



Sketch Level Assessment of Potential Truck Diversion from Nogales-Mariposa Port of Entry to Texas



Prepared for the

DANNENBAUM

Prepared By



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**Sketch Level Assessment of Potential Truck
Diversion from Nogales-Mariposa Port of Entry
to Texas**

Final Report

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Hidalgo County Regional Mobility Authority
through
Dannenbaum Engineering Corporation

By

C&M Associates, Inc.

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Table of Contents

	<u>Page</u>
List of Tables.....	iii
List of Figures.....	iv
List of Acronyms and Abbreviations	v
1. Introduction.....	1
1.1. Background on HCRMA's Request	2
1.2. Study Area.....	2
2. Trends and Historical Traffic Characteristics.....	5
2.1. Border Crossing Trends for Cargo	5
2.2. Overweight and Oversize Truck Permits.....	12
2.3. Existing Data	16
3. Demand Modeling.....	21
3.1. Zoning.....	21
3.2. Bi-National OD	21
3.3. Travel Time Assumptions	23
3.4. Results.....	23
4. Hidalgo County POE System	24
4.1. Route Choice Model.....	24
4.2. Forecast Scenarios	26
5. Conclusion	30

List of Tables

	<u>Page</u>
Table 2-1. Historical NB Truck AADT for POEs in the study area	6
Table 2-2. Northbound Trucks Pharr International Bridge	7
Table 2-3. Actual Waiting Times of the study area POEs	11
Table 2-4. National Truck Regulations by Country	12
Table 2-8. Travel Condition from Mazatlan to the U.S.	17
Table 2-9. OD Truck Rates for Selected Routes, 1 st Quarter 2013 (\$/Truck).....	18
Table 3-1. Bi-National Truck OD 2012	22
Table 4-1: Annual OW/OS Total Permits and Revenue	28
Table 4-2. Low Case Scenario for the Permit and Revenue Estimates by POE	29
Table 4-3. High Case Scenario for the Permit and Revenue Estimates by POE	29
Table 5-1. Forecasted Annual NB Truck Volume by POE; Scenario A	30
Table 5-2. Forecasted Annual NB Truck Volume by POE; Scenario B	30

List of Figures

	<u>Page</u>
Figure 1-1. Location map of the Mazatlán-Matamoros Highway	2
Figure 1-2. Study Area	3
Figure 2-1. Historical Truck AADT at Border Crossings.....	7
Figure 2-2. Agriculture Produce Imports into the U.S. by POE in U.S. Dollars	8
Figure 2-3. 2012 (Q1) Fruit and Vegetable Truck Shipments from Mexico, by POE	9
Figure 2-4. U.S. Imports in Tons at the Pharr International Bridge.....	10
Figure 2-5: Designated OW/OS Routes.....	15
Figure 2-6. Existing Toll roads in Mexico	17
Figure 2-7. Mexican Exports and Imports in Tons by POE	19
Figure 3-1. Aggregated Zones U.S. and Mexico	21
Figure 3-2. Mexican Imports on the Nogales POE by Month of the Year 2012	23
Figure 4-1. Border Waiting Time Model Calibration	25
Figure 4-2. Resulting Waiting Time Function by Booth and Type.....	25
Figure 4-3. Annual North Bound Truck Volume NB on the Hidalgo County POEs diverted from the Nogales POE.....	27

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Description
ADOT	Arizona Department of Transportation
BTS	Bureau of Transportation Statistics
C-TPAT	Customs-Trade Partnership Against Terrorism program
C&M	C&M Associates, Inc.
CANACAR	Cámara Nacional del Autotransporte de Carga
CBP	Customs and Border Protection
DGST	Dirección General de Servicios Técnico
FAST	Free and Secure Trade
FHWA	Federal Highway Administration
FAF	Freight Analysis Framework
HCRMA	Hidalgo County Regional Mobility Authority
OD	Origin and Destination
OW/OS	Overweight and Oversize
POE	Port of Entry
RITA	Research and Innovative Technology Administration
SCT	Secretaria de Comunicaciones y Transportes
TxDOT	Texas Department of Transportation
USDA AMS	U.S. Department of Agriculture's Agricultural Marketing Service

Photo on cover page obtained from SCT Dirección General de Carreteras, Puente Baluarte.

1.Introduction

Nogales, Arizona, is the largest gateway for fresh produce arriving from Mexico, receiving about 40 to 50 percent of all fruits and vegetables shipped into the United States, according to the Arizona-Sonora Master Plan.¹ The proximity of the Nogales Port of Entry (POE) to the Mexican agricultural zones in the state of Sinaloa is the main reason for this high percentage. In addition, the Mexican road infrastructure offers limited options for east-west corridors in the north of Mexico.

The Durango-Mazatlán Highway, expected to open to traffic by the fall of 2013, will be the only high performance east-west connection between the Pacific coast near the Mexican cities of Mazatlan and Durango. This road, as presented in Figure 1-1, cuts a direct route across the Sierra Madre Occidental Mountains. The road is about 232 kilometers long and has one-lane per direction with an extra wide shoulder. The section between Km 156+300 and Km 164+000 (8 km) will be constructed as a four-lane highway. By building a safer, more direct route through the mountains, the Federal Secretary of Communications and Transport (SCT) hopes to improve trade and increase tourism along the larger Mazatlán-Matamoros corridor, connecting the Pacific coast in Mexico with the Rio Grande Valley in Texas. To ensure design speeds of at least 55 mph, the SCT is building a highway with 63 tunnels and 115 bridges.

It is expected that by traveling in the new Mazatlán-Matamoros corridor, transport of Mexican produce to markets in the central and eastern United States will experience substantial time savings. As a result, stakeholders in Hidalgo County², Texas, are anticipating that a portion of the Nogales fresh produce market can be captured by the local POEs.

¹ Arizona-Sonora Border Master Plan, Newsletter Spring 2012

² "Mayor highlights Edinburg's successes in past ye." www.yourvalleyvoice.com. 9 Mar. 2012. 11 June 2013 <http://www.yourvalleyvoice.com/news/edinburg/article_6f78dd60-6a3c-11e1-91f9-001871e3ce6c.html>.



Figure 1-1. Location map of the Mazatlán-Matamoros Highway

1.1. Background on HCRMA's Request

The Hidalgo County Regional Mobility Authority (HCRMA) through Dannenbaum Engineering, their GEC, requested that C&M produce a sketch level estimate of the potential increase in truck crossings from Mexico that may be generated by diverting truck traffic from the Nogales POE as a result of the opening of the Durango-Mazatlán Highway. The objective of this study is to estimate the impact of truck traffic to the existing and future POEs of Hidalgo County, due to the changes in the Mexican road network, and the attractiveness of the Mazatlán-Matamoros Corridor.

1.2. Study Area

The study area is comprised by the border area of the U.S. states of Arizona, New Mexico, and Texas, as well as the Mexican States of Sonora, Sinaloa, Chihuahua, Durango, Coahuila, Nuevo Leon, Colima, Jalisco, and Tamaulipas.

The Mazatlán-Durango highway is not the only project in the study area which has been pursued by the Mexican government to improve east-west connectivity in the north of Mexico: the extension of the Saltillo-Monterrey Toll Road to Mex-40 and the construction of the Reynosa Bypass are important projects which have improved east-

west travel conditions and travel times towards the Hidalgo and Cameron County POEs over the last three years. These improvements are highlighted in Figure 1-2

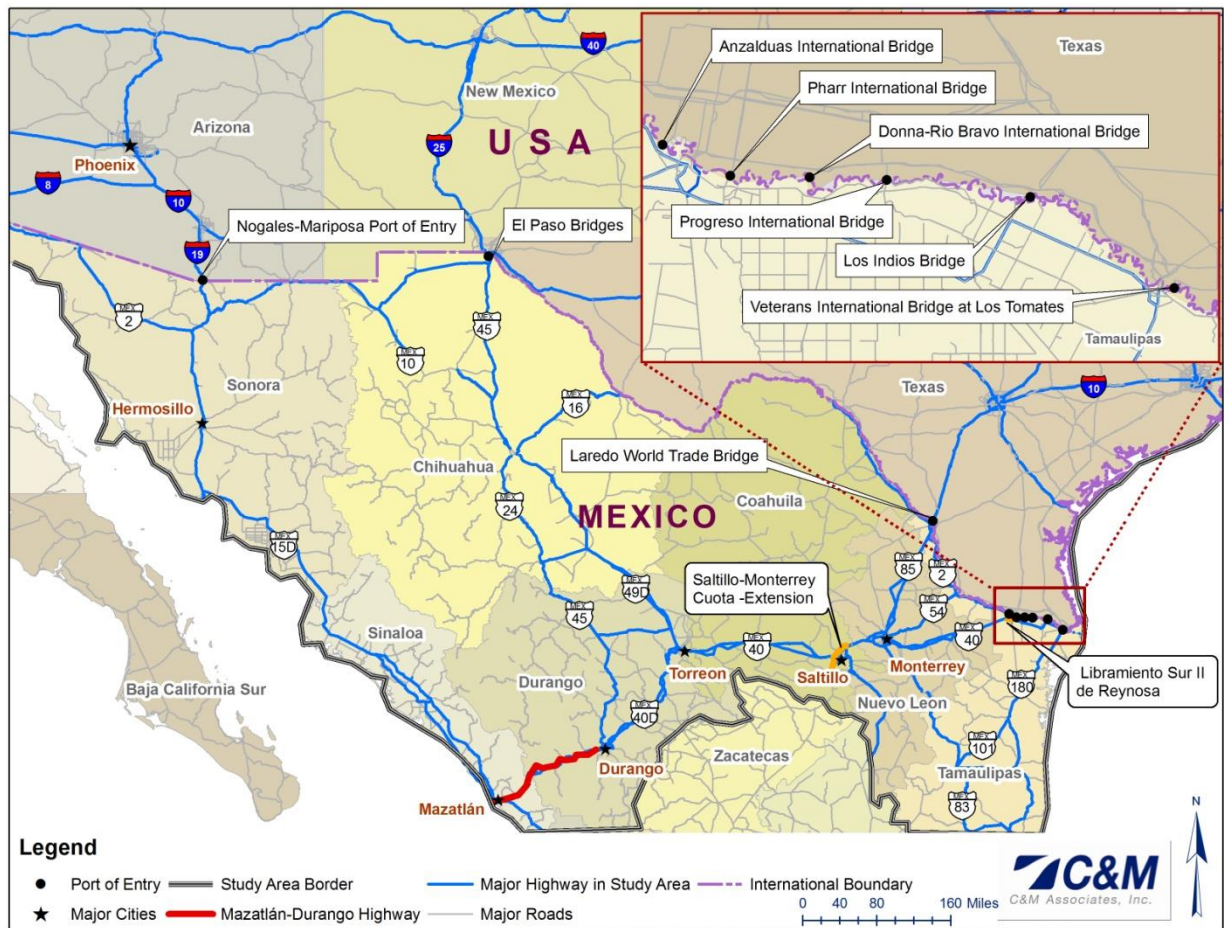


Figure 1-2. Study Area

The extension of the toll road between Monterrey and Saltillo, which constitutes a loop around the Saltillo urban area, is a two-lane highway with a wide shoulder. The average travel speeds are estimated to be around 56 mph. The same condition applies for the Libramiento Sur II of Reynosa. Due to the wide shoulder, these two loops outside of the urban areas operate as a super two-lane highway, which gives slower vehicles the possibility to move to the far right of the extra large shoulder to let a faster vehicle pass.

