH620	The Northern Trust Company	Prukop Farms	12/22/2016	$5,970,000	1859.489	$3,211	0	No
RGVH621	L.J. & J Family LP	Eberle Investments, LTD	3/11/2020	$1,000,000	275.251	$3,633	350	Yes
RGVH623	Rio Farms, Inc.	Wonderful Citrus II LLC	3/27/2019	$19,220,000	4805	$4,000	0	No
RGVH624	Neuhaus & Sons, LLC	Texas Citrus Exchange	3/29/2019	$1,143,744	272.32	$4,200	0	No
RGVH625	Kuby Estate	Rio Fresh, Inc.	8/6/2013	$1,221,075	542.7	$2,250	0	No
RGVH626	Rio Farms, Inc.	D&M Finance Co, LLC	7/26/2010	$2,000,000	1008.97	$1,982	0	No
RGVS118	STARR PORCION 99, LLC	LOZANO, DANILO	6/13/2019	$480,000	271.51	$1,768	250	No
RGVS135	Starr County Land Co., LLC	State of Texas through General Land Office.	1/26/2006	$5,113,251	3098.91	$1,650	4859.1	No
RGVS16	3BU FAMILY LIMITED PARTNERSHIP	THOMASON, BILL	6/22/2018	$920,000	597.98	$1,539	0	No
RGVS81	Annett K. Cottingham, et al	City of Laredo	3/18/2016	$3,476,250	933.54	$3,724	2307.98	No
RGVW1	Southside Bank, Trustee of the Loanna Silvey Jacobs Testame	Rio Farms, Inc.	11/30/2018	$1,858,765	675.06	$2,753	0	No
RGVW2	Maria Cimodocia Garza, Trustee	TMZ West, LLC, a Texas limited liability company	12/5/2018	$872,499	371.34	$2,350	0	No
RGVW3	Susan N. Knight, etal	Swanberg Interests	12/15/2009	$1,436,688	795.23	$1,807	0	No
RGVW4	Roberts & Bowles	S.R. Stone & C.D. Stone	1/27/2011	$956,269	406.923	$2,350	0	No


Sales Utilized in Farmland Analysis
RGVS16
RGVS118
RGVS135
RGVS81
RGVH500
RGVH623
RGVH626
RGVH620
RGVH615
RGVH616
RGVH625
RGVH506
RGVH618
RGVH617
RGVH600
RGVH540
RGVH612
RGVH621
RGVH513
RGVH519
RGVH522
RGVH619
RGVH614
RGV671
RGV650
RGV52
RGV672
RGVW2
RGVW1
RGV656
RGVW3
RGV660
RGV655
RGV651
RGV654
RGVW4
RGV663
RGV658
RGV670
RGV657
RGV665
RGV673
RGV674
RGV602
RGV503
RGV604
RGV601
RGV603
RGV600
Laguna Madre
Starr County
Miguel Aleman
Rio Grande City
Ciudad Camargo
Comales
Edinburg
McAllen
Mission
Reynosa
Rio Bravo
Valle Hermoso
Harlingen
San Benito
Brownsville
Matamoros
Los Fresnos
Raymondville
Lyford
Willacy County
Cameron County
Laguna Atascosa National Wildlife Refuge
MEX 40
MEX 40D
MEX 2D
I 69C
I 69E
US 77
N
W
E
S
0 5 10 20 30 40
Miles
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Dataset Comments

The 79 sales utilized as a focus for Section 3 are presented on the preceding pages. Due to size constraints, the map exhibit providing a location for the sales is not able to provide labels for all sales. For a more detailed understanding of the location of all 79 sales, practitioners may view the data books associated with this report which provide segmented views of the entire Lower Rio Grande Valley with regard to the locations of all sales collected.

It should be noted that the dataset includes some sales that meet the criteria needed for extra verification protocols within the Uniform Standards of Federal Land Acquisitions (USFLA). RGVS135 and RGVS81 were both purchased by governmental entities (General Land Office of Texas and the City of Laredo respectively). Practitioners utilizing these sales should do so only after meeting the criteria outlined in USFLA. This report has met those standards, and based upon our analysis of the sales, it is our opinion they meet the definition of market value, thus they are included in this analysis for further indications.

Other sales, for example RGV655, have been noted by various appraisers as being transactions that have questionability regarding the arm's length test of market value. RGV655 was acquired by a long-term tenant on the property and the sale price is seen as being below market by some practitioners. Such sales are included in this section, and notations have been made within the sale sheets contained in the associated data books regarding these situations. Practitioners may make their own determination if those sales should be utilized in valuation assignments.

The following discussion summarizes the findings of the analysis.

Market Conditions (Time)

The collected data ranges in date from 1999 through 2020. Bulk analysis, paired sales analysis, reviews of published literature (Texas A&M's Real Estate Research Center), as well as the statistical analysis presented in Section 2 all indicate that property values have changed during the time period covered by the study. When viewed in totality, the general trend in the production agriculture market is that values have steadily increased throughout the period of study at a nominal compound rate of 3.0% per year, or 0.25% per month. Section 2 of the report concluded an $81 per year price increase within the agricultural market (Table 35) based on a dataset with an average price per acre of $2,839. This equates to an annual rate of change of 2.9% ($81/$2,839). Further data analyzed in Starr County for rural recreational land uses indicated price increases of 3.16% to 4.86% annualized (Table 67). Thus, Section 3's findings are generally consistent with those found in Section 2.

Size (Acres)

A bulk analysis was conducted utilizing the 79 sales in conjunction with all sales out of the broader database containing 100 acres or more. In addition, paired sales analysis was conducted to test the results of the bulk analysis. Both versions of analysis yielded similar results with the concluded adjustment being a negative 10% adjustment for each doubling in size when comparing a smaller tract to a larger tract and a positive 12% adjustment for each doubling in size when comparing a larger tract to a smaller tract.

Section 2 of this report analyzed size within the agricultural market and concluded a $25 per acre adjustment for every 100 acres difference in size utilizing a dataset with an average price of $2,839 per acre and an average size of approximately 581 acres (Table35). Utilizing this adjustment, a property containing 1,160 acres would be expected to command $2,694 per acre, all else equal

(1,160 acres – 581 acres = 579 acres difference / 100 = 5.79 x $25 = $145, $2,839 - $145 = $2,694). This would equate to a 5.1% change in price for one doubling ($145 difference / $2,839) when moving from small to large and a 5.4% change in price for one doubling when moving from large to small ($145 / $2,694). This generally supports the conclusions found within Section 3 of the report. The more sensitive smaller size range is also supported through analysis conducted in Table 39, Table 61, and Table 62 of Section 2.

Soil Mixtures and Uses

Analysis performed on soil classifications indicates that more productive soils command higher prices per acre than less productive soils. The NRCS soil survey system was utilized to measure the acres of various soil types within each property. These soil types were then combined into their productivity ratings as indicated by the soil survey system. The system outlines 8 soil classifications (a description of which is found later in this section). The data concludes price breaks between Class I and Class II soils, between Class II and Class III soils, and between Class III and Class IV-VIII soils (combined). Few farms in the LRGV contain much, if any, acreage in soils that are classified as IV or lower, thus the bottom productive soils were combined (IV through VIII).

Table 70

Concluded Price Ratios	
Land Classification	**Price Ratio**
Class I Soils	100%
Class II Soils	90%
Class III Soils	70%
Class IV-VIII Soils	50%
Outage	15%
Speculative Development	180%

In addition to the measurement of soil types within a property's boundaries, aerial photography was utilized to measure acreage that is not part of the tillable land for each sale. This acreage is described in this section as "outage" and references those areas that are encumbered by brush, irrigation canals, roadways, etc. Finally, some farm sales within the dataset contain portions of their acreage that are influenced by development patterns in the immediate area. These farms reflect various degrees of premiums above those sales that are found in the less developed areas of the LRGV. Aerial photography was utilized to measure the typical depth pattern of these light development activities along the paved public roadways found adjacent to the sale. The acreage was allocated as "speculative development", which commands a premium above the portion of the sale allocated to farming activities. These areas may or may not be developed in the immediate future, but the recognition of such land area impacts the consistency of the analysis. Sensitivity to soil mixture is supported by the statistical analysis performed in Section 2 (Table 35).
Once all analysis was conducted regarding soil classifications, outage, and light development, a ratio system was developed in which each sale price is allocated consistently to perform further analysis.

Floodway vs Non-Floodway Values

An overview of the LRGV Flood Control Project is presented later in this section. The Project includes a complex levee system along the Rio Grande River, through the central portion of Hidalgo and Cameron Counties, and north of the City of Harlingen. This creates floodways known as the Rio Grande Floodway, the Main Floodway, Central Floodway, and North Floodway. An analysis was conducted utilizing sales found in these floodways in comparison to the dataset found outside of the floodways. The results provide strong indications that land found within the floodway does not command the same price as its identical counterpart outside of the floodway. The concluded relationship based upon the data in this report is that floodway acreage commands 80% of the price that its identical non-floodway counterpart does. That is to say, the soil and land use table presented in Table 71 has been expanded from Table 70 to account for floodway by reducing the floodway price ratio by 80% of its non-floodway counterpart. For example, Class II soils are referenced with a 90% price ratio, Class II floodway soils are referenced with a 72% price ratio (90% x 80%). Again, this conclusion is supported by the regression model contained in Table 35 of Section 2 which indicated farms with acreage above, or outside the levee system, command a premium over farms located within the floodways of the levee system.

Table 71

Concluded Price Ratios in Conjunction with Floodway Areas	
Land Classification	**Price Ratio**
Class I Soils	100%
Class I Floodway Soils	80%
Class II Soils	90%
Class II Floodway Soils	72%
Class III Soils	70%
Class III Floodway Soils	56%
Class IV-VIII Soils	50%
Class IV-VIII Floodway Soils	40%
Outage	15%
Speculative Development	180%

Water Right Contribution

Many production agriculture tracts adjacent to the Rio Grande River possess adjudicated water rights which are utilized for irrigation purposes. These water rights can be converted to a municipal use and sold to municipalities. Many people are aware of these transactions as they are public in nature. An expansive narrative is contained later in this section depicting the history of water rights in the Lower Rio Grande Valley. Common prices paid by municipalities range from $1,500 to $2,000 per acre foot giving many practitioners the false impression that these governmental acquisitions represent the market value of the water rights. Both USPAP and USFLA discuss the unit rule of appraisal methodology where components of a property should not be valued separately and added together rather, they should be measured as their contribution to the unitary whole.
Analyzing the farm sales that transferred water rights in conjunction with the purchase price indicates the true market value as a contributory component to the unitary whole is less than its stand-alone investment value to a municipality. Measured contribution varies from approximately $100 per acre-foot to approximately $811 per acre foot and offers a median and average centering around $380 per acre-foot. This is the concluded contribution for water rights within Section 3.

Statistical modeling presented in Section 2 offered an adjustment of $.12 per acre-foot for land containing water rights (Table 35). The average acre-feet of water rights transferred in the model is 1,627.466 which would equate to a water right contribution of $195 per acre-foot ($.12 x 1,627.466 = $195). Again, both analyses between the two sections generally support each other. Readers and practitioners should understand that measuring contribution of a right such as those dealing with water usage involves a residual process in which surface values are deducted from a sale price. The residual amount left after performing the deduction is the market recognized contribution for the water rights. Water rights, much like mineral rights, or even structural improvement contribution,

should not be expected to have the exact same indication within each individual sale price. Rather there is a range of indications with that range typically being wider than a more uniform dataset only transferring surface rights. Regardless of the spread in indicated contribution values found in this report, or likely to be found by any practitioner's analysis, the evidence is clear that the market recognized contributory value of a water right is not commensurate with the municipal investment value reflected in the isolated purchase of water rights by municipalities.

Practitioners who begin analysis of a sale by deducting the municipal investment value of water rights ($1,500 - $2,000 per acre-foot) from the sale price violate the unit rule present in both USPAP and USFLA. Such a process assumes market contribution is the same as municipal investment value of the water right independent of the surface. When this process is performed (sale price less municipal investment value of water right) the residual remaining in the sale price is so far removed from a reasonable price of farms throughout the LRGV that it should immediately indicate that the investment value is incorrect as a contributory component. Following this process will often result in surface prices that are less than even non-irrigated farms throughout the LRGV. This section will present evidence that the difference between the median price of non-irrigated tracts and the median of irrigated tracts is $819 per acre. This simple indication should highlight that the market contribution rate of water rights does not typically exceed $819, as a tract with no water rights and no ability to purchase water is, by nature, a non-irrigated tract of land. The reality is some portion of the $819 is the water right contribution, and some portion is payment for physical attributes perfected on the farm (machine leveling, underground water piping, etc.).

