Anzalduas International Bridge Traffic Study

Prepared by:

TEI *Traffic Engineers, Inc.*

In Association with:

Center for Transportation Research

August 1998

Table of Contents

Table of Contents (Continued)

List of Figures

List of Tables

Anzalduas International Bridge
Traffic Study
Executive Summary

Introduction and Objective

Construction of the Anzalduas International Bridge is being proposed in Hidalgo County, Texas. The bridge would be located three miles west of the existing Hidalgo-Reynosa Bridge, in an area south of Mission and McAllen, and across the Rio Grande from Anzalduas, Mexico, which is located immediately northwest of Reynosa, Mexico.

In December 1994, Wilbur Smith Associates (WSA) prepared a traffic study for the proposed Anzalduas International Bridge that estimated amount of traffic and revenues that would be generated by the proposed crossing.

Since the completion of the WSA study, several significant changes relating to the project have occurred, such as the opening of the Pharr International Bridge, Mexico's 1994 peso devaluation, and the continued trade increase due to NAFTA.

Traffic Engineers, Inc. (TEI) of Houston, Texas, and the Center for Transportation Research at the University of Texas (CTR) in Austin, Texas, were contracted to review and update the 1994 traffic study prepared for the Anzalduas International Bridge. The work included an analysis of the nearby river crossings, a review of the study area, crossing trends and variations, travel patterns, origin-destination (OD) studies, and traffic projections for the project.

Traffic Trends in the Area

Total two-way traffic on the entire system was analyzed from 1982 to 1997. The data indicate a steady growth, which averaged 4.2 percent in that period. There are four distinct growth periods, which were likely influenced by economic conditions, work zone disruptions, and other factors. The lowest average growth rate was observed between 1990 and 1993, following the highest growth seen after the General Agreement on Tariffs and Trade (GATT) and the Hidalgo Bridge improvements. Another significant

growth rate followed approval of the North American Free Trade Agreement (NAFTA) in 1994. Even with the peso devaluation, this latest growth period is expected to affect the overall growth rate for the analysis period. Assuming the current upswing continues for approximately the next five years, then stabilizes (as was seen after GATT), an overall average growth rate of 4.2 percent will be used and is consistent with the observed trend thus far. Because the previous study was completed before this latest upswing could be taken into account, this analysis will employ a higher overall average growth than the rate of 3.3 percent used in the WSA 1994 study. This study did not take into consideration the Hunt Realty/Grupo San Juan development because it is not possible to realistically estimate the number of trips that will be generated by this development.

Traffic Surveys

This study included two major traffic surveys: a two-day roadside survey of privately owned vehicles at each bridge, and a mail-out survey of commercial traffic directed at the Custom Brokers. Surveys of privately owned vehicles indicate that the major travel pattern was from McAllen to central Reynosa with 29.1 percent of weekday travel and 11.8 percent of weekend travel. While the WSA study did not specifically report on truck movements, this study captured over 23 percent of the 1997 truck trips made over the Hidalgo-Pharr-Progreso bridge system, as well as the seasonal impacts that previous studies have been unable to measure. The most common trip patterns observed in the commercial truck data were:

- 16 percent of total truck trips (both directions) were between the U.S. Interior and Central Reynosa;
- 50 percent of southbound traffic originated in the U.S. Interior;
- 44.5 percent of southbound traffic was destined to Reynosa, west of Mexico's Highway 97, with approximately half of this traffic headed to Mexico's West Interior;
- 36 percent of northbound truck traffic was destined to the U.S. Interior; and
- 60 percent of northbound truck traffic originated in Reynosa west of Mexico's Highway 97, with over half of this traffic beginning trips in Mexico's West Interior.

Bridge System Vehicular Capacity

The capacity of an international border crossing is controlled by the following three principal elements.

- *Capacity of the international bridge*—this is seldom a constraint, since most uncontrolled traffic lanes can carry 1,200 to 1,600 vehicles per hour depending on the mix of commercial and POVs.
- *Capacity of the northbound and/or southbound border stations and other facilities*—the critical element is generally the northbound inspection facility because the toll plazas are flexible enough to

increase throughput using devices such as automated toll collection and electronic vehicle tags. Lack of human resources is the main constraint.

- *Capacity of the roadway system connecting to the major distribution thoroughfares*—the roadway corridors can control the capacity of the bridge system, especially when the bridge is located inside the central business district.

The capacities of the bridge, the border station, and the roadway system should be balanced in order to maximize traffic circulation at the bridge. Since the three bridge elements function sequentially, an increase in the capacity of one or even two elements will not improve traffic circulation if the remaining element(s) continue to operate near capacity. For example, in July 1998, data on commercial vehicles going through the Pharr primary station indicated that the facility is already operating between 67 and 78 percent of its capacity. This element thus constraints the capacity of the Pharr Bridge. Expansion, however, is underway for the Pharr primary station.

As for the roadway system, two-way capacity of a typical street system ranges from 20,000 to 30,000 vehicles per day. Rural conditions typically allow a higher capacity, which can approximate 40,000 vehicles per day for two-way traffic. Therefore, it is estimated that the existing three-bridge system has a vehicular capacity of 60,000 to 120,000 vehicles per day. In order to avoid congestion, the desirable demand levels for the existing bridge system would range from approximately 45,000 to 90,000 vehicles per day. According to the current growth pattern, the existing bridge system will generate enough demand to make the roadway system reach vehicular capacity on or before 2008. In order to establish an optimal opening date for the Anzalduas Bridge, it is necessary to analyze the vehicular capacity of the entire bridge system, including the capacity of the street systems, urban and rural, on both sides of the Rio Grande.

Forecasted Traffic Demand

The traffic demand on the proposed Anzalduas Bridge has been estimated based on the data collected and on observed growth patterns in the region, and is shown in **Table ES1** below. Additionally, the distribution of the forecasted growth of system traffic has been estimated for two scenarios: the Anzalduas Bridge is not built, and the Anzalduas is built. These volumes, expressed in average daily two-way traffic, are tabulated in the **Table ES2**. These values assume that a corridor capacity exists and constrains the capacity of each bridge. **Figures ES1** and **ES2** display the information from **Table ES2**

in a graphical manner, and include the total system traffic for each scenario. Additionally, **Figure ES3** displays the scenario with the Anzalduas Bridge, but combines the Hidalgo and Anzalduas Bridge into one subsystem.

Major Findings and Conclusions

This study has yielded several major findings and conclusions pertaining to the study area and the transborder travel that occur across the bridge system.

- Socio-economic indicators suggest sustained growth in the region.
- The west side of Reynosa has historically had more Maquiladora construction than both the east side of Reynosa and Rio Bravo combined.
- Without the Anzalduas Bridge, capacity constraints will cause a significant loss of traffic and revenue from the region before 2008.
- Upon opening of the Anzalduas Bridge, traffic will divert, in order of magnitude, from the Hidalgo, Pharr, and Progreso Bridges. Although each bridge will initially experience a *loss*, the overall system will be better equipped to carry more traffic. The Anzalduas Bridge will be able to capture traffic otherwise lost once the Hidalgo and Pharr Bridges become constrained by capacity.
- Without the Anzalduas Bridge, the maximum average two-way daily traffic using the bridge system is estimated at approximately 80,000 vehicles per day. The peak two-way system traffic is approximately 105,000 vehicles per day when the Anzalduas Bridge is factored into the system.
- This traffic study indicates that the Anzalduas Bridge is viable and will enhance the regional bridge system capacity.