2. Trends and Historical Traffic Characteristics

2.1. *Border Crossing Trends for Cargo*

C&M made an extensive review of trade sources to understand what the industry — and specifically the trucks transporting produce and agricultural products — is experiencing today, and what their outlook is. The following paragraphs describe some of the information collected:

- According to the newsletter of Agricultural Refrigerated Truck Quarterly, USDA, it is expected that the improvements on the Mazatlán-Durango highway would save approximately six hours of drive time between the two cities. This shorter distance on any given day translates to about \$2,025 in savings per load. This has been indicated as the main reason that Mexican shippers are increasingly intent on shipping through South Texas. It is anticipated a significant increase in the volume of Mexican produce passing through Texas. South Texas is evolving into the primary U.S. entry point for Mexican produce, just in the first quarter of 2012, crossings through Texas accounted for 40 percent of all truck shipments to the United States from Mexico, with the vast majority of shipments made through Pharr, Laredo, and Progreso.³
- The variety of products available from South Texas makes shipping more efficient, since it is easier to load in the area because there are several products that can be combined to make shipping more efficient.
- New facilities are being built in the City of Edinburg's Rio Grande Produce Park, an 87 acre area dedicated to the import and export of Mexican produce. Many importers expect that the Durango-Mazatlán highway in Mexico will be the conduit for increased produce shipped to South Texas.⁴
- The Edinburg Economic Development Corp. expects that farmers in Mexico's western states will export greater amounts of produce through the Rio Grande Valley once the Mazatlán-Durango highway is finished. The highway will make it easier for Mexican farmers who generally exported fresh fruit and vegetables through Nogales, Arizona to send them to Texas due to the shorter route to the cities in the Northeast of the U.S.⁵
- Many Texas produce shippers have already invested in farming operations in Mexico, and produce already crosses the border into the Lower Rio Grande Valley for distribution throughout the U.S. and Canada⁶. Cameron and Hidalgo

³ Femia, Michael. "Texas Positions Itself To Be One-Stop Shop For Mexican And Texas Produce." PRODUCE BUSINESS. Dec. 2012. 21 June 2013 <http://www.michaelfemia.com/experience/assets/mfemia_TexasProduce.pdf>.

⁴ "Mayor highlights Edinburg's successes in past ye." www.yourvalleyvoice.com. 9 Mar. 2012. 11 June 2013 <http://www.yourvalleyvoice.com/news/edinburg/article_6f78dd60-6a3c-11e1-91f9-001871e3ce6c.html>.

⁵ Parra, Luis F. "THE SIERRA MADRE BYPASS: A CHALLENGE TO THE NOGALES PRODUCE DISTRIBUTION INDUSTRY." bordereco.com. 21 Dez. 2011. 11 June 2013 <<http://bordereco.com/internationalbusiness/2011/12/21/the-sierra-madre-bypass-a-challenge-to-the-nogales-produce-distribution-industry/>>.

⁶ "Texas Produce Shipments to Loom Larger in Future." [HaulProduce.com](http://haulproduce.com). 1 Oct. 2012. 11 June 2013 <<http://haulproduce.com/2012/texas-produce-shipments-to-loom-larger-in-future/>>.

counties are seeing a greater amount of imported produce with estimates as high of 40 percent in the past five years.⁷

- The Valley has regularly been a destination for produce from states like Veracruz, Chiapas, and Oaxaca in southern Mexico. However, with the Durango-Mazatlán Highway, produce from states in western Mexico like Sonora, Sinaloa, Nayarit, and Durango could be shipped more easily to Texas.⁸

While this information is appropriate for sketch level analysis, further in depth analysis needs to be performed to understand their effect in Hidalgo County.

The historical trends related to cargo imports from Mexico from the different sources are presented in the following sections.

2.1.1. *Historical POE Truck Crossings*

The main commercial POEs in the study area and crossing statistics for North Bound (NB) trucks are shown in Table 2-1. The table shows Laredo with 50 percent of the crossings, El Paso with 20 percent and Hidalgo (Pharr International Bridge) 14 percent are the major commercial border crossings in the study area. Nogales POE has 9 percent of all commercial border crossings in the study area. The presented commercial Truck crossings represent 90 percent of all commercial crossings of the U.S. states of Arizona, New Mexico, and Texas. The remaining commercial POEs in the west of Arizona or in New Mexico and Texas have not been consider to be significant for this study, either because of the location or the commercial crossing volume.

Table 2-1. Historical NB Truck AADT for POEs in the study area

Year	AZ: Nogales	TX: Brownsville*	TX: El Paso**	TX: Hidalgo	TX: Laredo
2000	910	1,069	2,573	1,336	5,332
2001	890	899	2,359	1,316	5,014
2002	865	889	2,519	1,394	5,149
2003	869	819	2,356	1,450	4,837
2004	884	808	2,570	1,623	4,971
2005	951	838	2,645	1,754	5,199
2006	1,034	868	2,661	1,635	5,425
2007	1,055	854	2,796	1,738	5,585
2008	1,085	794	2,710	1,700	5,554
2009	989	677	2,301	1,498	4,937
2010	1,098	741	2,537	1,640	5,663
2011	1,025	743	2,552	1,619	6,057
2012	1,099	779	2,589	1,720	6,391

*Los Indios, Venterans International

**Bridge II, Bridge of the Americas (BOTA), Ysleta

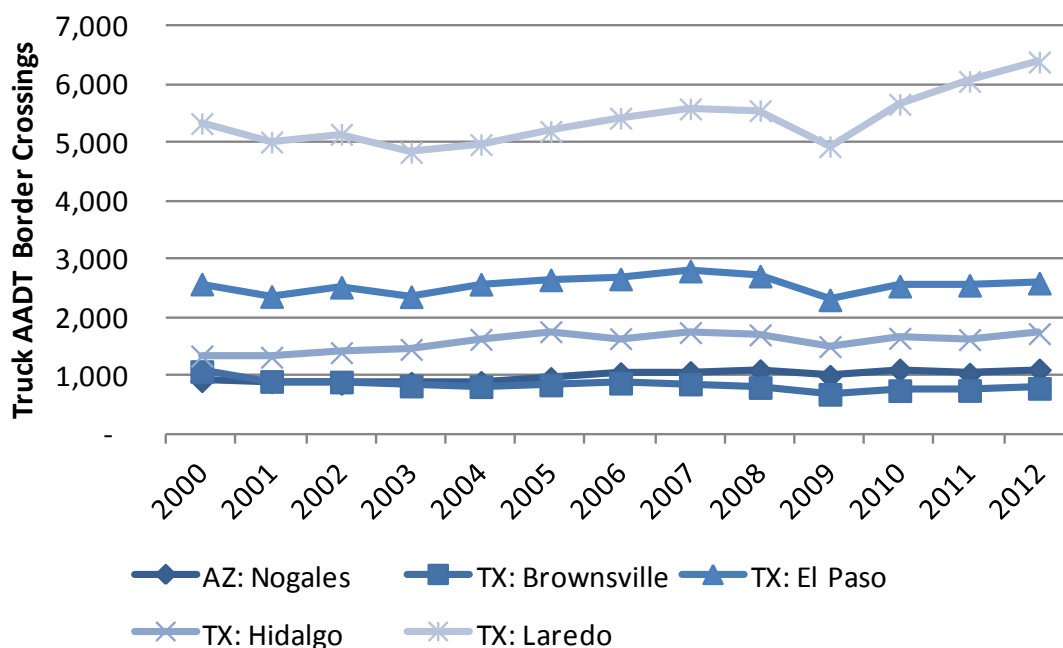
Source: RITA⁹

⁷ Parra, Luis F. "THE SIERRA MADRE BYPASS: A CHALLENGE TO THE NOGALES PRODUCE DISTRIBUTION INDUSTRY." *bordereco.com*. 21 Dez. 2011. 11 June 2013 <<http://bordereco.com/internationalbusiness/2011/12/21/the-sierra-madre-bypass-a-challenge-to-the-nogales-produce-distribution-industry/>>.

⁸ Parra, Luis F. "THE SIERRA MADRE BYPASS: A CHALLENGE TO THE NOGALES PRODUCE DISTRIBUTION INDUSTRY." *bordereco.com*. 21 Dez. 2011. 11 June 2013 <<http://bordereco.com/internationalbusiness/2011/12/21/the-sierra-madre-bypass-a-challenge-to-the-nogales-produce-distribution-industry/>>.

⁹ "TransBorder, Border Crossing/Entry and Transshipment data." Research and Innovative Technology Administration (RITA). 11 Jun. 2013. 11 June 2013 <http://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_Index.html>.

All POEs reached truck crossings peaks in 2008. The Great Recession affected the POE's significantly in 2009, and recovered at different times by 2012. The Laredo POE (World Trade Bridge) has had the best performance among these POEs and recovered much earlier from the Great Recession as previously shown in Figure 2-1. In the reported time period of 2000 to 2012, Hidalgo County's POEs have experienced a higher growth than the Nogales POE. During this period the Nogales POE crossings have grown by 21percent, equal to 1.6 percent per year; the Hidalgo International Bridge crossings by 29 percent which translates to 2.1 percent per year.