Impact of Border Wall

Section 3 concludes with an analysis conducted on several sales that have occurred since the 2008 Border Wall Project was announced and/or concluded and were bisected by the completed wall. Analysis is conducted on these sales to give the reader an indication as to whether the presence of the Border Wall had a clear, measurable impact on value.

It should be noted that all such sales are found in Cameron or Hidalgo counties and are farm tracts by nature. All sales have both the IBWC levee as well as the Border Wall bisecting them, which introduces a natural physical barrier restricting use. The analysis of the sales indicates no measurable impact to value for the presence of the Border Wall in these areas. This same conclusion was reached in the regression analysis completed in Section 2, along with comparison of relative population growth trends Pre-Border Wall and Post-Border Wall. This report cautions that the 2020 Border Wall Project may impact properties found in Starr County where farm tracts are minimal and the IBWC levee system is not present. Nevertheless, the market indications found within this report on the known transactions occurring after the 2008 Wall Project provide meaningful data. Any deviation from these findings should be explained and supported by practitioners involved with the appraisal of land in Starr County.

The following pages outline the analysis performed to arrive at the results summarized in this introduction.

Market Conditions (Time)

The data collected during this market study spans from 1999 through 2019. The majority of this report focuses on all sales from 2006 forward, thus Table 72 outlines 73 of the 79 sales occurring in 2006 or after.

It should be noted that market conditions do not move in a linear fashion. The data will demonstrate that some years see an extreme difference in price vs the previous year; however, when looked at through a leveled lens, the data begins to be more uniform. The table below summarizes sales in the collected dataset alongside data provided by the Texas A&M University Real Estate Research Center. In general, the overall trends in both datasets mirror each other with average year on year price changes at around 5%, and an indicated compound rate of change of approximately 3% throughout the study period.

Table 72

Farm Dataset Sales over Time								
			Local Data			TAMU Real Estate Center Data		
Year	Sales	Median Size	Median $/Ac.	YoY % Change	Compound % to 2019	Median Price	YOY % Change	Compound % to 2019
2006	6	731.13	$1,693		4%	$2,098		5%
2007	5	374.89	$2,824	67%	0%	$2,352	12%	4%
2008	8	229.24	$2,507	-11%	1%	$2,555	9%	4%
2009	1	795.23	$1,807	-28%	5%	$2,457	-4%	5%
2010	2	931.18	$1,866	3%	5%	$2,517	2%	5%
2011	4	513.09	$2,425	30%	2%	$2,576	2%	5%
2012	11	500.00	$3,023	25%	-1%	$2,790	8%	5%
2013	6	490.85	$4,260	41%	-6%	$3,056	10%	4%
2014	6	310.98	$4,500	6%	-8%	$3,608	18%	1%
2015	4	161.43	$3,539	-21%	-5%	$3,368	-7%	3%
2016	5	807.73	$3,211	-9%	-3%	$3,411	1%	4%
2017	4	441.90	$2,625	-18%	5%	$3,824	12%	0%
2018	6	380.88	$2,702	3%	7%	$3,695	-3%	3%
2019	5	271.51	$2,900	7%		$3,823	3%	
			Average	7%	1%		5%	4%

All years analyzed provide median size ranges that are found to be comparable later in this report. Generally, those sales in the 100-acre to 800-acre size range do not exhibit sensitivity to size. For this reason, the data is unadjusted when analyzing market conditions. The year on year price changes contained within the local dataset tends to fluctuate more sporadically than does the data collected by the TAMU Real Estate Center. While the local data summarized includes only those sales collected exceeding 100 acres in size, the Center's data is a conglomerate of many more sales with varying size ranges statistically adjusted. It should also be noted that the Center's data is associated with a much broader South Texas market area than just the Lower Rio Grande Valley, thus it picks up some sensitivity to what has occurred within the South Texas brush country located between the Lower Rio Grande Valley of Texas and the Hill Country region of Texas to the north. While the local dataset exhibits more sporadic movement, the general direction of the market year to year consistently mirrors that of the Center's data with a few exceptions. When a compound rate of change is measured for each year through the last year of the study period, the rates tighten

considerably. The local data indicates an average compound rate of change of 1% and the Center's data indicates an average compound rate of change of 4%.

Paired sales analysis has been performed on a selection of sales contained within the database. These sales are either sales that transacted twice during the study period or are sales that are similar in all aspects with the exception of the time period in which they were sold. Those pairings are offered in Figure 3.1.

Figure 3.1

Time Pairing No. 1		
Sale ID	0611222	RGV332
Sale Date	5/3/2012	8/22/2017
Sale Price	$95,200	$124,916
DeededAcres	19.7	19.25
$/Acre	$4,832	$6,489
Difference	$1,657	
Periods	64.57	
Monthly Compound %	0.5%	
Annualized	5.5%	

Time Pairing No. 2		
Sale ID	RGV660	RGV666
Sale Date	4/17/2006	5/3/2011
Sale Price	$1,075,000	$1,548,125
DeededAcres	619.25	619.25
$/Acre	$1,736	$2,500
Difference	$764	
Periods	61.40	
Monthly Compound %	0.6%	
Annualized	7.1%	

Time Pairing No. 3		
Sale ID	RGV661	RGV657
Sale Date	9/25/2006	12/26/2012
Sale Price	$1,686,000	$2,556,478
DeededAcres	843	845.603
$/Acre	$2,000	$3,023
Difference	$1,023	
Periods	76.13	
Monthly Compound %	0.5%	
Annualized	6.5%	

Time Pairing No. 4		
Sale ID	RGV500	RGV245
Sale Date	2/26/2010	7/29/2016
Sale Price	$132,000	$156,000
DeededAcres	30	37.58
$/Acre	$4,400	$4,151
Difference	-$249	
Periods	78.17	
Monthly Compound %	-0.1%	
Annualized	-0.9%	

Time Pairing No. 5		
Sale ID	0611224	RGV398
Sale Date	8/23/2012	6/19/2018
Sale Price	$257,079	$259,220
DeededAcres	37	38
$/Acre	$6,948	$6,822
Difference	-$127	
Periods	70.87	
Monthly Compound %	0.0%	
Annualized	-0.3%	

Time Pairing No. 6		
Sale ID	RGV150	RGV288
Sale Date	2/2/2015	2/3/2017
Sale Price	$85,000	$95,000
DeededAcres	10.01	11.15
$/Acre	$8,492	$8,520
Difference	$29	
Periods	24.40	
Monthly Compound %	0.0%	
Annualized	0.2%	

Time Pairing No. 7		
Sale ID	RGV5	RGV137
Sale Date	6/12/2009	8/22/2014
Sale Price	$57,500	$75,000
DeededAcres	10	10.51
$/Acre	$5,750	$7,136
Difference	$1,386	
Periods	63.23	
Monthly Compound %	0.3%	
Annualized	4.1%	

Time Pairing No. 8		
Sale ID	RGVH15	RGVH381
Sale Date	2/19/2016	12/4/2018
Sale Price	$95,000	$82,500
DeededAcres	9.81	9.81
$/Acre	$9,684	$8,410
Difference	-$1,274	
Periods	33.97	
Monthly Compound %	-0.4%	
Annualized	-5.0%	

Time Pairing No. 9		
Sale ID	RGVS28	RGVS66
Sale Date	4/25/2008	9/16/2013
Sale Price	$2,131,250	$2,594,000
DeededAcres	775.28	810.78
$/Acre	$2,749	$3,199
Difference	$450	
Periods	65.67	
Monthly Compound %	0.2%	
Annualized	2.8%	

Compound rates of change were extracted in these pairings based on monthly compounding. The monthly rate is then annualized by multiplying by 12. Rates range from -5% (Pairing No. 8) to 7.1% (Pairing 2). The average of all pairing indications is 2.2% and the median of all indications is 2.8%.

Market Conditions Conclusions

As with any data analysis, appraisers must reconcile the analysis and conclude whether the data offers support for an adjustment, and whether the adjustment can be quantified. The analysis presented in this text indicates the market has changed throughout the period studied. Viewing data through a broad lens, as well as through individual pairings offers results centering around a compound rate of change of 3% per year. Section 2 of the report concluded a $81 per year price increase within the agricultural market (Table 35) based on a dataset with an average price per acre of $2,839. This equates to an annual rate of change of 2.9% ($81/$2,839). Further data analyzed in Starr County indicated price increases of 2.25% annualized for rural residential uses, and slightly more for rural recreational uses. Thus, Section 3's findings are generally consistent with those found in Section 2. This is the reconciled adjustment utilized for further analysis within the dataset. When required, the rate is applied on a monthly basis of 0.25% (3.0% / 12).

Size (Acres)

The size of a tract of land typically has an impact upon the unitary price for the property. Properties that contain large amounts of acreage typically command a lower price per acre than properties that contain small amounts of acreage. This is primarily due to the purchasing power of the population. There are far more potential buyers in the population that can afford, or qualify for lending requirements, for properties that are less than $200,000 than those that can afford greater than $200,000. Likewise, there are more buyers that can afford up to $1,000,000 than can afford greater than $1,000,000. As the number of potential buyers drop out of the market, there is downward pressure placed upon the unitary price, thus while the overall purchase price is greater for a larger property, the price per acre is less than that of a smaller property.

Table 73

Bulk Size Comparisons

Size Range (Acres)		Sales	Median Size (Acres)	Median $/Ac.	Median Sale Date	Time Periods	Rate	Adjusted $/Ac.	Doubles	% Change	% Change per Double
0	99	9	42.0	$3,320	12/20/2012	86	0.25%	$4,115			
100	199	43	137.4	$2,500	5/7/2015	57	0.25%	$2,882	1.64	-30%	-18%
200	399	41	294.6	$2,499	2/19/2015	60	0.25%	$2,903	1.07	1%	1%
400	799	39	587.3	$2,500	8/6/2012	91	0.25%	$3,138	0.99	8%	8%
800	8000	27	1009.0	$2,000	12/26/2012	86	0.25%	$2,479	0.72	-21%	-29%

Table 73 presents a bulk analysis regarding size. In order to have an adequate volume for a bulk analysis, the 79 primary sales utilized throughout Section 3 for analysis have been combined with all other sales containing 100 acres or more contained within the broader dataset. This results in 159 total sales represented in Table 73. All median prices are adjusted to January 13, 2020 at a compound monthly rate of change of 0.25% based on previous analysis. This date is selected as it is the effective date of this market study.

The results delineate the downward pressure on price per acre expected. Those sales in the lowest size category (0 to 99 acres) demonstrate the highest price per acre both on a non-time adjusted and time adjusted basis. The first stair step to the size range of 100 to 199 acres indicates a negative 30% discount to the larger properties in comparison to the smaller properties. On a percent change per doubling basis, the categories indicate an 18% change per doubling. The 100 to 199 category to 200 to 399 category does not demonstrate much, if any change in prices. The same can be said about the next stair step from 200 to 399 to 400 to 799 acres. This comparison actual indicates an direct relationship in which the larger sized properties demonstrate a higher price per acre vs the lower category. A majority of the river farm sales containing water rights are found within this size range (400 to 799) which is the concluded reason for the skewed results. Stair stepping from 400 to 799 acres yields a -21% relationship, or -29% per doubling. Because of the consistent results demonstrated from 100 acres through 799 acres, the categories are merged to form those shown in Table 74.

