

# Sierra Vista Metropolitan Planning Organization Origin & Destination Study

Contract MPO-06

**FINAL**

*February 16, 2017*

*Prepared for:*

Sierra Vista Metropolitan Planning Organization



*Prepared by:*

Lee Engineering, LLC



In association with  
Crossborder Group

## TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>2</b>
STUDY AREA	2
BACKGROUND	3
DATA COLLECTION METHODOLOGY	5
<b>TRAVELER SURVEY RESULTS</b>	<b>6</b>
<b>AGUA PRIETA FOCUS GROUP INTERVIEWS</b>	<b>11</b>
<b>DEMAND FOR RURAL INTERCITY BUS SERVICE</b>	<b>13</b>
<b>WI-FI ORIGIN-DESTINATION AND TRAVEL TIME ANALYSIS</b>	<b>14</b>
DATA COLLECTION	14
ORIGIN-DESTINATION RESULTS	16
<b>PRINCIPAL FINDINGS AND RECOMMENDATIONS</b>	<b>19</b>
<b>APPENDIX A</b>	
SAMPLING PLAN AND QUESTIONNAIRE	
<b>APPENDIX B</b>	
TRAVELER SURVEY RESULTS	
<b>APPENDIX C</b>	
ORIGIN-DESTINATION ASSUMPTIONS AND FURTHER ANALYSIS	
<b>APPENDIX D</b>	
MEXICAN PESO EXCHANGE RATE - IMPACTS	
<b>APPENDIX E</b>	
METHODOLOGY FOR ESTIMATED ANNUAL RETAIL EXPENDITURE IN SIERRA VISTA	
<b>APPENDIX F</b>	
LIMITATIONS ON ESTIMATING RETAIL EXPENDITURE BY MEXICO-RESIDING VISITORS TO SIERRA VISTA	



## INTRODUCTION

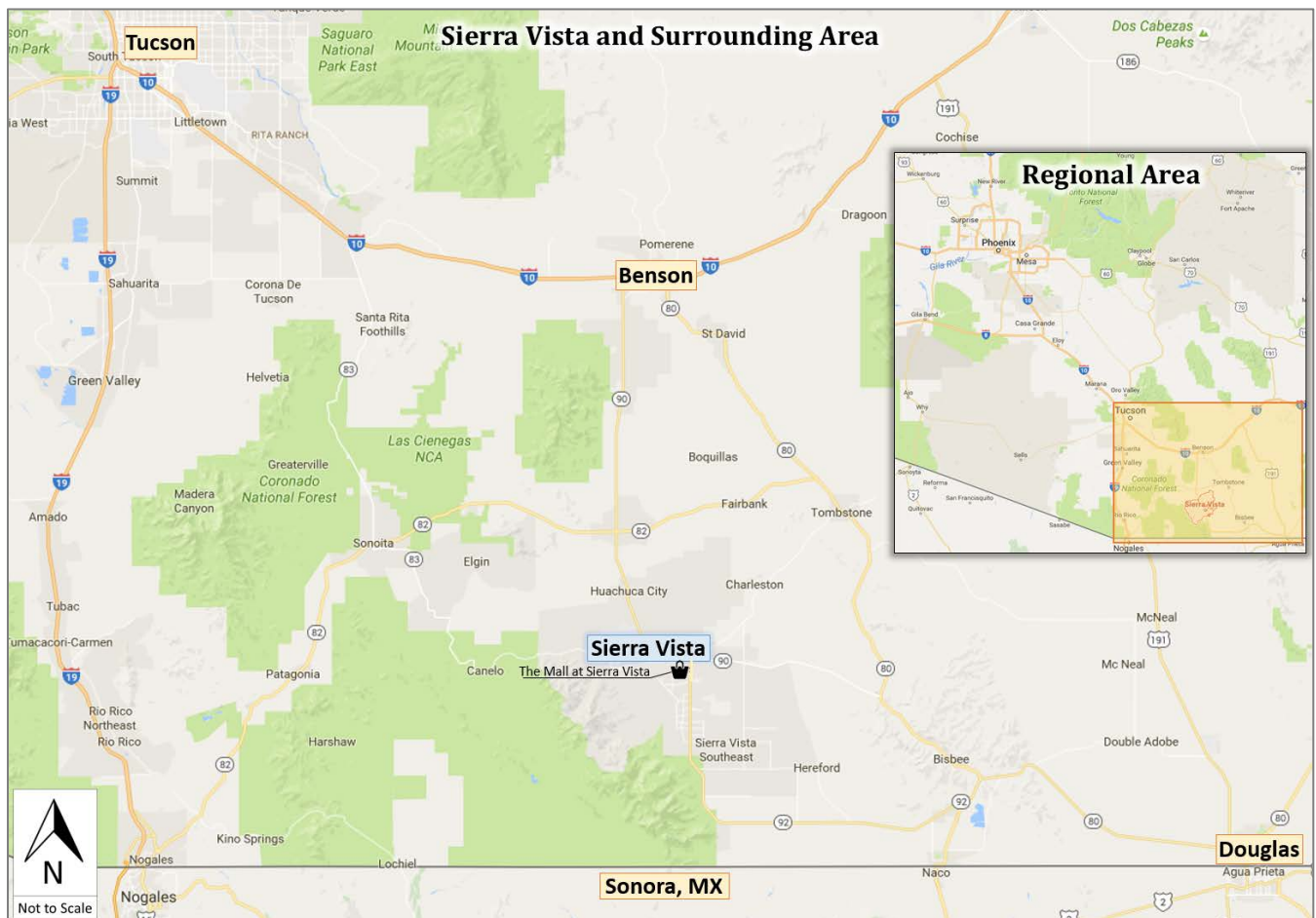
The City of Sierra Vista, Arizona in collaboration with the Sierra Vista MPO (SVMPO) has identified cross border visitors crossing from Agua Prieta, Sonora, Mexico to Douglas, Arizona through the Raúl Héctor Castro (formerly Douglas) Port of Entry (POE) as a potential key target for stimulating economic development. Past data from 2008 indicates that Mexico visitors spent approximately \$186.4 million annually in Cochise County (primarily in retail stores), with additional significant state-wide economic impacts.

The overall goal of this study is to provide the City of Sierra Vista and the Sierra Vista MPO with insights into cross border visitors from Mexico, their trip purpose, their origination/destination plans, their expenditures and store preferences, and other related information to assist Sierra Vista in attracting and expanding businesses within the City (as well as understanding the current economic impact of these visitors).

The Sierra Vista MPO and the City of Sierra Vista will use the findings and conclusions of this study to better understand the types of shopping and services that would attract more Mexican visitors to shop and dine in Sierra Vista, instead of passing by.

## STUDY AREA

The study area, displayed in **Figure 1**, is located in southeastern Arizona, and spans between Douglas, Sierra Vista, Benson, and Tucson. Also included in the study area is the Raúl Héctor Castro POE, which links Douglas, Arizona to Agua Prieta, Sonora (MX). From the border crossing in Douglas, Sierra Vista can be accessed, from the east, using State Routes 80 and 90 or, from the south, using State Routes 80 and 92.



## BACKGROUND

This study takes place against a backdrop of increased interest throughout the state of Arizona in building economic ties to Mexico, which is by far the state's largest trading partner. Since 2011, numerous initiatives throughout the state—many at the local level—have been launched to build off of these robust and long-standing economic ties between Arizona and Mexico. These efforts include continuous trade missions led by entities such as the City of Phoenix, the City of Tucson, Maricopa Association of Governments and others to Mexico City, Guadalajara, Hermosillo and elsewhere in Mexico. They also include policy initiatives such as the potential expansion of the Border Crossing Card (BCC) zone to include the entire state of Arizona. The Border Crossing Card is issued to Mexican citizens who pass a background check and allows cardholders to enter the United States for a limited amount of time in a predetermined area; in Arizona, the zone for BCC holders currently extends 75 miles north of the international boundary.

The Raúl Héctor Castro POE is the second largest commercial port in the state of Arizona, where in 2014 alone, it processed more than 64,000 commercial trucks and close to \$4 billion worth of trade between the U.S. and Mexico.<sup>1</sup> In 2015, the port processed 2.85 million personal vehicle passengers and 1.06 million pedestrians. This is decrease from 3.57 million personal vehicle passengers in 2008.<sup>2</sup> Over the same time period, the population of Agua Prieta increased approximately 3% each year to 80,000 residents<sup>3</sup> and the population of Douglas remained about the same at 17,000 residents<sup>4</sup>. The historical totals of northbound and southbound personal vehicle passengers and pedestrians crossing the Raúl Héctor Castro POE are shown in **Figure 2**.

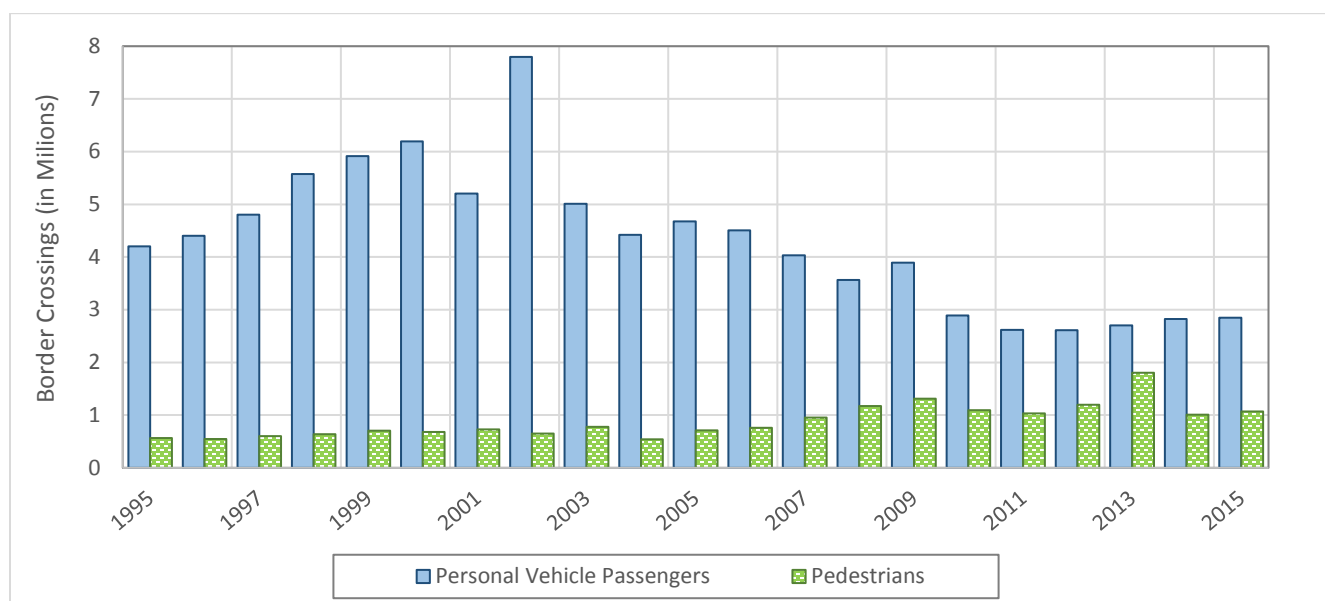


Figure 2: Personal Vehicle Passengers and Pedestrian Crossing Volumes at the Raúl Héctor Castro (Douglas) Port of Entry, 1995-2015

<sup>1</sup> Fernandez, J. (2015, November 10). GSA dedicates the Raúl Héctor Castro Port of Entry. Retrieved November 23, 2016, from <http://www.gsa.gov/portal/content/118814>

<sup>2</sup> "Border Crossing/Entry Data," Bureau of Transportation Statistics, United States Department of Transportation. Retrieved November 23, 2016, from [https://transborder.bts.gov/programs/international/transborder/TBDR\\_BC/TBDR\\_BC\\_Index.html](https://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_Index.html)

<sup>3</sup> Population of Agua Prieta, Sonora, Mexico. Retrieved November 23, 2016, from <https://www.citypopulation.de/php/mexico-sonora.php?cityid=260020001>

<sup>4</sup> Population of Douglas, Arizona, United States. Retrieved November 23, 2016, from <https://www.citypopulation.de/php/usa-census-arizona.php?cityid=0420050>

Analysts in Arizona have known for some time that Mexican visitors are a major economic driver for the state. “Mexican Visitors to Arizona: Visitor Characteristics and Economic Impacts, 2007-08,”<sup>5</sup> produced by the University of Arizona under the auspices of the Arizona Office of Tourism, is one of the most often cited studies in discussions on the economic impact of Mexican visitors to the state of Arizona. The report revisited components of a previous study conducted in 2001 and looked at various aspects of Mexican visitation to Arizona, including party size; length of stay in Arizona; frequency of travel to Arizona; visitor income; reasons for visiting; and specific origin of visitors, among other factors. The report found a sizable overall statewide economic impact that included over 23,000 jobs directly attributable to this flow of visitors as well as total income of \$837.24 million and \$3.61 billion in sales.

The report presented a mixed picture of this impact at the local level, however. For example, Cochise County ranked last out of the four border counties in terms of the geographic distribution of economic impacts of Mexican visitation and behind Maricopa County. In addition, the three border counties of Cochise, Santa Cruz and Yuma witnessed increased expenditures from Mexican visitors yet lost significant market share to Pima County between 2001 and 2007. Mexican visitors were venturing farther beyond the border into the interior of the state. Other trends noted by the report were a greater number of overnight visitors; more pedestrian crossings; and a relatively strong Mexican peso to US dollar exchange rate during the time of the 2007-2008 study, which in all likelihood contributed to the strong visitation numbers cited in the report. The historical value of the peso in relation to the US dollar is shown in **Figure 3**; a discussion about exchange rate impacts on retail sales in border counties can be found in **Appendix D**.

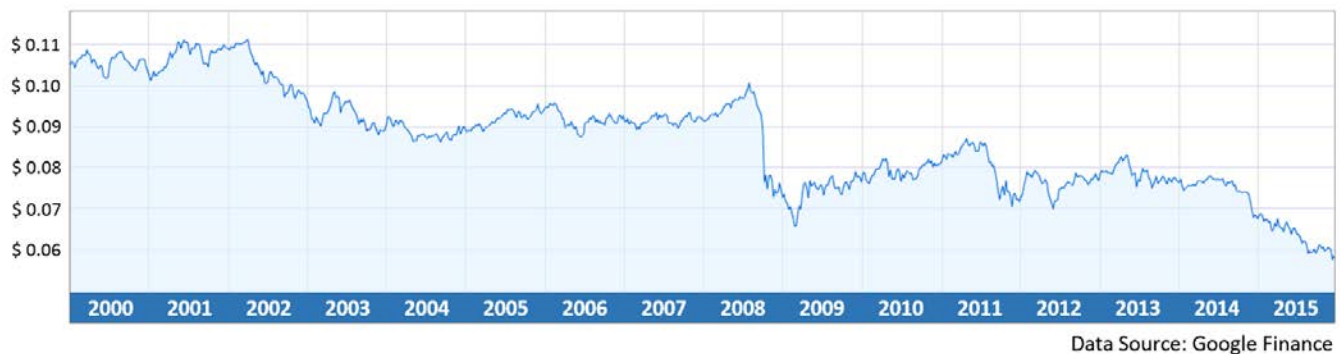


Figure 3: Historical Exchange Rate of 1 Mexican Peso to the US Dollar

The report is now nine years old, and communities such as Sierra Vista who are vying for Mexican visitors' spending need updated data and analysis on this important flow. The significant economic impacts of the Great Recession, which affected the United States, as well as economic developments in Mexico at the national, state and local levels all affect Mexican visitation to Sierra Vista and other communities throughout the state on an ongoing basis. For example, as mentioned previously, the city of Agua Prieta has grown significantly, though the number of cross border car passengers using the Douglas POE has decreased by 500,000 per year. With such diverging economic trend lines, communities such as Sierra Vista are in need of updated and more granular data as well as more comprehensive analysis on Mexican visitation.

In addition, each destination is a unique market for Mexican and other visitors, and Sierra Vista is no exception. While the University of Arizona report looked in detail at the impact of visitors statewide, detail on local impacts was quite general. Sierra Vista is discussed only twice in the report to note a) the opening of new stores and b) that two stores in the city ranked as alternatives for visitors to Douglas.

<sup>5</sup> Vera Pavlakovich-Kochi, PhD and Alberta H. Charney, PhD, *Mexican Visitors to Arizona: Visitor Characteristics and Economic Impacts, 2007-08*. Economic and Business Research Center, University of Arizona, 2008.



Finally, the 2012-2013 Cochise County Visitors' Study<sup>6</sup> looked at international visitation to Cochise County. Interestingly, visitation from Mexico ranked relatively low (9<sup>th</sup> overall) behind, Canada, the United Kingdom, Italy and others. While it is likely that that Mexican visitation was undercounted for Cochise County, these numbers also indicate a clear challenge for the economic development community and private sector (particularly retail and hospitality) in Sierra Vista and Cochise County more generally.

## DATA COLLECTION METHODOLOGY

Visitor data was collected using three primary methods: physical survey, interviews with a small focus group of residents from Agua Prieta (Sonora, Mexico), and Wi-Fi Anonymous Re-IDentification (ARID) origin-destination analysis. A questionnaire survey, developed for this study, and conducted on travelers (drivers of personal vehicles in Mexico) at the Raul Hector Castro POE waiting to cross into the United States, as well as interviews conducted with the focus group, aimed to determine the following:

- Primary residence of those crossing the border
- Frequency of border crossing
- Primary motivation for people coming into the United States (trip purpose)
- Where people in vehicles are traveling once they cross the border into the United States (general location and specific stores)
- An approximation of the amount of money they expect to spend in the United States
- Other information such as what stores or products they desire, their visitation to other cities (such as Tucson), and suggestions for increasing visitation to Sierra Vista.