Table ES1. Traffic Growth Schedule for Bridge System and Share of System Total Utilizing the Anzalduas Bridge

Year	System Total [1]	Anzalduas Total [2]	Truck Total [3]	Anzalduas Share
1994	*36,348*	-	-	-
1995	*38,113*	-	-	-
1996	*42,285*	-	-	-
1997	*42,274*	-	-	-
1998	44,264	-	-	-
1999	46,348	-	-	-
2000	48,531	-	-	-
2001	50,816	-	-	-
2002	53,210	-	-	-
2003 [4]	55,717	9,519	833	17.1%
2004	58,448	10,028	946	17.2%
2005	61,311	10,563	1,075	17.2%
2006	64,313	11,125	1,159	17.3%
2007	67,461	11,715	1,250	17.4%
2008	70,761	12,336	1,349	17.4%
2009	74,221	12,988	1,455	17.5%
2010	77,848	13,673	1,570	17.6%
2011	81,652	14,392	1,695	17.6%
2012	85,639	15,148	1,830	17.7%
2013	89,819	15,942	1,975	17.7%
2014	92,379	17,138	2,057	18.6%
2015	94,494	18,568	2,123	19.6%
2016	96,888	20,210	2,199	20.9%
2017	98,998	21,992	2,270	22.2%
2018	100,358	23,987	2,321	23.9%
2019	101,824	26,075	2,376	25.6%
2020	103,400	28,261	2,436	27.3%
2021	105,093	30,550	2,500	29.1%
2022	105,236	31,250	2,499	29.7%
2023	104,213	30,750	2,461	29.5%

1. System total expressed in average daily traffic.
2. Anzalduas total includes POV and truck traffic.
3. Truck total includes diversion due to closing of Hidalgo Bridge to Southbound commercial traffic.
4. Estimated opening of Anzalduas Bridge.

Table ES2. Two-Way System Total Average Daily Traffic Distribution Scenarios[1]

	Anzalduas Bridge NOT BUILT				Anzalduas Bridge BUILT				
Year	**Hidalgo**	**Pharr**	**Progreso**	**Total**	**Anzalduas**	**Hidalgo**	**Pharr**	**Progreso**	**Total**
1997	*28,170*	*8,577*	*5,527*	***42,274***	-	*28,170*	*8,577*	*5,527*	***42,274***
1998	28,994	9,595	5,674	**44,264**	-	28,994	9,595	5,674	**44,264**
1999	29,843	10,680	5,825	**46,348**	-	29,843	10,680	5,825	**46,348**
2000	30,716	11,833	5,981	**48,531**	-	30,716	11,833	5,981	**48,531**
2001	31,616	13,060	6,141	**50,816**	-	31,616	13,060	6,141	**50,816**
2002	32,541	14,364	6,305	**53,210**	-	32,541	14,364	6,305	**53,210**
2003	33,494	15,750	6,474	**55,717**	9,519	26,025	13,797	6,376	**55,717**
2004	34,474	17,222	6,647	**58,343**	10,028	26,787	15,086	6,547	**58,448**
2005	35,484	18,785	6,825	**61,093**	10,563	27,571	16,455	6,722	**61,311**
2006	36,523	20,443	7,007	**63,973**	11,125	28,378	17,908	6,902	**64,313**
2007	37,592	22,202	7,195	**66,990**	11,715	29,209	19,449	7,087	**67,461**
2008	38,000	24,889	7,388	**70,277**	12,336	30,065	21,083	7,277	**70,761**
2009	37,500	28,800	7,587	**73,886**	12,988	30,945	22,816	7,472	**74,221**
2010	37,000	32,869	7,790	**77,659**	13,673	31,851	24,652	7,673	**77,848**
2011	36,500	34,702	8,067	**79,269**	14,392	32,784	26,596	7,879	**81,652**
2012	36,000	36,428	8,357	**80,785**	15,148	33,745	28,656	8,090	**85,639**
2013	35,500	36,000	8,719	**80,219**	15,942	34,733	30,836	8,308	**89,819**
2014	35,000	35,500	9,093	**79,593**	17,138	35,000	31,653	8,588	**92,379**
2015	34,500	35,000	9,480	**78,980**	18,568	34,500	32,546	8,880	**94,494**
2016	34,000	34,500	9,879	**78,379**	20,210	34,000	33,497	9,181	**96,888**
2017	33,500	34,000	10,290	**77,790**	21,992	33,500	34,000	9,506	**98,998**
2018	33,000	33,500	10,715	**77,215**	23,987	33,000	33,500	9,871	**100,358**
2019	32,500	33,000	11,153	**76,653**	26,075	32,500	33,000	10,249	**101,824**
2020	32,000	32,500	11,605	**76,105**	28,261	32,000	32,500	10,639	**103,400**
2021	31,500	32,000	12,073	**75,573**	30,550	31,500	32,000	11,043	**105,093**
2022	31,000	31,500	12,555	**75,055**	31,250	31,000	31,500	11,486	**105,236**
2023	30,500	31,000	13,053	**74,553**	30,750	30,500	31,000	11,963	**104,213**

1. Values represent average daily traffic that would use each bridge given the capacity constraint of the respective corridors.