Table 74

Bulk Size Comparisons with Combined Size Ranges

Size Range (Acres)		Sales	Median Size (Acres)	Median $/Ac.	Median Sale Date	Time Periods	Rate	Adjusted $/Ac.	Doubles	% Change	% Change per Double
0	99	9	42.0	$3,320	12/20/2012	86	0.25%	$4,115			
100	799	123	282.8	$2,500	12/20/2013	74	0.25%	$3,007	2.68	-27%	-10%
800	8000	27	1009.0	$2,000	12/26/2012	86	0.25%	$2,479	1.78	-18%	-10%

Combining the size ranges yields consistent results for an adjustment of size. Both resulting stair steps yield a negative 10% per doubling as a size adjustment when moving from a smaller property to a larger property. It should be noted that percentages are a result of dividing one number into a base number. Thus, while a negative 10% adjustment is applicable when moving from a smaller sale to a larger sale, a positive 12% to 14% adjustment is applicable when moving from a larger sale to a smaller sale. For example, the adjusted price of the smallest range (0 to 99 acres) is $4,115 per acre. The adjusted price of the mid-range (100 to 799 acres) is $3,007. This represents a difference of $1,108 per acre. Dividing the difference into the smaller range price of $4,115 yields a total percentage difference of 27%. The median sizes are 2.68 doubles apart resulting in an adjustment of -10% per double. Reversing the pairing would require dividing the difference of $1,108 into the mid-size price of $3,007 representing a total percentage difference of 36.85%. Dividing this total percentage by the number of doubles (2.68) between the median sizes yields an adjustment of +13.75% per double. The results of Table 74 are tested with individual parings below in Figure 3.2.

Figure 3.2: Paired Sales Analysis for Impact of Size

Size Pairing 1		
Sale ID	RGV669	RGV651
Sale Date	9/12/2012	1/27/2014
Land Cover	Non-Irrigated Crop	Non-Irrigated Crop
Sale Price	$1,250,000	$3,208,171
Improvements	$0	$325,000
Land Contribution	$1,250,000	$2,883,171
Deeded Acres	500	1153.7
Land $/Deeded Ac.	$2,500	$2,499
ER	92%	90%
Adjusted for ER[1]		$2,555
Time Periods		-17
Time Adjusted[2]	$2,500	$2,448
Difference[3]	$52	
Doubles	1.15	
Small to Large[4]	-1.8%	
Large to Small[5]		1.8%
Footnotes:		
1. %▲ 90 to 92 x $2499 + $2499		
2. PV = -$2555, Rate = 0.25%, N = -17, Solve FV		
3. $2500 - $2448		
4. $52 ÷ $2500 ÷ 1.15		
5. $52 ÷ $2448 ÷ 1.15		

Size Pairing 2		
Sale ID	RGVH615	RGVH620
Sale Date	10/18/2013	12/22/2016
Land Cover	Irrigated Crop	Irrigated Crop
Sale Price	$2,100,000	$5,970,000
Improvements	$0	$0
Land Contribution	$2,100,000	$5,970,000
Deeded Acres	439	1859.489
Land $/Deeded Ac.	$4,784	$3,211
ER	89%	78%
Adjusted for ER[1]		$3,663
Time Periods		-39
Time Adjusted[2]	$4,784	$3,323
Difference[3]	$1,460	
Doubles	2.06	
Small to Large[4]	-14.8%	
Large to Small[5]		21.3%
Footnotes:		
1. %▲ 78 to 89 x $3211 + $3211		
2. PV = -$3663, Rate = 0.25%, N = -39, Solve FV		
3. $4784 - $3323		
4. $1460 ÷ $4784 ÷ 2.06		
5. $1460 ÷ $3323 ÷ 2.06		

Size Pairing 3		
Sale ID	RGVH539	RGVH619
Sale Date	9/30/2008	12/22/2017
Land Cover	Irrigated Crop	Irrigated Crop
Sale Price	$439,225	$2,669,590
Improvements	$0	$0
Land Contribution	$439,225	$2,669,590
Deeded Acres	175.69	970.76
Land $/Deeded Ac.	$2,500	$2,750
ER	77%	84%
Adjusted for ER[1]		$2,521
Time Periods		-112
Time Adjusted[2]	$2,500	$1,906
Difference[3]	$594	
Doubles	2.38	
Small to Large[4]	-10.0%	
Large to Small[5]		13.1%
Footnotes:		
1. %▲ 84 to 77 x $2750 + $2750		
2. PV = -$2521, Rate = 0.25%, N = -112, Solve FV		
3. $2500 - $1906		
4. $594 ÷ $2500 ÷ 2.38		
5. $594 ÷ $1906 ÷ 2.38		

Size Pairing 4		
Sale ID	RGVH614	RGVH616
Sale Date	12/14/2012	10/25/2013
Land Cover	Irrigated Crop	Irrigated Crop
Sale Price	$2,100,000	$4,800,000
Improvements	$0	$0
Land Contribution	$2,100,000	$4,800,000
Deeded Acres	500	1284.865
Land $/Deeded Ac.	$4,200	$3,736
ER	93%	109%
Adjusted for ER[1]		$3,187
Time Periods		-11
Time Adjusted[2]	$4,200	$3,101
Difference[3]	$1,099	
Doubles	1.28	
Small to Large[4]	-20.4%	
Large to Small[5]		27.6%
Footnotes:		
1. %▲ 109 to 93 x $3736 + $3736		
2. PV = -$3187, Rate = 0.25%, N = -11, Solve FV		
3. $4200 - $3101		
4. $1099 ÷ $4200 ÷ 1.28		
5. $1099 ÷ $3101 ÷ 1.28		

Size Pairing 5		
Sale ID	RGV658	RGV657
Sale Date	12/16/2016	12/26/2012
Land Cover	Irrigated Crop	Irrigated Crop
Sale Price	$2,552,445	$2,556,478
Improvements	$0	$0
Land Contribution	$2,552,445	$2,556,478
Deeded Acres	654.9	845.603
Land $/Deeded Ac.	$3,897	$3,023
ER	101%	86%
Adjusted for ER[1]		$3,551
Time Periods		48
Time Adjusted[2]	$3,897	$4,003
Difference[3]	$105	
Doubles	0.29	
Small to Large[4]	9.3%	
Large to Small[5]		-9.0%
Footnotes:		
1. %▲ 86 to 101 x $3023 + $3023		
2. PV = -$3551, Rate = 0.25%, N = 48, Solve FV		
3. $4003 - $3897		
4. $105 ÷ $3897 ÷ 0.29		
5. $105 ÷ $4003 ÷ 0.29		

Size Pairing 6		
Sale ID	RGV52	RGVH623
Sale Date	10/28/2011	3/27/2019
Land Cover	Irrigated Crop	Irrigated Crop
Sale Price	$2,748,735	$19,220,000
Improvements	$0	$0
Land Contribution	$2,748,735	$19,220,000
Deeded Acres	832.95	4805
Land $/Deeded Ac.	$3,300	$4,000
ER	94%	94%
Adjusted for ER[1]		$4,000
Time Periods		-90
Time Adjusted[2]	$3,300	$3,195
Difference[3]	$105	
Doubles	2.44	
Small to Large[4]	-1.3%	
Large to Small[5]		1.3%
Footnotes:		
1. %▲ 94 to 94 x $4000 + $4000		
2. PV = -$4000, Rate = 0.25%, N = -90, Solve FV		
3. $3300 - $3195		
4. $105 ÷ $3300 ÷ 2.44		
5. $105 ÷ $3195 ÷ 2.44		

The pairings presented in Figure 3.2 require two primary adjustments in order to complete. First, the two sales are adjusted for an equivalency rating (ER). This rating is determined by the way in which the property is allocated based primarily on soil classifications and their associated productivity. The allocation of sales is discussed later in this report. The ER adjustment determines

the percent change from one ER to another and applies that percent change to the price per gross acre. For example, RGV669 has an ER of 92 while RGV651 has an ER of 90 in Size Pairing 1. The difference in ERs is 2 (92 – 90) which is divided into RGV651's ER of 90 to get a percent change of 2.2% (2 / 90). This 2.2% is applied to the gross price per acre of RGV651 to derive an adjustment of $55 (2.2% x $2,499) resulting in an adjusted price of $2,555 per acre ($2,499 + $55). The second adjustment applied is that of time which is based upon the concluded 3% compound rate of change discussed previously. The rate is applied on a monthly basis at 0.25% (3% / 12 months).

The results of the pairings generally follow that found in the bulk analysis with an average indication of a +9.4% per doubling when moving from large to small and an average of -6.5% when moving from small acreage to large acreage.

Size Conclusions

All analysis conducted in relation to size indicates that as properties grow in acreage, the price per acre tends to move down. The results provide consistent adjustments of approximately negative 10% per doubling between two sizes when adjusting from the small size to the large size. As noted, percentage adjustments are sensitive to the direction in which they are applied. Given this mathematical reality, an adjustment of positive 12% is concluded when adjusting a larger property to a smaller property. These adjustments are utilized throughout the remainder of Section 3 as needed.

Soil Mixtures and Land Uses

This section focuses on a ratio study conducted to aid in the comparison of properties with differing soil classifications as determined by NRCS Soil Surveys that have been digitized. In addition to the soil classifications, portions of properties that have a potential for development were analyzed and related to the soil contribution rates. The goal of this portion of the analysis is to let the market evidence dictate price relationships between its varying components. Ratio analysis is first explained for those readers unaware of its applicability. The section then continues with an explanation of how acreages were allocated into various soil types and land uses, and concludes with the results of the market data from such allocations.

Ratio Analysis Overview

Ratio analysis is a process heavily subscribed to by the American Society of Farm Managers and Rural Appraisers. The organization has a long history of teaching and writing about ratio analysis as it pertains to rural land including the publications of *The Appraisal of Rural Property, 2nd Edition* (jointly published with the Appraisal Institute), and *Valuing Rural America: Foundations of Data Analysis* (independently published).

At its core, ratio analysis is simply a residual process to allocate portions of a sale price to each property type, whether that be soil classifications, physical class of land (recreation, crop, woods, etc.), or any other example when the market demonstrates a propensity to alter its overall price per acre based on the attributes found within its boundaries. Ratios, however, take the residual process a step further and reconcile the general relationship with each land type found through residual analysis to a single relationship so that all sales can be allocated uniformly. Doing this allows for further traditional analysis (i.e. paired sales, etc.) in a manner that delivers more uniform results. In a textbook example of how the ratio analysis process progresses, a sale with only one land type is identified. Texts refer to this type of sale as a "puritan", meaning it is not a blended sale, but rather a pure sale. The price per acre of this sale is then superimposed upon another sale that is mixed with the same land type as the puritan and an additional land type. After applying the price per acre of

the known from the puritan, the results are subtracted from the total sale price and the residual is allocated to the second land type. This process is demonstrated in the following hypothetical example:

	Sale 1		Sale 2	
Sale Price	2000000		1750000	
Gross Acres	500		500	
$/Gross Acre	$4,000		$3,500	
	Acres	$/Ac.	Acres	$/Ac.
Land Type 1	500	$4,000	250	$4,000
Land Type 2	0	N/A	250	$3,000

In the hypothetical example, Sale 1 is a "puritan" in that it only has Land Type 1 acreage. Sale 2 is a "mixed" sale containing acreage in two land types. The $4,000 per acre from Sale 1 is superimposed to the acreage found in Land Type 1 for Sale 2. This results in a total contribution of $1,000,000 for the Type 1 Land found in Sale 2 ($4,000 x 250 acres). That contribution is then deducted from the sale price resulting in a residual of $750,000 ($1,750,000 sale price - $1,000,000 Land Type 1 contribution = $750,000). The $750,000 is the contribution of Land Type 2 of Sale 2, or $750,000 / 250 acres = $3,000 per acre contribution for the second land type to a mixed property.