Source: RITA¹⁰

Figure 2-1. Historical Truck AADT at Border Crossings

Table 2-2 shows the most recent truck crossings in the Pharr International Bridge and the growth rate of the first four months compared to the previous year.

Table 2-2. Northbound Trucks Pharr International Bridge

Month	2012	2013	Diff	Growth
January	38,668	44,106	5,438	14%
February	39,127	41,354	2,227	6%
March	44,618	42,925	(1,693)	-4%
April	39,476	45,740	6,264	16%
Average	40,472	43,531	3,059	8%

Source: Pharr International Bridge¹¹

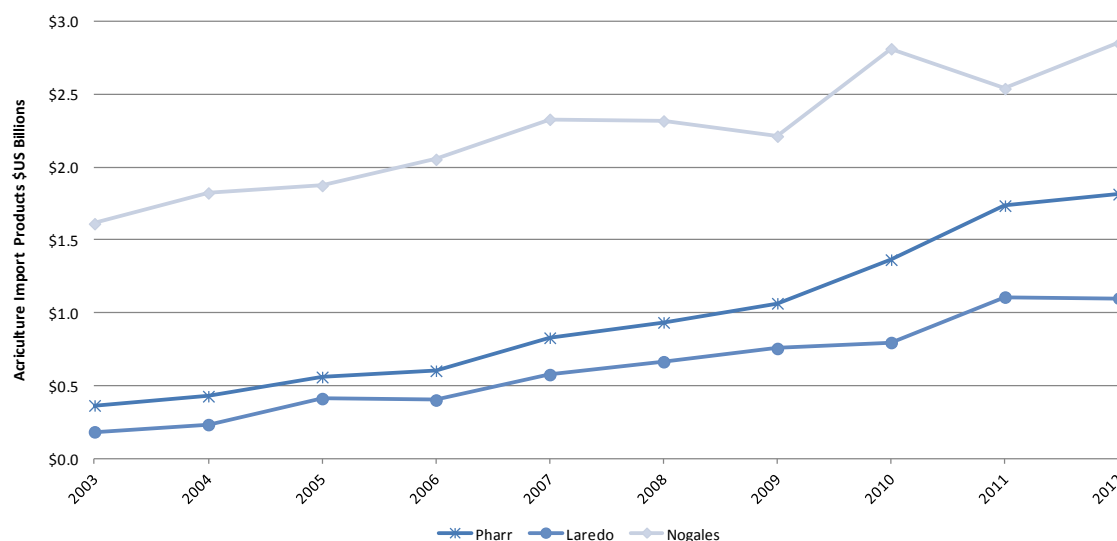
¹⁰ "TransBorder, Border Crossing/Entry and Transshipment data." Research and Innovative Technology Administration (RITA). 11 Jun. 2013. 11 June 2013 <http://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_Index.html>.

The 2013 year to date growth rate is comparable to the rates that were observed before the Great Recession. This trend shows the recent truck traffic recovery of the area.

2.1.2. *POE Commodity Characteristics by POE*

Every POE on the Mexican-U.S. border has its own unique market for commercial goods. Some POEs receive more produce, manufacturing goods, or other products, depending on infrastructure, policy, or closeness to other facilities such as ports.

Fruits and vegetable shipments from Mexico to the U.S. represents more than 30 percent of the total reported shipments of fresh fruits and vegetables during the 1st quarter 2013,¹² with the POEs of Nogales, Pharr, and Laredo receiving the greatest share of agriculture imports. The historical trend in value of agricultural imports by POE is shown in Figure 2-2, and the share of the produce market in 2012 (Q1) by POE is presented in Figure 2-3.



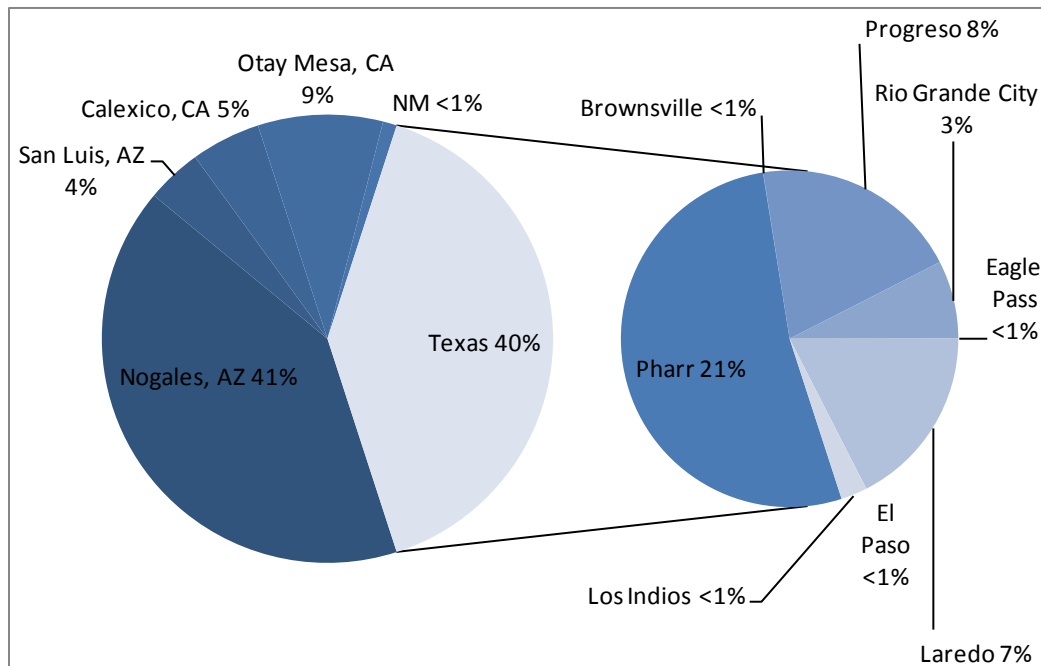
Source: U.S. Census¹³

Figure 2-2. Agriculture Produce Imports into the U.S. by POE in U.S. Dollars

¹¹ "Northbound Truck Crossings." Pharr International Bridge. 12 Jun. 2013. 12 June 2013 <<http://www.pharr-tx.gov/departments/pharr-reynosa-intl-bridge/northbound-truck-crossings>>.

¹² U.S. Department of Agriculture, Agricultural Marketing Service. Agricultural Refrigerated Truck Quarterly Report. June 2013. Web. <<http://dx.doi.org/10.9752/TS051.06-2013>>

¹³ "USA Trade@ Online." US Census. 12 Jun. 2013. 12 June 2013 <<http://https://usatrade.census.gov/>>.

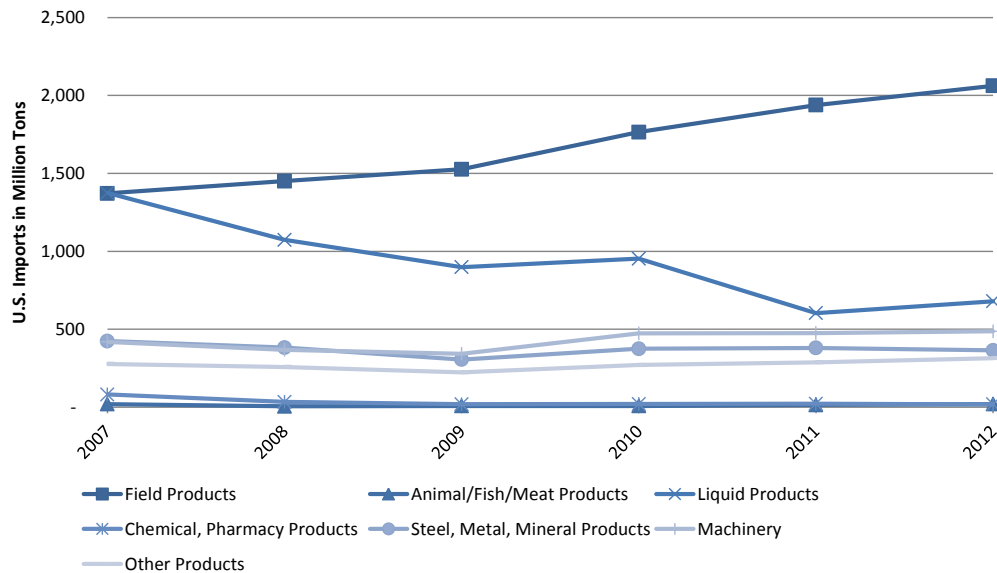


Source: USDA¹³

Figure 2-3. 2012 (Q1) Fruit and Vegetable Truck Shipments from Mexico, by POE

Monetary value of produce cargo also shows important trends in the area. As previously presented in Figure 2-2, the value of imported agricultural products at the Nogales POE is greater than that of Pharr or Laredo POEs. However the growth rate in agriculture products' monetary value in the last ten years has been greater at the Pharr POE with a Compound Growth Rate (CAGR) of 19.5 percent versus a CAGR of 6.5 percent for Nogales.

This has translated in a greater importance of agricultural products for the Pharr POE. The share of the agricultural products imported tons at the Pharr POE has grown from 35 percent in 2007 to 53 percent in 2012. Figure 2-4 presents the historical growth at the Pharr POE. In contrast, agricultural products at the Nogales POE are typically high at about 80 percent share by weight in 2012.



Source: RIITA¹⁴

Figure 2-4. U.S. Imports in Tons at the Pharr International Bridge

2.1.3. POE Crossing Times

Border crossing times are an important factor to consider for international shippers. The border crossing time is in general divided into two different times: The waiting time, which is considered as the time a truck needs to both reach and pass the Customs and Border Protection (CBP) inspection, and the crossing time which consists of the secondary inspection time and includes the Texas Department of Transportation (TxDOT) vehicle revision time. The crossing time varies by type of truck and cargo, while the waiting time before the booth can be influenced by the POE manager in opening or closing the number of booths for crossing the border. Time varies by truck and cargo type but is about the same through all POEs.