Figure ES1. Two-Way Volume on Bridge System, Anzalduas Bridge **NOT BUILT**

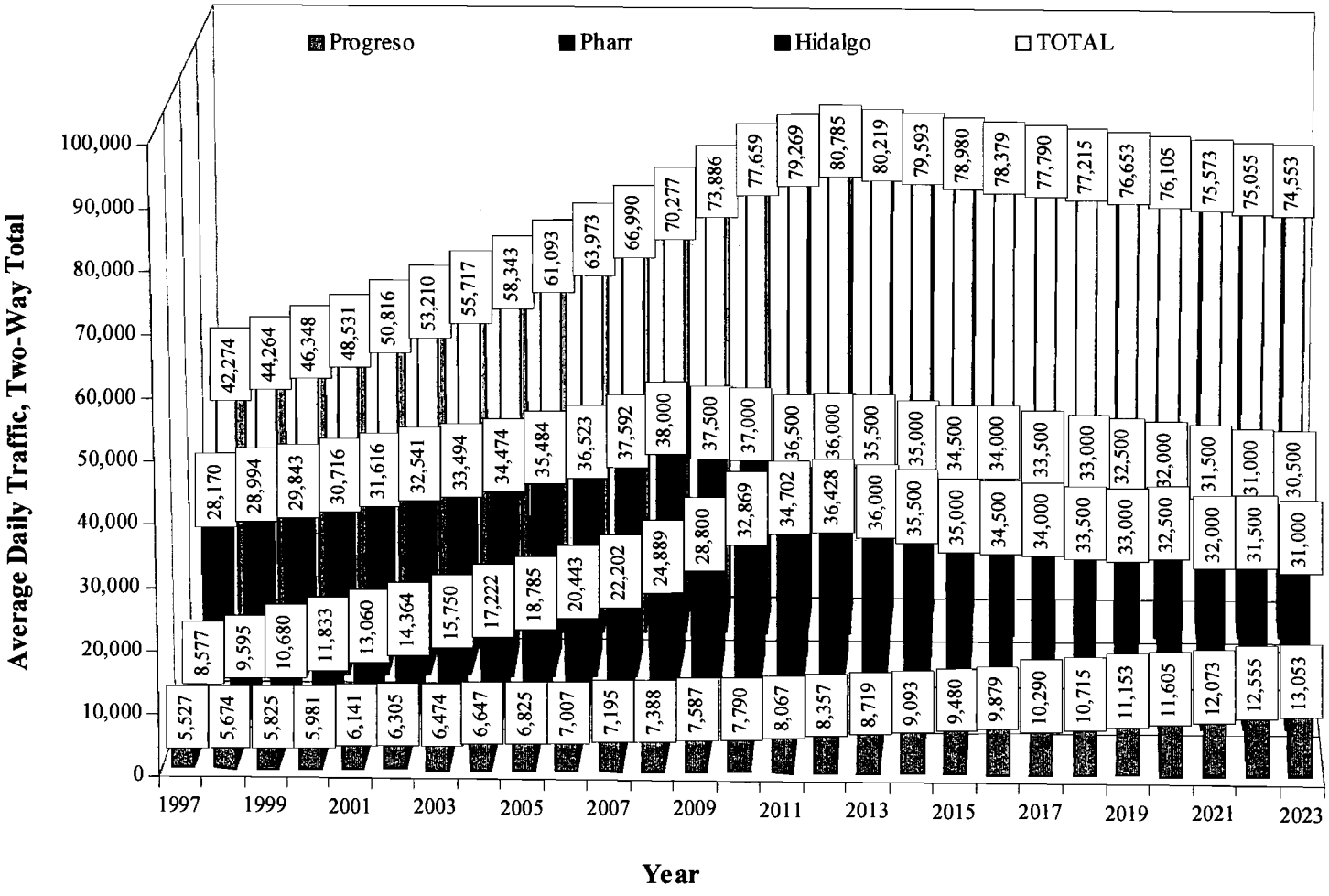


Figure ES2. Two-Way Volume on Bridge System, Anzalduas Bridge **BUILT**

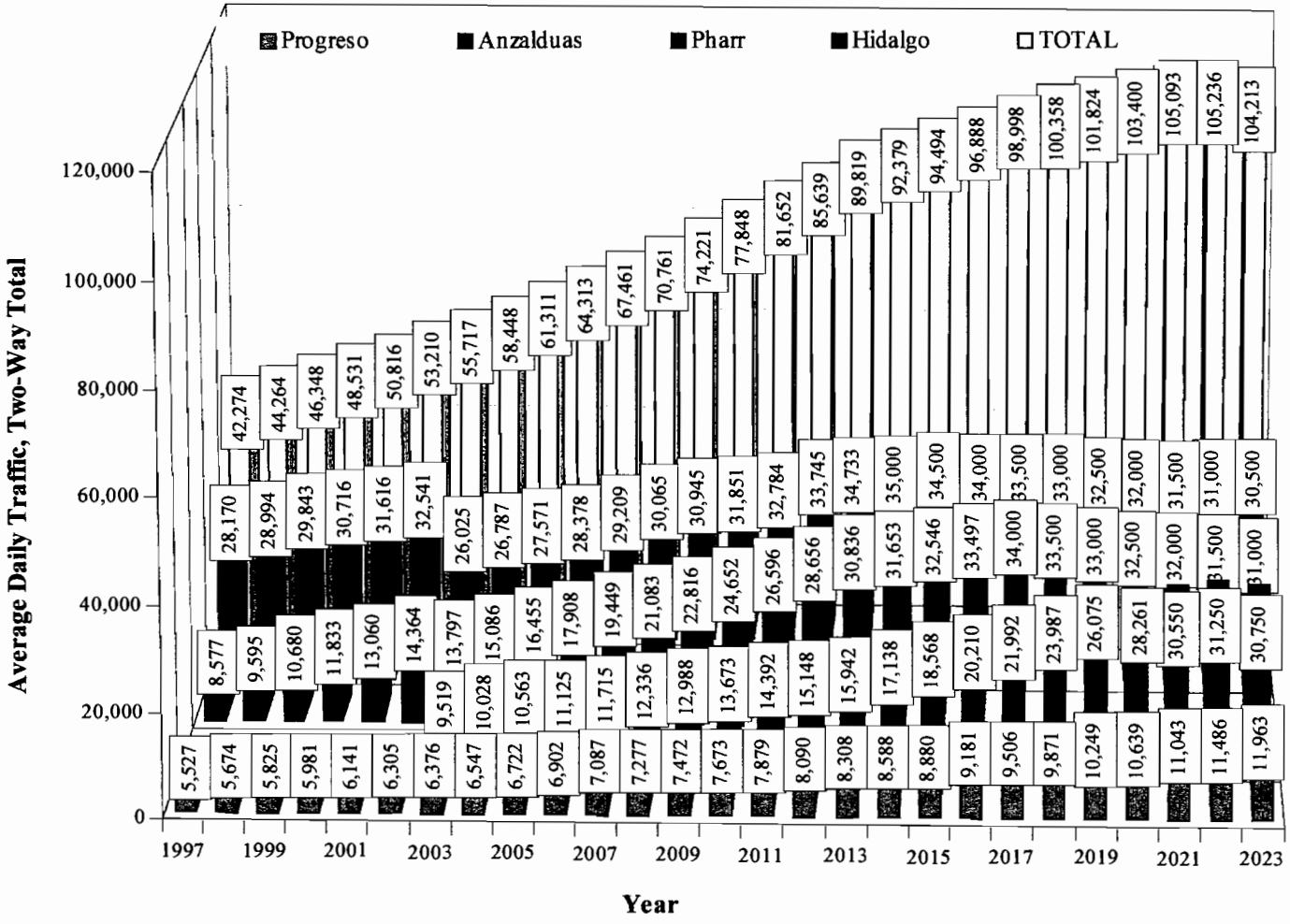
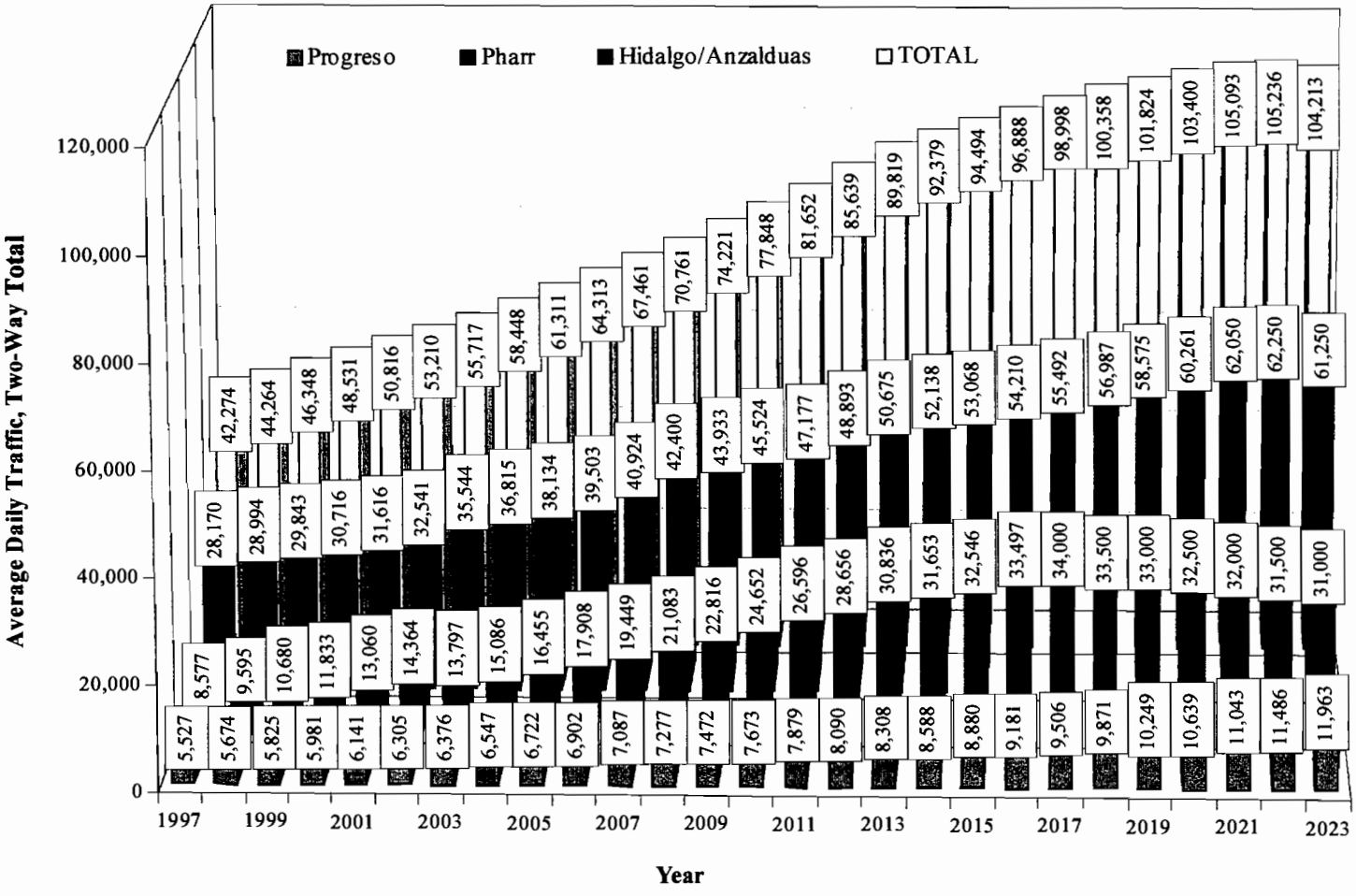