In this example, ratios can be made utilizing Land Type 1 as the basis of the analysis. Land Type 1 commands $4,000 per acre and Land Type 2 commands $3,000 per acre. The relationship between the two is Land Type 1 at a factor of 1.00 and Land Type 2 at a factor of 0.75, and when converted to ratios would result in Land Type 1 being 100% and Land Type 2 being 75%.
These ratios can then be utilized to allocate the sale price of other farms within a dataset. For example:

Sale 3

	Gross Acres		Ratio		Equivalent Acres
Land Type 1	350	x	100%	=	350
Land Type 2	150		75%		112.5
TOTALS	500				462.5
Sale Price	$1,850,000	/	462.5 EA	=	$4,000
	$4,000	x	75%	=	$3,000

Utilizing the ratios, each gross acre of Sale 3 is converted to an equivalent acre. In this case Land Type 1 is the basis of the ratios, so the equivalent acres represent Land Type 1 acreage. In other words, even though Sale 3 has 500 gross acres, in terms of value it is equal to a property with 462.5 acres entirely comprised of Land Type 1. The sale price is then divided by the equivalent acreage resulting in a contribution for Land Type 1 acreage of $4,000. Applying the Land Type 2 ratio to this contribution rate yields a contribution of $3,000 per acre for the Type 2 Land. As a proof to the

allocation results, practitioners can apply the results to the gross acres found within each land type, sum the results, and ensure the sum equates to the actual sale price:

Sale 3

Land Type 1	350	x	$4,000	=	$1,400,000
Land Type 2	150	x	$3,000	=	$450,000
	500		$3,700		$1,850,000

The blending demonstrated by the above example should raise suspicion of the ability to conduct meaningful paired sales analysis, or meaningful comparisons to a subject property, without the recognition of the mixed properties of each sale when analysis is conducted on a price per gross acre. This stems from the traditional explanation of paired sale analysis found in numerous appraisal texts. Such explanations point that in a perfect world, paired sales analysis takes two properties that differ only in one attribute. The two prices are compared, and the difference is an indication of a quantifiable measurement for the attribute's contribution. However, as demonstrated in this example, when properties are mixed, there are rarely two sales that are identical in their mixture, thus some process must be utilized to adjust for that difference. As an example to the difficulty of analysis, review the 3 hypothetical sales and assume they all have the same attributes as each other and the same attributes as the subject property.

	Sale 1	Sale 2	Sale 3
Sale Price	$2,000,000	$1,750,000	$1,850,000
Gross Acres	500	500	500
$/Gross Acre	$4,000	$3,500	$3,700

Given the sales above, a practitioner has no way to reconcile the price per gross acre and reconcile a defendable value for the subject property. The value for the subject is fully dependent upon the subject's mixture of acreage. *Valuing Rural America: Foundations of Data Analysis* suggests two ways to handle this discrepancy. The first is to calculate an equivalency ratio, i.e. what portion of each sale is equivalent to the best land type. This is arrived at by dividing the equivalent acreage into the gross acreage or dividing the $/Gross acre into the $/Equivalent acres.

	Sale 1	Sale 2	Sale 3
Sale Price	$2,000,000	$1,750,000	$1,850,000
Gross Acres	500	500	500
$/Gross Acre	$4,000	$3,500	$3,700
$/Equiv. Ac.	$4,000	$4,000	$4,000
Equiv. Ratio	100%	88%	93%

Each sale now has a comparative attribute known as the equivalency ratio that demonstrates the overall property blend based on the ratios utilized. This allows more precise analysis. If the subject property had an equivalency ratio of 90%, the value per gross acre should fall somewhere between $3,500 and $3,700 demonstrated by Sale 2 and Sale 3 with equivalency ratios of 88% and 93% respectively. A subject with an equivalency ratio of 78% should have a value less than all three of the sale price indications as a 78% blend is worse than all three sales. The mathematical method of

equating the sales with a subject, or another sale in paired sales analysis, is by determining the percent change between the two equivalency ratios. Because percent change is calculated by taking the difference between two numbers and dividing into a base, it is important to divide into the correct base. To adjust from a sale to a subject, the difference between the subject's ER and the sale's ER is divided into the ER of the sale. This percent change is then applied to the blended price per acre to calculate a land mix adjustment necessary to equalize the sale's land mixture to the subject.

	Subject	Sale 1	Sale 2	Sale 3
A. Sale Price		$2,000,000	$1,750,000	$1,850,000
B. Gross Acres	500	500	500	500
C. $/Gross Acre		$4,000	$3,500	$3,700
D. $/Equiv. Acre		$4,000	$4,000	$4,000
E. Equiv. Ratio (Eq. Acre / Gross Acre)	78%	100%	87.5%	92.5%
F. Difference (Subject ER - Sale ER)		-22%	-10%	-15%
G. % Change (F / E)		-22.00%	-10.86%	-15.68%
H. Land Mix (ER) Adj. (G x C)		-$880	-$380	-$580
I. Indicated Value per Gross Acre (C - H)		$3,120	$3,120	$3,120

As demonstrated above, mathematically adjusting for the difference in equivalency ratios results in uniform results for an indication of value per gross acre of $3,120. Practitioners utilizing the ratio style of analysis must understand these relationships and how they flow through analysis and application to valuation. The mixture issues rear their challenges throughout the analysis and making it from point A to point Z without making a mistake or without utilizing pre-programed computer software is difficult. For this reason, *Valuing Rural America: Foundations of Data Analysis* suggests that analysis may be conducted on a price per equivalent acre rather than a price per gross acre. Because ratios are utilized to convert each sale to an equivalent acreage in terms of value, and that equivalent acreage is the same base throughout the analysis, the price per equivalent acre is a standardized price point that leaves the challenges of land mixture out of the process.

For example, while the price per gross acre for all three sales varies from $3,500 per acre to $4,000 per acre, the price per equivalent acre consistently demonstrates a price of $4,000. Applying the ratios of 100% and 75% to the subject's acreage results in an equivalent acreage of 390. Thus, if analysis were conducted on a price per equivalent acre, the value of the subject would be as follows: 390 Equivalent Acres x $4,000 / Equiv. Acre = $1,560,000 / 500 Gross Acres = $3,120/Gross Acre Analyzing the sales on a price per equivalent acre yields the same overall value if applied to the subject's equivalent acreage. The total value can then be divided by the gross acreage of the subject for an indication of value per gross acre. Again, the results of the price per gross acre are the same as those arrived at by applying a land mix adjustment to each sale's price per gross acre. It should be noted that equivalent acre is a term that deduces a property's size in terms of the best land type, or 100% ratio. It is a valuation concept and is not related to terms such as net tillable acre, which is an industry term deducing the amount of land within a property that is tilled.

This report continues analysis on a price per gross acre basis, making ER adjustments when necessary, but practitioners utilizing a price per equivalent acre in analysis are equally correct in the mathematical process of data analysis.

The above discussion on ratios, where they come from, why they are utilized, how they impact analysis, and best practices identified by professional appraisal organizations is an extremely brief

and basic presentation intended to educate the reader enough to understand how data was analyzed in this section of the report. Practitioners should not embark on such analysis without a solid understanding of the process, but they should recognize through the analyzed data that mixture is an important element of comparison in the agricultural market of the Lower Rio Grande Valley.

Allocation of Acreages Amongst Sales

Now, with an understanding of ratio analysis, this section describes how acreage was allocated within the sales.

The NRCS Soil Classification System has been utilized to measure soils contained within each property. This system has been in use for many years beginning with the original county level soil survey manuals and advancing with technology. The current system may be accessed via the Web Soil Survey[10] housed under the U.S. Department of Agriculture. Practitioners utilizing advanced software packages such as ESRI's ArcGIS or other GIS systems may access downloadable files for local use from the NRCS Data Gateway[11]. To utilize this downloadable data, a GIS plugin must be downloaded and installed on the local computer called Soil Data Viewer, with the current version being 6.2.[12]

Buyers and sellers present in the LRGV are keenly aware of the soils found within the boundaries of properties as evidenced by both interviews and analysis of purchase prices. Many participants rely upon the measurement of soils from the local Farm Service Agency (FSA) office, which utilize their own GIS packages to allocate the soils within a property. While FSA data has historically been accessible by the public, more recent confidentiality standards now require approval from the landowner for release of confidential data. While such records do provide useful information to appraisers such as production records (yields, etc.), they are not essential to perform data analysis so long as some method is utilized to understand the composition of the property's soils and their productivity levels.

For the reader's benefit, the NRCS Soil Classifications and brief description are presented below:

Class I (1) soils have slight limitations that restrict their use.

Class II (2) soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class III (3) soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV (4) soils have very severe limitations that restrict the choice of plants or require very careful management, or both.

[10] https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

[11] https://datagateway.nrcs.usda.gov/

[12] https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcseprd337066

Class V (5) soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.

Class VI (6) soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.

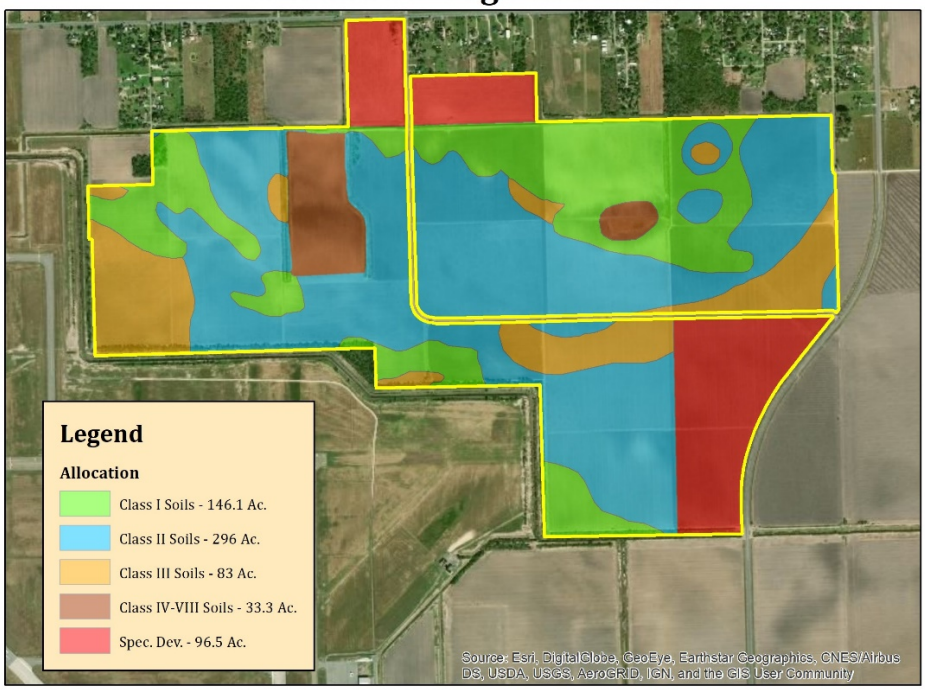
Class VII (7) soils have very severe limitations that make them unsuited to cultivation and that restrict their use mainly to grazing, forestland, or wildlife.

Class VIII (8) soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for esthetic purposes.

A review of the farm sales contained herein, and a physical inspection of the LRGV in general indicates the primary soils being cultivated are Class I, Class II, and Class III soils. It is recognized that there are farms containing Class IV – VIII soils, but the quantity of those soils pale in comparison to the top 3 classifications. Typically, when a production farm tract contains the lower rated soils, such areas are left in wooded plots and/or they are found in portions of the farm that are subject to ponding during heavy rainfall. For this reason, our analysis regarding soils focuses on the top 3 classifications. Soils with a classification rating of IV through VIII have been merged into a single category.

Once all soils are appropriately extracted within the boundaries of a sale, further steps are taken to modify the findings. All soils containing the same productivity rating are merged into a single polygon in order to calculate the land area found within that classification. In addition, aerial photography is utilized to measure, and extract land contained within the boundary that is not in production farm ground. Brush, irrigation canals, major on-farm roadways, etc. produce portions of a property that are not conducive to farming. These areas are extracted from the soils and categorized as “outage”. Finally, in areas in which rural residential and/or light development is occurring, those portions of the farm that could logically change uses and be segmented from the farm are measured and extracted from the soils. An example of the process is presented on the following page.

RGV658 Acreage Allocation



This sale is located adjacent to Valley International Airport in Harlingen. It contains road frontage along FM 509 and along FM 508. As demonstrated in the aerial photography this area has seen some light rural residential uses along the paved roadways. The portion of the farm depicted in red are allocated as development influence and contain 96.5 acres. Outside of the development influence, there is no measurable outage, thus none of the property is allocated as such. The remainder of the farm is allocated based upon its soil classification with 146.1 acres measured in Class I soils, 296 acres measured in Class II soils, 83 acres measured in Class III soils, and 33.3 acres measured in Class IV-VIII soils. These measurements can be utilized to analyze the data further.

Irrigated vs Non-Irrigated Prices

75 of the sales contained in Table 70 were predominately purchased for production agriculture. Those sales are summarized in Table 75 below on an irrigated and non-irrigated basis. The sales contain 44 irrigated tracts, and 31 non-irrigated tracts.