The questionnaire developed for this study was applied to Mexico-residing car drivers and pedestrian visitors coming from Mexico crossing at the Douglas Port of Entry, with a core set of questions to collect information on demographics and shopping/visitation for all participants, a subset of questions about Tucson visitation to car crossers, and a subset of questions about transit service to Sierra Vista to pedestrians. The survey questionnaire was designed to minimize impacts to the operation of the Raúl Héctor Castro POE and regional roadways. Crossborder Group applied the survey to Mexico-residing border crossers of passenger vehicles in northbound queues at the Douglas-Agua Prieta border crossing. Two sampling efforts were targeted to ensure collection of two representative seasons; vacation/low-school crossings during summer and "normal" work/school crossings in the fall. The summer surveys were collected over six days, from Thursday, July 28, 2016 to Tuesday, August 2, 2016. The second wave of surveys during the fall was conducted over six days, from Wednesday, September 21, 2016 to Monday, September 26, 2016. The Crossborder Group staff conducting the surveys were bilingual English-Spanish speakers, and a screening question was applied to determine both which language participants preferred, as well as if they were residents of Mexico or the United States. Only residents of Mexico had the cross border survey applied to them. The general plan for these at-border surveys and the English-language version of the survey is provided in **Appendix A**.

Traveler surveys were conducted concurrently with the deployment of six Wi-Fi ARID roadside units on key highways (SR-80, SR-90, SR-92, and I-10) between Douglas, Sierra Vista, Benson, and Tucson. The Wi-Fi ARID roadside units record the timestamp and the unique identifier (i.e., MAC address) that are broadcasted from Wi-Fi enabled devices (i.e., smartphone) within vehicles passing by. The goal of the ARID deployment is to determine the distribution of border-crossing vehicles that are either traveling to or passing through Sierra Vista, and the vehicles that are bypassing the City Sierra Vista. This data also provides insight into the average time visitors from Mexico spend in Sierra Vista.

---

<sup>6</sup> *Cochise County Visitor Study, 2012-2013*. Arizona Hospitality Research & Resource Center, Center for Business Outreach, W.A Franke College of Business, Northern Arizona University, 2014.

## TRAVELER SURVEY RESULTS

During 2016, two waves of at-border surveys were conducted by Crossborder Group at the Raúl Héctor Castro POE between Douglas, Arizona and Agua Prieta, Sonora, for this study. A total of 779 surveys were applied during the summer, with another 1,171 surveys applied in the fall – all to Mexico-residing car crossers. The results of both survey waves are summarized and discussed in the following sections. **Appendix B** provides the detailed tabular data and traveler survey results.

### DRIVER AGE AND RESIDENCE

The median age of Mexico-residing drivers crossing the border at the Raúl Héctor Castro POE was approximately 40 years old. Summer visitors from Mexico tended to be slightly older and fall visitors had a slightly higher proportion of drivers in their thirties.

Including both the summer and fall surveys, the vast majority of border crossing trips originate locally, near the border. During the summer and fall survey waves, 83% and 92% of drivers responded that their primary residence is Agua Prieta, Sonora. An additional 15% (summer) and 7% (fall) responded that they live in another area within Sonora. Only 1% to 2% of Mexico-residing drivers indicated that they live in other Mexican states.

### FREQUENCY OF BORDER CROSSING

Of the border crossing drivers surveyed, most indicated that they cross the border five or more times per week (36% in summer and 59% in fall). Other popular responses were 1 and 2 times per week. Although the trends are consistent in both survey wave results, there was a greater percentage of drivers in the fall that indicated that they cross the border five or more times per week, which may be due to more work- and school-related crossings. The drivers' responses on border crossing frequency is shown in **Figure 4**.

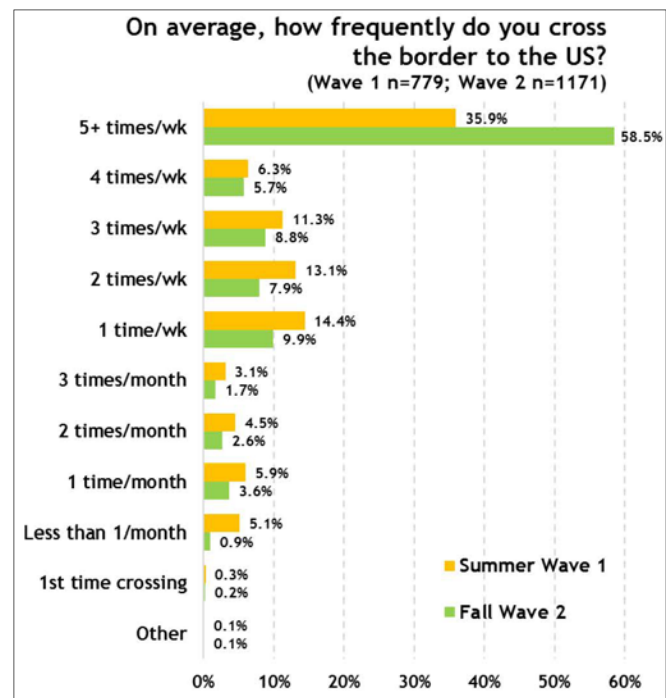


Figure 4: Frequency of Border Crossing

### DESTINATIONS, TRIP PURPOSE AND DURATION

Most drivers indicated that their destination was Douglas, Arizona. The summer and fall surveys found that 73%<sup>7</sup> and 91% were destined for Douglas, 1% and 3% were destined for Tucson, and 2% and 2% were destined for Sierra Vista, respectively. From Douglas, Tucson is accessed using the route of US 191, SR 80, and I-10. The route from Douglas to Tucson is 118 miles, with a travel time of approximately 2 hours and 5 minutes during free flow conditions. From Douglas, Sierra Vista can be accessed using two routes; one using US 191, SR 80, and Charleston Road, or the second route using SR 80 and SR 90. The faster route, using US 80, is approximately 50 miles in length with a free flow travel time of 1 hour.

Shopping is the most popular trip purpose among the drivers surveyed in both waves. Seasonal variation is notable in fall, where the school and work trips increase. The results are shown in **Table 1**.

<sup>7</sup> In the summer survey, respondents could answer Agua Prieta as a destination location of where they would end their trip (i.e., within one day they travelled from Agua Prieta to Douglas to Agua Prieta). It is likely that close to 90% of respondents were destined for Douglas in the summer. For the fall survey, questions A-4b was revised to "...and approximately where will your trip end today?" and clarification was obtained if the same location was given for the trip origin and trip destination.

Table 1: Trip Purpose

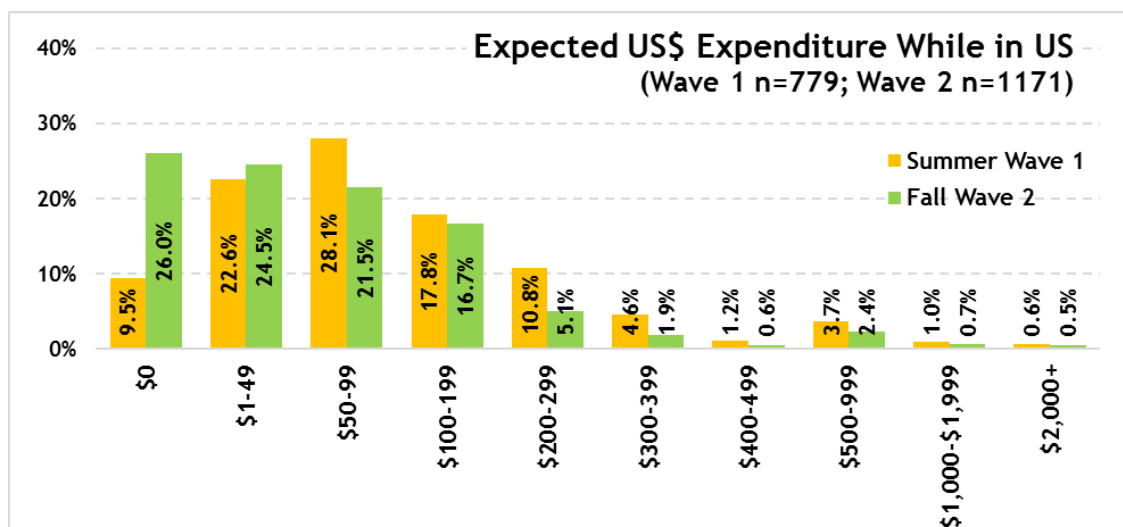
	Shopping	Work/ Business	Family/ Social	Medical	Vacation/ Tourism	School	Other
Wave 1 (Summer)	70.6%	14.1%	10.9%	0.6%	2.1%	1.5%	0.1%
Wave 2 (Fall)	50.7%	16.2%	13.0%	1.0%	0.8%	18.0%	0.3%

Over three-quarters of cross border visitors (76%-81%) spend less than five hours in the United States. Over 90% of visitors spent less than one day, which is consistent with the percentage of drivers who indicated they were traveling for shopping, work, social/family, and school trips. During the summer wave, 8% of drivers indicated they would be spending more than one day in the US. This number decreases to 4.6% in the fall. These results indicate that most crossers prefer quick, basic shopping available in Douglas, Arizona (e.g., Walmart, Food City, JCPenney, Fallas, DD's, Dollar Tree).

### RETAIL/SHOPPING ANALYSIS

The average expected expenditure in Arizona by all Mexico visitors was \$146 per trip during the summer survey, and \$95 per trip during the fall survey. Those that specifically identified Sierra Vista as their destination had a slightly higher average expected expenditure: \$252 during the summer, and \$203 during the fall (however, as sample sizes for Sierra Vista-destined visitors were small, these results have a lower level of statistical confidence). The difference between the “all Mexico visitors” expected expenditure and those specifically visiting Sierra Vista likely reflect that Douglas-bound visitors make more frequent, lower expenditure trips (while those visiting to Sierra Vista and beyond likely have higher incomes and make larger, non-daily purchases). The methodology used to estimate the average annual retail expenditure in Sierra Vista is shown in **Appendix E**, and a discussion on the limitations of estimating retail expenditure of Mexico-residing visitors to Sierra Vista is provided in **Appendix F**. The variation noted between the two time periods may be due to a combination of seasonal changes (i.e.: higher vacation/tourism expenditures during summer), as well as the decrease in purchasing power of the Mexican peso which had an exchange rate of 18.91 MXN / 1 USD on July 28, 2016 and 19.86 MXN / 1 USD on September 26, 2016. Additional results of expected expenditure are shown in **Figure 5**.

Figure 5: Expected Expenditure during US Visit



The drivers were also asked how many times during the past two months they had gone shopping or purchased goods within the City of Sierra Vista, and the stores that they visited. Between 42% (summer) and 35% (fall) of respondents indicated that they had shopped in Sierra Vista within the previous two months. Approximately 5% indicated that they shop in Sierra Vista once every two weeks or more frequently.



While clearly Douglas appears to be the primary destination for crossborder shopping and visitation, based on trip data and stated expenditure estimates it would appear that Sierra Vista likely captures a minimum of \$4.6 to 8.3 million in direct annual retail expenditures by Mexico-residing visitors (a conservative estimate that may be potentially higher).

In terms of retail locations, crossborder visitors were also asked to indicate their top three places they like to visit, dine or shop at. Notably for both the summer and the fall surveys, the top seven places mentioned were in the same order. This result suggests strong familiarity and frequent visitation to these seven destinations (results of this question are shown in **Table 2**).

Table 2: Top Retail/Dining Destinations

Rank	Retail/Dining Destination	Summer	Fall
1	Mall	37.5%	46.3%
2	Ross	31.8%	23.0%
3	Walmart	22.8%	19.4%
4	Golden Corral	14.4%	17.6%
5	Target	11.7%	10.5%
6	Home Depot	8.4%	7.6%
7	Marshalls	7.8%	6.4%

Other frequently mentioned destinations include Sears, Kmart, Food City, Dollar Tree, McDonald's, and Olive Garden. When asked what stores or services Mexico visitors would most like to see in Sierra Vista that currently do not exist, 61% of respondents were unsure. However, the most frequently mentioned specific response was Costco (11%). Other specific store responses provided were Aeropostale (3%), Guess (2%), JC Penney (1.8%), and Hollister (1.2%). Other stores mentioned less frequently include Forever 21, Sam's Club, Gap, and Guitar Center. Several respondents answered that they would like to see a Target, Kmart, Home Depot, Ross, and Best Buy in Sierra Vista, although these retail stores already exist. Additional advertising and/or education of Sierra Vista's retail offerings to Mexico may increase the frequency of shopping visits to these existing stores.

As Tucson, Arizona, is also a common destination for cross border shopping trips, drivers at the Raúl Héctor Castro POE were surveyed about the number of times they had gone shopping or purchased goods in both Sierra Vista and Tucson within the previous two months. As seen in **Figure 6**, during the summer wave, 42% stated that they had shopped in either Sierra Vista or Tucson within the last two months; during fall, Sierra Vista's visitation for shopping was slightly higher (34%) compared to Tucson (32%). Interestingly, for both cities, approximately 4 to 5% indicated that they shop once every two weeks or more frequently.

Several stores that were mentioned as top retail destinations in Tucson include Walmart, Ross, and Home Depot, which are also present in Sierra Vista. Additional advertising and education may encourage visitors to shop in Sierra Vista rather than traveling further to Tucson.

Tucson may not be a retail competitor. During the course of research, local retail representatives referred to "Sonoran Sundays" – a weekend retail situation where Mexico visitors that travel to Tucson (and Phoenix) but make a final stop in Sierra Vista prior to returning to Sonora. While no data was specifically collected on this, several retail malls that were visited in Sierra Vista were seen to have a higher number of Sonora-plated vehicles on Sundays – tentatively confirming this activity. Such behavior may present opportunities for multi-city retail tourism marketing efforts.

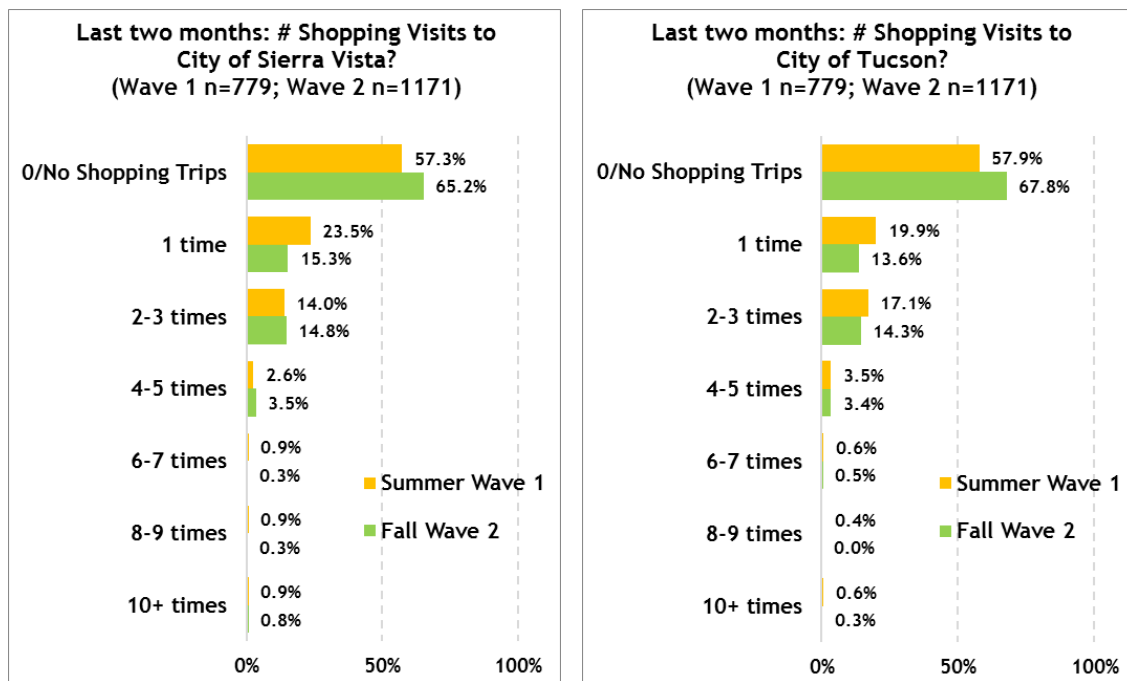


Figure 6: Cross Border Shopping Frequency in Sierra Vista and Tucson, Arizona

#### DEMAND FOR MEDICAL SERVICES: SURVEY & FOCUS GROUP FEEDBACK

While neither the survey respondents nor the focus group participants rated medical services highly as a reason for crossing, the study did uncover some interesting data and trends in this area.

During the at-border survey, cross border visitors were asked several questions about their recent use of medical services in Sierra Vista. Drivers were asked to indicate the number of times someone in their household (including themselves) had visited the Canyon Vista Hospital in Sierra Vista within the past 24 months. Most respondents did not indicate recent use of the hospital; however, approximately 5% (summer) and 10% (fall) of respondents reported visiting the hospital within the previous 24 months. The seasonal variation may be related to the greater proportion of Agua Prieta-residing, “local”, POE users in the fall, compared to the slightly greater “non-local” users during the summer.