Another important factor for the border waiting times is the number of Free and Secure Trade (FAST) lanes inside the POE facilities. The FAST program is a commercial clearance program for known low-risk shipments entering the U.S. from Canada and Mexico. Initiated after the events of September 11, 2001, this trusted traveler/trusted shipper program allows for expedited processing of commercial carriers who have completed background checks and fulfill certain eligibility requirements. More than 87,000 commercial drivers are currently enrolled in the FAST program nationwide.¹⁵ The FAST program is open to enrollment to U.S., Canadian and Mexican truck drivers.

The FAST program was first implemented in December 2002 for U.S./Canada land POEs. The first dedicated FAST lanes on the U.S./Mexico border were located in El

¹⁴ "North American Transborder Freight Data." North American Transborder Freight Database. 12 Jun. 2013. 12 June 2013 <<http://transborder.bts.gov/programs/international/transborder/index.html>>.

¹⁵ "Free and Secure Trade (FAST)." US CBP. CBP. Apr. 2008. CBP, Government. 04/02/2011 <http://www.cbp.gov/linkhandler/cgov/newsroom/fact_sheets/travel/fast/fast_fact.ctt/fast_fact.pdf>

Paso, Texas and on the Pharr International Bridge and opened in 2004. Participation in FAST requires that every link in the supply chain, from manufacturer to carrier to driver to importer, is certified under the Customs-Trade Partnership Against Terrorism (C-TPAT) program. C-TPAT is a voluntary government-private sector partnership in which companies involved in commerce destined for the U.S. demonstrate that they have implemented enhanced security measures within their facilities and day-to-day operations to prevent terrorists and weapons of mass effect from infiltrating the supply chain. At about 25 percent, the percentage of trucks meeting all requirements of the FAST program is low, when compared to the number of commercial shipments (35 percent) which meet at least one of C-TPAT program requirements.

The benefits of FAST members are dedicated access lanes for faster crossing time and efficiency in the processing of transporter shipments, reduced number of inspections resulting in reduced delays at the border, and priority (front of the line) processing for CBP inspections. Some shippers are not registering in the FAST program because some POEs including the Pharr International Bridge do not have separate access lanes for FAST trucks, denying any time saving since all FAST trucks share the same queue with the regular trucks and have no time saving benefits. Current waiting times and number of FAST lanes are shown in Table 2-3.

Table 2-3. Actual Waiting Times of the study area POEs

Commercial POEs	RITA ID	State	# of Commercial Lanes	# of FAST Lanes	Max Waiting time*	Average Waiting Time*
Mariposa	Nogales	Arizona	7	1	210	32
Bridge II	El Paso	Texas	2	0		
Bridge of the Americas (BOTA)	El Paso	Texas	6	2	120	22
Ysleta	El Paso	Texas	8	2	80	16
World Trade Bridge	Laredo	Texas	16	3	120	35
Pharr	Hidalgo	Texas	6	1	180	26
Progreso	Progreso	Texas	1	0	45	20
Los Indios	Brownsville	Texas	4	0	40	3
Veterans International	Brownsville	Texas	4	1	120	30

Source: CBP¹⁶ and tcalit2¹⁷

2.1.4. Future Projects

There are two projects in development which would have an impact on commercial trucks crossing Hidalgo County's border, the opening of commercial truck lanes at the Anzalduas and the Donna International Bridges. These openings will reduce waiting times at the border by increasing the capacity available for crossing assuming they are appropriately staffed by CBP.

The Anzalduas International Bridge serves the Rio Grande Valley and Mexican cities such as Monterrey and Mexico City with a direct route to the MEX85 Highway. It also

¹⁶ "Border Crossing Wait Times." Customs and Border Protection (CBP). 11 Jun. 2013. 11 June 2013 <<http://apps.cbp.gov/bwt/>>.

¹⁷ "Best Time to Cross the Border." it2callit2. 11 Jun. 2013. 11 June 2013 <<http://http://traffic.calit2.net/border/border-wait-times.php?type=commercial&sub=standard&port=260402>>.

connects directly to the newly-developed area of maquiladora and warehouse in the Mexican side¹⁸ and will be the closest commercial crossing towards the McAllen Foreign Trade Zone. The U.S. State Department linked the Anzalduas Bridge's presidential permit to the following condition: construction of cargo import facilities by Jan. 1, 2015 — or until the Pharr International Bridge traffic reached 15,000 northbound trucks a week. Pharr isn't likely to reach that number before 2015.¹⁹ It was therefore assumed for this study that the opening of the Anzalduas Bridge to be January 2015.

The Donna International Bridge is located at the intersection of FM493 and US281 (Military Highway). Trucks that would use this POE from Mexico would be able to avoid all the urbanized and congested areas of Reynosa and Matamoros into Mexico when they are originated east of Reynosa.

The McAllen Foreign Trade Zone (20 minutes to the west) and the Edinburg Foreign Trade Zone (35 minutes to the north) are home to dozens of multinational corporations. The Donna International Bridge is legally able to open commercial vehicle lanes any time since its opening in December 2010. A Presidential Permit has been issued to allow unrestricted commercial traffic-truck crossings to start as soon as the U.S. Customs and Border Protection inspection facilities are built.²⁰ C&M assumed that the opening of the commercial facilities of the Donna Bridge for the purpose of this study would occur in 2020.

2.2. **Overweight and Oversize Truck Permits**

Current Mexican regulations allow trucks to be larger and carry more weight than what U.S. regulations allow. In Mexico, trucks are allowed to carry 125,000 pounds, while in the U.S., trucks heavier than 80,000 pounds are required to have an overweight permit. When these Mexican over weight trucks arrive at the border they typically re-distribute their cargo to other trucks in order to cross the border. Table 2-4 presents current standards of U.S. and Mexico

Table 2-4. National Truck Regulations by Country

Standard	High	Wide
U.S.	14 feet	8.5 feet
Mexico	15 feet 6 inches	12 feet

Source: U.S. Department of Transportation

¹⁸ "Reynosa Industrial Map." www.mexicoindustrialmaps.com. n.d. . 13 June 2013 <http://www.mexicoindustrialmaps.com/reynosa/park_location.html>.

¹⁹ Hendricks, Dave. "Anzalduas bridge prepares for southbound traffic." *The Monitor*. 25 Feb. 2013. 12 June 2013 <http://www.themonitor.com/news/local/article_a11cc550-7efb-11e2-b62f-001a4bcf6878.html>.

²⁰ "Alliance River Crossing." Alliance International Bridge. n.d. . 13 June 2013 <<http://www.alliancerivercrossing.com/alliance-international-bridge-2/overview/>>.

2.2.1. **Overweight Permit for Border Crossings**

Obtaining overweight and oversize (OW/OS) permits for trucks crossing from Mexico to Texas is a common practice in Cameron County; although the cargo varies greatly and includes steel, iron, minerals, scrap, polyethylene resin, sand, lubricants or oils, and wood. Around 2,700 permits were issued every month (2006) to go from the Veterans International Bridge to the Port of Brownsville.²¹ The current price of this overweight permit is \$80.

In addition to permits obtained at the Veteran's International Bridge POE, TxDOT also provides overweight and oversize permits on a case-by-case basis. However, because of the complexity of regulations related to these permits, the proportion of these issues permits is low compared the total number of permits issued in Texas.²²

For agricultural products, the Arizona Department of Transportation (ADOT) established a single-trip overweight permit for \$75 for produce trucks traveling into Arizona from Mexico at the Nogales POE. This permit allows commercial loads up to 90,800 pounds. Trucks purchasing the permit are able to cross at the Nogales POE and travel up to 25 miles from the international border to off-load and return. After 9 months of implementing this program, more than 16,000 permits were purchased and approximately \$1.2 million in state revenue was collected.²³ This figure is about 14% all agricultural produce truck crossing in Nogales POE. It is estimated that shippers save an average of \$285 per trip by using the Arizona overweight permit.²⁴ Additional revenues are sent for to the state's Highway User Revenue Fund, which is the primary source of funding for state and local transportation projects and maintenance.²⁵

TxDOT currently issues oversize/overweight (OS/OW) permits in the state, especially in areas near or around ports and industrial parks. These permits allow OW/OS vehicles to travel on designated roads, paying \$80.²⁶

The Legislature of the State of Texas brought the OW/OS Permit act for Hidalgo County through the house and senate and will take effect September 1, 2013. This bill, designated No. A474, is described in Section 2.2.1 of this report.

²¹ Emmanuel, Fernando G. "Investigation of the Effects of Routine Overweight Truck Traffic on SH4/48." Texas Transportation Institute. Apr. 2006. 4 June 2013 <<http://ftp.dot.state.tx.us/pub/txdot-info/rti/psr/0-4184-s.pdf>>.

²² Carlos, Miranda. Notes from telephone conversation with Ms. Tracy Staffer 7 Jun. 2013: DMV Permit Division.

²³ Trenkner, Tina. "AZ Permits for Overweight Trucks Expedite Crossings at Border." *Idea Center*. 14 Feb. 2011. 10 June 2013 <<http://www.governing.com/idea-center/AZ-Permits-for-Overweight-Trucks-Expedite-Crossings-at-Border.html>>.

²⁴ Coppola, Manuel C. "ADOT pilot program 'truly a win-win'." *Nogales International*. 3 Feb. 2011. 10 June 2013 <http://www.nogalesinternational.com/news/adot-pilot-program-truly-a-win-win/article_299999ef-5e82-50b0-8517-223f83855327.html>.

²⁵ Thompson, Christina. "Overweight Border Permit program a success during first year." *TucsonNewsNow.com*. 3 Feb. 2011. 10 June 2013 <<http://nogales-riorico.tucsonnewsnow.com/news/news/overweight-border-permit-program-success-during-first-year/52451>>.

²⁶ "Oversize/Overweight Vehicle Permit Fee Study." Center for Transportation Research - The University of Texas at Austin . Dec. 2012. 21 June 2013 <http://www.utexas.edu/research/ctr/pdf_reports/0_6736_2.pdf>.