Table 75

Irrigated vs Non-Irrigated Farmland					
Land Type	Sales	Median Date	Median Size	Median $/Ac.	Ratio
Irrigated Crop	44	12/23/2012	384.40	$3,230	100%
Non-Irrigated Crop	31	9/12/2012	498.71	$2,350	73%

Notes:
Conclusion that non-irrigated cropland sells for 75% of irrigated cropland.
This relationship means that a -25% adjustment is applicable when moving from irrigated to non-irrigated
This relationship means that a +33.33% adjustment is a applicable when moving from non-irrigated to irrigated

Both datasets contain a comparatively equal number of sales, both have similar median dates, and both have similar size. The median price per gross acre for all non-irrigated transactions is approximately $2,350 per acre and the median price per acre for all irrigated tracts is

approximately $3,230 per acre. Thus, the data indicates non-irrigated land typically commands 75% of irrigated cropland. Utilizing this adjustment, the price of all non-irrigated tracts can be divided by 75% to equate them to irrigated prices. Likewise, the price of all irrigated tracts can be multiplied by 75% to equate them to non-irrigated prices. The relationship results in actual adjustments of negative 25% to move from irrigated to non-irrigated and positive 33.33% to move from non-irrigated to irrigated prices. This relationship is utilized to adjust all sales to irrigated prices for the remainder of this analysis, except where noted otherwise.

Class I, Class II, and Class III Soils

Once the adjustment for irrigation is made, the percentage of each sale contained with each soil classification is determined. For example, a property that contains 500 gross acres, and has a measured Class I soil area of 250 acres would contain 50% of its land mass within the Class I category. Once this is completed, a comparison is made between properties containing a bulk of their acreage within each category.

Table 76

Class I, Class II, Class III Soils Relationships

Soil Classification	Minimum	Volume[1]	Median Date	Median Size	Median $/Ac. as Irrigated	Time Periods	Rate	Adjusted $/Ac.[2]	Ratio
Class I	50%	8	7/28/2014	389.33	$3,539			$3,539	100%
Class II	50%	28	6/6/2012	458.54	$2,995	26	0.25%	$3,196	90%
Class III	50%	9	10/16/2013	542.70	$2,500	10	0.25%	$2,563	72%

Notes:

1. Number of sales with at least 50% of their physical acreage found within each soil classification
2. Adjusted price is a result of a time value of money calculation where PV = Median $/Acre, R = 3%/12 months, N=Time Periods

Table 76 demonstrates the data follows a stair step pattern with regards to the three most productive soil types. A time adjustment is applied to the median prices of the Class II and Class III soils to equalize them with the Class I soils. It is noted that those sales with a bulk of their acreage found in Class II soils make up most of the indications, but those in Class I and Class III contain an adequate number of sales for this style analysis.

Few of the sales contain meaningful acreage within the Class IV through Class VIII soils as classified by NRCS. Logically, these lower classes of soils should command lower contribution rates than the more productive soils. Given the low volume of sales containing these soil classifications, it is concluded appropriate to allocate acreage contained in these soil categories at 50% of Class I values. This number is concluded based upon the stair step pattern from Class II soils to Class III soils presented in Table 76 representing a 20% reduction in contribution. Thus, from a soil capability perspective, Class I soils are assigned a 100% ratio, Class II soils are assigned a 90% ratio, Class III soils are assigned a 70% ratio, and Class IV-VIII soils are combined and assigned a 50% ratio. Outage is classified as all non-tillable land and all land not allocated as speculative development (discussed in the next portion). Outage may include items such as roads and waste, irrigation canals, or wetlands. These areas are assigned a 15% ratio.

Speculative Development Influence

The final analysis conducted with regard to ratios and soil classifications centers around portions of larger acreage properties that may be influenced by surrounding development. Many farms located in the LRGV are found in areas with urban growth pressure. Some farms are purchased, kept in production agriculture, and slowly sold off or segmented into higher intensity uses such as rural residential or light commercial. To the extent possible, this report has allocated acreage to a speculative development category recognizing this enhanced value. Acreage found along good quality public roadways (primarily paved road frontage) was measured at the depth of typical

development found within the area of the sale and assigned as speculative development land (again with the intent being a representation of some higher value than farm but not necessarily immediate development).

Table 77

Farm Contribution Values vs Spec. Dev. Contribution Values		
Property Type	Farm w/Spec. Dev.	Farm w/out Spec. Dev.
Volume of Sales	26	51
Median Date	12/8/2013	10/5/2012
Median Size	263.32	439.00
Median $/Acre	$3,855	$2,987
Time Periods		14
Rate		0.25%
Adjusted Price[1]	$3,855	$3,093
Residual Analysis		
Median Sale Price[2]	$1,014,971	
Median Non-Spec. Acres[3]	183.65	
$/Acre	$3,093	
Median Non-Spec. Contribution[4]	$567,983	
Residual to Spec. Dev.[5]	$446,988	
Median Spec. Dev. Acres	79.67	
Median Contribution/Acre	$5,610	
Relationships		
	Contribution/Ac.	Ratio
Spec. Development[6]	$5,610	181%
Non-Spec. Development	$3,093	100%

Notes:
1. Time value of money where PV=-$2,987, Rate=0.025%, Periods=14
2. Median size x median price per acre (263.32 acres x $3,855/Ac.)
3. Median Acres - Median Spec. Dev. Acres (262.32 - 79.67)
4. Median Non-Spec. Acres x Median Non-Spec. Cont./Ac. (183.65 acres x $3,093/Ac.)
5. Median Sale Price - Median Non-Spec. Contribution ($1,014,971 - $567,983)
6. Spec. Development ratio using Non-Spec. Farm Value as basis ($5,610 ÷ $3,093)

The sale dataset used in this analysis contains 26 transactions that contain larger than 1% of its acreage within the speculative development category. The median price per acre of those transactions is $3,855. The dataset contains 51 transactions with less than 1% of land area found within the speculative development category. The median price per acre (adjusted to irrigated prices) for these tracts is $2,987. Adjusting for time, the adjusted price per acre for the farms without speculative development is $3,093. This value is utilized to perform a residual analysis on the farms with speculative development. Doing so results in a median contribution per acre for the speculative development land of $5,610. Comparing the contribution rate of speculative development with the contribution rate of the agricultural land, or non-speculative development, results in a ratio of 180%. This ratio is utilized to allocate the speculative development portions of properties containing such acreage and is added to the array of ratios utilized throughout the LRGV for data analysis.

Soil Mixture and Land Use Conclusions

All ways in which the data are analyzed yield a sensitivity to prices based upon the soils found within a property's boundaries. Bulk analysis and individual analysis, in general, yields consistent results noting a stair step between Class I and II soils, Class II and Class III soils, and Class III and Class IV-VIII soils. Analysis also indicates those portions of a property prone to development influence should be allocated at a higher rate than pure farm prices. Utilizing Class I soils as the basis of the ratios, Table 78 summarizes the relationships supported by the market evidence.

Table 78

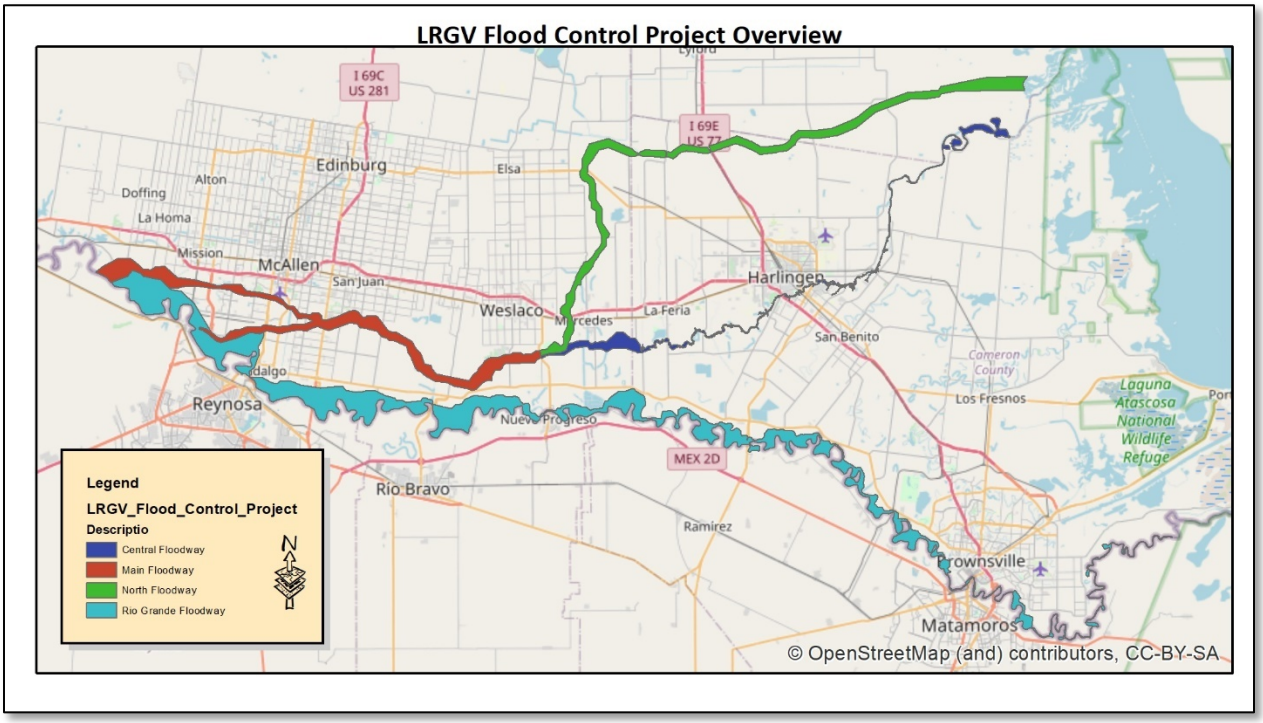
Price Ratio Conclusions w/Spec. Development	
Soil Classification	Price Ratio
Class I Soils	100%
Class II Soils	90%
Class III Soils	70%
Class IV-VIII Soils	50%
Outage	15%
Speculative Development	180%

These ratios are utilized to analyze data further in the report. The list will be expanded based upon the following discussion that centers upon land located within the floodways of the Lower Rio Grande Valley.

While not an exact replica, statistical modeling in Section 2 of the report does lend credibility to the findings within Section 3. Table 35 in Section 2 demonstrates price sensitivity within the soil mixtures, particularly in relation to Class I through Class IV soils. These soil indications demonstrate a stair step pattern much like what is found within this section of the report. It is clear that regardless of the way in which the data is analyzed, the more productive soils drive the price of farm properties in the Lower Rio Grande Valley and should be included in any analysis regarding sale prices.

Floodway vs Non-Floodway Prices

The next area of analysis regarding price allocations involves a study of sales that contain acreage within the floodways produced by the IBWC levee system in conjunction with the Lower Rio Grande Valley Flood Control Project. The project was developed in the 1930s and improved in the 1950s and 1960s. The project is designed to aid in controlled flooding of the Rio Grande River. It created several floodways via the construction of levee systems. These floodways are generally referred to as the Rio Grande Floodway, the Main Floodway, the North Floodway, and the Central Floodway. The Central Floodway moves water from the Main Floodway into the Colorado Arroyo drainage basin and is not as complex of a system as the other floodways.



The objective of this analysis focuses upon land that lies within one of the floodways designated in the exhibit. The term floodway should not be confused with terms such as flooded, or ponded, which are utilized in the NRCS Soil Survey System to describe soils that may be prone to poor drainage during times of heavy rainfall or irrigation practices. Instead, the floodway identifier refers to a locational attribute depicting land that is physically located inside one of the floodways.

Table 79 outlines those sales with predominant Class I, Class II, and Class III soil classifications vs those sales with predominant Class I, Class II, and Class III soils found within the floodways.