The respondents who indicated visitation to the Canyon Vista Hospital within the last 24 months were asked to identify the type of medical services used during the visit. The selection options were dental, pediatric, surgical, general care, maternity, or “other”. The results are shown in **Figure 7** at right. More than half of all medical service visits were related to general care or maternity services. The greatest seasonal variation was found in surgical visits, which accounted for 7.4% of all medical trips in the fall, and 17.1% of all medical trips in the summer. This may be a result of long distance medical visits or seasonal scheduling.

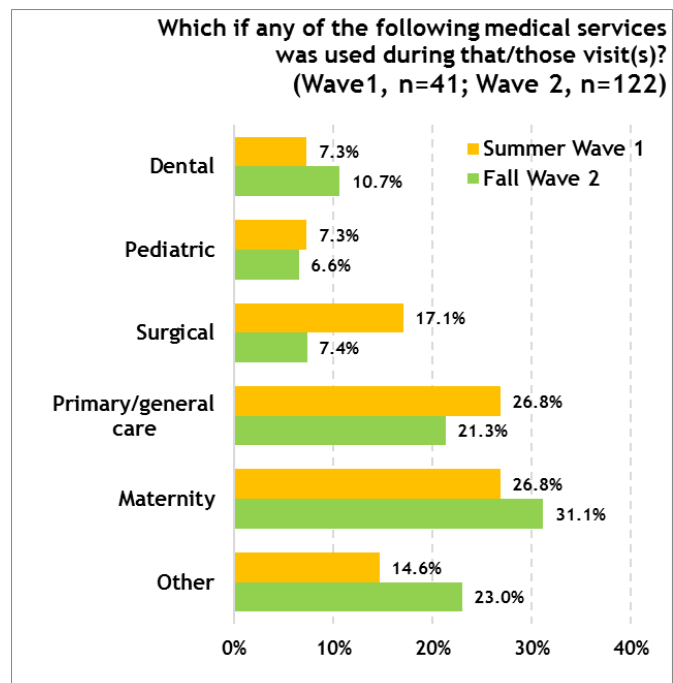


Figure 7: Cross Border Trips for Medical Services

The subject of medical services was also a topic in the project focus group (discussed in more detail in the following sections). It was noted that relatively few focus group participants viewed Arizona in general or Sierra Vista specifically as a destination for medical care. Only four participants had visited Arizona doctors over the last two years. Of these four, one participant had taken their children for pediatric visits and another had visited a natural medicine specialist. Two other participants who had visited Sierra Vista for medical care had visited an eye doctor and urologist.



Figure 8: Canyon Vista Medical Center in Sierra Vista, Arizona

Several reasons were given for the relatively small number of visits to Sierra Vista for medical care:

- Medical care in the U.S. is far more expensive than the same care in Mexico, so medical visits anywhere outside Mexico are quite often simply cost-prohibitive and are thought of as a last option, or for highly-specialized services.
- Survey respondents and focus group participants who were able to afford medical care in the U.S. noted that they feel more comfortable receiving medical care in Tucson, where they are more likely to find medical personnel that speak Spanish and who have cross-cultural competency in the medical field.
- Respondents and participants believed that Spanish-speaking doctors were hard if not impossible to find in Sierra Vista.

## AGUA PRIETA FOCUS GROUP INTERVIEWS

Crossborder Group supplemented the data collected via at-border surveys by conducting several focus group interviews with a total of twenty border-crossing residents of Agua Prieta to gain a better understanding of how residents of that city view Sierra Vista as a retail destination. Twelve females and eight males between the ages of 16 and 55 living in three principal zip codes (*codigo postales*) in Agua Prieta were recruited for the group interviews. Their responses about key topics are summarized below.

### THE BORDER CROSSING EXPERIENCE

Crossing the border is, obviously, the first step in a visit to Sierra Vista and can be a major aspect in how visitors perceive the overall experience (and both if they choose to return, and with what frequency). Focus group participants utilize three principal methods for crossing the border in personally-owned vehicles at the Raúl Héctor Castro POE in Douglas. A majority utilize the Ready Lane (a special lane in which documents with radio-frequency identification chips are used to reduce inspection processing times at the border). Five participants use the regular lanes and three cross using the SENTRI lane (a trusted traveler program of U.S. Customs and Border Protection that generally delivers faster border crossing times for program participants). In terms of frequency, the largest group, seven people, cross twice per week. Three out of twenty participants crossed five times per week, while no one in the group crossed less than once per month.

### CROSSING TO SHOP OR DINE IN ARIZONA

Shopping is clearly the principal reason that focus group participants visited Arizona. Nineteen out of twenty focus group participants indicated that they had crossed at least once during the previous 60 days to shop, and a full sixty percent of those in the focus groups indicated that they had crossed between 11 and 40 times for shopping during the previous 60 days. Seventeen participants indicated zero crossings specifically for dining, while 16 participants indicated zero crossings for recreation/entertainment. It would appear that retail (rather than restaurants or recreation) currently is the primary motivation for crossborder expenditures.

*One Focus Group participant noted the large number of stores in Sierra Vista was much greater than in Agua Prieta or Douglas – particularly in clothing and shoes.*

*However, distance poses a problem for some potential visitors: “I don’t like the lack of transportation options between Douglas and Sierra Vista. Sometimes for whatever reason you don’t have a car available, and then you have to make do with what’s here [in Douglas].”*

Table 3: Focus Group Shopping Frequency

<i>In the last 60-days, approximately how many times have you visited Arizona for shopping?</i>		
	Frequency	Percent
Total	20	100%
0	1	5%
1-10	6	30%
11-20	6	30%
21-30	3	15%
31-40	3	15%
41-50+	1	5%

Focus group participants clearly indicated that Sierra Vista has plenty of competition with other Arizona destinations for their dollars. While fifty percent of respondents indicated that they had visited Sierra Vista during the previous 60 days, a full 70% had visited Tucson, 30% had visited Phoenix and 10% visited Bisbee. No respondents indicated that they had visited any of the four cities mentioned above more than 10 times during the previous 60 days. While Douglas certainly is the most convenient place for crossborder shopping, as one person notes, “When I can’t find it in Douglas, I can find it in Sierra Vista.”

## MEXICO VISITOR SPENDING

Participants noted a wide range of spending patterns on groceries, restaurants, gas, and shopping during their most recent trip to Arizona. When asked what they spent on these items, participants gave answers ranging from \$80 to \$1,400 with an average of \$196 per person. Retail shopping was the highest spending category (\$1,486 combined for all 20 participants), followed by groceries (\$1,343 combined), gas (\$717 combined), and dining (\$381 combined). While there are certainly grocery shopping options in Agua Prieta and Douglas, focus group participants mentioned that grocery shopping in

Sierra Vista was considered a good option for two reasons: first, it was convenient to do at the end of a shopping trip to Sierra Vista (and prior to their return to Agua Prieta); and, second, Agua Prieta residents liked the larger variety of grocery shopping options in Sierra Vista. A majority of respondents spent \$49 or less on gas and restaurants, while a majority spent \$50 or more on groceries during their last visit. Respondents were evenly split among those who spent more than or less than \$50 on retail shopping during their last visit.

*Interestingly, one participant specified why a currency exchange (casa de cambio) center was important – she had forgotten to change pesos to US dollars in Douglas, and after arriving in Sierra Vista, realized she would have to return to Douglas in order to change her money.*

***“If you don’t take a sufficient amount in dollars with you, you can’t buy what you want.”***

## PERSPECTIVE OF SIERRA VISTA

Sierra Vista was clearly on most participants’ radar. Twelve out of twenty participants had visited the city between one and three times during the previous 60 days to shop, dine, buy gasoline or some other activity. Thirty-five percent of respondents had not visited at all during that time period.

Eight of 20 participants mentioned Sierra Vista Mall as their top destination when visiting the city. Variety, competitive prices, and convenience were given as reasons the Mall stood out. Sears, Walmart, and the Golden Corral were tied for second place as respondents’ top destination in the city. The Mall was also mentioned most often as the second most popular destination in the city, a fact which shows its predominance in the overall crossborder shopping experience in Sierra Vista.

What types of places did focus group participants want to see more of in Sierra Vista? Aeropostale was the most common answer, while an outlet mall, a Victoria’s Secret, a musical instrument store, currency exchanges, and simply “a greater variety of stores” were mentioned by several participants.

Table 4: Focus Group Suggestions for Stores, Restaurants, and Services in Sierra Vista

<b><i>What stores, restaurants or services would you like to see in Sierra Vista that are not currently there?</i></b> (Top Responses Shown)
<p>Aeropostale</p> <p>Casa de Cambio</p> <p>Outlet stores</p> <p>Victoria’s Secret</p> <p>Costco</p> <p>Fun parks</p> <p>Toys R’ Us</p>

Table 5: Focus Group Ideas for Making Sierra Vista More Attractive to Shoppers from Mexico

<b><i>If you could give two or three ideas to the city of Sierra Vista to make it more attractive for visitors from Agua Prieta like you, what would you suggest?</i></b> (Top Responses Shown)
<p>Fun parks</p> <p>Direct transport to Sierra Vista from Douglas</p> <p>Additional store publicity/promotion</p> <p>Concerts or cultural events</p>



Participants offered several suggestions to make the City of Sierra Vista more attractive for visitors from Agua Prieta. Fun parks were mentioned several times, as was transportation to and from Douglas, and more publicity for stores and sales. The lack of Spanish-speaking staff at stores was singled out by several participants; one frank response noted that what was needed was “Employees that at least speak Spanish, treat us better and make us feel more at home.” Sporting events and concerts were also mentioned as important potential attractions.

*One participant liked Sierra Vista for its safety and the fact that “your money goes far in Sierra Vista.”*

*Another observed that Mexican visitors were not treated well in some locations.*

Focus group participants clearly see Sierra Vista as distinct from other destinations; while at times it simply can’t compete with enormous retail variety in Tucson and Phoenix, its convenience was comparatively attractive given the longer drive to those destinations. Thirteen participants indicated that they preferred to visit Phoenix or Tucson over Sierra Vista, in part due to the presence of family, the greater variety of stores in Phoenix and Tucson, and the greater degree of cultural acceptance in those communities. However, Sierra Vista won out over Phoenix and Tucson with some participants because of the shorter distance and a sufficient variety of stores.

### LODGING

Lodging is a challenging area for Sierra Vista with respect to visitors from Agua Prieta. Only one out of twenty participants indicated that they had stayed overnight in a hotel in Sierra Vista. However, nearly half (9) indicated that they might consider doing so if there was a concert or musical event that was attractive. Others mentioned theme parks and additional shopping options as potential reasons to stay overnight in Sierra Vista.

## DEMAND FOR RURAL INTERCITY BUS SERVICE

The demand for bus service was estimated using the TCRP B-37 Toolkit for Estimating Demand for Rural Intercity Bus Service, which estimates demand using population data, route length, and stops along the route. The TCRP B-37 Toolkit uses 2000 population Census data, which is equal to or greater than 2010 population Census data for the cities analyzed. Without manual adjustment due to potential demand from Mexican tourists and shoppers, the projected annual rural intercity bus demand for a route from Douglas to Bisbee to Sierra Vista is 2,400 annual trips. The results of the traveler survey indicated that approximately 83% to 93% of the border crossing respondents live in Agua Prieta. Douglas, Arizona and Agua Prieta, Sonora are adjacent towns separated by the US-Mexico Border. Agua Prieta, Sonora has a population of approximately 80,000, while Douglas, Arizona has a population of 17,000. In 2015, there were more than 1.14 million pedestrians who crossed the border; an average of approximately 3,100 pedestrians per day. This demonstrates the close vicinity of the two jurisdictions, and the potential additional demand for rural connections from Douglas to nearby cities.

A second estimation was conducted using the TCRP B-37 Toolkit for the same route from Douglas to Bisbee to Sierra Vista; however, this estimation included the Agua Prieta population along with the other populations. Including Agua Prieta, the projected annual rural intercity bus demand for the route is 6,900 annual trips. Pedestrian volume across the border was not included as a factor in the calculation of the demand as many of these may be school-related trips. In the focus group of 20 border crossing residents of Agua Prieta, the majority indicated that when crossing the border, shopping is their primary trip purpose. The distance between Douglas and Sierra Vista is a barrier to some cross-border shoppers that would prefer to shop in Sierra Vista due to a better selection of retail options, but cannot access Sierra Vista due to transportation limitations.

The implementation of a rural intercity bus service is supported by the following study results:

- 1) The majority of border crossing visitors are visiting Arizona for shopping and retail purposes. Those who visit Sierra Vista spend more than the average border crossing visitor to Arizona. The traveler survey determined that 5% of border crossers shop in Sierra Vista at least once every two weeks, and the average visitor expenditure in Sierra Vista is \$252 in the summer, and \$205 in the fall.
- 2) Without manual adjustment due to demand from Mexican tourists and shoppers, the projected annual rural intercity bus demand for a route from Douglas to Bisbee to Sierra Vista is 2,400 annual trips.
- 3) Including the population of Agua Prieta with the population of Douglas results in potential rural intercity bus service demand of 6,900 annual trips to Sierra Vista. This is likely an overestimate due to the added challenge of residents in Agua Prieta crossing the U.S./Mexico border.
- 4) There are significant pedestrian volumes crossing the border. An individual in the focus group indicated that they felt limited in their transportation options between Douglas and Sierra Vista. A rural intercity bus service would provide visitors from Mexico without a vehicle more options.
- 5) Insights from the focus group surveys revealed that currency exchange (casa de cambio) centers will be important, thus should be co-located at transit stops.

## WI-FI ORIGIN-DESTINATION AND TRAVEL TIME ANALYSIS

### DATA COLLECTION

The objective of the temporarily installed Wi-Fi data collection devices was to determine traveler route characteristics of visitors traveling from the Raúl Héctor Castro POE toward Sierra Vista. Six Wi-Fi devices were installed in the Sierra Vista area to create a network of possible routes from the border.

Wi-Fi data collection devices were used to collect origin-destination data of probe vehicles that broadcast a Wi-Fi signal from an enabled cell phone, computer, vehicle feature, etc. Because the broadcasted signal is associated with a unique, but personally unidentifiable, media access control (MAC) address, it can be recorded at different locations along a corridor and then matched through software algorithms to determine the time passed between the deployment locations. The equipment includes a data processing device, Wi-Fi antenna, and a cellular modem. The Wi-Fi devices can collect hundreds of data points per day for as long as the equipment is left in the field.

Vehicle identification at two device locations indicates the chosen route and the travel time between the two locations. The purpose of the Wi-Fi data collection effort is to determine the following:

- Trip distribution of border crossing vehicles visiting or traveling directly through Sierra Vista
- Trip distribution of border crossing vehicles bypassing the Sierra Vista area entirely
- Average time spent in Sierra Vista by border crossing vehicles

Six Wi-Fi capable devices were deployed at various locations for the duration of three months, from mid-July to late September. The six locations were selected to create a network of possible regional destinations from the Raúl Héctor Castro POE in Douglas, Arizona. Three devices were installed within Sierra Vista or on primary highways providing access to Sierra Vista, and the other three devices were installed in Tucson, Benson, and near the Raúl Héctor Castro POE, as shown in **Figure 9**. The device closest to the Raúl Héctor Castro POE was installed at the intersection of US 191 and SR 80, approximately one mile north of the Port of Entry.