2.2.1. Bill No.A474

The commission may authorize a regional mobility authority to issue permits for the movement of oversize or overweight vehicles carrying cargo in Hidalgo County on the here listed roads:

- U.S. Highway 281 between its intersection with the Pharr-Reynosa International Bridge and its intersection with State Highway 336;
- State Highway 336 between its intersection with U.S. Highway 281 and its intersection with Farm-to-Market Road 1016;
- Farm-to-Market Road 1016 between its intersection with State Highway 336 and its intersection with Trinity Road;
- Trinity Road between its intersection with Farm-to-Market Road 1016 and its intersection with Farm-to-Market Road 396;
- Farm-to-Market Road 396 between its intersection with Trinity Road and its intersection with the Anzalduas International Bridge;
- Farm-to-Market Road 2061 between its intersection with Farm-to-Market Road 3072 and its intersection with U.S. Highway 281;
- U.S. Highway 281 between its intersection with the Pharr-Reynosa International Bridge and its intersection with Spur 29;
- Spur 29 between its intersection with U.S. Highway 281 and its intersection with Doffin Canal Road;
- Doffin Canal Road between its intersection with the Pharr-Reynosa International Bridge and its intersection with Spur 29; or
- another route designated by the commission in consultation with the authority (SH365).

Figure 2-5 shows the designated OW/OS permit roads in Hidalgo County.

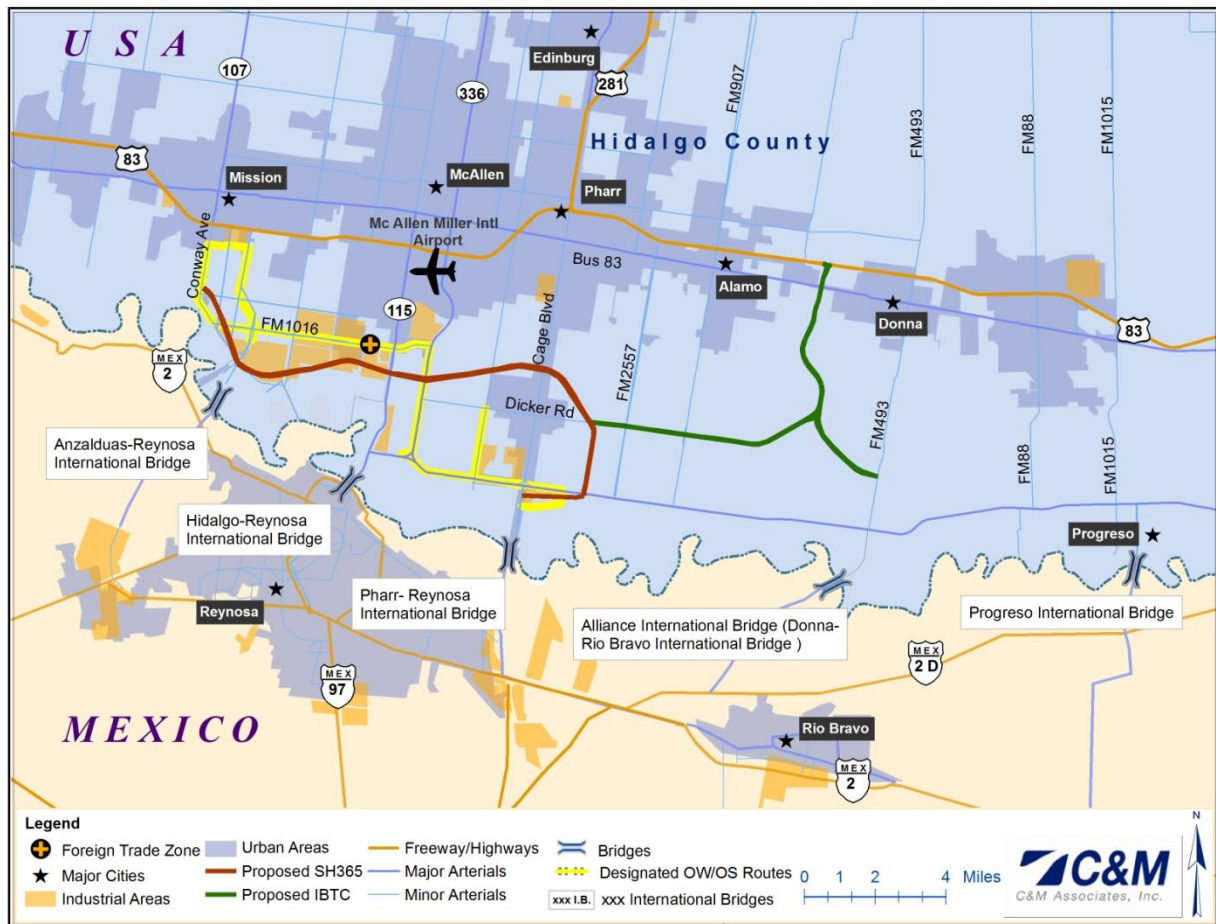


Figure 2-5: Designated OW/OS Routes

Beginning September 1, 2013, the maximum amount of the fee is not to exceed \$80 per trip. On September 1 of each subsequent year, the authority may adjust the maximum fee amount as necessary to reflect the percentage change during the preceding year according to the Consumer Price Index for All Urban Consumers U.S. City Average, published monthly by the United States Bureau of Labor Statistics or its successor in function.

Fees collected shall be used only for the construction and maintenance of the described roads and for the authority's administrative costs, which may not exceed 15 percent of the fees collected. The authority shall make payments to the Texas Department of Transportation to provide funds for the maintenance of roads and highways subject to the OS/OW Permit.

The gross weight of the vehicle for which a permit is issued may not exceed 125,000 pounds; the cargo may be transported in Hidalgo County only over the roads described above. A permit issued must specify the time during which movement authorized by the permit is allowed. Movement authorized may not exceed the posted speed limit or 55 miles per hour, whichever is less.

2.2.1. Recommendations

C&M recommends further studies to identify the current demand and potential revenue of an OW/OS permitting program in Hidalgo County. In the opinion of C&M, the following subjects need to be analyzed:

- Further investigation is required regarding the destinations within Hidalgo County of produce trucks, especially in the future. The existing locations and sizes of warehouses in the county are giving only a wake estimate of the existing destinations and their amount of trips generated.
- Besides the interests articulated by the public regarding OW/OS permits for Hidalgo County, what are the exact benefits and problems the county could face with actually issuing these permits on a day to day basis? One potential risk is a declining role of trucking syndicates in Reynosa, which may lose the short-haul trip market for produce trucks.
- Are the most efficient truck corridors the ones which are proposed in the bill for Hidalgo County, or can these routes be optimized based on an OW/OS schedule (management) or by their physical locations?
- What is the optimal price for an OW/OS permit: could \$80 be too high to attract produce trucks to the area?
- Further analysis is required regarding how the produce industry is reacting to the increase of FAST facilities on the border. What are the exact measures needed for produce shipments to get into the FAST Program, and what problems are they facing?
- What is the actual FAST share for produce trucks and how will this develop in the future?
- What will be the additional transactions and revenue for the proposed SH365 and IBTC from OW/OS produce trucks?

2.3. Existing Data

C&M evaluated the existing data on the four major corridors which are leading from Mazatlán, Sinaloa to cross the border to the U.S. on the most important commercial POEs: Nogales (AZ), El Paso (TX), Laredo (TX), and Pharr (TX).

2.3.1. General Travel Characteristics for Cargo Trucks

Travel conditions or travel times are not just affected by the characteristics of the road conditions. The major delays for commercial trucks are: (i) delays during customs revisions at border crossings and in the inland custom stations in Mexico and the U.S., and (ii) delays during random revisions at weight stations on major highways. In the Mexican territory, there are additional delays for any vehicle due to the inspection by the Mexican military, which has control stations on major Mexican roads as part of the Mexican war against organized crime, beginning in 2006. All these control stations have similar delays for heavy vehicle traffic, since they follow similar procedures. Figure 2-6 presents the existing toll roads and locations of the Mainline toll plazas for the considered corridors in the study area.



Figure 2-6. Existing Toll roads in Mexico

Based on available SCT public data for travelers in Mexico, Table 2-5 presents the travel time, cost, and distance of the analyzed corridors for a 5 axle trailer truck.

Table 2-5. Travel Condition from Mazatlán to the U.S.

From City	State	To	POE	Distance (km)	Travel Time	Toll Mx Pesos	Toll \$US
Mazatlán	Sinaloa		Brownsville Veterans International Bridge	1,233.11	13:51	\$ 3,848	\$ 296
			Pharr International Bridge	1,132.77	12:39	\$ 3,688	\$ 284
			Laredo World Trade Bridge	1,163.08	13:01	\$ 3,392	\$ 261
			El Paso	1,338.15	14:02	\$ 4,099	\$ 315
			Nogales Mariposa	1,164.45	11:14	\$ 1,872	\$ 144

Source: SCT²⁷

²⁷ "SUBSECRETARIA DE INFRAESTRUCTURA DIRECCIÓN GENERAL DE DESARROLLO CARRETERO." Secretaria de Comunicaciones y Transportes (SCT). Wednesday, June 05 2013. 6 June 2013 <http://aplicaciones4.sct.gob.mx/sibuac_internet/ServletManager>.

As the table shows, for trucks currently traveling from Mazatlan Sinaloa to Texas POEs, the Pharr International Bridge has the shortest travel time and the Laredo World Trade Bridge is the cheapest when compared to the current Nogales route.

These travel times have been significantly reduced by the new tollway systems implemented in the last three years, including some sections of the Mazatlán - Durango Highway and will reduce more when the Mazatlán - Durango Highway will be finalized by the fall of 2013. C&M estimates that these improvements might provide travel time savings of about 5 hours to south Texas destinations.

While the travel time in Mexico is an important factor for routing, the cost per truck in the U.S. is important as well. As it is shown in the Table 2-6 the cost per truck originating from Texas to the destination cities in the east of the U.S. is much cheaper than from Arizona. In average a shipper will save \$1,295 per truck by choosing Texas as its shipment origin instead of Arizona, when the destination is in the East or Central U.S.

Table 2-6. OD Truck Rates for Selected Routes, 1st Quarter 2013 (\$/Truck)

Origin/Destination	Atlanta	Chicago	Dallas	Los Angeles	Miami	New York	Philadelphia
Mexico-AZ	\$ 3,880	\$ 3,525	\$ 2,208	\$ 963	\$ 5,233	\$ 5,840	\$ 5,565
Mexico-TX	\$ 2,604	\$ 2,735	\$ 1,250	\$ 2,258	\$ 3,350	\$ 4,414	\$ 4,129
Difference	\$ 1,276	\$ 790	\$ 958	\$ (1,295)	\$ 1,883	\$ 1,426	\$ 1,436

Source: USDA²⁸

While these figures are appropriate for this level of study, C&M recommends further study to determine true cost savings for trucks in both Mexico and the U.S.