Figure ES3. Two-Way Volume on Bridge System, Anzalduas Bridge **BUILT**
(Hidalgo/Anzalduas Combined)



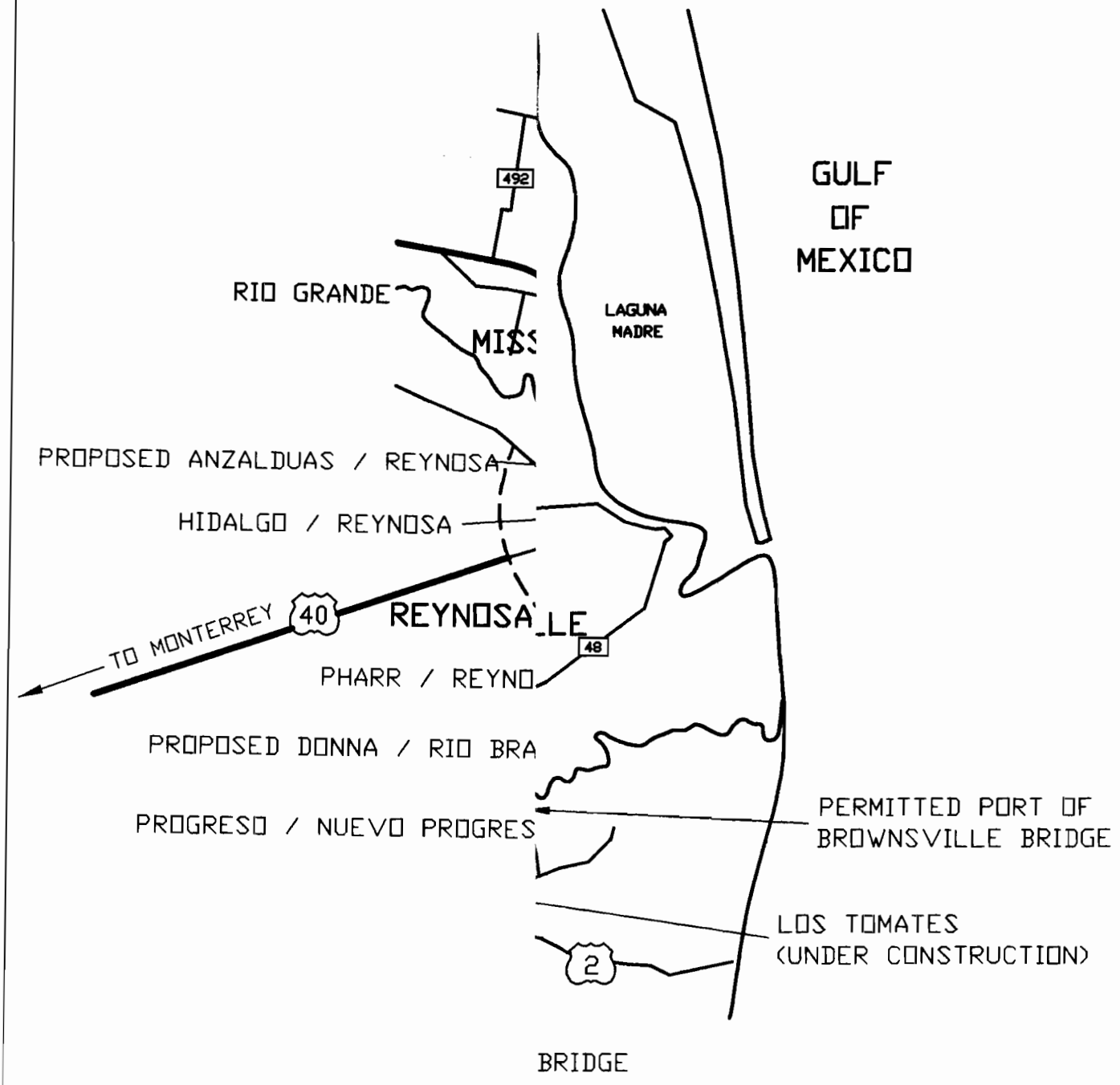
Anzalduas International Bridge
Traffic Study

Introduction

Construction of the Anzalduas International Bridge is being proposed in Hidalgo County, Texas. The bridge would be located three miles west of the existing Hidalgo-Reynosa Bridge, in an area of south Mission and southwest McAllen, and across the Rio Grande from Anzalduas, Mexico, which is located immediately northwest of Reynosa, Mexico. In December 1994, Wilbur Smith Associates (WSA) prepared a traffic study for the proposed Anzalduas International Bridge. The traffic study projected the estimated amount of traffic and revenues that would be generated by the proposed crossing. The proposed crossing included a connector road to F.M. 1016 and to F.M. 494 on the United States side, and a connector road to Route 40 in Reynosa, Mexico.

Since the completion of the WSA study, several significant changes relating to the project have occurred. These changes include the opening of the Pharr International Bridge, Mexico's 1994 peso devaluation, the continued trade increase due to NAFTA, and other relevant events that would affect the traffic projections for the proposed Anzalduas International Bridge. Because of these significant developments, it is necessary to conduct another traffic study for the proposed Anzalduas Bridge. Since the 1994 study, the McAllen/Hidalgo Bridge Board has applied for a Presidential Permit and cleared all environmental measures.

Figure 1 shows the existing and proposed international crossing in the Lower Rio Grande Valley, including the sites of the proposed Anzalduas Bridge, the permitted Port of Brownsville Bridge, and the Los Tomates Bridge, which is currently under construction.