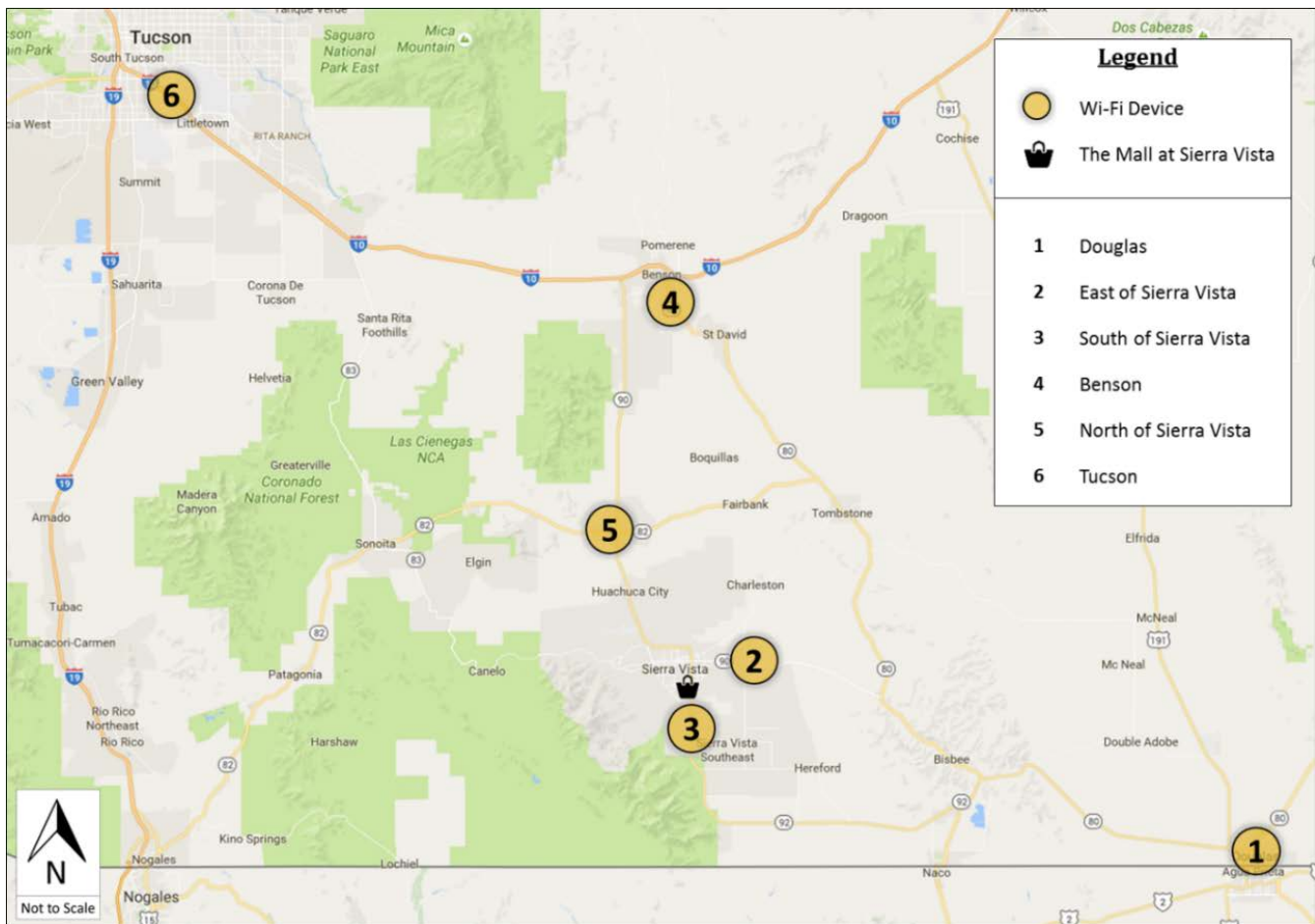


Figure 9: Wi-Fi Device Locations

Software algorithms are used to create unique MAC address matches between multiple Wi-Fi device locations and filter out any “invalid” matches. Matches may be considered “invalid” if a match was made in significantly less time or significantly more time than the typical route travel time. As a vehicle passes by a Wi-Fi device, a MAC address within the vehicle may be detected multiple times, especially if the vehicle is within the detection zone for an extended period of time (i.e., waiting at a traffic signal). In these cases of multiple detection reads, the first valid read is stored and the other reads are filtered out.

The use of Wi-Fi capable data collection devices provides insight into popular routes and destinations, duration in a particular region/city, and the time it takes for vehicles to travel between two devices. This information can be used to develop an origin destination matrix, which indicates common locations where trips begin and end. The origin destination analysis tool was used to determine the most commonly utilized routes from the Hector Raul Castro (Douglas) POE. The results estimate the distribution of vehicles between the five possible destination routes.

From the Raúl Héctor Castro POE, The Mall at Sierra Vista is accessible by two primary routes; the first by State Routes 80 and 90 (Device 1 – Device 2), and the second by State Routes 80 and 92 (Device 1 – Device 3). The first route accesses the City of Sierra Vista from the East, and the second route accesses Sierra Vista from the South.

## ORIGIN-DESTINATION RESULTS

The origin-destination study estimated the distribution of vehicles which were traveling from the Raúl Héctor Castro POE to Tucson, Benson, and three areas near Sierra Vista (North of Sierra Vista on SR 90, East of Sierra Vista on SR 90, and South of Sierra Vista on SR 92). This analysis may not represent all border crossers and they do not include vehicles who traveled to other locations (e.g., eastbound) after passing through the Raúl Héctor Castro POE. The percentages shown in the origin destination figures represent a sample of vehicles that originated from Douglas, Arizona using US Highway 191 (toward McNeal and Cochise) or State Route 80 (toward Cotton City and Lordsburg) to reach the five destinations with Wi-Fi devices. The sample size of these vehicles (determined by Wi-Fi matching) represents approximately 8% to 29% of the total roadway vehicles. Further information on the sample size and total estimated roadway vehicles is provided in **Appendix C**.

Based on Google driving directions, the fastest route from Douglas to The Mall at Sierra Vista is by State Route 80 and State Route 90. This indicates that most visitors coming to Sierra Vista for shopping, dining, or entertainment will use the route between the Douglas (1) device and the East of Sierra Vista (2) device. The results of the origin-destination study concluded that of the five possible destinations, this route (1-2) was the most commonly used by vehicles traveling from the Raúl Héctor Castro POE in Douglas.

Wi-Fi device data collected between July 27, 2016 and September 30, 2016 was included in this analysis. Trips were included if the travel time between the two devices did not exceed four hours. The average weekday (M-F) distribution resulted in 44.1% of vehicles traveling to East of Sierra Vista (2), 21.2% to Benson (4), 13.8% to South of Sierra Vista (3), 13.1% to Tucson (6), and 7.9% to North of Sierra Vista (5). These results are represented in **Figure 10**.

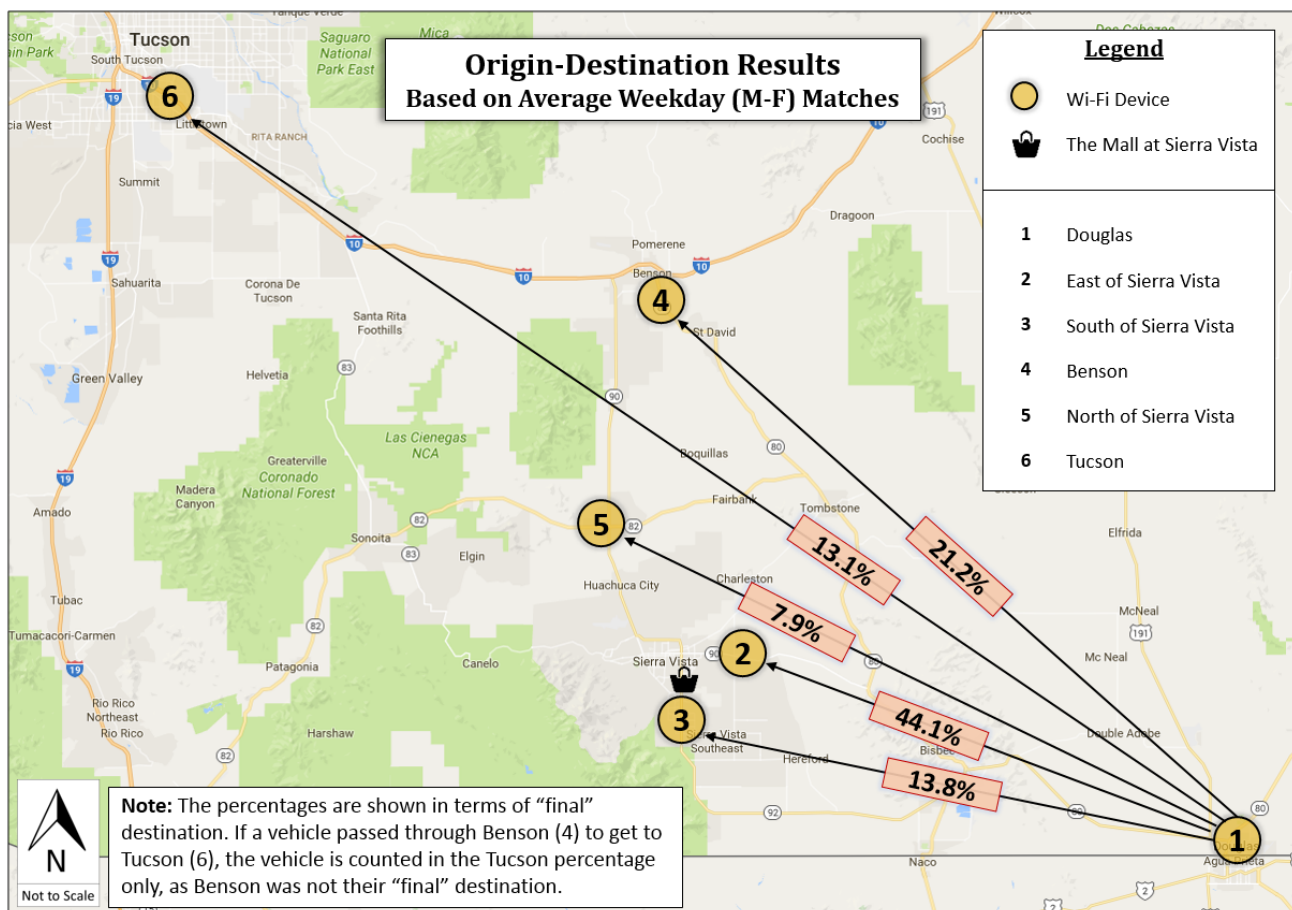


Figure 10: Origin-Destination Results based on Average Weekday (M-F) Wi-Fi Matches



The average weekend (Saturday and Sunday) distribution resulted in 37.4% of vehicles traveling to East of Sierra Vista (2), 32.2% to Benson (4), 14.2% to Tucson (6), 10.7% to South of Sierra Vista (3), and 5.5% to North of Sierra Vista (5). These results are shown in **Figure 11**.

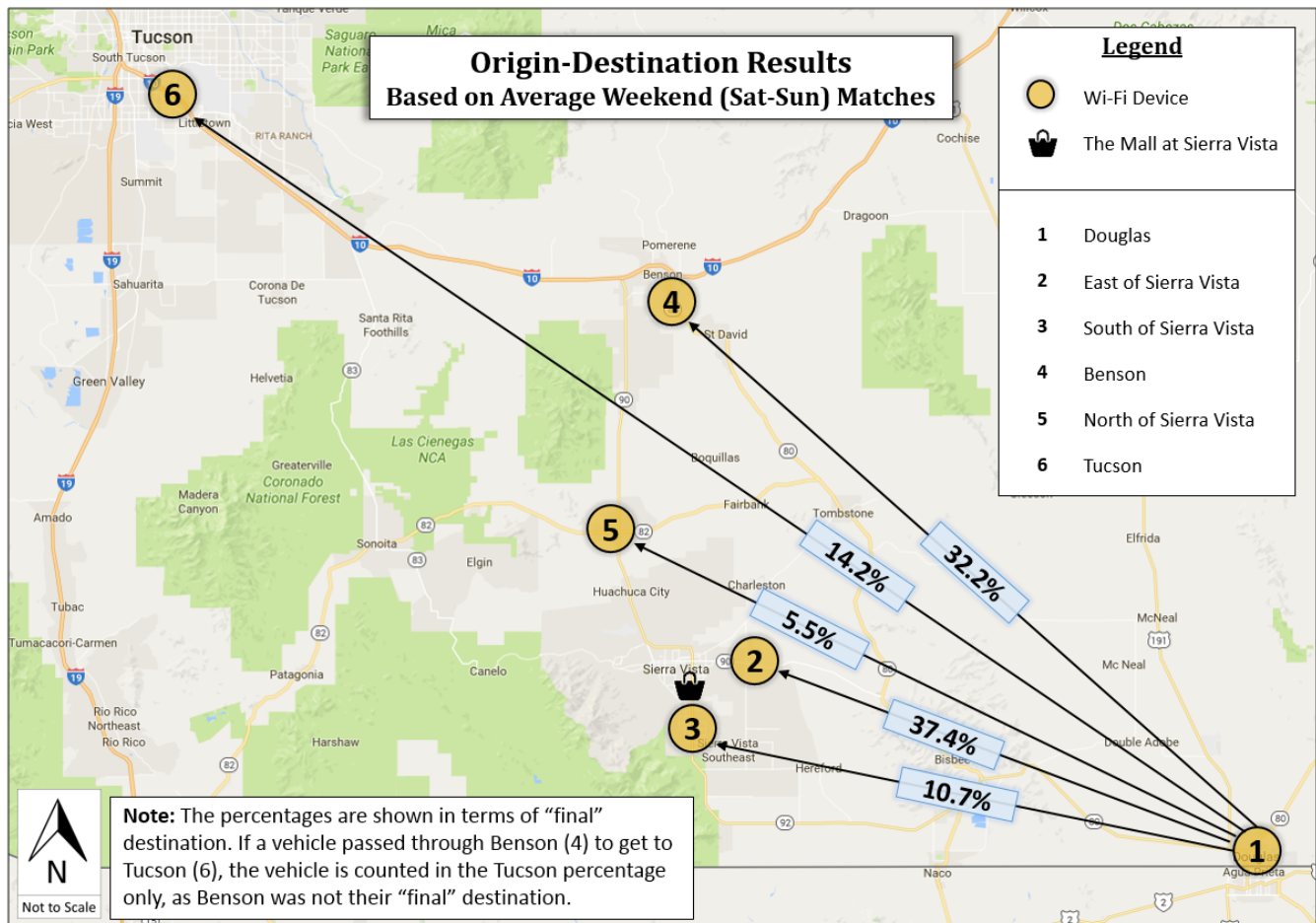


Figure 11: Origin-Destination Results based on Average Weekend (Sat-Sun) Wi-Fi Matches

If vehicles were identified in multiple segments along their route (i.e., identified as they were passing through Benson on the way to Tucson) they were recorded only once as a Douglas (1) to Tucson (6) traveler, rather than a Douglas (1) to Benson (4) traveler *and* a Benson (4) to Tucson (6) traveler. Assumptions made to develop the percentage of trips from the border that visited/passed through the City of Sierra Vista and the percentage of trips that completely bypassed the City of Sierra Vista are provided in **Appendix C**.

Of the total trips originating from the Douglas POE, it was concluded there is a greater percentage of trips that visit or pass through Sierra Vista than trips that bypass Sierra Vista entirely. On an average weekday (Monday through Thursday), approximately 64% of vehicles visit or pass through the City of Sierra Vista, while 36% bypass the City completely. A similar trend was observed on weekends; on an average Saturday or Sunday 54% of vehicles visited or passed through Sierra Vista and 46% of vehicles bypassed the City. The results are shown in **Table 6**.



Table 6: Percent of Cross-Border Trips Visiting/Passing Through and Bypassing Sierra Vista

	Visiting or Passing Through the City of Sierra Vista			Bypassing the City of Sierra Vista Entirely		
	Average Daily Matches	Percent of Total Daily Matches	Estimated Daily Volume*	Average Daily Matches	Percent of Total Daily Matches	Estimated Daily Volume*
Weekday (M-F)	301	<b>64.4%</b>	1,362	166	<b>35.6%</b>	1,224
Weekend (Sat/Sun)	257	<b>53.7%</b>	1,041	222	<b>46.3%</b>	942

\*Daily volumes were estimated using historical ADOT count station data along SR 80 and the distribution of trips observed in the origin-destination study. Additional details are provided in **Appendix C**.

Compared to weekday results, the proportion of total trips visiting or passing through Sierra Vista is slightly lower on the weekends. This is likely due to a greater number of long-range trips (Tucson, Phoenix) that are possible during the weekend.

### TRAVEL TIME AND TRIP DURATION RESULTS

An analysis was conducted to determine the average visitor time spent in Sierra Vista. A four-week period of data collection during the month of August was included in the analysis. The two reasonable routes from Douglas to Sierra Vista were analyzed; first, vehicle trips between Device 1 and Device 2 (located just east of Sierra Vista) and second, between Device 1 and Device 3 (located just south of Sierra Vista). Vehicle trips were included in the analysis if they were identified in the following manner:

- Identified to be traveling from Device 1 to Device 2 AND returning along the same route from Device 2 to Device 1; or
- Identified to be traveling from Device 1 to Device 3 AND returning along the same route from Device 3 to Device 1.

In addition, the data was filtered to the exclude the following trips:

- Trips where travel time from Douglas to Sierra Vista or from Sierra Vista to Douglas exceeded 2 hours (typical expected travel time is approximately 1 hour)
- Trips where the duration in Sierra Vista exceeded 8 hours (work-related trips)<sup>8</sup>

The average time spent in Sierra Vista is defined by the elapsed time between the initial vehicle identification entering Sierra Vista to the secondary vehicle identification as the vehicle departs Sierra Vista. The analysis concluded that the average visitor spends approximately 3 to 3 ½ hours in the vicinity of Downtown Sierra Vista, which includes the Mall at Sierra Vista.

Table 7: Average Time Spent in Sierra Vista

	Average Duration of Sierra Vista Visit (between entering and exiting detection)	Average Travel Time from Wi-Fi Device to Downtown Sierra Vista	Estimated Average Time Spent in Downtown Sierra Vista
Travelers accessing Sierra Vista using Route from 1-2 (SR80/SR90)	3 Hours 17 Minutes	11 Minutes	<b>2 Hours 55 Minutes</b>
Travelers accessing Sierra Vista using Route from 1-3 (SR80/SR92)	3 Hours 52 Minutes	8 Minutes	<b>3 Hours 36 Minutes</b>

<sup>8</sup> There were 84 matches identified from 1-2 and subsequently from 2-1 between July 28<sup>th</sup> and August 16<sup>th</sup>, 2016. Of these trips, 22% stayed in Sierra Vista for more than 8 hours and were considered “work related trips”. For the secondary route, there were 28 matches identified from 1-3 and subsequently from 3-1 between July 28<sup>th</sup> and August 30<sup>th</sup>, 2016. Of these trips, 14% stayed in Sierra Vista for more than 8 hours and were considered “work related trips” and were excluded from the analysis. The “work related trips” were excluded from the rest of the analysis.