2.3.2. Cargo Origin and Destination Data Mexico

The SCT has produced an origin and destination (OD) matrix of goods movements in Mexico by metric ton for the year 2010. This OD matrix includes truck movements to the border counties of the study area.

The first nationwide freight OD matrix was developed in 1997 as part of the development of the national network of roads and railways of Mexico; the SCT included the strategic freight model of Mexico and its connections with the U.S. The data sources for this model were: (i) the national OD of railway-cargo, containing the origins and destinations of stations according to the national rail system, and (ii) the nationwide OD surveys conducted by the Dirección General de Servicios Técnico (DGST) for truck data.

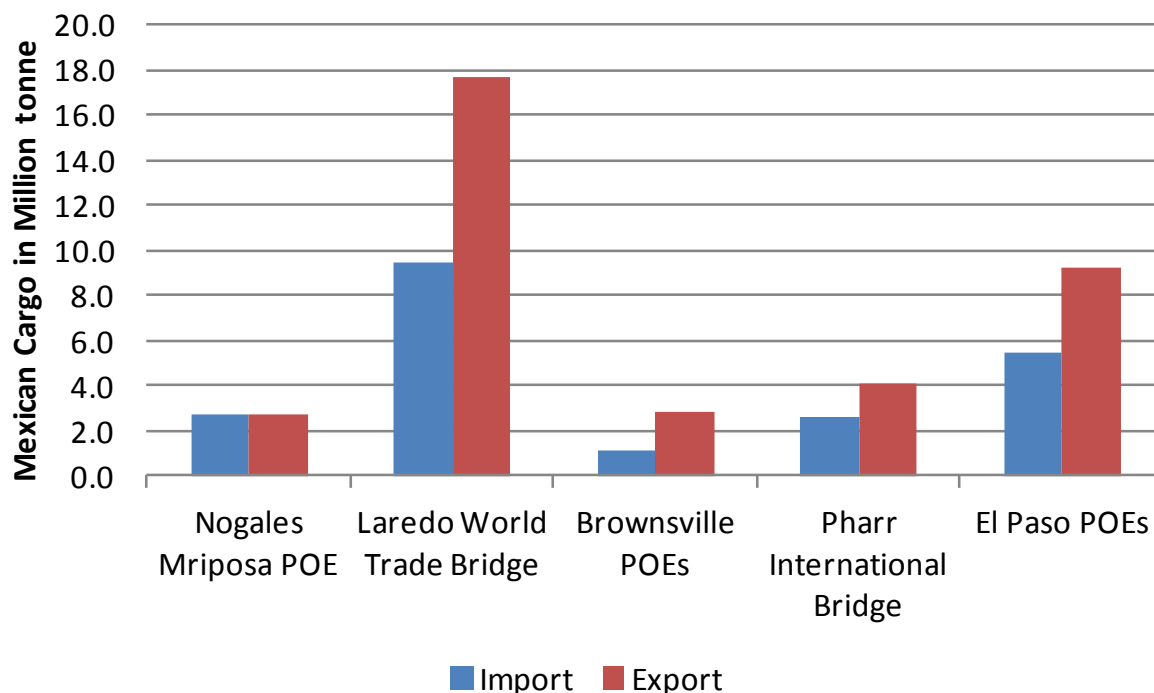
The current data for the 2010 OD matrix comes from various sources, such as:

- The General Coordination of Ports and Merchant Marine of the SCT,
- The Department of Rail and Multimodal Transport, and
- DGST Origin – Destination surveys.

²⁸ U.S. Department of Agriculture, Agricultural Marketing Service. Agricultural Refrigerated Truck Quarterly Report. June 2013. Web. <<http://dx.doi.org/10.9752/TS051.06-2013>>

The data was calibrated with survey data and traffic counts that take place every year in different parts of the nationwide network performed by the SCT, to match the cargo OD to existing truck traffic. The SCT has performed this process to create a freight OD matrix every 10 years.

The OD matrix includes 44 major ODs in Mexico and 16 ODs in the border states of the U.S. The major ODs in Mexico are the capitals of the Mexican states and/or important destinations for cargo transport and production. Figure 2-7 presents the resulting Mexican imported and exported goods in tons.



Source: SCT

Figure 2-7. Mexican Exports and Imports in Tons by POE

2.3.3. *Cargo Origin and Destination Data U.S.*

There are two important public sources for cargo ODs in the United States: the Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA) cargo state wide flow matrices.

The Border Crossing/Entry Data captured at the POE's provides summaries for U.S. bound crossings at the Canadian and Mexican borders at the port level. Data are available for trucks, trains, containers, buses, personal vehicles, passengers, and

pedestrians. Customs and Border Protection does not collect comparable data on outbound crossings.²⁹

The FHWA monitors freight management and operation and publishes the Freight Analysis Framework (FAF) application. The FAF integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. The current FAF version, version 3, uses the 2007 Commodity Flow Survey and additional sources, to provide estimates for tonnage, value, and domestic ton-miles by region of origin and destination, commodity type, and mode. It currently produces 2007 estimates, the most recent year, and forecasts through 2040. Also included are state-to-state flows for these years plus 1997 and 2002, summary statistics, and flows by truck assigned to the national highway network for 2007 and 2040.³⁰

²⁹ "TransBorder, Border Crossing/Entry and Transshipment data." Research and Innovative Technology Administration (RITA). 11 Jun. 2013. 11 June 2013 <http://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_Index.html>.

³⁰ "Freight Analysis Framework (FAF)." US Department of Transportation. 8 Jan. 2013. 13 June 2013 <http://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm>.

3.Demand Modeling

C&M developed a sketch level spread sheet model to estimate the possible truck diversion from the Nogales Mariposa POE to the POEs in Texas, considering the improved travel time of the finished Mazatlan-Durango Highway. The following text describes the sketch level elements produced for this study.

3.1. Zoning

In most transportation planning studies, the first step is the definition of a zoning scheme. Normally zoning is developed by mixing a certain degree of land usage homogeneity and using administrative borders as zone limits. In this sketch level study the zoning is based on the most disaggregated zones of the existing OD data: 44 zones in Mexico and 51 zones on the U.S. side. To simplify the outputs from the model, an aggregated zoning level was implemented as presented in Figure 3-1.



Figure 3-1. Aggregated Zones U.S. and Mexico

3.2. Bi-National OD

Due to the nature of the U.S.-Mexico border, their OD pairs have in common POE's where the trucks cross. On these intercept points C&M created a Bi-National OD matrix. This matrix includes tonnage cargo movements from the cargo's origin in Mexico to its

final destination in the U.S., and vice versa. This data has been validated with publicly available information for international good movements.³¹

Once the matrix was validated, C&M employed the same methodology used by FAF to generate truck demand.³² This loaded truck demand by POE was then calibrated to the inbound and outbound loaded truck traffic on the corresponding POEs. Empty trucks were assumed to not make long distance trips and therefore were calculated individually by POE to the existing loaded/empty commercial crossing ratio. Table 3-1 presents the resulting OD Matrix based on the aggregated zoning.

Table 3-1. Bi-National Truck OD 2012

O \ D	WNC	WSC	ESC	ENC	Atl	West	NorthWest	Pacific	NorthCenter	Center	EastGulf	SouthMex
WNC							890	41,354	1,451	4,635	3,641	9,571
WSC							18,087	840,694	29,504	94,215	74,012	194,573
ESC							1,566	72,808	2,555	8,159	6,410	16,851
ENC							4,193	194,902	6,840	21,842	17,159	45,109
Atl							4,087	189,969	6,667	21,290	16,724	43,967
West							4,395	204,293	7,170	22,895	17,985	47,282
NorthWest	3,393	67,971	6,214	21,224	12,742	23,689						
Pacific	4,827	96,702	8,841	30,195	18,128	33,703						
NorthCenter	6,081	121,811	11,136	38,035	22,835	42,454						
Center	7,776	155,781	14,242	48,642	29,203	54,293						
EastGulf	7,655	153,352	14,020	47,883	28,747	53,446						
SouthMex	31,711	635,256	58,078	198,356	119,085	221,399						

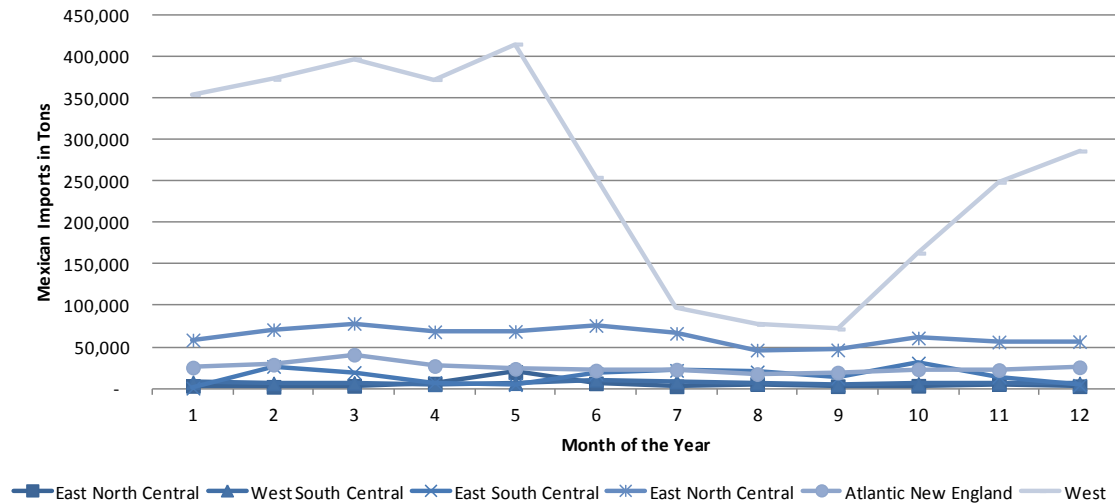
The final product of this process is an OD matrix for commercial trucks independent of POE. Therefore, every trip, using the C&M model, is able to choose its route based on each POE's attractiveness along its route to cross the border.