TEI Traffic Engineers, Inc.
8323 Southwest Freeway, Suite 200, Houston, TX 77074
TEL (713) 270-8145/FAX (713) 270-8148
Email tei@compuserve.com

LOWER

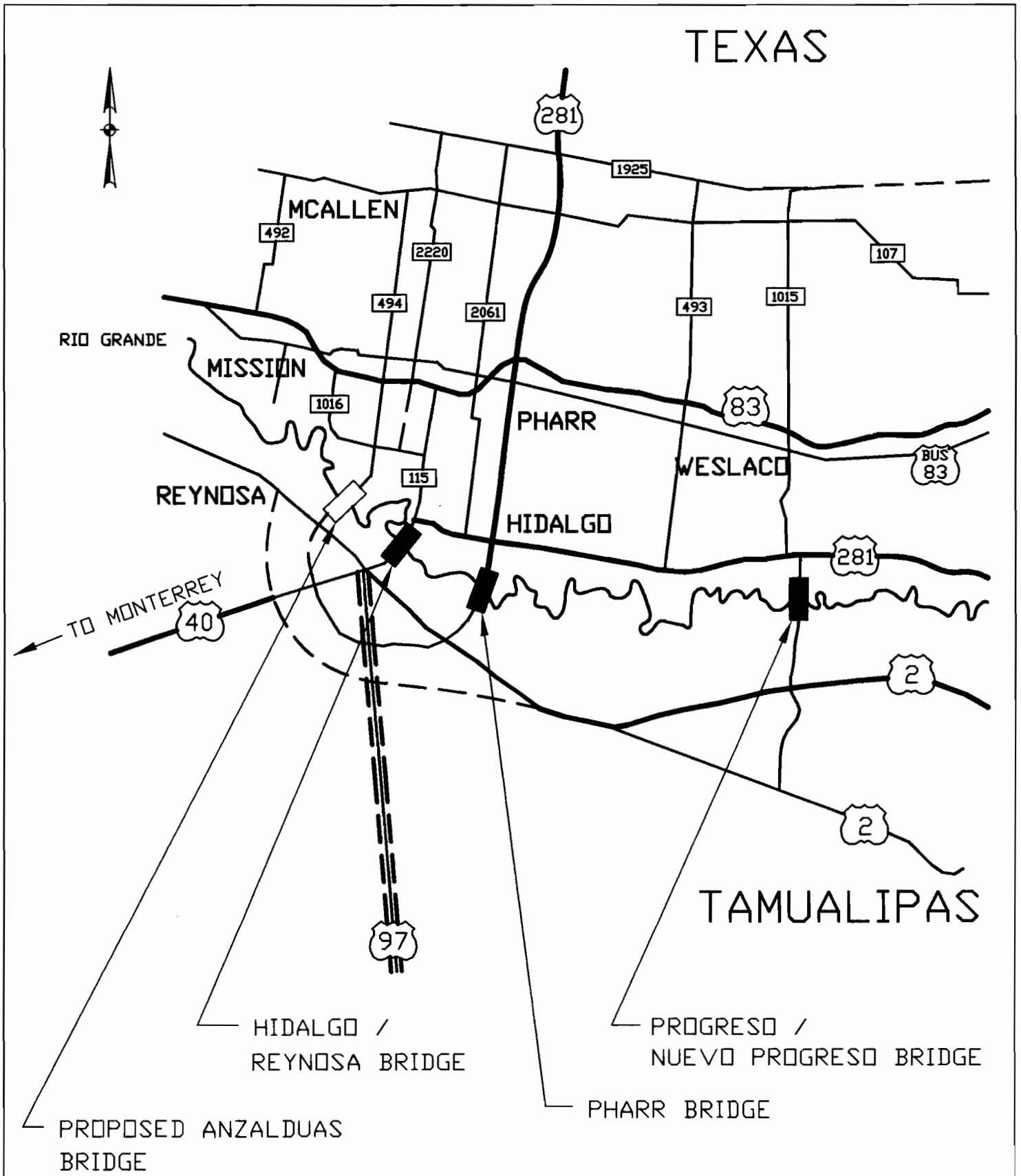
FIGURE 1

Description of Project

The proposed Anzalduas Bridge is planned to cross the Rio Grande between the cities of McAllen and Mission, Texas, and Reynosa, Tamaulipas. **Figure 2** shows the area under consideration, along with existing bridges and the site of the proposed Anzalduas Bridge. A planned extension and widening of Farm-to-Market Route (F.M.) 494 will provide access to the Anzalduas Bridge, but is expected that F.M. 2220 will also be used to link to U.S. Expressway 83. In Mexico, the Monterrey Autopista (Toll Highway), Highway 40, will be accessible via a proposed connector, the proposed Libramento Anzalduas, which is part of the bridge project on the Mexico side. To serve the proposed Anzalduas crossing, new customs facilities are planned for commercial and private vehicles by both the United States and Mexican governments.

Scope of Services

Traffic Engineers, Inc. (TEI) of Houston, Texas, and the Center for Transportation Research at the University of Texas (CTR) in Austin, Texas, were contracted to review and update the 1994 traffic study prepared for the Anzalduas International Bridge. The work included an update of the nearby river crossings, a review of the study area, crossing trends and variations, travel patterns, origin-destination (OD) studies, and traffic projections for the life of the project. This study also included collection of data on northbound bridge crossings. Extensive collection of commercial traffic characteristics was unique to this study. Northbound travel characteristics and traffic projections are located in the **Appendix**.



TEI Traffic Engineers, Inc.
8323 Southwest Freeway, Suite 800, Houston, TX 77074
TEL (713) 270-8146/FAX (713) 270-8148
Email tei@compuserve.com

PROPOSED ANZALDUAS INTERNATIONAL BRIDGE

LOWER RIO GRANDE VALLEY

FIGURE 2

Nearby River Crossings

If built, the Anzalduas Bridge would complement the three other International Bridges that are located nearby in the Central Lower Rio Grande Valley area. It is expected that the relative impact on each of these bridges will increase as the distance from the Anzalduas Bridge decreases. The relative locations of the Hidalgo/Reynosa, Pharr, and Progreso Bridges to the site of the proposed bridge are also shown in **Figure 2**.

Hidalgo/Reynosa International Bridge

The Hidalgo/Reynosa Bridge is located approximately three miles southeast of the proposed bridge site and is expected to receive the greatest impact from the Anzalduas Bridge. According to previous CTR inventories of infrastructure at the border, this bridge is comprised of two four-lane spans: one built in 1966 to replace the original suspension bridge, and the other was completed in 1988 to provide additional capacity (*1*). The new bridge provides four lanes into the U.S., while the old bridge provides four lanes into Mexico. The Hidalgo/Reynosa Bridge serves as a connection between downtown Reynosa in Mexico and a roadway leading to the McAllen-Edinburg area in the United States. Access to and from Mexico requires vehicles to maneuver Reynosa's local street system and their central retail district.

According to a report published in 1994 by the Center for Transportation Research at the University of Texas, northbound commercial traffic at the Hidalgo-Reynosa Bridge exceeded the 100,000 mark in 1990. In September 1996, however, the Hidalgo-Reynosa Bridge was closed to northbound commercial traffic and the vehicles diverted to the then-newly-constructed Pharr Bridge.

Pharr International Bridge

The Pharr Bridge is a four-lane bridge that was opened in early 1995 with intentions that it would relieve the traffic congestion on the Hidalgo-Reynosa Bridge, specifically commercial traffic congestion that negatively impacts the downtown area of Reynosa. Access to the Pharr Bridge is provided directly from U.S. Highway 281 in the United States. In Mexico, there is a direct connector road from the Pharr Bridge to Mexico's Highway 2, which connects Reynosa to Matamoros and provides access to Reynosa's airport. These roads allow traffic using the Pharr Bridge to bypass the heavily urbanized

areas of McAllen, Hidalgo, and Reynosa. The Pharr Bridge is approximately eight miles downstream from the site of the proposed Anzalduas Bridge.