The two routes from Douglas to Sierra Vista were found to have similar results. The origin-destination analysis indicated that the route from Douglas to Sierra Vista using SR80/SR90 (1-2) had more than three times the number of trips than the route using SR80/SR92 (1-3). This was also demonstrated in the trip duration analysis, the route from 1-2 and 2-1 had more than four times the vehicle match sample size of the 1-3 and 3-1 route. Based on these results, the average amount of time spent in Downtown Sierra Vista is approximately 3 hours.

## PRINCIPAL FINDINGS AND RECOMMENDATIONS

### FINDINGS

The traveler survey targeted cross border visitors at the Raúl Héctor Castro POE whose primary residence is within Mexico. The focus group targeted border-crossing residents of Agua Prieta, Sonora. The traveler survey and focus group resulted in the following findings:

- Most survey respondents indicated that they cross the border five or more times per week. This was 35.9% of all respondents in the summer survey and 58.5% in the fall survey. The second most common response was crossing the border one or two times per week.
- The surveys found that 83% (summer) and 92% (fall) of Mexico-residing drivers lived in Agua Prieta, Sonora. Only 1% to 2% of Mexico-residing drivers indicated that they live outside of Sonora.
- Shopping is the most popular trip purpose among the drivers surveyed in both waves. During the summer and fall, 70.6% and 50.7% of survey respondents, respectively, answered that shopping was their primary trip purpose. Seasonal variation is notable in fall, where the school and work trips increase.
- Between 42% (summer) and 35% (fall) of cross border visitors indicated that they had shopped in Sierra Vista within the previous two months. Approximately 5% of visitors indicated that they shop in Sierra Vista once every two weeks or more frequently. These shopping frequency trends are consistent with border crossing shopping frequency of Tucson, Arizona.
- Over three-quarters of cross border visitors surveyed (76%-81%) spent less than five hours in the United States.
- The average expected expenditure of all Mexico visitors was \$146 per trip during the summer survey, and \$95 per trip during the fall survey. Crosstabs of those visitors that were surveyed heading to Sierra Vista specifically had higher expected spending (\$252 in summer, \$203 in fall), however confidence levels for these answers were also smaller. Focus group participants stated that they spent an average of approximately \$196 during their most recent visit to Arizona.
- Using conservative trip and expected spending data, it is estimated that that Sierra Vista likely captures a minimum of \$4.6-8.3 million in direct retail expenditures by Mexico-residing visitors annually (although this figure may undercount higher Holiday Season expenditures, as well as Mexico-originating visitors that stop in Sierra Vista in their return to Sonora after visiting other areas of Arizona).
- In order of descending popularity, the survey respondents indicated that their top retail/dining destinations within Sierra Vista are the Mall at Sierra Vista, Ross, Walmart, Golden Corral, Target, Home Depot, and Marshalls. The Mall at Sierra Vista, Sears, Walmart and Golden Corral were also mentioned as top destinations by focus group participants.
- There may be a need for additional marketing or promotion of the retail offerings within Sierra Vista, as several survey respondents indicated a lack of awareness of stores that are already present in Sierra Vista (i.e., Target, Kmart, Home Depot, Ross, and Best Buy).
- Retail stores specifically mentioned as desired by crossborder visitors and focus group participants included Costco, Aeropostale, Guess and JC Penney.
- In terms of medical-related visits to Sierra Vista, approximately 5% (summer) and 10% (fall) of all survey respondents reported that someone in their household (including themselves) had visited Canyon Vista Hospital in Sierra Vista for medical services within the past 24 months. Most of these trips were related to general care or maternity care. Focus group participants noted the cost barriers to using medical services in

Arizona generally, although they also noted the periodic use of medical services in Tucson, and their preference for Spanish-speaking medical personnel.

- Spanish-speaking retail store staff, and a more welcoming acceptance of Mexico visitors were mentioned by focus group participants as ways to increase visitation to Sierra Vista. It was also noted that overnight stays might be more demanded if concert, musical events, or sporting events geared toward Mexico visitors were promoted.
- Focus group participants also specifically mentioned the value of direct bus transport between Douglas and Sierra Vista as a way to increase shopping visitation.

The Wi-Fi origin-destination and travel time analysis resulted in the following findings:

- Considering only five regional destinations from the Raúl Héctor Castro POE (Tucson, Benson, North of Sierra Vista/Whetstone, South of Sierra Vista, and East of Sierra Vista), the most vehicles travelled through the Wi-Fi device east of Sierra Vista.
  - The analysis of weekday trips resulted in 44.1% of trips headed toward East of Sierra Vista, 21.2% toward Benson, 13.8% toward South of Sierra Vista, 13.1% toward Tucson, and 7.9% toward North of Sierra Vista.
  - The analysis of weekend trips resulted in 37.4% of trips headed toward East of Sierra Vista, 32.2% toward Benson, 10.7% toward South of Sierra Vista, 14.2% toward Tucson, and 5.5% toward North of Sierra Vista.
  - On an average weekday (Monday through Friday), approximately 64% of the border crossing trips visit or pass through Sierra Vista, while the other 36% completely bypass the City. This equates to approximately 1,362 daily vehicle trips that visit or pass through Sierra Vista and an estimated 1,224 daily vehicle trips that bypass Sierra Vista entirely.
  - On an average Saturday or Sunday, approximately 54% of the border crossing trips visit or pass through Sierra Vista, while the other 46% completely bypass the City. This equates to approximately 1,041 daily vehicle trips that visit or pass through Sierra Vista and an estimated 942 daily vehicle trips that bypass Sierra Vista entirely.
- The Wi-Fi data analysis concluded that the average visitor spends approximately 3 to 3 ½ hours within Sierra Vista, which is consistent with the results of the survey where the majority of trips (76-81%) to Sierra Vista were less than five hours in duration.

## RECOMMENDATIONS

- Given the existing positive economic benefits Sierra Vista is already receiving from crossborder visitors, the City economic development and tourism stakeholders can potentially build upon this to increase crossborder retail tourism through a number of steps:
  - Working with city retailers in Sierra Vista to better promote existing retail options and upcoming sales, preferably in Spanish-language materials and information targeting Agua Prieta and surrounding communities in Sonora. Multi-city promotions that include Sierra Vista and other cities (such as Tucson or Phoenix) might also increase visitation to Sierra Vista, as well (the so-called “Sonora Sunday”).
  - Fostering awareness of Spanish-speaking personnel at retail, food establishments, and other Sierra Vista attractions may enhance the experience of, and increase the visitation by, visitors from Mexico;
  - Related to this, if medical tourism is a goal for Sierra Vista, more Spanish-speaking medical personnel would help to build visitors’ impressions of Sierra Vista as a destination for such services (both for those in Agua Prieta, and further away in Hermosillo). Tucson is currently the preferred destination for medical care, in large part because of the cross-cultural competency of medical personnel there and experience with Mexican patients.

- Strategically planned concerts or major events that are attractive to residents of Agua Prieta and Sonora generally may increase overnight stays and associated higher retail/food expenditures, as well as differentiate Sierra Vista from other Southern Arizona cities.
- Establishment of targeted, regularly scheduled express bus service between Sierra Vista and Douglas would likely result in increased retail trips by crossborder visitors.
  - Adding currency exchange options in Sierra Vista, preferably co-located with a future transit station, would facilitate additional spending by Mexico-residing tourists and shoppers.

# **APPENDIX A**

## **SAMPLING PLAN AND QUESTIONNAIRE**



## Sierra Vista MPO - Border Survey Questionnaire Version FINAL

The following is the Final Draft survey questionnaire developed for the Sierra Vista MPO and the Origination/Economic Impact Study related to crossborder visitors from Mexico. The questionnaire is intended to be applied to Mexico-residing car drivers and pedestrian visitors coming from Mexico crossing at the Douglas Port of Entry, with a core set of questions to collect information on demographics and shopping/visitation for all participants, a subset of questions about Tucson visitation to car crossers, and a subset of questions about transit service to Sierra Vista to pedestrians.

The goal is to apply this survey questionnaire to 1,100 passenger vehicles driven by Mexico-residing border crossers.



### Section A: Introduction & Initial Core Questions

*Hi, we're doing a quick survey to measure the positive benefits of economic and tourism to Arizona - can we ask you a few questions that are completely confidential?*

A-1: For demographic purposes only, in what year were you born?: \_\_\_\_\_

A-2: On average, how frequently do you cross the border to the US? [PAUSE, READ OPTIONS ONLY TO PROMPT]

- |  |                                       |  |
|--|---------------------------------------|--|
| <input type="checkbox"/> 5+ times/wk       | <input type="checkbox"/> 4 times/wk   | <input type="checkbox"/> 3 times/wk        |
| <input type="checkbox"/> 2 times/wk        | <input type="checkbox"/> 1 times/wk   | <input type="checkbox"/> 3 times/month     |
| <input type="checkbox"/> 2 times/month     | <input type="checkbox"/> 1 time/month | <input type="checkbox"/> Less than 1/month |
| <input type="checkbox"/> 1st time crossing | <input type="checkbox"/> Other: _____ | <input type="checkbox"/> DK/NA             |

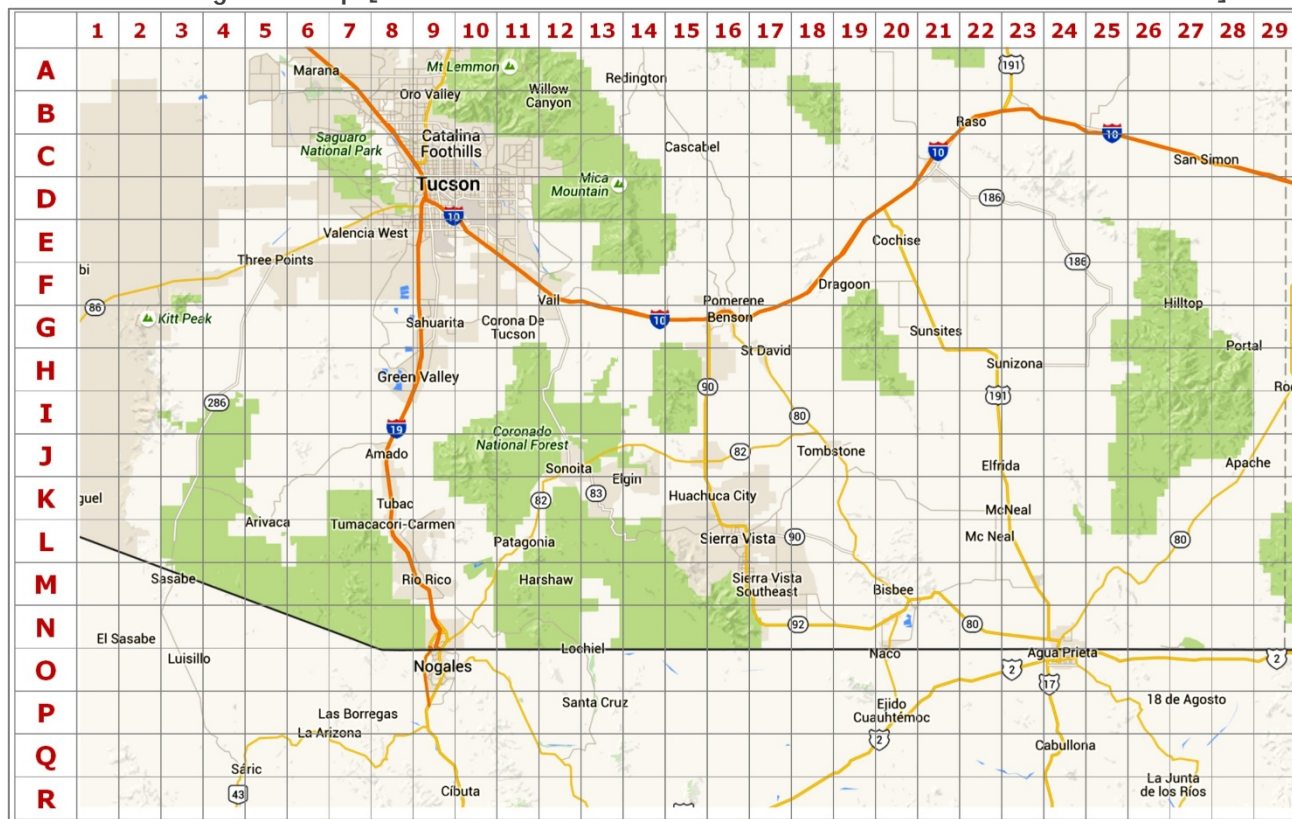
A-3: In what city or area do you have your primary residence or do you live? [PAUSE FOR ANSWER, BEGIN LISTING OPTIONS IF NO RESPONSE; "\*\*\*" INDICATES JUMP TO O-11/END SURVEY]

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Agua Prieta-SON   | <input type="checkbox"/> Naco-SON             | <input type="checkbox"/> Hermosillo-SON       |
| <input type="checkbox"/> *Douglas-AZ       | <input type="checkbox"/> *Bisbee-AZ           | <input type="checkbox"/> *Sierra Vista-AZ     |
| <input type="checkbox"/> *Tucson-AZ        | <input type="checkbox"/> Other Area of Sonora | <input type="checkbox"/> Other Area of Mexico |
| <input type="checkbox"/> *Other Area of AZ | <input type="checkbox"/> *Other Area of US    | <input type="checkbox"/> Other: _____         |
| <input type="checkbox"/> DK/NA             |   |   |

A-4a: Looking at the maps [SEE NEXT PAGE; SURVEYOR WILL HAVE LAMINATED, LETTER-SIZED VERSION, WITH SIERRA VISTA/SOUTHERN ARIZONA REGION ON ONE SIDE], approximately where did you start your trip from today?: \_\_\_\_\_ [OPEN ENDED; SURVEYOR WILL RECORD COORDINATES; IF OUTSIDE OF MAP, WILL RECORD STATED CITY/LOCATION]

A-4b: ...and approximately where will your trip end today?: \_\_\_\_\_ OPEN ENDED; SURVEYOR WILL RECORD COORDINATES OR STATED; IF OUTSIDE OF MAP, WILL RECORD CITY/LOCATION MENTIONED]

Grid SV Regional Map [WILL BE PRESENTED TO PARTICIPANT ON LETTER-SIZED PAGE]



A-5: What is the principal reason for your trip today to the US?

- ☐ Shopping
- ☐ Work or business
- ☐ Family or Social Visit
- ☐ Medical or Health [JUMP TO A-5A]
- ☐ Recreation/Tourism [JUMP TO A-5B]
- ☐ School
- ☐ Other: \_\_\_\_\_

A-5A: Confidentially, what type of medical services? [THEN JUMP TO A-6]

- ☐ dental ☐ pediatrics ☐ surgery ☐ primary care ☐ maternity ☐ other: \_\_\_\_\_

A-5B: Where will you visit? \_\_\_\_\_

A-6: During this trip, approximately how many hours or days do you plan to stay in the US?:

- ☐ 0.5 to 5 hours
- ☐ 6 to 11 hours
- ☐ 12 to 23 hours
- ☐ 1-day (overnight)
- ☐ 2-3 days
- ☐ 4+ days
- ☐ NA

A-7: In dollars, approximately how much do you estimate you will spend during this trip to the US? \_\_\_\_\_ [OPEN ENDED]

A-8: Of the amount you just mentioned, approximately how much will you spend on the following:

A8-A - ...Groceries? \_\_\_\_\_

A8-B - ...Restaurants? \_\_\_\_\_

A8-C - ...Shopping? \_\_\_\_\_

A-9: Generally, when you visit Arizona, what are the top three stores in which you usually spend your money? \_\_\_\_\_ [OPEN ENDED]

A-10: During the last two months, approximately how many times have you gone shopping or purchased goods in the City of Sierra Vista [SHOW ON MAP]?:

☐ 0/NO SHOPPING TRIPS [JUMP TO A-12]

☐ 1 time

☐ 2-3 times

☐ 4-5 times

☐ 6-7 times

☐ 8-9 times

☐ 10+ times

☐ NA/DK

A-11: When shopping in Sierra Vista, what are the top three places you like to visit, dine or shop at? \_\_\_\_\_ [OPEN ENDED]

A-12: What stores or services would you like to see in Sierra Vista that are not currently there? \_\_\_\_\_ [OPEN ENDED]

## Section B: Tucson Shopping

[SAY TO PARTICIPANT: "JUST A FEW MORE QUESTIONS"]

B-1: During the last two months, how many times have you gone shopping or purchased goods in Tucson?:

☐ 0/NO SHOPPING TRIPS

☐ 1 time

☐ 2-3 times

☐ 4-5 times

☐ 6-7 times

☐ 8-9 times

☐ 10+ times

☐ NA/DK

B-2: When shopping in Tucson, what 2-3 stores do you generally visit? \_\_\_\_\_ [OPEN ENDED]

B-3: Final question: When visiting Tucson, what shopping malls do you generally visit?  
\_\_\_\_\_ [OPEN ENDED]

### Section C: Medical Services

[SAY TO PARTICIPANT: "JUST TWO MORE QUESTIONS"]

C-1: Confidentially, over the last 24 months, approximately how many times have you or someone in your household visited the Hospital in Sierra Vista (Canyon Vista Hospital)?