Table 79

Floodway vs Non-Floodway Prices								
Soil Classification	**Minimum**	**Volume**	**Median Date**	**Median Size**	**Median $/Acre[1]**	**Time Adjustment[2]**	**Adjusted Price**	**Ratio[3]**
Class I Soils	50%	5	10/18/2013	339.66	$3,300		$3,300	100%
Class I Floodway Soils	50%	3	5/12/2015	535.89	$3,724	($173)	$3,551	108%
Class II Soils	50%	20	9/23/2012	499.36	$3,316		$3,316	100%
Class II Floodway Soils	50%	7	3/24/2011	235.50	$2,000	$92	$2,092	63%
Class III Soils	50%	6	5/22/2013	386.84	$2,762		$2,762	100%
Class III Floodway Soils	50%	2	12/13/2014	329.49	$1,985	($92)	$1,893	69%

Notes
1. Prices are all datapoints adjusted to irrigated prices by dividing non-irrigated prices by 75%
2. Time value of money adjustment where N=months between the two datasets, R=0.25%, PV=current price
3. Ratio using non-floodway soils as a basis. Example Class II soils = $3,316, Class II Floodway Soils = $2,092, $2,092 ÷ $3,316 = 63%

Class I soil prices are compared to their floodway counterpart (Class I floodway). The median price per acre of the floodway prices are adjusted for time between the two indications at the rate of 0.25% per month. The same process is followed in comparing Class II soils with Class II floodway soils and Class III soils with Class III floodway soils. The results indicate Class I soils command approximately the same as the floodway Class I soils, but that Class II and Class III soils demonstrate a disconnect in prices. It should be noted that the Class II comparison contains the largest volume of data points.

Figure 3.3

Analysis of RGVH625		
	RGVH625	Median Sale
Property Type	Irrigated Crop	Irrigated Crop
Date	8/6/2013	10/17/2013
Sale Price	$1,221,075	$1,428,788
Deeded Acres	542.7	428.69
Price/Acre[1]	$2,250	$3,333
ER[2]	67%	90%
%▲ in ER[3]		-25.56%
Adjusted Price		$2,481
Time Periods		-2
Rate		0.25%
Adjusted Price		$2,469
Irrigation Potential	100%	100%
Adjustment[4]		0%
Adjusted Price		$2,469
Size Doubles		0.27
Rate[5]		0%
Adjusted Price	$2,250	$2,469
Ratio[6]	91%	

Notes:
1. Median of sales not on river or in floodway adjusted to irrigated prices
2. ER utilizing ratios found in Table 3.9
3. %▲ from 90 to 67 ((67-90) ÷ 90)
4. %▲ in Irrigation Potential x 25%
5. +12% per double large to small, -10% per double small to large
6. Ratio of sale price to median price

In addition to the bulk analysis demonstrated in Table 79, eight sales were identified individually for further analysis. These sales were located either within the Central Floodway system, or along the Rio Grande River. Those sales along the Rio Grande River utilized did not have the Border Wall, nor contain any water rights in order to isolate the analysis. The price was compared to the median price per acre of the entire primary dataset adjusted for irrigated or non-irrigated acreage depending upon the sale. An equivalency rating was calculated for each sale utilizing the soil classification price ratios referenced in the previous section. The equivalency rating (ER) provides a numeric snapshot of the blend for the property. It is utilized to perform a land mix adjustment by taking the percent difference between the sale and the subject (subject in this case being the sale selected for further analysis and sale in this case being the median of the entire dataset). The process is demonstrated in Figure 3.3 utilizing RGVH625 as an example.

RGVH625 was an irrigated crop sale containing 542.7 acres. The total sale price was $2,250 and based upon the soil classifications the property has an ER of 67%. The median sale price found within primary dataset is $3,333 after adjusting all non-irrigated sales up to irrigated values. The sale date for RGVH625 was August, 6, 2013, whereas the median date of the dataset is October 17,

2013. The median price is adjusted down at the concluded 3% (0.25% monthly) compound rate identified previously in the report. While the median is 0.27 doubles smaller than RGVH625, both indications represent median sizes within the range of 100 to 800 acres. This size range was concluded to be comparable, thus no adjustment for size is made. Both the sale and the median price are reflective of properties with 100% irrigation potential; thus, no adjustment is necessary. After adjustments are made, the median of the primary database indicates a value of $2,469 per acre for Sale RGVH625. The sale actually brought $2,250 per acre; thus, the actual sale price was $219 less than what one would expect. This represents an 8.87% reduction in price, or a ratio of 91% rounded. Table 80 summarizes the results of applying the analyses exemplified in Figure 3.3 for each of the seven sales.

Table 80

Floodway vs Non-Floodway Prices							
Sale ID	RGVH625	RGV503	RGVH536	RGVH537	RGVH528	RGVH529	RGVH26
Sale Price/Acre	$2,250	$3,200	$1,750	$1,129	$1,667	$2,618	$1,720
Adjusted Median $/Ac.	$2,469	$3,857	$1,762	$1,436	$2,793	$3,067	$2,101
Difference	($219)	($657)	($12)	($307)	($1,127)	($448)	($381)
% Difference	-9%	-17%	-1%	-21%	-40%	-15%	-18%
Median Difference	-17%						

In all but one instance, the actual price per acre was less than the median price per acre adjusted for soil mixture, market conditions, and size as compared to the sale. The median of all indications is 17% below the suggested value from the model. This indicates that soils found in the floodways do not command the same price as soils found outside of the floodway and supports the findings from the bulk analysis of the entire dataset presented in Table 79.

Floodway vs Non-Floodway Soils Conclusions

The bulk analysis indicated price breaks in all categories except for Class I soils when comparing floodway vs non-floodway acreage. The analysis of seven sales indicates a price relationship of approximately 80% between soils found in floodways and those outside of floodways. This relationship is merged into the final allocation schematic utilized to allocate sale prices. For example, Class II soils are allocated at 90% of Class I soils. Class II floodway soils are allocated at 80% of Class II soils, or 72% (90% x 80%).

Table 81

Final Price Ratio Conclusions	
Soil Classification	**Price Ratio**
Class I Soils	100%
Class I Floodway Soils	80%
Class II Soils	90%
Class II Floodway Soils	72%
Class III Soils	70%
Class III Floodway Soils	56%
Class IV Soils	50%
Class IV Floodway Soils	40%
Outage	15%
Speculative Development	180%

The final schematic is presented in Table 81. It should be noted at this stage of the analysis that ratio conclusions are not universally applicable to all practitioners. They are a result of the way in which data is analyzed. Different practitioners may conclude slightly different price relationships than those concluded in this market study. However, the data is clear that some sort of recognition must be made regarding the composition of a property in relation to its overall price per gross acre. Failure to make some sort of allocation based on those attributes reflected by the market will yield sporadic and inconsistent results, and may lead to non-supportable value conclusions.

Again, as a matter of reconciliation, Section 2 tested the floodway component of the data through a regression analysis found in Table 35. In that model, individual soil classifications found in floodways was not separated, rather the total percentage of each farm subject to floodways was added as an independent variable to the analysis. The results found a $460 per acre discount multiplied by the % acreage of floodway. The mean average floodway % was 31% and applying this mean average to the $460 acre discount would suggest a discount of $166 per acre ($460 x 31% = $166). Based on the mean average sale price of the data set of $2,839/acre, the average adjustment would be around 6%. Although on the lower end of the reconciled conclusion within the data of Section 3, the regression analysis results offer additional support to the conclusions reached here.

Water Rights

This section of the report focuses on water rights and their contribution to a whole property's value. Water rights have been sold to municipalities in the recent past and there is confusion in the valuation and legal professions as it pertains to the investment value of the standalone water rights to a municipality and the contribution to a farm as a component of a package of rights. Prior to the analysis, the following discussion is designed to give a brief education to the reader and/or practitioners as to the history and framework of the water right system in the Lower Rio Grande Valley.

In the Lower Rio Grande Valley, there are two sources of irrigation – ground wells and surface water. Ground wells are not widely used due to the quality and quantity of water, and the relatively high cost of irrigation from this source. Irrigation from surface water is the primary method, and the Rio Grande River is the predominant source of this water.

The Rio Grande River is the fifth longest river in North America and the 20th longest in the world.[13] Rising from the San Juan Mountains in southern Colorado, the Rio Grande River meanders some 1,901 miles southeast to the Gulf of Mexico. Since the Treaty of Guadalupe Hidalgo in 1884, the Rio Grande River has served as the international border between the Republic of Mexico and the United States (in the state of Texas).

By treaty in 1944, the United States and Mexico established the International Boundary and Water Commission, United States and Mexico (IBWC):

> *"…whose mission is to provide binational solutions to issues that arise during the application of the United States – Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region."*[14] The IBWC is vested with *"…extensive authority over the Rio Grande waters including the measuring, storing and release of reservoir waters for flood prevention purposes or to satisfy the water needs of the contracting nations."*[15] *Texas and Mexico share 1,255 miles in common border*

[13] https://www.britannica.com/place/Rio-Grande-river-United-States-Mexico

[14] https://www.ibwc.gov/home.html

[15] Lower Rio Grande Valley Water Documents issued and compiled by The State of Texas Water Rights Commission and Attorney General, June 1971.

and are joined by 28 international bridges and border crossings. This include 2 dams, 1 hand-drawn ferry, and 25 other crossings that allow commercial, vehicular and pedestrian traffic.[16]

On the Texas border, the Rio Grande River has two dams - Amistad and Falcon. These dams created reservoirs on the Rio Grande River that have the dual purpose of flood control and the storage of surface water, not only from the Rio Grande River, but from the Pecos and Devils Rivers in Texas and the Rios Conchos, Salado, and San Juan in Mexico as well. Along the Texas border, the Rio Grande River supplies water for more than 6 million people and 2 million acres of land on both sides of the border.[17]

Amistad Dam is located in Val Verde County, approximately 12.8 miles above Del Rio, Texas. Completed in 1969, the reservoir covers some 65,000 acres at conservation storage level, and normal conservation capacity is 3,275,532 acre-feet.[18] By treaty, the water at conservation capacity is allocated 56.2% to the United States and 43.8% to Mexico.

Falcon Dam is located at Falcon Heights, Texas, some 20 miles upriver from the City of Roma in Starr County. Built in 1954, the reservoir covers some 78,300 acres at conservation storage level, and normal conservation capacity is approximately 2.6 million acre-feet.[19] The water at conservation storage behind Falcon Dam is divided (by treaty) with 58.6% to the United States and 41.4% to Mexico.[20]

The International Boundary and Water Commission (IBWC) operates and maintains Amistad and Falcon Dams. Even though the Rio Grande River serves as the southwestern border of Texas, the State does not control or regulate any portion of the Rio Grande River; however, the Texas Commission on Environmental Quality (TCEQ) does administer the United States share of the water resources, for both municipal and agricultural use. Under the TCEQ, the Rio Grande Watermaster Program manages the water rights in the Rio Grande River Basin.

Distribution of the United States' share of water in the Amistad-Falcon system falls in either of two categories: water rights with municipal priority (MDI reserve), or water rights with a Class A or Class B priority. The municipal rights have the highest priority to ensure the availability of municipal, domestic, and industrial water before any other use. Allocation of water for irrigation, mining, and recreation use is subject to the availability of water. The basis for water allocation is a system of weighted priorities designated as Class A and Class B. Adjudication of Class A and Class B water rights were determined by judicial proceedings based on either riparian use under common law, or appropriative use by statute.

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[16] https://www.txdot.gov/inside-txdot/projects/studies/statewide/border-crossing.html

[17] https://www.ibwc.gov/CRP/riogrande.htm

[18] http://www.twdb.texas.gov/surfacewater/rivers/reservoirs/amistad/index.asp

[19] https://www.ibwc.gov/Files/CF_URG_Project_History_042116.pdf

[20] Lower Rio Grande Valley Water Documents issued and compiled by The State of Texas Water Rights Commission and Attorney General, June 1971.