Progreso International Bridge

The Progreso Bridge is a privately owned steel bridge structure located approximately 23 miles downstream from the proposed Anzalduas Bridge site. This border crossing was originally set up in the early 1900s by an act of Congress, which granted a permit to own and operate an international bridge crossing to two private investors: Mr. Brown and Mr. Pate. Consequently, the very first structure at this crossing was known as the Brown and Pate Bridge but was swept away in a flood in the late 1940s. The bridge, which is currently in use at this site, was built in 1951 as a replacement for the Brown and Pate Bridge. This facility is a two-lane toll bridge connecting the towns of Progreso and Progreso Lakes in the United States with Nuevo Progreso in Mexico. F.M. 1015 from the Progreso Bridge provides direct access through a predominantly rural area to U.S. Highway 281. In Mexico, the bridge leads directly into the local streets of downtown Nuevo Progreso. The current owner of the bridge, Mr. Sam Sparks is in the process of obtaining the local and environmental permits needed for building a replacement structure (forecasted construction in 1999). The new structure will be a four-lane concrete bridge with sidewalks on both sides to accommodate pedestrians. The bridge has been designed such that it can be constructed adjacent to the existing structure while the current toll and customs facilities can continue to be used.

Cameron County Bridges

Cameron County has three bridges: Free Trade Bridge at Los Indios, and the Gateway and the B&M Bridges in Brownsville. The Los Tomates Bridge is under construction and an additional bridge to serve the Port of Brownsville is proposed. The location of these bridges relative to the proposed Anzalduas Bridge can be seen in **Figure 1**.

An origin and destination study conducted as part of the financial feasibility and traffic assignment analysis for the Los Tomates Bridge indicated that only a small percentage of trips (2.4 percent southbound and 3.0 percent northbound) originated or were destined to locations west of the Brownsville/Matamoros area (*2*). Even if Anzalduas could some of these trips, the impact of the

proposed Anzalduas Bridge would still be negligible in the three international crossings in the Brownsville area: the B&M Bridge (privately owned and operated), the Gateway Bridge, and the Los Tomates Bridge (currently under construction).

The Free Trade Bridge at Los Indios is located approximately 35 miles east of the proposed Anzalduas Bridge. This bridge currently carries approximately 156 daily commercial vehicles and 1,600 passenger cars southbound (*3*). The Los Indios Bridge demand is still developing, and the overall impact of Anzalduas would be significantly less than the impact of the Los Tomates, located at about half the distance.

The planned Port of Brownsville International Bridge would be used by commercial vehicles only and would serve trips between Mexico and the Port of Brownsville Navigation District (*4*). If built, this bridge will primarily affect and be affected by conditions at the nearby Brownsville/Matamoros area bridges, and effects of the Anzalduas Bridge will be near zero.

In summary, the Anzalduas Bridge in the Mission-McAllen area is not likely to have a significant impact on the existing or planned international bridges in Cameron County.

Overview of Study Area

In order to determine the growth potential, which would in turn affect the travel demand in the area, base year and forecasted demographic information was obtained from the Hidalgo County Metropolitan Planning Organization (MPO). Currently, the area surrounding the site of the proposed bridge is predominantly rural in the U.S. and under-developed in Mexico. As mentioned in the description of the project, an extension to F.M. 494 and F.M. 1016 will connect the bridge to the U.S. network of highways. Specifically, it will connect the proposed Anzalduas Bridge to U.S. Expressway 83 and U.S. 281, and will allow access to the McAllen Free Trade Zone (FTZ) and the McAllen and Mission activity centers. F.M. 2220 is also expected to carry traffic, especially commercial vehicles, because it provides access from the FTZ to U.S. Expressway 83.

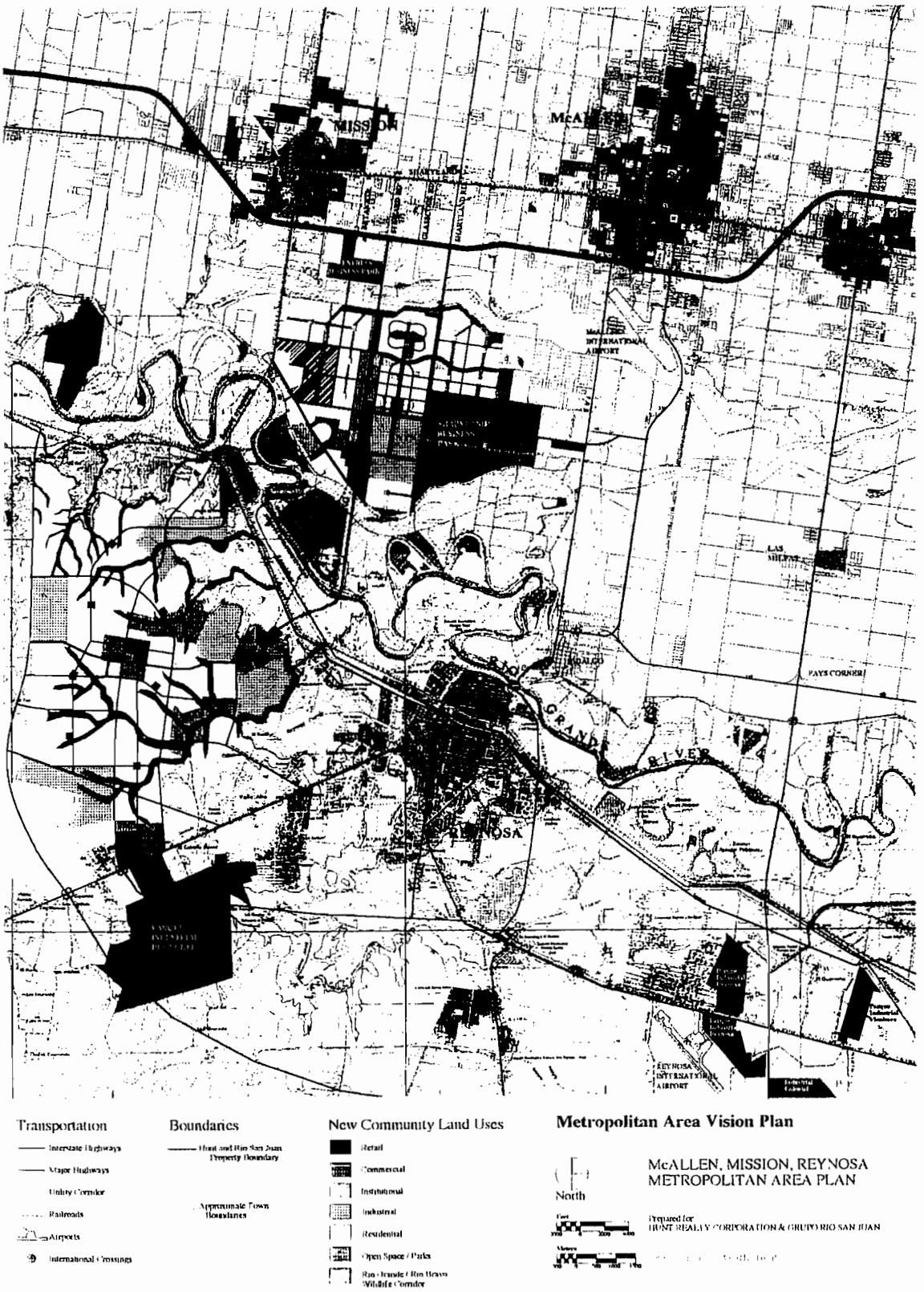
The McAllen FTZ was identified in the WSA study as handling the highest dollar volume and tonnage of merchandise of any inland FTZ in America. In 1996, the McAllen FTZ was ranked first nationwide in exports by percentage: 98 percent of all goods that passed through the zone were shipped "off-shore."