- ☐ 0 times [JUMP TO SECTION O]
- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ 5-9 times
- ☐ 10+ times
- ☐ NA/DK [JUMP TO SECTION O]

C-2: Which if any of the following medical services was used during that/those visit(s)?  
[MULTIPLE CHOICE/MULTIPLE ANSWER]

- ☐ dental
- ☐ pediatric
- ☐ surgical
- ☐ primary/general care
- ☐ maternity
- ☐ other: \_\_\_\_\_

### Section O: Observationals (Mexico-Residing Participants)

[SAY TO PARTICIPANT: "Thank you for participating!"]

O-1: Language used for survey

- ☐ Spanish
- ☐ English









O-2: Gender/Sex of participant

- ☐ Male
- ☐ Female

O-3: Traveler type

- ☐ Pedestrian-REG [JUMP TO O-8]
- ☐ Pedestrian-ReadyLane [JUMP TO O-8]
- ☐ Car-SENTRI
- ☐ Car-ReadyLane
- ☐ Car-Regular

O-4: General POV Type

							
1. Hatchback, Coupe, Sedan	2. SUV - Compact	3. SUV - Large	4. Light Pickup Truck	5. Heavy Duty Truck	6. Mini Van	7. Commercial Van	8. Other

- ☐ Car-Hatchback/Coupe/Sedan
- ☐ SUV-Compact/Crossover
- ☐ SUV - Large
- ☐ Light Truck
- ☐ Heavy Duty Truck
- ☐ Mini Van
- ☐ Commercial Van
- ☐ RV/Recreational Vehicle/Motor Home
- ☐ Other

**O-5: License plate of vehicle**

☐ Sonora    ☐ Chihuahua    ☐ Arizona    ☐ Other US    ☐ Other MX  
☐ Not Observed

**O-6: Number of adults in car**

☐ 1    ☐ 2    ☐ 3    ☐ 4    ☐ 5+

**O-7: Number of children in car**

☐ 1    ☐ 2    ☐ 3    ☐ 4    ☐ 5+

**O-8: Day Surveyed**

☐ Saturday    ☐ Sunday    ☐ Monday    ☐ Tuesday    ☐ Wednesday  
☐ Thursday    ☐ Friday

**O-9: Time Survey Started**

☐ 6:00AM-6:59AM    ☐ 7:00AM-7:59AM    ☐ 8:00AM-8:59AM    ☐ 9:00AM-9:59AM  
☐ 10:00AM-10:59AM    ☐ 11:00AM-11:59AM    ☐ 12:00PM-12:59PM    ☐ 1:00PM-1:59PM  
☐ 2:00PM-2:59PM    ☐ 3:00PM-3:59PM    ☐ 4:00PM-4:59PM    ☐ 5:00PM-5:59PM  
☐ 6:00PM-6:59PM    ☐ 7:00PM-7:59PM

**O-10: Time to Complete Survey**

☐ 3 minutes    ☐ 4 minutes    ☐ 5 minutes    ☐ 6 minutes    ☐ 7+ minutes

**O-11: Survey Is**

☐ Complete    ☐ Incomplete    ☐ Test  
☐ Didn't Meet Criteria (US Residing)

**END**



# **APPENDIX B**

## **TRAVELER SURVEY RESULTS**

During 2016, two waves of at-border surveys were conducted by Crossborder Group at the Raul Hector Castro POE between Douglas, Arizona and Agua Prieta, Sonora, for the Sierra Vista MPO. A total of 779 surveys were applied during the Summer wave, with another 1,171 surveys applied in Fall – all to Mexico-residing car crossers. Below are additional details from those surveys. The original question and results are presented, as well as additional cross-tabulations when useful.

	Traveler type			Total
	Regular	Ready Lane	SENTRI	
Wave 1	558	575	38	1171
Wave 2	426	353	0	779

**A-1: For demographic purposes only, in what year were you born?**

In what year were you born?				
	Wave-1	Wave-2	Wave-1	Wave-2
Total	779	1171	100.0%	100.0%
1925 - 1929	1	0	0.1%	0.0%
1930 - 1934	0	3	0.0%	0.3%
1935 - 1939	4	7	0.5%	0.6%
1940 - 1944	10	24	1.3%	2.0%
1945 - 1949	26	21	3.3%	1.8%
1950 - 1954	43	43	5.5%	3.7%
1955 - 1959	52	71	6.7%	6.1%
1960 - 1964	65	106	8.3%	9.1%
1965 - 1969	73	103	9.4%	8.8%
1970 - 1974	92	127	11.8%	10.8%
1975 - 1979	114	147	14.6%	12.6%
1980 - 1984	94	164	12.1%	14.0%
1985 - 1989	76	168	9.8%	14.3%
1990 - 1994	80	108	10.3%	9.2%
1995 - 1999	48	76	6.2%	6.5%
2000 - 2004	1	3	0.1%	0.3%

**A-2: On average, how frequently do you cross the border to the US?**

On average, how frequently do you cross the border to the US?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
5+ times/wk	280	685	35.9%	58.5%
4 times/wk	49	67	6.3%	5.7%
3 times/wk	88	103	11.3%	8.8%
2 times/wk	102	93	13.1%	7.9%
1 time/wk	112	116	14.4%	9.9%
3 times/month	24	20	3.1%	1.7%
2 times/month	35	31	4.5%	2.6%
1 time/month	46	42	5.9%	3.6%
Less than 1/month	40	11	5.1%	0.9%
1st time crossing	2	2	0.3%	0.2%
Other	1	1	0.1%	0.1%

**Wave-1**

	Traveler type	
	Auto-Regular	Auto-ReadyLane
Total	100%	100%
5+ times/wk	36%	36%
4 times/wk	5%	8%
3 times/wk	12%	11%
2 times/wk	12%	14%
1 times/wk	15%	14%
3 times/month	4%	3%
2 times/month	6%	3%
1 time/month	6%	6%
Less than 1/month	5%	5%
1st time crossing	0%	1%
Other	0%	0%

**Wave-2**

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
Total	100.0%	100.0%	100.0%
5+ times/wk	51.3%	63.1%	94.7%
4 times/wk	3.9%	7.8%	0.0%
3 times/wk	10.8%	7.5%	0.0%
2 times/wk	9.1%	7.1%	2.6%
1 time/wk	12.2%	8.2%	2.6%
3 times/month	2.3%	1.2%	0.0%
2 times/month	3.8%	1.7%	0.0%
1 time/month	5.2%	2.3%	0.0%
Less than 1/month	1.3%	0.7%	0.0%
1st time crossing	0.0%	0.3%	0.0%
Other	0.2%	0.0%	0.0%

### A-3: In what city or area do you have your primary residence or do you live?

In what city or area do you have your primary residence or do you live?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
<b>Total</b>	<b>779</b>	<b>1171</b>	<b>100.0%</b>	<b>100.0%</b>
Agua Prieta-SON	646	1078	82.9%	92.1%
Naco-SON	19	18	2.4%	1.5%
Hermosillo-SON	27	16	3.5%	1.4%
Another area of Sonora	72	50	9.2%	4.3%
Another area of Mexico	14	8	1.8%	0.7%
Other	1	1	0.1%	0.1%

#### Wave-1

	Traveler type	
	Auto-Regular	Auto-ReadyLane
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>
Agua Prieta-SON	81.9%	84.1%
Naco-SON	1.2%	4.0%
Hermosillo-SON	3.5%	3.4%
Other Area of Sonora	11.5%	6.8%
Other Area of Mexico	1.9%	1.7%
Other	0.0%	0.0%

#### Wave-2

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
Agua Prieta-SON	89.6%	93.9%	100.0%
Naco-SON	1.4%	1.7%	0.0%
Hermosillo-SON	1.4%	1.4%	0.0%
Otra area de Sonora	6.5%	2.4%	0.0%
Otra área de México	0.9%	0.5%	0.0%
Other	0.2%	0.0%	0.0%

### A-4a: Looking at the maps, approximately where did you start your trip from today?

Approximately where did you start your trip from today?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
<b>Total</b>	<b>779</b>	<b>1171</b>	<b>100.0%</b>	<b>100.0%</b>
Agua Prieta	669	1111	85.9%	94.9%
Cananea	27	18	3.5%	1.5%
Esqueda	18	7	2.3%	0.6%
Nacozari	18	8	2.3%	0.7%
Hermosillo	16	6	2.1%	0.5%
Other Sonora	20	13	2.6%	1.1%
Other Mexico	11	8	1.4%	0.7%

### A-4b: ...and approximately where will your trip end today?

Approximately where will your trip end today?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
<b>Total</b>	<b>779</b>	<b>1171</b>	<b>100.0%</b>	<b>100.0%</b>
Douglas	572	1064	73.4%	90.9%
Agua Prieta	162	20	20.8%	1.7%
Sierra Vista	13	21	1.7%	1.8%
Tucson	11	31	1.4%	2.6%
Phoenix	10	9	1.3%	0.8%
Nogales	3	9	0.4%	0.8%
Bisbee	1	8	0.1%	0.7%
Other AZ	4	2	0.5%	0.2%
Other USA	0	5	0.0%	0.4%

#### A-5: What is the principal reason for your trip today to the US?

What is the principal reason for your trip today to the US?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
Shopping	550	594	70.6%	50.7%
Work or Business	110	190	14.1%	16.2%
Family or Social Visit	85	152	10.9%	13.0%
Medical or Health Reasons	5	12	0.6%	1.0%
Vacation or Tourism	16	9	2.1%	0.8%
School	12	211	1.5%	18.0%
Other	1	3	0.1%	0.3%

#### Wave-1

	Traveler type	
	Auto-Regular	Auto-ReadyLane
Total	100.0%	100.0%
Shopping	69.7%	71.7%
Work or Business	16.0%	11.9%
Family or Social Visit	9.9%	12.2%
Medical or Health Reasons	0.2%	1.1%
Vacation or Tourism	2.3%	1.7%
School	1.6%	1.4%
Other	0.2%	0.3%

#### Wave-2

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
Total	100.0%	100.0%	100.0%
Shopping	50.5%	53.2%	15.8%
Work or Business	17.9%	14.4%	18.4%
Family or Social Visit	15.8%	10.8%	5.3%
Medical or Health Reasons	1.3%	0.9%	0.0%
Vacation or Tourism	1.1%	0.5%	0.0%
School	13.3%	20.0%	57.9%
Other	0.2%	0.2%	2.6%

#### A-5A: MEDICAL/HEALTH JUMP QUESTION - Purpose of Crossing at Moment: Confidentially, what type of medical services?

Confidentially, what type of medical services?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	6	17	100.0%	100.0%
Dental	1	1	16.7%	5.9%
Pediatrics	0	4	0.0%	23.5%
Surgery	0	0	0.0%	0.0%
Primary Care	4	7	66.7%	41.2%
Maturity	0	0	0.0%	0.0%
Other	5	5	83.3%	29.4%

#### A-5B: TOURISM JUMP QUESTION - Purpose of Crossing at Moment: Where will you visit?

Where will you visit?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	16	9	100.0%	100.0%
Tucson	3	0	18.8%	0.0%
Parks	2	1	12.5%	11.1%
Las Vegas	1	0	6.3%	0.0%
Scottsdale	1	0	6.3%	0.0%
Sierra Vista	1	1	6.3%	11.1%
Tombstone	1	0	6.3%	0.0%
Fair	0	5	0.0%	55.6%
Other	7	2	43.8%	22.2%

A-6: During this trip, approximately how many hours or days do you plan to stay in the US?

During this trip, approximately how many hours or days do you plan to stay in the US?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
0.5 to 5 hours	592	951	76.0%	81.2%
6 to 11 hours	103	139	13.2%	11.9%
12 to 23 hours	19	23	2.4%	2.0%
1-day (overnight)	22	24	2.8%	2.0%
2-3 days	19	23	2.4%	2.0%
4+ days	24	7	3.1%	0.6%
NA	0	4	0.0%	0.3%

Wave-1

	Traveler type	
	Auto-Regular	Auto-ReadyLane
Total	100.0%	100.0%
0.5 to 5 hours	78.4%	73.1%
6 to 11 hours	12.0%	14.7%
12 to 23 hours	1.9%	3.1%
1-day (overnight)	2.8%	2.8%
2-3 days	2.8%	2.0%
4+ days	2.1%	4.2%

Wave-2

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
Total	100.0%	100.0%	100.0%
0.5 to 5 hours	76.7%	86.1%	73.7%
6 to 11 hours	14.5%	8.7%	21.1%
12 to 23 hours	1.3%	2.6%	2.6%
1-day (overnight)	2.5%	1.6%	2.6%
2-3 days	3.2%	0.9%	0.0%
4+ days	1.1%	0.2%	0.0%
NA	0.7%	0.0%	0.0%



A-7: In dollars, approximately how much do you estimate you will spend during this trip to the US?

Approximately how much do you estimate you will spend during this trip to the US?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
\$0	74	305	9.5%	26.0%
\$1-49	176	287	22.6%	24.5%
\$50-99	219	252	28.1%	21.5%
\$100-199	139	196	17.8%	16.7%
\$200-299	84	60	10.8%	5.1%
\$300-399	36	22	4.6%	1.9%
\$400-499	9	7	1.2%	0.6%
\$500-999	29	28	3.7%	2.4%
\$1,000-\$1,999	8	8	1.0%	0.7%
\$2,000+	5	6	0.6%	0.5%

A-8: Of the amount that you just mentioned, approximately how much will you spend on the following:

Of the amount you just mentioned, approximately how much will you spend on the following:						
	Summer Wave 1					
	Groceries	Restaurants	Shopping	Groceries	Restaurants	Shopping
Total	167	135	145	100.0%	100.0%	100.0%
\$0	0	0	0	0.0%	0.0%	0.0%
\$1-\$49	28	18	16	16.8%	13.3%	11.0%
\$50-\$99	123	114	110	73.7%	84.4%	75.9%
\$100-\$199	9	3	13	5.4%	2.2%	9.0%
\$200-\$299	4	0	3	2.4%	0.0%	2.1%
\$300-\$399	2	0	0	1.2%	0.0%	0.0%
\$400-\$499	0	0	1	0.0%	0.0%	0.7%
\$500-\$999	1	0	2	0.6%	0.0%	1.4%
\$1,000-\$1,999	0	0	0	0.0%	0.0%	0.0%
\$2,000+	0	0	0	0.0%	0.0%	0.0%

Of the amount you just mentioned, approximately how much will you spend on the following:						
	Fall Wave 2					
	Groceries	Restaurants	Shopping	Groceries	Restaurants	Shopping
Total	287	78	117	100.0%	100.0%	100.0%
\$0	0	0	0	0.0%	0.0%	0.0%
\$1-\$49	95	39	40	33.1%	50.0%	34.2%
\$50-\$99	94	23	28	32.8%	29.5%	23.9%
\$100-\$199	77	11	30	26.8%	14.1%	25.6%
\$200-\$299	13	3	9	4.5%	3.8%	7.7%
\$300-\$399	3	0	1	1.0%	0.0%	0.9%
\$400-\$499	1	1	3	0.3%	1.3%	2.6%
\$500-\$999	3	1	2	1.0%	1.3%	1.7%
\$1,000-\$1,999	1	0	2	0.3%	0.0%	1.7%
\$2,000+	0	0	2	0.0%	0.0%	1.7%

*Additional data on Fall Wave 2 Estimated Expenditure:*

Groceries					
	Traveler Type			Total Travelers	Estimated Expenditure
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI		
Total	110	173	4	287	
\$5.00	3	0	0	3	\$ 15.00
\$10.00	8	2	0	10	\$ 100.00
\$15.00	3	0	0	3	\$ 45.00
\$20.00	14	14	1	29	\$ 580.00
\$25.00	2	2	0	4	\$ 100.00
\$28.00	0	1	0	1	\$ 28.00
\$30.00	12	14	0	26	\$ 780.00
\$38.00	1	0	0	1	\$ 38.00
\$40.00	8	8	1	17	\$ 680.00
\$45.00	0	1	0	1	\$ 45.00
\$50.00	26	39	1	66	\$ 3,300.00
\$60.00	4	6	0	10	\$ 600.00
\$70.00	2	3	0	5	\$ 350.00
\$80.00	2	11	0	13	\$ 1,040.00
\$100.00	17	40	0	57	\$ 5,700.00
\$108.00	0	1	0	1	\$ 108.00
\$120.00	0	1	0	1	\$ 120.00
\$130.00	0	1	0	1	\$ 130.00
\$150.00	2	15	0	17	\$ 2,550.00
\$200.00	4	7	1	12	\$ 2,400.00
\$240.00	0	1	0	1	\$ 240.00
\$300.00	0	3	0	3	\$ 900.00
\$400.00	1	0	0	1	\$ 400.00
\$500.00	0	3	0	3	\$ 1,500.00
\$1,000.00	1	0	0	1	\$ 1,000.00
Average Grocery-Related Expenditure per Vehicle					\$ 79.26

Restaurants					
	Traveler Type			Total	Estimated Expenditure
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI		
Total	39	38	1	78	
\$5.00	3	1	0	4	\$ 20.00
\$7.00	1	0	0	1	\$ 7.00
\$10.00	3	2	0	5	\$ 50.00
\$12.00	0	1	0	1	\$ 12.00
\$15.00	1	1	0	2	\$ 30.00
\$20.00	10	5	0	15	\$ 300.00
\$25.00	1	2	0	3	\$ 75.00
\$30.00	5	2	0	7	\$ 210.00
\$40.00	0	1	0	1	\$ 40.00
\$50.00	4	11	0	15	\$ 750.00
\$60.00	2	2	0	4	\$ 240.00
\$70.00	1	1	0	2	\$ 140.00
\$80.00	1	1	0	2	\$ 160.00
\$100.00	4	4	1	9	\$ 900.00
\$150.00	1	1	0	2	\$ 300.00
\$200.00	2	1	0	3	\$ 600.00
\$400.00	0	1	0	1	\$ 400.00
\$500.00	0	1	0	1	\$ 500.00