As defined by the Texas Administrative Code, a Class A water right is:

> *"A water right in the Lower or Middle Rio Grande Basin designated as a Class A right and held under a certificate of adjudication, granted in the Adjudication of Lower and Middle Rio Grande River in State v. Hidalgo County Water Control & Improv. Dist. No. 18, 443 S.W.2d 728 (Tex. App. – Corpus Christi 1969), writ ref'd n.r.e., or issued by the commission. If converted to a domestic, municipal, and industrial (DMI) water right, a Class A right is converted to 50% of the existing water right."*[21]

Class A embraces those who have acquired a right to use waters of the Rio Grande River by virtue of having complied with the appropriation statutes of the State or those whose rights have been recognized by the State.[22]

As defined by the Texas Administrative Code, a Class B water right is:

> *"A water right in the Lower or Middle Rio Grande Basin designated as a Class B right and held under a certificate of adjudication, granted in the Adjudication of Lower and Middle Rio Grande River in State v. Hidalgo County Water Control & Improv. Dist. No. 18, 443 S.W.2d 728 (Tex. App. – Corpus Christi 1969), writ ref'd n.r.e., or issued by the commission. If converted to a domestic, municipal, and industrial (DMI) water right, a Class B right is converted to 40% of the existing water right."*[23]

Class B embraces those who have been making a good faith use of the waters of the Rio Grande River for irrigation purposes prior to the institution of [the 1971] suit but do not qualify as Class A users. The water districts embrace the greater part of the land ownerships, large and small, lying within the delta area and those entitled in equity to a Class B priority are the owners of lands outside the boundaries of the various water improvement and water control and improvement districts.[24]

The various irrigation districts and municipalities in the Lower Rio Grande Valley (Valley) own the vast majority of the water rights. The Valley has 26 irrigation districts, all of which are located in Cameron, Hidalgo, and Willacy Counties. Irrigation districts deliver an estimated 85% of all water used from the Rio Grande River, both for agricultural uses and municipal uses.[25]

Farms along the Rio Grande River having adjudicated water rights can pump water directly from the river at established diversion points. On such farms, the farm operator diverts water from the

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[21] https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=303&rl=2

[22] Lower Rio Grande Valley Water Documents issued and compiled by The State of Texas Water Rights Commission and Attorney General, June 1971.

[23] https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=303&rl=2

[24] Lower Rio Grande Valley Water Documents issued and compiled by The State of Texas Water Rights Commission and Attorney General, June 1971.

[25] http://www.ce.utexas.edu/prof/maidment/giswr2015/TermProject/Eatman.pdf

river using some type of pumping system, which can vary from permanent pumps and motors to portable gator pumps powered by the power take off (PTO) on tractors. Irrigation water is pumped from the river into a system of pipelines or ditches, and is then diverted to the various fields. Ownership of such irrigation systems are usually private, belonging either to the landowner or to the farm operator.

Farms not located on the Rio Grande River do not have riparian water rights for irrigation; however, these farms may be entitled to irrigation water if they are within the boundaries of one of the organized irrigation districts in the Valley. The various districts own adjudicated water rights from the Rio Grande River, and they own the pumping station, the main canal from the river, various storage reservoirs, and the distribution canals and pipelines to the various farms within their district. The district diverts water from the Rio Grande River and delivers it to various farms in the district via a system of pumps, canals, and pipelines. Standpipes and valves allow the diversion of water from the canals to smaller lateral lines, which then flow to the various fields. The individual fields are then flood irrigated using either portable poly pipe or temporary earthen ditches. Districts charge a flat tax per net irrigable acre to cover their maintenance and operation costs, and in addition to the annual flat rate, districts sell water by the acre to the farmers.

Class A and Class B water rights are components of the bundle of sticks associated with real property rights and ownership. As with any such right, they may be severed from the surface estate and sold separately, apart from the land. When this occurs, the remainder property no longer possesses the right to the water. During the late 1980's and early 1990's, potable water supply corporations began acquiring water rights to accommodate their growing needs. Prior to this, few sales of water rights occurred since farms generally had sufficient rights for their needs and the Valley's incorporated towns and cities had received generous adjudications. Proliferation of the water supply corporations caused an increase in the volume of sales of water rights, but the price remained at the $450 to $500 per acre-foot level.

Circa 1991, the City of Laredo entered the market with substantial funding and substantial water needs. As a result, prices quickly increased to $900 per acre for Class A rights and $720 per acre for Class B rights. However, during this same period, no significant price movement in irrigated farmland occurred, which indicates that the contributory (market) value of water rights to a farm was not directly proportionate to the municipal investment rates paid for water rights. As demand grew, the City of Laredo offered to pay $1,200 per acre for Class B rights and then increased to $1,400 per acre. Subsequently, Laredo began exploring alternative sources for water and reduced their offering price to $1,250 per acre in 2001. However, other potable water suppliers are facing shortages and are requiring land developers to furnish actual water rights, not cash, before proposed subdivisions are furnished with potable water. Those actions caused the price of Class B water rights to increase to $1,800 per acre and Class A rights increased to $2,000 per acre and higher.

An active market for water rights still exists, and water rights routinely sell on the open market. Today, water rights are bringing approximately $1,200 per acre-foot for Class B rights and $1,500 per acre-foot for Class A rights.[26] It should be noted, however, that all such transactions represent either governmental acquisitions (see City of Laredo discussion above), or buyers under duress with a specific need for water (see developer notation above). All of these instances fail to meet the

[26] http://www.rgrwa.org/images/Public_Notices/2019_Municipal_Water_Rate_Current_Market_Value.pdf

definition of market value as they represent purchases to a specific buyer, or class of buyer, or they represent a buyer with a specific need for the right.

The Rio Grande Regional Water Authority (RGRWA) maintains a database of water right sales and transfers. RGRWA was created by the Texas Legislature in 2003 as a conservation and reclamation district "to serve a public use and benefit" by bringing together regional water interests to accomplish projects and services within Willacy, Cameron, Hidalgo, Starr, Zapata, and Webb Counties (excluding the City of Laredo).[27] More information about RGRWA can be seen at their website (rgrwa.org), and information about water rights sales can be found under Public Notices.

All of the preceding history and general price information regarding water rights is presented to setup the question of "what do water rights actually contribute to the sale of farmland in the Lower Rio Grande Valley?"

Sale Analysis

Fourteen sales were analyzed regarding water right contribution. A similar process was followed to estimate a surface contribution as was utilized in the floodway vs non-floodway price analysis. The median indication of the entire database (excluding sales with water rights) was utilized as the basis of the valuation. The median price was adjusted for land mixture through an equivalency rating comparison between the median and the sale. The price was further adjusted for time and size (where needed). The indicated price per acre was then deducted from the actual price per acre leaving a residual allocated to the water right contribution. The total water right contribution was then derived by multiplying the contribution per acre by the gross acres of the sale. This total contribution was then reduced to a contributory rate per acre foot of water rights by dividing the total contribution by the total acre feet of water transferred.

Figure 3.4

Analysis of RGVS81		
	RGVS81	Median Sale
Property Type	Irrigated Crop	Irrigated Crop
Date	3/18/2016	5/5/2013
Sale Price	$3,476,250	$1,414,665
Deeded Acres	933.54	428.69
Price/Acre[1]	$3,724	$3,300
ER[2]	71%	89%
%▲ in ER[3]		-20.22%
Adjusted Price		$2,633
Time Periods		35
Rate		0.25%
Adjusted Price		$2,873
Irrigation Potential	107%	100%
Adjustment[4]		0%
Adjusted Price		$2,873
Size Doubles		1.09
Rate[5]		-10%
Adjusted Price	$3,724	$2,560
Residual Analysis		
Sale Price	$3,476,250	
Land $/Ac.	$2,560	
Total Land Value	$2,390,169	
Residual to Water	$1,086,081	
AF of Water Rights	2307.98	
Cont. / AF of Water	$471	

Notes:
1. Median of sales with no water rights adjusted to irrigated or non-irrigated prices
2. ER utilizing ratios found in Table 3.12
3. %▲ from 89 to 71 ((89-71) ÷ 89)
4. %▲ in Irrigation Potential x 25% (Above 100% receives no adjustment)
5. +12% per double large to small, -10% per double small to large
6. Ratio of sale price to median price

RGVS81 is presented in Figure 3.4 as an example of the analysis. The sale contained an equivalency rating of 71%, while the median equivalency rating was 89%, thus a downward adjustment is applied for the ER factor, or land mixture. The median occurred 35 months prior to RGVS81, thus it is adjusted up for time. Finally, the sale is 933.54 acres while the median size is 428.69 acres, thus a

[27] http://www.rgrwa.org/index.php/about

downward adjustment is applied at a rate of 10% per doubling. The final adjusted price indicates a surface contribution of $2,560 per acre. The sale commanded $3,724 per acre. The difference of $1,164 per acre is allocated to water right contribution, and when applied to the sale's gross acreage, it equates to a total contribution of $1,086,081. The sale transferred a total of 2,307.98 acre-feet of water, rendering a contribution per acre-foot of $471.

Table 82 summarizes the analysis exemplified in Figure 3.6 when carried out on all fourteen of the sales transferring water rights:

Table 82

Water Right Contribution Analysis							
Sale ID	**$/Ac.**	**Adjusted Median$/Ac.**	**Residual to Water**	**Gross Acres**	**Water Contribution**	**AF of Water Rights**	**$/AF of Water**
RGV600	$2,000	$1,413	$587	235.504	$138,270	175	$790
RGV603	$2,882	$2,328	$554	669.668	$371,241	1496.25	$248
RGV676	$2,000	$1,852	$148	374.89	$55,301	131.7	$420
RGVH500	$3,600	$2,823	$777	210.18	$163,230	450.82	$362
RGVH506	$3,201	$2,434	$767	807.73	$619,815	2565.235	$242
RGVH540	$4,117	$2,278	$1,839	535.887	$985,537	1325	$744
RGVH545	$3,812	$2,939	$873	131.18	$114,472	311.62	$367
RGVH612	$2,413	$1,956	$458	1259.5	$576,329	710.45	$811
RGVH617	$2,330	$1,874	$456	429.138	$195,841	702.8	$279
RGVH618	$1,581	$1,345	$236	813.07	$192,054	1821.225	$105
RGVH621	$3,633	$3,412	$221	275.251	$60,757	350	$174
RGVS118	$1,768	$1,445	$323	271.51	$87,646	250	$351
RGVS135	$1,650	$1,305	$345	3098.91	$1,069,919	4859.1	$220
RGVS81	$3,724	$2,560	$1,163	933.54	$1,086,081	2307.98	$471
						Median	$356
						Average	$399
*Sale IDs highlighted have the 2008 border fence. Further analysis provided later in report.							

The median of all indications is $356 per acre-foot of water right transferred. The average of all indications is $399 per acre foot. Given the analysis conducted, the market evidence points towards a recognized contribution rate of approximately $380 per acre-foot. It should be noted that Table 82 offers some insight into the value of Class A water rights in comparison to Class B water rights. The two sales containing only Class A rights (RGVH540 and RGVH545) have an average contribution of $556 per acre-foot. Those sales only transferring Class B rights (RGV603, RGVH612, RGVH617, RGV600, and RGVH618) have an average contribution of $446 per acre-foot. This would indicate that Class B rights have a value of approximately 80% of Class A rights. This report does not reconcile a difference between Class A and Class B values, but several factors indicate that the two rights should not be expected to be the same. First, Class A water rights have a higher priority than Class B, thus they protect against water shortages better than Class B rights. Secondly, when converted to municipal uses through a severed stand-alone sale, Class A rights are reduced by 50% whereas Class B rights are reduced by 60%. This relationship mirrors the 80% relationship indicated by the data. Reducing 500 acre-feet of Class A rights by 50% yields 250 acre-feet, whereas reducing 500 acre-feet of Class B rights by 60% yields 200 acre-feet. 200 acre-feet divided by 250 acre-feet indicates an 80% ratio. Both of these factors aid in the explanation of why those sales in Table 82 containing only Class A rights indicate higher prices per acre foot than the other sales. Regardless of any potential allocation between Class A and Class B rights, all indications demonstrate that the market value of a water right is not commensurate with the investment value represented by the $1,500 to $2,000 per acre-foot purchases by municipalities or users with a specific need for water as a stand-alone unit.

Water Rights Conclusions

Sales containing water rights were analyzed utilizing a median price point from a very large dataset. The dataset was adjusted to each individual property utilizing an equivalency factor that accounted for soil mixture and development potential mixture. It was further adjusted for time and, when necessary, for size. The indicated contribution rates yielded consistent results with most results falling in the $250 to $500 per acre-foot range. The median of all indications was $356 per acre-foot which is less than the prices reflected by municipal purchases of water rights. A more thorough valuation of each individual sale may yield slightly different results, but the amount of data utilized to extract the contribution rates is large, and an individual property would need a significant attribute to impact the analysis in a meaningful way. As with all analyses of the various components which make up a sale price, the reality of price allocation is that the sum of the parts may never equal more than or less than the total sale price. Thus, while some practitioners may place more contribution on the water rights, doing so will reduce the surface contribution. This is acceptable so long as the surface contribution is not forced lower than other surface sales would indicate, and the same relationship is maintained in the appraisal of a particular property. The blend of components should flow through to yield similar results.