In Reynosa, the area that will be served by the Anzalduas Bridge has developed in areas along Mexico's Route 2 and areas adjacent to the interchange of Mexico's Route 40 and the Reynosa Bypass. Near Route 2, the development is primarily commercial, but some residential subdivisions are located within the urbanized limits of Reynosa. In the proximity of the Route 40/Reynosa Bypass interchange, the development is commercial, industrial, and residential. The Parque Industrial del Norte, which is located near this interchange, has become a focal point for expansion of the maquiladora industry, with over 85 percent of the new maquiladora construction built in the southwest quadrant of Reynosa since January 1989. This increase in maquiladora construction has also provided an increase in residential units within the area to accommodate new workers, plus a new technical college to provide a source for employment in this rapidly growing area.

As part of the Anzalduas Bridge Project, a roadway connecting the Route 40/Reynosa Bypass to the international bridge would be constructed. This connector road would provide a west-side bypass of Reynosa, which would likely result in accelerating the current maquiladora development and encourage new commercial/retail uses for land in the area.

Hunt Realty and Grupo Rio San Juan

According to a March 1998 report titled "Vision Plan: Hunt Realty & Grupo Rio San Juan," a preliminary plan was outlined for a proposed major development of two properties on each side of the Rio Grande. If directly connected by border crossings, the properties are envisioned to behave as one unified planned community. The total proposed development has an area of approximately 21,000 acres, but the rate and schedule for its construction is unknown at this point. Using the Institute of Transportation Engineers' trip generation tables in conjunction with numerous assumptions on the nature of the development, trip projections show that the development could generate 50,000 to 60,000 daily auto trips when fully developed. The percentage of those trips that would consist of transborder trips would have to be estimated based on current data on total versus transborder trips in the McAllen-Hidalgo-Mission area. Such analyses are beyond the scope of this study. Additional transborder commercial truck trips would depend on the number of plants attracted by the developers, and cannot be estimated at this time. This traffic demand would create a significant increase in the traffic projections for the life of the proposed Anzalduas Bridge. At this point, however, it is not possible to realistically estimate the number of trips that would be generated by this development. Subsequently, the traffic estimates in this report do not include this potential development within the study area although the continued high growth rate in this area would be supported by this development. By January 1999, one million of the 75 million square feet of industrial space will be built. The tremendous impact of this development in the western area of McAllen would change a number of infrastructure elements. For example, the combined land and building value for the development on both sides of the border is estimated at approximately $10 billion (*5*). **Figure 3** shows the new development expected in the McAllen/Reynosa metropolitan area. As can be seen, the magnitude of this new development is comparable to the existing urbanized area.



HUNT REALTY / GRUPO RIO SAN JUAN DEVELOPMENT

MCALLEN / REYNOSA METROPOLITAN AREA

FIGURE 3

Crossing Trends and Variations

In order to expand the data that was collected at the three international bridges located in the study area, it was necessary to determine the trends and variations of traffic crossing the Progreso, Pharr, and Hidalgo Bridges.

Annual Crossing Trends

An analysis of historic annual crossing trends for the Progreso and Hidalgo Bridges was conducted for the time period between 1986 and 1997. Data for the Pharr Bridge was analyzed from 1995 to the first six months of 1998. Yearly southbound volumes are shown in **Table 1**.

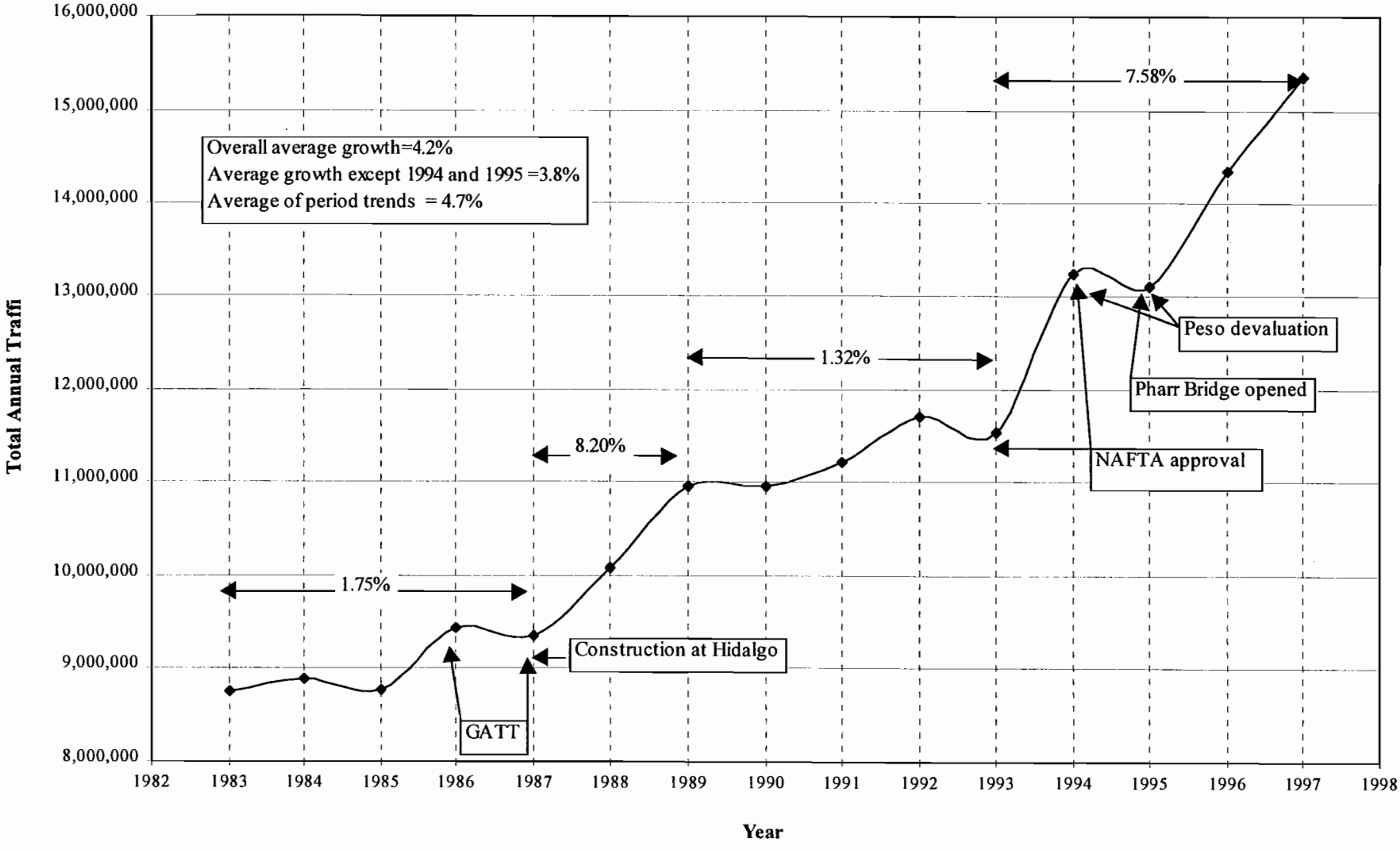
Table 1. Annual Southbound Crossing Trends (in thousands)

Year	Progreso	Pharr	Hidalgo	System
1986	784	-	3,958	4,742
1987	799	-	3,895	4,694
1988	900	-	4,242	5,142
1989	935	-	4,630	5,565
1990	928	-	4,740	5,668
1991	935	-	4,708	5,643
1992	956	-	4,994	5,950
1993	956	-	5,421	6,377
1994	982	-	5,419	6,401
1995	942	793	4,713	6,448
1996	1,044	1,045	5,019	7,108
1997	996	1,265	5,261	7,522
1998[1]	1,064	1,828	5,453	8,283
Average Annual Percent Change	2.7%	32.5%	2.9%	4.8%