The estimated truck diversion from Nogales to the Texas POEs is at the end based on the cargo's origin and destination pairs. For trucks originating in Mexico, they must have their origin in the pacific coast states of Sinaloa, Nayarit, Colima, and Jalisco, and their destination the U.S. states east of the West zone described in the previous section. The Nogales POE shows a strong distribution of goods towards the west of the U.S., as shown in Figure 3-2.

Based on the previous discussion, C&M estimates that about 48,000 trucks per year are eligible to shift from Nogales to the Texas POEs.

³¹ "North American Transborder Freight Data." North American Transborder Freight Database. 12 Jun. 2013. 12 June 2013 <<http://transborder.bts.gov/programs/international/transborder/index.html>>.

³² "FAF 3 FREIGHT TRAFFIC ANALYSIS ." Freight Analysis Frame Work. 23 Mar. 2011. 14 June 2013 <http://faf.ornl.gov/fafweb/Data/Freight_Traffic_Analysis/faf_fta.pdf>.



Source RITA³³

Figure 3-2. Mexican Imports on the Nogales POE by Month of the Year 2012

3.3. Travel Time Assumptions

Travel times between all the disaggregated zones of the OD matrix have been estimated using Google Maps and the SCT travel online application. Using C&M's sketch level model, C&M adjusted with the existing travel times for truck's crossing by POE. The resulting share for the Texas POEs from the Nogales POE was then estimated by adjusting the speeds to 65 mph on the representative Highway portion between the cities of Mazatlán and Durango.

3.4. Results

Based on C&M's model, the estimated number of trucks which would have diverted to the Hidalgo County POEs in the year 2012 is in the range of 24,000 to 48,000, if the Mazatlán-Durango Highway would have been open. These additional truck crossings represent 7 to 15 percent of all the trucks crossing the Nogales POE. The reason for this wide range is the limited information about the attractiveness of Hidalgo County POEs' in competition with of other POEs in Texas. Assuming most of the diverted trucks from Nogales POEs will be carrying fresh agricultural products, Hidalgo County's infrastructural developments are more attractive to this market.

Trucks that are attracted from the Nogales POE are assumed to be loaded trucks; the effect of fewer loaded trucks in the Nogales area will further reduce traffic since every loaded truck produced a number of empty trucks.

The model results also show that truck traffic from the U.S. to Mexico will affect the Laredo World Trade Bridge, due to their final destination in Mexico.

³³ "North American Transborder Freight Data." North American Transborder Freight Database. 12 Jun. 2013. 12 June 2013 <<http://transborder.bts.gov/programs/international/transborder/index.html>>.

4. Hidalgo County POE System

Due to the planned future developments for commercial traffic in Hidalgo County's POEs, C&M has developed a route choice model to distribute the future truck traffic between the existing and future Hidalgo POEs. The decision of a shipper to choose between different POEs to cross the border is based on the several factors, the most important being OD and travel time.

C&M has performed field studies in Hidalgo County since 2007, and for this study C&M used its estimate of commercial truck ODs for the Pharr international Bridge performed in October, 2009³⁴. This comprehensive OD was utilized within the future POE route choice model for this study.

The following sections describe the travel time savings assumptions of different existing and future POEs and the overall usage of this model.

4.1. *Route Choice Model*

C&M developed a model for this study to estimate the border crossing waiting time based on the individual physical setup of each existing and future Hidalgo County POE. As previously discussed, the key-factors to determine border crossing waiting time are the cargo type, the number of CBP control booths and the booth type. Based on these factors C&M can produce a processing rate estimated and its corresponding exponential waiting time function.

The assumptions used for this study are based on the following commercial border crossing studies:

- Evaluation of Travel Time Methods to Support Mobility Performance Monitoring - World Trade Bridge³⁵, April 2002
- Traffic Analysis Study for Pharr International Bridge - City of Pharr ETSI, November 2007
- Análisis de Capacidad del Puente Anzalduas – Cal Y Mayor, 2012

In these studies the service rates by a commercial revision booth range from 35 to 40 commercial vehicles per hour for a standard booth.

Based on the most conservative service rate of 35 commercial vehicles, the waiting time model was calibrated to existing waiting times reported on the Texas border.³⁶ Figure 4-1 presents the results of the calibration.

³⁴ "C&M Associates, Inc." Draft Report for Hidalgo County Loop Intermediate T&R Forecast Update 8 Dec. 2009

³⁵ "Evaluation of Travel Time Methods to Support Mobility Performance Monitoring - World Trade Bridge." Federal Highway Administration. Apr. 2002. 1 June 2013
<http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CFMQFjAF&url=http%3A%2F%2Fops.fhwa.dot.gov%2Ffreight%2Fdocuments%2Fwrl_d_trd_br_site_rpt.doc&ei=w8DAUf2VA5Tm8gTq0YHwDg&usg=AFQjCNFPraAaV89pNf7tRTqQgK mLQI-udfQ&sig2=ZPKgY7IPIbK075mVaH9eMg&bvm=bv.47883778,d.eWU>.

³⁶ "Border Crossing Information System - Real Time Information." Texas A&M Transportation Institute, The Texas A&M University System. 18 Jun. 2013. 18 June 2013 <<http://bcis.tamu.edu/en-US/index.html>>.

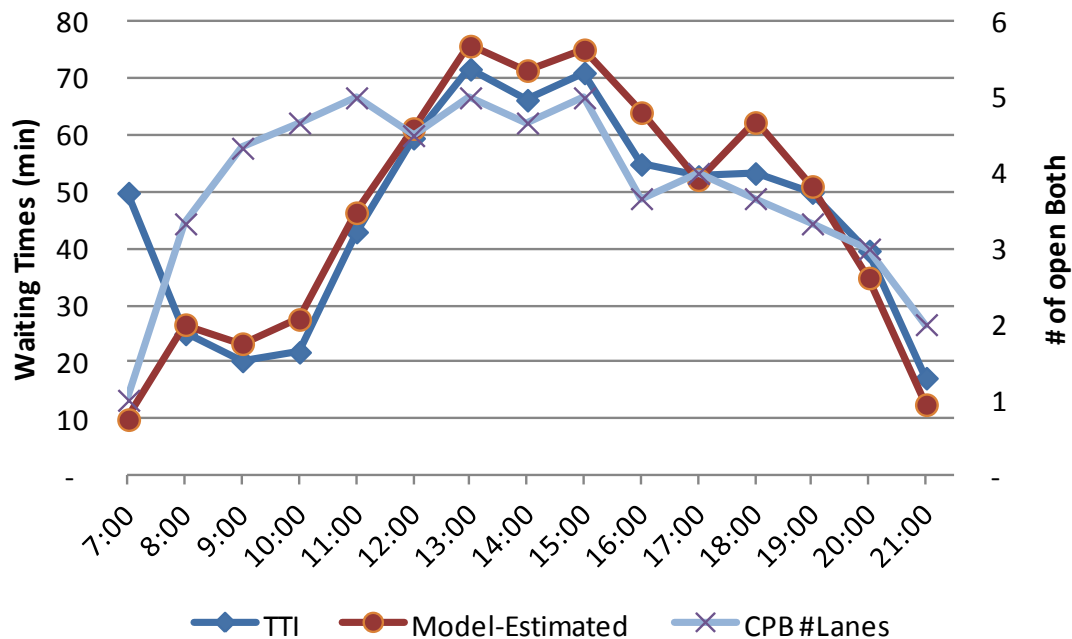


Figure 4-1. Border Waiting Time Model Calibration

The FAST booths, as mentioned before, have a higher processing rate, which leads to a different waiting time function. The resulting functions for standard and a FAST booth are shown in Figure 4-2.

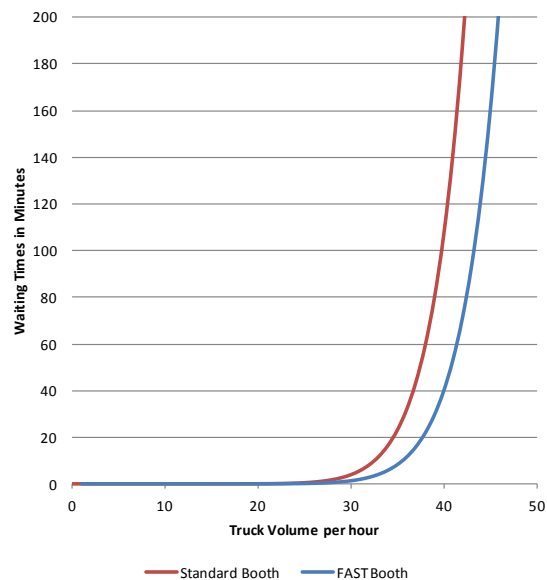


Figure 4-2. Resulting Waiting Time Function by Booth and Type

The C&M model includes the Pharr, Anzalduas, and Donna International Bridges, and it assumes that the Anzalduas and Donna bridges will accept commercial traffic on 2015 and 2020, respectively. The Progreso International Bridge is also a POE in Hidalgo County but is not considered to be inside the distribution model of the Hidalgo POEs for this study. The Progreso International Bridge has its own overweight market of

commercial vehicle crossings, with different crossing patterns than the Pharr International Bridge.

C&M currently treats the Progreso International Bridge as an independent crossing and concluded that any truck traffic capture due to the Mazatlan – Durango Highway would be minimal.

Further study of the interaction between the Progreso and the Dona International Bridge is required for better estimates of all the impacts in Hidalgo County.

4.2. Forecast Scenarios

C&M produced two different scenarios for truck traffic capture; these scenarios are based on the uncertainties of a sketch level forecast. The scenarios are based on different assumptions of the influence from the Durango-Mazatlán Highway, a ramp up period and future growth rates:

- Scenario A represents the assumption of 25,000 truck crossing diverted from the Nogales POE to Hidalgo County POEs.
- Scenario B represents the assumption of 48,000 truck crossing diverted from Nogales POE to Hidalgo County POEs.

The ramp up assumptions are considered to be 45 percent in the first year, 55 percent in the second and 80 percent in the third year of the produce trucks moving from Nogales POE to the Hidalgo County POEs. The ramp up assumptions consider the time the produce industry needs to react to the new Durango-Mazatlan Highway.