Statistical modeling presented in Section 2 offered an adjustment of $.12 per acre-foot for land containing water rights (Table 35). The average acre-feet of water rights transferred in the model is 1,627.466 which would equate to a water right contribution of $195 per acre-foot ($.12 x 1,627.466 = $195). Again, both analyses between the two sections generally support each other.

Impact of Border Wall

This section of the report focuses on seven properties that sold either after the 2008 Border Wall Project was complete or sold after acquisition of the wall right-of-way but before construction. Those sales occurring before construction sold with the knowledge that a wall would bisect the property upon completion of the project. With the analysis concluded on market conditions, size, floodway vs non-floodway, soil mixture, and water right contribution completed, all sales contained in this section of the report are utilized for value indications through a median styled analysis. Each of the seven properties are valued in two separate methods. The first method applies an adjustment for water rights at a rate of $380 per acre-foot. This is based on the median contribution of water rights indicated in the previous analysis. The second analyzes value through its components in relation to select sales.

Method 1

The first method is demonstrated in Figure 3.5. In this method, the sale price for RGVH612 is divided by its gross acreage yielding a price per acre of $2,413. The median sale price of the dataset is $3,300 per acre. RGVH612 has an allocated equivalency rating of 72% while the median equivalency rating is 89%. The median price is reduced by the percentage difference between the two ER's yielding an adjusted price of $2,670 per acre. The median sale date is May 5, 2013 for the dataset whereas RGVH612 occurred on April 29, 2008. This represents 61 periods difference and a compound rate of change of 0.25% is applied to the median price yielding a time adjusted price of $,2,293 per acre. The size of RGVH612 is 1,259.5 acres vs the median size of 428.69 acres. The median is adjusted down at 10% per doubling for size. The median of the dataset does not contain any water right value. RGVH621 transferred 710.45 acre-feet of water rights. The median contribution for water rights was found to be approximately $380 per acre-foot. Applying this median contribution to the water rights transferred yields a total contribution of $269,971. Dividing the total contribution by RGVH612's 1,259.5 acres yields a contribution per acre of $214. This adjustment is applied to the median sale price. The final adjusted price for the median dataset is $2,170 per acre. RGVH612 sold for $2,413 per acre, thus it commanded approximately $243 per acre more than its indicated price. On a percentage basis, the tract brought 11% more than the indicated price ($243/$2,170).

Figure 3.5

Analysis of RGVH612		
	RGVH612	Median Sale
Property Type	Irrigated Crop	Irrigated Crop
Date	4/29/2008	5/5/2013
Sale Price	$3,039,600	$1,414,665
Deeded Acres	1259.5	428.69
Price/Acre[1]	$2,413	$3,300
ER[2]	72%	89%
%▲ in ER[3]		-19.10%
Adjusted Price		$2,670
Time Periods		-61
Rate		0.25%
Adjusted Price		$2,293
Irrigation Potential	100%	100%
Adjustment[4]		0%
Adjusted Price		$2,293
Size Doubles		1.47
Rate[5]		-10%
Adjusted Price		$1,956
AF of Water Rights	710.45	0
Water Right Adjustment[6]		$214
Adjusted Price	$2,413	$2,170
Indicated Impact[7]	11%	

Notes:
2. ER utilizing ratios found in Table 3.12
3. %▲ from 89 to 72 ((72-89) ÷ 89)
4. %▲ in Irrigation Potential x 25% (Above 100% receives no adjustment)
5. +12% per double large to small, -10% per double small to large
6. $380/AF x AF of water for Subject ÷ Subject Gross Acres
7. Difference divided into median indicated price per acre.

This method is somewhat sensitive to the concluded market-based contribution per acre-foot of water. For example, if it were concluded that water rights typically command $500 per acre-foot when they sell as part of a real property package, the median adjusted price for RGVH612 would be $2,238. This would result in a difference between the actual price and the median indication of $175 per acre, or approximately 8% more than the indicated value. We utilize a contribution of

$380 per acre-foot as that is the supportable median indication provided in the analysis summarized in Table 82.

Table 83 summarizes the analysis exemplified in Figure 3.4 when applied to all seven sales containing the Border Wall. It should be noted that size adjustments were not applicable to any of these analyses, with the exception of RGVH612 which compared a 1295-acre sale (RGVH612) with the median size sale of 428.69. All other sales were in the comparable range with the median with regard to size.

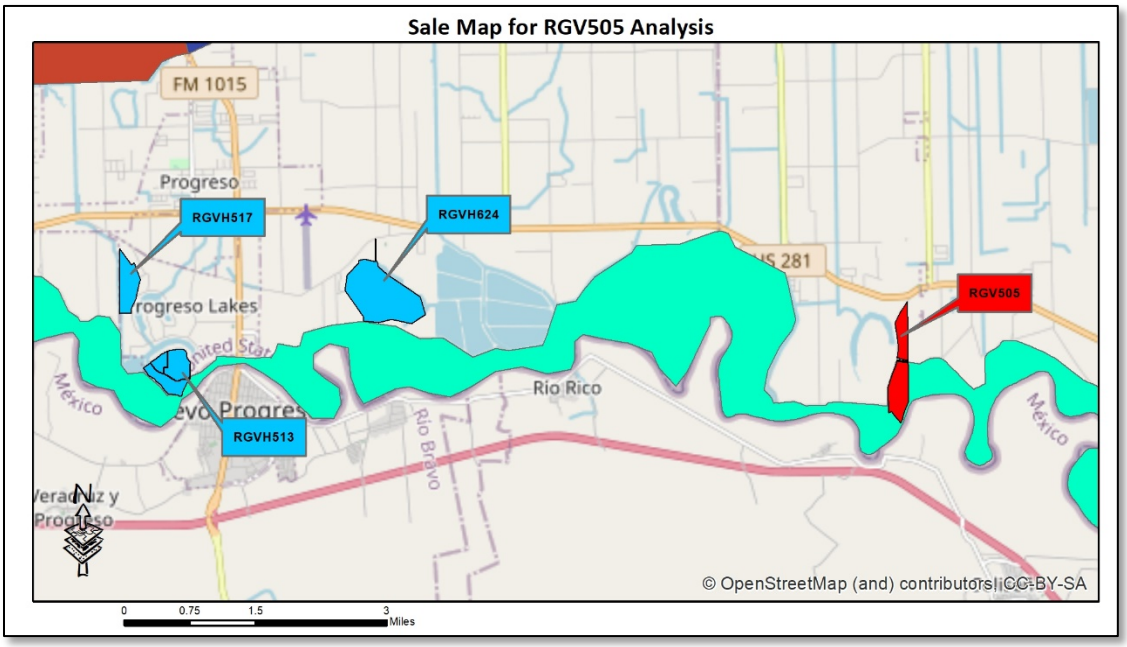
Table 83

Border Fence Sales Applying Median $/AF. Water as Adjustment							
Sale ID	RGVH612	RGV603	RGVH540	RGVH621	RGVH545	RGV502	RGV505
Water Rights	Yes	Yes	Yes	Yes	Yes	No	No
Sale Price/Acre	$2,413	$2,882	$4,117	$3,633	$3,812	$1,901	$3,400
Median Adjusted Price	$2,170	$3,177	$3,217	$3,896	$3,842	$2,473	$2,975
Difference	$243	-$295	$900	-$262	-$30	-$572	$425
% Difference	11%	-9%	28%	-7%	-1%	-23%	14%
Median Indication	-1%						
Average Indication	2%						

The results of all seven analyses are typical of an imperfect real estate market. Some sales indicate prices higher than the median, and some indicate lower. The largest deviation on the positive side is RGVH540 indicating 28% above the expected price. The buyers of this sale placed great importance on the water rights. This is reflected in the analysis of the sale found in Table 82 in which the water rights indicated a contribution of $744 per acre-foot, exceeding the typical contribution rate. Given the analysis of the sale, it is considered to demonstrate no measurable impact due to the Border Wall. The largest deviation on the negative side is RGV502 representing a -23% deviation from the indicated price. The property resold under RGV505 at which point it exceeded the median indicated value. sporadic, but the median of all indications is a positive 6.3%. This analysis does not insinuate that the presence of the Border Wall increased the value of farms with positive relationships to the median. Rather, it insinuates that the properties sold within a reasonable range of where one would expect. In totality, the analysis does not demonstrate a supportable impact due to the Border Wall from market evidence.

Method 2

In this method of analysis, a sale is analyzed through its components rather than as its unitary whole. RGV505 is utilized for this analysis. The sale did not have frontage along Military Highway but did contain approximately 45 acres north of the IBWC levee and the Border Wall.



The remaining acreage was located south of the levee system and wall. RGVH624, RGVH517, and RGVH513 are all sales that were located south of Military Highway but north of the levee and Border Wall systems. Adjusting these three sales for time yields value indications of $3,754, $3,362, and $3,496 respectively.

As demonstrated in the sale map, the three sales utilized for analysis of RGV505 were all located north of the IBWC levee. The indications offer a median of $3,496 per acre and an average of $3,537 per acre. Applying a contribution of $3,500 per acre to the 45 acres of RGV505 located north of the levee and Border Wall yields a total contribution of $157,500. Deducting this contribution from the sale price yields a contribution of $404,686 for the land found within the floodway of the Rio Grande. Reducing the total contribution to a contribution per acre yields $3,339 ($404,686 / 74.0254 acres). Thus, this analysis indicates a contribution for land north of the levee at $3,500 acre and the land south of the Border Wall at $3,339 per acre. The relationship between the land south of the wall vs. that north of the wall can be expressed as 95% ($3,339 / $3,500). The relationship exceeds the concluded floodway vs non-floodway

Figure 3.6

Value of Land North of Levee				
Sale ID	RGV505	RGVH624	RGVH517	RGVH513
Sale Date	7/9/2015	3/29/2019	2/20/2015	5/7/2015
Sale Price	$404,686	$1,143,744	$250,000	$392,000
Deeded Acres	119.0254	272.32	75.3	112.68
Price/Acre	$3,400	$4,200	$3,320	$3,479
Time Periods		-45	5	2
Rate		0.25%	0.25%	0.25%
Adjusted Price		$3,754	$3,362	$3,496
Median Price		$3,496		
Average Price		$3,537		
Sale Allocation				
Acres Above Levee	45			
$/Ac. Above Levee	$3,500			
Contribution	$157,500			
Sale Price	$404,686			
Contribution Below Levee	$247,186			
Acres Below Levee	74.0254			
$/Acre Below Levee	$3,339			
Below Levee Ratio	95%			

discussed previously of 80% but falls within the range of those results in totality. This analysis indicates no impact to the sale price due to the Border Wall.

Border Wall Impact Conclusions

All ways in which the market data was analyzed indicate no support for the Border Wall having an impact on production agricultural properties. As stated in the introduction of this section, readers should be aware that sales available for analysis lie in Cameron and Hidalgo counties where the IBWC levee system has been in place for many years. The levee system itself creates a physical deterrent for development and the IBWC jurisdiction creates a legal aspect that all but prohibits any form of development.

Demographic analysis presented in Section 2 of this report did not suggest a detrimental impact when comparing pre-Border Wall relative population growth to post-Border Wall relative population growth in areas south of US Highway 281. The regression analysis of agricultural land use sales also presented in Section 2 suggested that a Border Wall location was not a significant variable for price.

The findings of this analysis are applicable to similar properties found under similar circumstances. The 2020 U.S. Border Wall Project will require the appraisal of properties along the Rio Grande River in Starr County where the levee system does not exist. This removes a physical deterrent from the analysis and may cause conclusions to change. That said, land within Starr County found within the Rio Grande's floodway is still under the legal jurisdiction of the IBWC, thus much of the land found south of the 2020 Border Wall Project will have legal restrictions for development similar to that found in Cameron and Hidalgo counties. Even with the lack of a levee system, analysis conducted on these sales is pertinent to valuation assignments in Starr County, as they give an appraiser multiple data points in which the market evidence indicates the wall did not impact values.