Average Restaurant-Related Expenditure per Vehicle	\$ 60.69
--	----------

Shopping					
	Traveler Type			Total	Estimated Expenditure
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI		
Total	76	41	0	117	
\$5.00	2	0	0	2	\$ 10.00
\$10.00	5	2	0	7	\$ 70.00
\$15.00	3	0	0	3	\$ 45.00
\$20.00	11	4	0	15	\$ 300.00
\$25.00	1	0	0	1	\$ 25.00
\$30.00	6	2	0	8	\$ 240.00
\$40.00	1	2	0	3	\$ 120.00
\$43.00	0	1	0	1	\$ 43.00
\$50.00	13	7	0	20	\$ 1,000.00
\$60.00	2	2	0	4	\$ 240.00
\$70.00	1	2	0	3	\$ 210.00
\$80.00	0	1	0	1	\$ 80.00
\$100.00	6	10	0	16	\$ 1,600.00
\$120.00	1	0	0	1	\$ 120.00
\$150.00	10	2	0	12	\$ 1,800.00
\$180.00	1	0	0	1	\$ 180.00
\$200.00	5	3	0	8	\$ 1,600.00
\$240.00	1	0	0	1	\$ 240.00
\$300.00	1	0	0	1	\$ 300.00
\$400.00	0	2	0	2	\$ 800.00
\$440.00	0	1	0	1	\$ 440.00
\$600.00	2	0	0	2	\$ 1,200.00
\$1,000.00	2	0	0	2	\$ 2,000.00
\$2,400.00	1	0	0	1	\$ 2,400.00
\$3,800.00	1	0	0	1	\$ 3,800.00

Average Shopping-Related Expenditure per Vehicle	\$ 161.22
--	-----------



A-9: Generally, when you visit Arizona, what are the top three stores in which you usually spend your money? (multiple responses)

**Wave 1**

Generally, when you visit Arizona, what are the top three stores in which you usually spend your money?		
Summer Wave 1		
	Frequency	Percent
<b>Total</b>	<b>779</b>	
Walmart	735	94.4%
Food City	185	23.7%
JC Penney	129	16.6%
Fallas	115	14.8%
DD's	77	9.9%
Dollar Tree	49	6.3%
Stage	38	4.9%
Iris Fashion Boutique	32	4.1%
Ross	32	4.1%
Target	24	3.1%
Auto Zone	22	2.8%
Mall	17	2.2%

**Wave 2**

Generally, when you visit Arizona, what are the top three stores in which you usually spend your money?		
Fall Wave 2		
	Frequency	Percent
<b>Total</b>	<b>1433</b>	
Walmart	1095	76.4%
Food City	247	17.2%
JC Penney	158	11.0%
DD's	94	6.6%
Fallas	60	4.2%
Dollar Tree	50	3.5%
Ross	47	3.3%
Stage	28	2.0%
Mall	24	1.7%
AutoZone	22	1.5%
Gasoline	20	1.4%

A-10: During the last two months, approximately how many times have you gone shopping or purchased goods in the City of Sierra Vista?

During the last two months, approximately how many times have you gone shopping or purchased goods in the City of Sierra Vista?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
0/No Shopping Trips	446	763	57.3%	65.2%
1 time	183	179	23.5%	15.3%
2-3 times	109	173	14.0%	14.8%
4-5 times	20	41	2.6%	3.5%
6-7 times	7	3	0.9%	0.3%
8-9 times	7	3	0.9%	0.3%
10+ times	7	9	0.9%	0.8%

Wave-1

	Traveler type	
	Auto-Regular	Auto-ReadyLane
Total	100.0%	100.0%
0/NO SHOPPING TRIPS	59.4%	54.7%
1 time	22.8%	24.4%
2-3 times	12.4%	15.9%
4-5 times	2.1%	3.1%
6-7 times	0.7%	1.1%
8-9 times	1.6%	0.0%
10+ times	0.9%	0.8%

Wave-2

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
Total	100.0%	100.0%	100.0%
0/NO SHOPPING TRIPS	64.5%	66.3%	55.3%
1 time	17.9%	12.5%	18.4%
2-3 times	10.6%	18.4%	21.1%
4-5 times	5.2%	1.9%	2.6%
6-7 times	0.2%	0.3%	0.0%
8-9 times	0.4%	0.2%	0.0%
10+ times	1.1%	0.3%	2.6%
NA/DK	0.2%	0.0%	0.0%

A-11: When shopping in Sierra Vista, what are the top three places you like to visit, dine or shop at? (multiple responses)

Wave 1

When shopping in Sierra Vista, what are the top three places you like to visit, dine or shop at?		
Summer Wave 1		
	Frequency	Percent
Total	333	
Mall	125	37.5%
Ross	106	31.8%
Walmart	76	22.8%
Golden Corral	48	14.4%
Target	39	11.7%
Home Depot	28	8.4%
Marshalls	26	7.8%

Wave 2

When shopping in Sierra Vista, what are the top three places you like to visit, dine or shop at?		
Fall Wave 2		
	Frequency	Percent
Total	408	
Mall	189	46.3%
Ross	94	23.0%
Walmart	79	19.4%
Golden Corral	72	17.6%
Target	43	10.5%
Home Depot	31	7.6%
Marshalls	26	6.4%

**A-12: What stores or services would you like to see in Sierra Vista that are not currently there? (multiple responses)**

A-12: What stores or services would you like to see in Sierra Vista that are not currently there?	
Total	1950
NA/DK	61.3%
Costco	10.9%
Aeropostale	3.1%
Guess	2.0%
JC Penney	1.8%
Hollister	1.2%
Ross	1.1%
Sam's Club	0.9%
Target	0.8%
Home Depot	0.4%
Guitar Center	0.3%
Gap	0.3%
Kmart	0.3%
Best Buy	0.2%
Forever 21	0.1%

**Top stores or services:  
Wave 1 + Wave 2**

**B-1: During the last two months, how many times have you gone shopping or purchased goods in Tucson?**

During the last two months, how many times have you gone shopping or purchased goods in Tucson?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
Total	779	1171	100.0%	100.0%
0/NO SHOPPING TRIPS	451	794	57.9%	67.8%
1 time	155	159	19.9%	13.6%
2-3 times	133	168	17.1%	14.3%
4-5 times	27	40	3.5%	3.4%
6-7 times	5	6	0.6%	0.5%
8-9 times	3	0	0.4%	0.0%
10+ times	5	4	0.6%	0.3%

**Wave-1**

	Traveler type	
	Auto-Regular	Auto-ReadyLane
Total	100.0%	100.0%
0/NO SHOPPING TRIPS	61.7%	53.3%
1 time	22.1%	17.3%
2-3 times	11.0%	24.4%
4-5 times	3.3%	3.7%
6-7 times	0.5%	0.8%
8-9 times	0.7%	0.0%
10+ times	0.7%	0.6%

**Wave-2**

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
Total	100.0%	100.0%	100.0%
0/NO SHOPPING	66.7%	69.0%	65.8%
1 time	14.0%	13.0%	15.8%
2-3 times	14.2%	14.6%	13.2%
4-5 times	3.9%	3.0%	2.6%
6-7 times	0.7%	0.2%	2.6%
8-9 times	0.0%	0.0%	0.0%
10+ times	0.5%	0.2%	0.0%



B-2: When shopping in Tucson, what 2-3 stores do you generally visit? (multiple responses)

Top 10 stores: Wave 1 + Wave 2

When shopping in Tucson, what 2-3 stores do you generally visit?		
	Frequency	Percent
<b>Total</b>	<b>1156</b>	
Mall	403	34.9%
Walmart	244	21.1%
Ross	198	17.1%
Tucson Mall	114	9.9%
Target	82	7.1%
Costco	73	6.3%
Aeropostale	54	4.7%
JC Penney	39	3.4%
Home Depot	38	3.3%
Marshalls	36	3.1%

B-3: Final question: When visiting Tucson, what shopping malls do you generally visit? (multiple responses)

Top 10 shopping malls: Wave 1 + Wave 2

When visiting Tucson, what shopping malls do you generally visit?		
	Frequency	Percent
<b>Total</b>	<b>1156</b>	<b>100.0%</b>
Tucson Mall	468	40.5%
Mall	382	33.0%
Ross	52	4.5%
Don't know	27	2.3%
Park Place	22	1.9%
Play Place	18	1.6%
Park	9	0.8%
El Con Mall	4	0.3%
Food Hills	3	0.3%
Curacao	2	0.2%

C-1: Confidentially, over the last 24 months, approximately how many times have you or someone in your household visited the Hospital in Sierra Vista (Canyon Vista Hospital)?

over the last 24 months, approximately how many times have you or someone in your household visited the Hospital in Sierra Vista (Canyon Vista Hospital)?				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
<b>Total</b>	<b>779</b>	<b>1171</b>	<b>100.0%</b>	<b>100.0%</b>
0 times	740	1056	95.0%	90.2%
1 time	25	64	3.2%	5.5%
2 times	5	33	0.6%	2.8%
3 times	3	9	0.4%	0.8%
4 times	2	4	0.3%	0.3%
5-9 times	1	3	0.1%	0.3%
10+ times	2	0	0.3%	0.0%
Opcional - OPT	1	2	0.1%	0.2%

Wave-1

	Traveler type	
	Auto-Regular	Auto-ReadyLane
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>
0 times	93.2%	97.2%
1 time	4.5%	1.7%
2 times	0.5%	0.8%
3 times	0.5%	0.3%
4 times	0.5%	0.0%
5-9 times	0.2%	0.0%
10+ times	0.5%	0.0%
Opcional - OPT	0.2%	0.0%

Wave-2

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
0 times	90.7%	89.7%	89.5%
1 time	5.7%	5.0%	7.9%
2 times	1.6%	4.2%	0.0%
3 times	0.7%	0.7%	2.6%
4 times	0.7%	0.0%	0.0%
5-9 times	0.4%	0.2%	0.0%
10+ times	0.0%	0.0%	0.0%
Opcional - OPT	0.2%	0.2%	0.0%

**C-2: CANYON VISTA HOSPITAL JUMP QUESTION - Which if any of the following medical services was used during that/those visit(s)?**

Which if any of the following medical services was used during				
	Wave-1	Wave-2	Summer Wave 1	Fall Wave 2
<b>Total</b>	<b>41</b>	<b>122</b>	<b>100.0%</b>	<b>100.0%</b>
Dental	3	13	7.3%	10.7%
Pediatric	3	8	7.3%	6.6%
Surgical	7	9	17.1%	7.4%
Primary/general care	11	26	26.8%	21.3%
Maternity	11	38	26.8%	31.1%
Other	6	28	14.6%	23.0%

**Wave-1**

	Traveler type	
	Auto-Regular	Auto-ReadyLane
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>
Dental	6.7%	5.9%
Pediatric	10.0%	0.0%
Surgical	13.3%	17.6%
Primary/general care	23.3%	23.5%
Maternity	26.7%	17.6%
Other	20.0%	35.3%

**Wave-2**

	Traveler type		
	Auto-Regular	Auto-ReadyLane	Auto-SENTRI
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
Dental	10.3%	11.7%	0.0%
Pediatric	10.3%	3.3%	0.0%
Surgical	8.6%	5.0%	25.0%
Primary/general care	19.0%	25.0%	0.0%
Maternity	32.8%	31.7%	0.0%
Other	19.0%	23.3%	75.0%

# **APPENDIX C**

## **ORIGIN-DESTINATION ASSUMPTIONS AND FURTHER ANALYSIS**

# ORIGIN DESTINATION ASSUMPTIONS

Several assumptions were made in developing the origin-destination results, which were based on a review of the individual matches. The assumptions were made for the likelihood of a driver using a particular route (if multiple routes are available between two points), the percentage of trips that either visited or passed through the City of Sierra Vista, and the percentage of trips that bypassed the City of Sierra Vista entirely.

For trips from Douglas (1) to Tucson (6) and from Douglas (1) to North of Sierra Vista (5), there are multiple routes a traveler can use. The following assumptions were made:

- Of the vehicles traveling from Douglas (1) to Tucson (6), 80% of vehicles traveled through Benson (4) and 20% of vehicles traveled through North of Sierra Vista (5).
- Of the vehicles traveling from Douglas (1) to North of Sierra Vista (5), 90% of vehicles traveled through East of Sierra Vista (2) and 10% of vehicles traveled through South of Sierra Vista (3).

The following assumptions were made to determine the percentage of vehicles from the border crossing that either visited or traveled through the City of Sierra Vista (to reach a final destination):

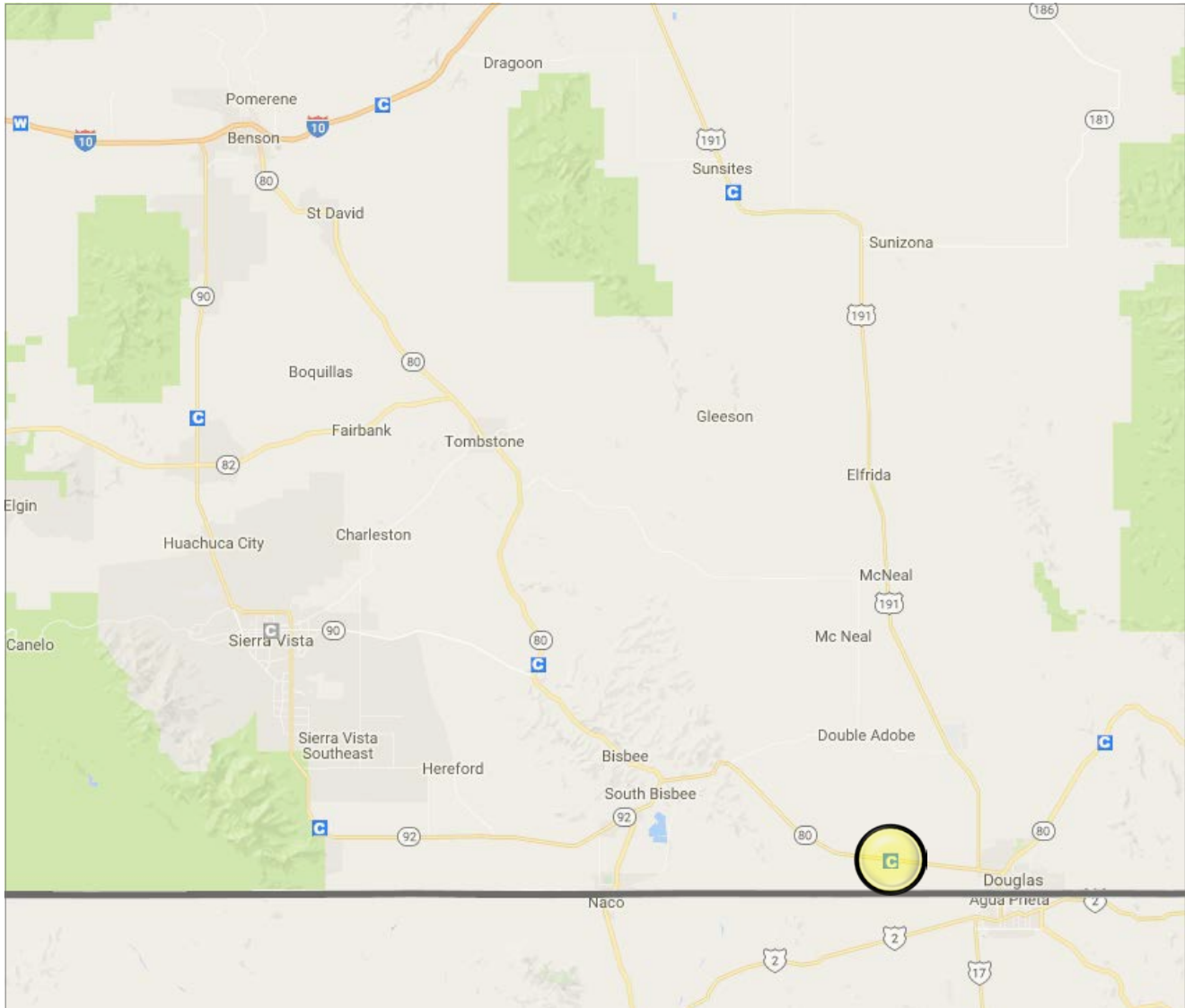
- Includes all vehicles passing by the East of Sierra Vista (2) and the South of Sierra Vista (3) devices
- Includes 50% of all vehicles passing by the North of Sierra Vista (5) device; as there are two routes similar in duration from Device 1 to Device 5 (one through Sierra Vista and one through Tombstone)
- Includes 20% of all vehicles passing by the Tucson (6) device; as it is assumed that this percentage of vehicles traveled through Sierra Vista

The following assumptions were made to determine the percentage of vehicles from the border crossing that bypassed the City of Sierra Vista entirely:

- Includes all of the vehicles passing by the Benson (4) device
- Includes 50% of all vehicles passing by the North of Sierra Vista (5) device; as there are two routes similar in duration from Device 1 to Device 5 (one through Sierra Vista and one through Tombstone)
- Includes 80% of the vehicles passing by the Tucson (6) device

## FURTHER ANALYSIS OF WI-FI MATCHES

The Wi-Fi matches for each route were compared to the total estimated volume on each route. The daily traffic volumes from Douglas to each destination device was estimated using historical count data along State Route 80, just west of Douglas. The location of this continuous ADOT count station is shown in the map below. To estimate the traffic volumes utilizing each route within the study area, the total volume along SR 80 was proportionally distributed using the percentages described in report Figures 10 and 11. The penetration rate was also calculated, which is simply the quantity of Wi-Fi matches divided by the total estimated vehicles on a particular route. The penetration rates ranged between 8% and 29%.