Truck traffic growth for the Hidalgo County POEs is assumed to be the same for both scenarios, equal to 3.5 percent CAGR until the year 2025. This growth rate is based on the recent observations and the historical observed average growth rate of 2.5 percent.

Figure 4-3 shows the annual produce truck volume forecast, which has been diverted from the Nogales POE towards the Hidalgo County POEs by the described scenarios.

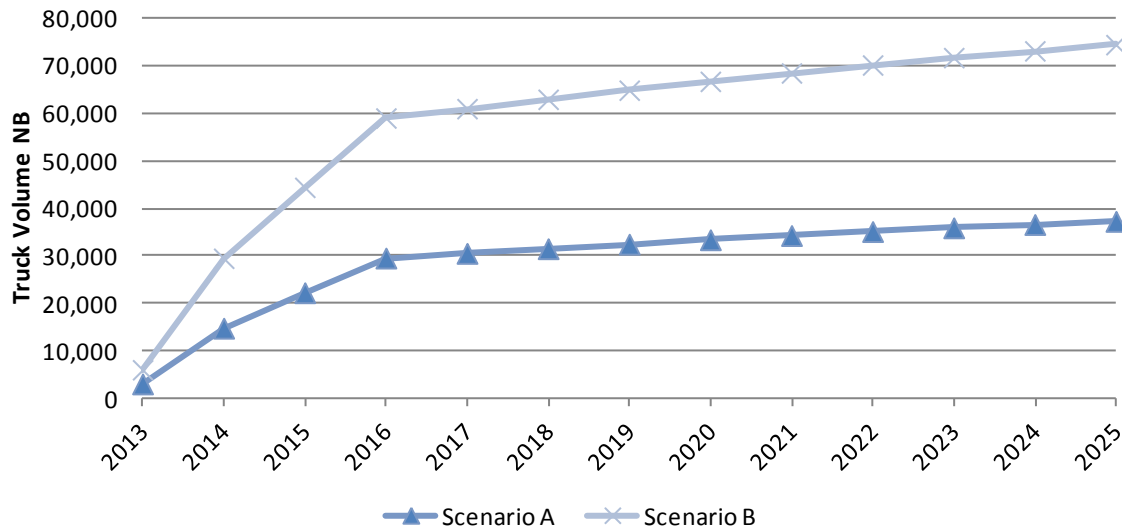


Figure 4-3. Annual North Bound Truck Volume NB on the Hidalgo County POEs diverted from the Nogales POE

4.2.1. Estimation of Overweight Permits and Revenue

Hidalgo County RMA, by issuing over weight permit and designating certain roads to allow overweight and oversize trucks, would have an additional revenue source to maintain the county's road network, and could reduce overall congestion since the number of trucks crossing the border would decrease. Once roads are added to the OW/OS program, paperwork to obtain these permits would be greatly reduced and they would become attractive for shippers. C&M considered that the RMA will issue OW/OS permits from September 1, 2013 onward.

The effect of these permits on border crossings depends on the location of the permitted routes. A large proportion of agriculture product warehouses are in Edinburg, but the permitted routes are serving only the San Juan, Pharr, McAllen, and Mission areas.

C&M studied the OW/OS permits as they correspond to produce trucks, using all the data collected for this study. Taking into consideration current truck crossings, and current trends in the Nogales market, it was estimated that between 17,000 and 19,000 permits for the year 2014 could be processed by the agricultural produce industry, resulting in estimated revenue of \$1.3 to \$1.5 million. According to the observed trend in Nogales POE, this figure is accounting for about 10 percent of agricultural produce trucks does not include other industries, such as the maquiladora or construction industries, that might benefit from this permit. Table 4-1 shows the annual number of permits and the resulting revenue, with A representing the low case scenario and B the high case scenario.

Table 4-1: Annual OW/OS Total Permits and Revenue

Year	OW/OS Transaction		Revenue (Millions)	
	A	B	A	B
2013	3,000	4,000	\$ 0.24	\$ 0.32
2014	17,000	19,000	\$ 1.37	\$ 1.53
2015	27,000	32,000	\$ 2.24	\$ 2.65
2016	39,000	46,000	\$ 3.32	\$ 3.92
2017	51,000	59,000	\$ 4.47	\$ 5.17
2018	63,000	74,000	\$ 5.67	\$ 6.66
2019	65,000	76,000	\$ 6.01	\$ 7.03
2020	67,000	78,000	\$ 6.37	\$ 7.41
2021	69,000	80,000	\$ 6.74	\$ 7.81
2022	70,000	82,000	\$ 7.02	\$ 8.22
2023	72,000	84,000	\$ 7.42	\$ 8.66
2024	73,000	85,000	\$ 7.73	\$ 9.00
2025	75,000	87,000	\$ 8.16	\$ 9.47

The base assumption for this annual estimate is the percentage of permits for produce trucks will grow in the first five years from 10 percent to 30 percent of trucks due to ramp up. The cost of the permit will be \$80 in 2013 and will increase by 2.75 percent every year on September 1, based on the estimated Consumer Price Index for All Urban Consumers U.S. City Average.

As a point of comparison, the Port of Brownsville, in Cameron County, approves about 31,000 permits a year, for revenues close to \$2.5 million.

4.2.2. Permits and Revenue by POE

Based on existing legislation, some of the Hidalgo County POEs will not be able to issue OW/OS permits because their International Bridges are not connected to the proposed OW/OS network. The Donna International Bridge and the Progreso International Bridge are not able to allow overweight trucks as per the current law.

The Anzalduas Bridge is presumed to permit only FAST trucks, and thus might get a lower share of produce truck shipments than other POE bridges with mixed commercial lanes. This is in general because the produce industry, by nature of its supply chain, has not had the optimal prerequisites to apply for the FAST program. However, with the continuous implementation of FAST lanes in all the U.S.-Mexico POE's and the obvious benefits of the FAST program, the produce industry may be compelled to overcome this disadvantage in the future.

Based on the above mentioned assumptions, forecasts for the number of permits and respective revenue for the Pharr and Anzalduas POEs are shown in Table 4-2 for the low case scenario and Table 4-3 for the high case scenario.

Table 4-2. Low Case Scenario for the Permit and Revenue Estimates by POE

Year	Number of Permits			Revenue (Millions)		
	Pharr	Anzalduas	Total	Pharr	Anzalduas	Total
2013	3,000	-	3,000	\$ 0.24	\$ -	\$ 0.24
2014	17,000	-	17,000	\$ 1.37	\$ -	\$ 1.37
2015	21,600	5,400	27,000	\$ 1.79	\$ 0.45	\$ 2.24
2016	30,600	8,400	39,000	\$ 2.61	\$ 0.71	\$ 3.32
2017	39,300	11,700	51,000	\$ 3.44	\$ 1.03	\$ 4.47
2018	47,600	15,400	63,000	\$ 4.28	\$ 1.39	\$ 5.67
2019	48,100	16,900	65,000	\$ 4.45	\$ 1.56	\$ 6.01
2020	48,600	18,400	67,000	\$ 4.61	\$ 1.75	\$ 6.37
2021	49,000	20,000	69,000	\$ 4.78	\$ 1.95	\$ 6.74
2022	48,700	21,300	70,000	\$ 4.88	\$ 2.14	\$ 7.02
2023	49,000	23,000	72,000	\$ 5.05	\$ 2.37	\$ 7.42
2024	48,500	24,500	73,000	\$ 5.14	\$ 2.59	\$ 7.73
2025	48,800	26,200	75,000	\$ 5.30	\$ 2.86	\$ 8.16

Table 4-3. High Case Scenario for the Permit and Revenue Estimates by POE

Year	Number of Permits			Revenue (Millions)		
	Pharr	Anzalduas	Total	Pharr	Anzalduas	Total
2013	4,000	-	4,000	\$ 0.32	\$ -	\$ 0.32
2014	19,000	-	19,000	\$ 1.53	\$ -	\$ 1.53
2015	25,600	6,400	32,000	\$ 2.12	\$ 0.53	\$ 2.65
2016	36,100	9,900	46,000	\$ 3.08	\$ 0.84	\$ 3.92
2017	45,400	13,600	59,000	\$ 3.98	\$ 1.19	\$ 5.17
2018	55,900	18,100	74,000	\$ 5.03	\$ 1.63	\$ 6.66
2019	56,200	19,700	76,000	\$ 5.20	\$ 1.83	\$ 7.03
2020	56,600	21,500	78,000	\$ 5.37	\$ 2.04	\$ 7.41
2021	56,800	23,200	80,000	\$ 5.54	\$ 2.26	\$ 7.81
2022	57,000	25,000	82,000	\$ 5.72	\$ 2.51	\$ 8.22
2023	57,100	26,800	84,000	\$ 5.89	\$ 2.77	\$ 8.66
2024	56,500	28,500	85,000	\$ 5.99	\$ 3.02	\$ 9.00
2025	56,600	30,400	87,000	\$ 6.15	\$ 3.31	\$ 9.47

5. Conclusion

The assumptions considered for this forecast are reasonable within a sketch level scope. C&M did not use field data, stakeholder surveys, or other sources to validate assumptions. The following tables present truck crossings by year and by POE for the Hidalgo County POEs.

Table 5-1. Forecasted Annual NB Truck Volume by POE; Scenario A

Year	Pharr	Anzalduas	Donna
2013	510,500	-	-
2014	541,000	-	-
2015	390,500	177,000	-
2016	392,000	201,900	-
2017	388,700	225,100	-
2018	384,900	248,600	-
2019	380,500	272,300	-
2020	349,100	275,300	47,000
2021	355,300	285,700	48,300
2022	361,100	295,700	49,400
2023	366,300	305,100	50,500
2024	370,700	313,900	51,500
2025	377,400	319,600	52,500

Table 5-2. Forecasted Annual NB Truck Volume by POE; Scenario B

Year	Pharr	Anzalduas	Donna
2013	513,500	-	-
2014	555,700	-	-
2015	405,700	184,000	-
2016	411,200	212,100	-
2017	407,600	236,600	-
2018	403,700	261,300	-
2019	399,200	286,000	-
2020	366,500	289,000	49,300
2021	373,000	299,900	50,600
2022	379,000	310,400	51,900
2023	384,500	320,300	53,000
2024	389,100	329,500	54,100
2025	396,100	335,500	55,100