		Daily Traffic Volume Estimates Based on Developed Route Percentages**				
Date of Data Collection	SR 80 WB Daily Traffic Volumes*	Douglas to East of Sierra Vista (1 to 2)	Douglas to South of Sierra Vista (1 to 3)	Douglas to Benson (1 to 4)	Douglas to North of Sierra Vista (1 to 5)	Douglas to Tucson (1 to 6)
Percentage of Total**:	100%	M-F (44.1%) Sa-Su (36.7%)	M-F (13.9%) Sa-Su (11%)	M-F (20.9%) Sa-Su (33%)	M-F (8.1%) Sa-Su (5%)	M-F (13.0%) Sa-Su (13.5%)
<b>Summer Wave</b>						
Thursday, July 28, 2016	2426	1069	338	507	197	314
Friday, July 29, 2016	2288	1008	319	478	186	296
Saturday, July 30, 2016	1874	826	261	392	152	243
Sunday, July 31, 2016	1705	751	238	357	139	221
Monday, August 1, 2016	2506	1104	349	524	204	325
Tuesday, August 2, 2016	2472	1089	344	517	201	320
<b>Fall Wave</b>						
Wednesday, September 21, 2016	2773	1017	314	920	148	375
Thursday, September 22, 2016	2910	1067	329	965	155	394
Friday, September 23, 2016	2677	981	303	888	143	362
Saturday, September 24, 2016	2391	876	270	793	127	324
Sunday, September 25, 2016	1963	720	222	651	105	266
Monday, September 26, 2016	2641	968	299	876	141	357

\*Data retrieved from ADOT TMC Continuous Data at count station ID 100871 on State Route 80: <http://adot.ms2soft.com>

\*\*Refer to Figures 10 and 11 of the Sierra Vista Origin Destination Report

		Wi-Fi Origin Destination Matches - Daily				
Date of Data Collection		Douglas to East of Sierra Vista (1 to 2)	Douglas to South of Sierra Vista (1 to 3)	Douglas to Benson (1 to 4)	Douglas to North of Sierra Vista (1 to 5)	Douglas to Tucson (1 to 6)
<b>Summer Wave</b>						
Thursday, July 28, 2016		197	50	108	34	54
Friday, July 29, 2016		189	49	116	39	58
Saturday, July 30, 2016		153	47	139	26	47
Sunday, July 31, 2016		125	41	165	21	50
Monday, August 1, 2016		164	59	120	45	54
Tuesday, August 2, 2016		169	50	118	38	46
<b>Fall Wave</b>						
Wednesday, September 21, 2016		138	46	72	30	17
Thursday, September 22, 2016		152	52	72	40	16
Friday, September 23, 2016		195	63	87	49	21
Saturday, September 24, 2016		150	54	105	26	18
Sunday, September 25, 2016		98	36	175	19	51
Monday, September 26, 2016		132	42	57	22	30

		Penetration Rates† (%)				
Date of Data Collection		Douglas to East of Sierra Vista (1 to 2)	Douglas to South of Sierra Vista (1 to 3)	Douglas to Benson (1 to 4)	Douglas to North of Sierra Vista (1 to 5)	Douglas to Tucson (1 to 6)
<b>Summer Wave</b>						
Thursday, July 28, 2016		18%	15%	21%	17%	17%
Friday, July 29, 2016		19%	15%	24%	21%	20%
Saturday, July 30, 2016		19%	18%	35%	17%	19%
Sunday, July 31, 2016		17%	17%	46%	15%	23%
Monday, August 1, 2016		15%	17%	23%	22%	17%
Tuesday, August 2, 2016		16%	15%	23%	19%	14%
<b>Average Penetration Rate</b>		<b>17%</b>	<b>16%</b>	<b>29%</b>	<b>19%</b>	<b>18%</b>
<b>Fall Wave</b>						
Wednesday, September 21, 2016		14%	15%	8%	20%	5%
Thursday, September 22, 2016		14%	16%	7%	26%	4%
Friday, September 23, 2016		20%	21%	10%	34%	6%
Saturday, September 24, 2016		17%	20%	13%	20%	6%
Sunday, September 25, 2016		14%	16%	27%	18%	19%
Monday, September 26, 2016		14%	14%	7%	16%	8%
<b>Average Penetration Rate</b>		<b>15%</b>	<b>17%</b>	<b>12%</b>	<b>22%</b>	<b>8%</b>

† Penetration rates are calculated by dividing the number of Wi-Fi matches by the total number of vehicles on each route, for each day.



# **APPENDIX D**

## **MEXICAN PESO EXCHANGE RATE - IMPACTS**

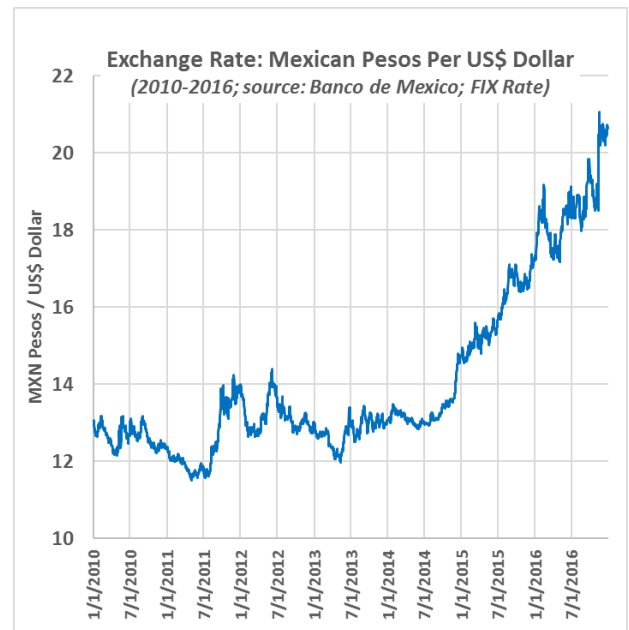
# MEXICAN PESO EXCHANGE RATE - IMPACTS

In the course of this study, one of the challenges was to assess how the changing value of the Mexican peso (compared to the U.S. dollar) may have affected crossborder retail and tourism expenditures by visitors from Mexico. As seen at right (as well as addressed earlier in this report), while the exchange rate of the Mexican peso (MXN) has been relatively stable in terms of its U.S. dollar value between 2010 and 2014, a significant weakening of the peso began to occur in early-2015.

In fact, between January 2014 and December 2016 (a three year span), the peso's value (compared to the U.S. dollar) decreased by 35.7%. In other words, the purchasing power of the Mexican peso for products and services denominated in U.S. dollars decreased by more than one-third.

While few studies exist that have analyzed the possible crossborder retail sales impacts of changes in the peso-U.S. dollar exchange rate, one such study<sup>9</sup> (*Shopping on the Border: The Mexican Peso and U.S. Border Communities*) published in 2001 looked at “[c]hanges in retail sales in eight counties on the U.S.-Mexico border”, using quarterly retail sales data from 1980 through 1999. Using regression models, the authors calculated exchange rate coefficients for each of the eight counties covered by the study (in California and Texas). Assuming that these same coefficients are still representative of the economic linkages within those counties, taking into consideration the recent 2014-2016 devaluation in the Mexican peso, the probable impact on total countywide retail sales in those regions potentially decreased between -3% up to -22% (see table below).

While no region in Arizona was included in this 2001 study, it is reasonable to assume that the 35.7% decrease in the value of the Mexican peso that has occurred between 2014-2016 had a similar type of impact on both retail sales and tourism made by Mexico-originating visitors to Cochise County and Sierra Vista.



County Studied	Study Coefficients (per 1% chg in MXN peso)	Calculated Impact on Total Retail Sales (%)
Webb County	-0.6281	-22.4
Imperial County	-0.2588	-9.2
Hidalgo County	-0.218	-7.8
San Diego County	-0.0852	-3.0

<sup>9</sup> James Gerber, PhD and J. Michael Patrick, PhD, *Shopping on the Border: The Mexican Peso and U.S. Border Communities*, March 2001.

# **APPENDIX E**

## **METHODOLOGY FOR ESTIMATED ANNUAL RETAIL EXPENDITURE IN SIERRA VISTA**

# Calculation Steps to Estimate Annual Expenditure of Mexico-Originating Visitors

Subtotal - Expenditure Based on Direct Trips to Sierra Vista		Low Estimate	High Estimate
<b>1 Determine Estimated Total Monthly MX-Originating POVs</b>		<b>100,619</b>	<b>110,010</b>
Equation: CBP Monthly Average for POE Crossings * Estimated % of MX-Originating POVs			
CBP Monthly Average for POE Crossings: (6 month average for 2016)		134,158	134,158
Estimated % of MX-Originating POVs (based on survey)		75%	82%
<b>2 Determine the Direct Monthly Visits of MX-Originating POVs to Sierra Vista</b>		<b>1,679</b>	<b>1,973</b>
Equation: Estimated Total Monthly MX-Originating POVs * Percentage of Direct MX-POV Visits to Sierra Vista			
Estimated Total Monthly MX-Originating POVs		100,619	110,010
Percentage of Direct MX-POV Visits to Sierra Vista (based on survey)		1.7%	1.8%
<b>3a Determine the Annual Estimated Retail Expenditures in Sierra Vista - Using Survey Data for "All MX Respondents"</b>		<b>\$ 1,914,208</b>	<b>\$ 3,456,433</b>
<b>3b Determine the Annual Estimated Retail Expenditures in Sierra Vista - Using Survey Data for "Sierra Vista Destined Respondents"</b>		<b>\$ 4,070,211</b>	<b>\$ 5,965,898</b>
Equation: Average Expenditure per POV Trip (All MX Respondents) * Direct Monthly Visits of MX-Originating POVs to Sierra Vista			
Equation: Average Expenditure per POV Trip (Sierra Vista Destined Respondents) * Direct Monthly Visits of MX-Originating POVs to Sierra Vista			
Estimated Total Monthly MX-Originating POVs		1,679	1,973
Average Expenditure per POV Trip (All MX Respondents)		\$ 95	\$ 146
Average Expenditure per POV Trip (Sierra Vista Destined Respondents)		\$ 202	\$ 252

Subtotal - Expenditure Based on "Sonora Sunday" Trips to Sierra Vista		Low Estimate	High Estimate
<b>4 Determine the Estimated Potential "Sonora Sunday" POVs from Mexico (Per Month)</b>		<b>3119</b>	<b>4510</b>
Equation: Est. Monthly MX-Orig. POVs * Percentage of "Sonoroa Sunday" MX Visitors (Based on Survey)			
Estimated Monthly MX-Originating POVs		100,619	110,010
Estimated Percentage of "Sonora Sunday" MX Visitors (Based on Survey)		3.1%	4.1%
<b>5 Determine the Estimated Number of "Sonora Sunday" POVs that Stop in Sierra Vista (Per Month)</b>		<b>468</b>	<b>1353</b>
Equation: Est. Potential "Sonora Sunday" POVs from MX * % of "Sonora Sunday" Visitors that Stop in Sierra Vista			
Estimated Potential "Sonora Sunday" POVs from Mexico (Per Month)		3119	4510
Percentage of "Sonora Sunday" POVs from Mexico that Stop in Sierra Vista (Based on a focus group estimate)		15%	30%
<b>6 Determine the Annual Expenditure of "Sonora Sunday" POVs that Stop in Sierra Vista</b>		<b>\$ 533,381</b>	<b>\$ 2,370,671</b>
Equation: Est. # of "Sonora Sunday" POVs per month that stop in Sierra Vista * Ave. Expenditure per POV Trip (All MX Resp.) * 12			
Average Expenditure per POV Trip (All MX Respondents)		\$ 95	\$ 146
Estimated Number of "Sonora Sunday" POVs that Stop in Sierra Vista (Per Month)		468	1353

Total Estimated Expenditures in Sierra Vista		Low Estimate	High Estimate
<b>7a Annual Est. Retail Expenditures in Sierra Vista INCLUDING SONORA SUNDAY TRIPS- Using Survey Data for "All MX Respondents"</b>		<b>\$ 2,447,590</b>	<b>\$ 5,827,105</b>
<b>7b Annual Est. Retail Expenditures in Sierra Vista INCLUDING SONORA SUNDAY TRIPS - Using Survey Data for "Sierra Vista Destined Respondents"</b>		<b>\$ 4,603,592</b>	<b>\$ 8,336,570</b>
Equation: Total 3a+6			
Equation: Total 3b+6			

# **APPENDIX F**

## **LIMITATIONS ON ESTIMATING RETAIL EXPENDITURE BY MEXICO-RESIDING VISITORS TO SIERRA VISTA**

# LIMITATIONS ON ESTIMATING RETAIL EXPENDITURE BY MEXICO-RESIDING VISITORS TO SIERRA VISTA

In this first attempt to estimate retail expenditures in Sierra Vista by Mexico-residing visitors, several limitations must be acknowledged – including the significant lack of available data on the topic; economic headwinds created by the relative decrease in the value of the Mexican peso (by over 35%); as well as the retail competition from surrounding communities (particularly Douglas, but also destinations such as Tucson and Phoenix) that have each made direct efforts to attract Mexican consumers.

Anecdotal estimates of crossborder shopping visitation (such as previous statements by local retail management that up to “20-33% of sales” were by Mexico-residing shoppers) may have accurately reflected past crossborder shopping behavior (especially with a stronger peso) – although, based on work done in other border communities, such high numbers are not likely to have been equally spread throughout Sierra Vista. For example, in the border communities of San Diego County, while retail stores located immediately adjacent to the border crossings generally estimate that 60-80% of their sales may come from crossborder shoppers, communities a short distance away (such as the City of Chula Vista, approximately 15 minutes via car) estimate closer to 20% of retail sales may be due to crossborder shoppers; and this number drops significantly (5-10%) for retailers that are 30 minutes or more away (although it should be noted that the urbanization of San Diego County and the high number of retail options for crossborder shoppers is very different than those crossing at Douglas, Arizona).

Based on the project focus group, a variety of factors – including distance from the border crossings, the absence of Spanish-language promotional materials, increasing retail competition from other communities, the value of the peso, and the perceived lack of a welcome reception at some locations –may be contributing to lower-than-expected retail impacts by crossborder shoppers in Sierra Vista. Some of these may be addressable by community efforts to increase visitation.

That said, additional limitations from the study design that may also have contributed to possibly undercounting retail spending estimates for Mexico-residing visitors to Sierra Vista include the following:

- **Participant Underestimation of Expenditures:** To secure the participation of Mexico-residing border crossers, the study relied on questionnaires applied at the border of north-bound travelers. As such, participants had to estimate their future estimated expenditure for “that trip” – potentially leading to underestimation of actual expenditures made while traveling in Arizona;
- **“Sonora Sundays” Expenditures En Route to Sonora:** As mentioned in this report, interviews for this project identified what was cited as a common occurrence: Mexico visitor stops to Sierra Vista en route to Sonora, following trips to Tucson, Phoenix, and other areas north of Sierra Vista (often on a Sunday – ergo, the phrase “Sonora Sundays”). Since the questionnaire was not designed to measure expenditures made on a return trip, such expenditures can only be estimated (as this study has done), but should be considered for inclusion in future border-related analyses;
- **Data Collection Timing:** In an attempt to provide some insights into seasonal differences of visitation patterns, the project included two waves of weeklong surveying (one during Summer, the second during Fall time periods). However, given the lack of previous, regularly-collected crossborder retail survey data from Mexican visitors at the Douglas/Raúl Héctor Castro POE, it is uncertain how much additional season variation may actually exist (beyond that identified in this report). In addition, field work for safety



purposes was done during daylight hours – potentially undercounting the economic impacts from evening shoppers;

- **Undercounting of SENTRI Users:** At other POEs, SENTRI lane border crossers generally have both higher US visitation frequency, and report higher average expected expenditures. While SENTRI lane users are only a small portion of border crossers at Douglas/Raúl Héctor Castro POE, the lack of queues inhibited collection of at-border surveys of this market segment – potentially leading to undercounting their economic contribution to Sierra Vista;
- **Undercounting of Pedestrian/Bus Visitors:** While likely a smaller source of potential undercounting, focus group participants did mention infrequent use of bus travel to Sierra Vista (citing it as one barrier, given the lack of direct bus service). Since the majority of visitors to Sierra Vista likely would use a car, the project survey design focused on Mexico-residing visitors that traveled in passenger vehicles – undercounting visitation that may have crossed on foot at the Douglas/Raúl Héctor Castro POE;
- **Mexico-Originating Visitors via Naco POE:** Another potential minor source of undercount is that the study design focused on border crossers only at the Douglas/Raúl Héctor Castro POE. Focus group participants mentioned on at least one occasion crossing via the Naco POE – which is significantly closer to Sierra Vista. That said, low traffic volumes at Naco POE likely mean that this study's crossborder retail estimates would only increase marginally if Naco border crossers had been included.