1. Based on crossing information for first six months.
Sources: WSA 1994 Study (1986 to 1993),
Summary of Traffic Data prepared by MJBCO (1994 to 1997)

Figure 4 shows the total two-way traffic on the entire system from 1982 to 1997. The data indicate a steady growth, which averaged 4.2 percent in that overall period. There are four distinct growth periods, which were likely influenced by economic conditions, work zone disruptions, and other factors. The lowest average growth rate was observed between 1990 and 1993, following the highest growth seen after the General Agreement on Tariffs and Trade (GATT) and the Hidalgo Bridge improvements. The aggregate effect of these two events was likely higher than expected for each alone. Another significant

Figure 4. Total Two-Way Traffic in Hidalgo-Pharr-Progreso System



growth rate followed approval of the North American Free Trade Agreement (NAFTA) in 1994. Even with the peso devaluation, this latest growth period is expected to affect the overall growth rate for the analysis period. Assuming the current upswing continues for approximately the next five years, then stabilizes (as was seen after GATT), an overall average growth rate of 4.2 percent will be used and is consistent with the observed trend thus far. Because the previous study was completed before this latest upswing could be taken into account, this analysis will employ a higher overall average growth than the rate of 3.3 percent used in the WSA 1994 study (*6*). **If this study had taken the Hunt Realty and Grupo Rio San Juan development into consideration, a higher growth rate would be justifiable.**

Monthly Crossing Variations

Because transborder travel in the Lower Rio Grande Valley is noted for its seasonal variation, monthly variations were analyzed for the three existing bridges. **Table 2** shows the monthly variations as a percentage of the average month for southbound crossings. The peak travel month for the Progreso and Pharr Bridges was December, and for the Hidalgo Bridge was March. Likewise, the Progreso and Pharr Bridges share the lowest travel month: February. September is the lowest travel month for Hidalgo. The Hidalgo Bridge also experiences the greatest variability, in that only one month approximates the *average month* (i.e., is near 100 percent). On the other hand, the Progreso and Pharr Bridges each have three months within one percentage point of the average.

Table 2. Monthly Variation on Southbound Traffic

Month	Progreso	Pharr	Hidalgo
January	91%	86%	99%
February	89%	86%	104%
March	98%	100%	119%
April	99%	95%	103%
May	105%	100%	105%
June	102%	98%	97%
July	104%	101%	99%
August	106%	97%	94%
September	98%	98%	84%
October	101%	107%	87%
November	100%	110%	98%
December	108%	124%	111%
Average Month	100%	100%	100%
Deviation	6%	10%	10%
Range	20%	38%	35%

Daily Crossing Variations

Table 3 shows the daily crossing variations for the Hidalgo Bridge. Because this is the international crossing which will likely be most affected by the construction of the Anzalduas Bridge, analysis of daily crossing variations for this bridge alone is sufficient. As with the monthly variations, the variability for daily crossings was also high for the Hidalgo Bridge. This is shown with the range of 38 percentage points observed between the minimum and maximum observed values. Saturday is the peak travel day for the Hidalgo Bridge.

Table 3. Daily Crossing Variations for Southbound Traffic on Hidalgo Bridge

Day of the Week	Hidalgo
Monday	96%
Tuesday	93%
Wednesday	86%
Thursday	94%
Friday	115%
Saturday	124%
Sunday	92%
Average Day	100%
Deviation	14%
Range	38%

Source: McAllen/Hidalgo Bridge Board

Privately-Owned Vehicles Origin and Destination Survey

In order to estimate the travel demand on the proposed Anzalduas Bridge, CTR designed and TEI administered a roadside origin and destination (OD) study of privately-owned vehicles (POVs) at the Progreso, Pharr, and Hidalgo International Bridges. **Figure 5** shows the survey instrument used at all three bridges. Although the southbound version is shown, the northbound survey instrument is identical except the choices for origin and destination are reversed (i.e., origins are in Mexico and destination in the United States). Motorists were queried on the origin and destination of their trip, the trip's purpose, the frequency at which they use the bridge, and the approximate crossing time. Time of day, vehicle registration, and vehicle occupancy were also noted by the surveyor.

Survey Methodology

The OD surveys were conducted in both directions at all three existing bridges: the Progreso, Pharr, and Hidalgo Bridges. Traffic on each bridge was surveyed for a 12-hour study period on two days: a weekday and a weekend. **Table 4** shows the survey dates, and the number of surveys as a percentage of the total southbound crossings on each bridge. A more detailed table, which shows the sample size for each day, is included in the **Appendix**. A 10 percent sample size was targeted for the southbound direction to accurately capture the traffic flow patterns. A smaller sample size was targeted for the northbound direction because of its less critical nature, and collection of this data was complementary.

Table 4. Sample Size for POV Traffic (Both days combined)

Location	Survey Dates	Total Crossings[1]	Coded Surveys	Sample Size
SB Progreso	June 5 & 6	3,524	727	20.6 %
SB Pharr	June 12 & 13	5,824	772	13.3 %
SB Hidalgo	June 19 & 20	21,402	2,557	12.0 %
TOTAL SOUTHBOUND		30,750	4,056	13.2 %
NB Progreso	June 5 & 6	6,778	617	9.1%
NB Pharr	June 12 & 13	5,282	496	9.4%
NB Hidalgo	June 19 & 20	19,704	617	3.1%
TOTAL NORTHBOUND		31,764	1,730	5.4%
TWO-WAY TOTAL		62,514	5,786	9.3%

1. Crossings during the combined 12-hour study period for each day.

Figure 5. POV Origin and Destination Survey Instrument (Southbound)

DATE:_____ **BRIDGE**_____ **SURVEYOR:**_____

Time of the survey (mark): 5-6 AM | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-1 PM | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10

License plate	Trip Origin (US)	Trip Destination	Auto occupancy	Trip purpose	Trip frequency	Average time to cross (brief inspection)
☐Texas ☐TAMPS ☐COAH ☐NL ☐Other: _____ _____ _____ _____ _____	☐Alamo ☐Brownsville ☐Donna ☐Edinburg ☐Harlingen ☐Hidalgo ☐La Feria ☐Los Fresnos ☐McAllen ☐Mercedes ☐Mission ☐Pharr ☐Progreso ☐San Benito ☐San Juan ☐South Padre ☐Weslaco ☐**Other**_____ _____ _____	**In Reynosa**: ☐Parque del Norte ☐Parque Colonia ☐Parque Reynosa ☐Parque Manimex ☐FINSA maquilapark ☐PEMEX ☐Central area ☐South central area ☐North area ☐Northwest area ☐East area ☐**Rio Bravo, TAMP** ☐**Nuevo Progreso, TAMP** ☐**Monterrey, NL** ☐**Saltillo, COAH** ☐**Torreon, COAH** ☐**Valle Hermoso, TAMP** ☐**Other**_____ _____ _____ _____	☐less than 1 ☐1 to 2 ☐2 to 3 ☐3 to 4 ☐4 to 5 ☐5 to 6 ☐6 or more	☐ Commute to/from work ☐ business ☐ personal ☐ school ☐ shopping ☐ recreation ☐other	_____/ day _____/ week _____/ month _____/ year ☐occasional/first time	☐ less than 5 min ☐ 6 to 10 min ☐11 to 15 min ☐ 16 to 20 min ☐ 21 to 30 min ☐ 31 to 40 min ☐ 41 to 50 min ☐ 51 to 60 min ☐ more than 1 hour

In order to expedite the data reduction process, each response on the completed surveys was given a code and entered into a spreadsheet, which was used to screen the data for errors and prepare the data for analysis. Once complete, the data records were imported into a database program to simplify the querying and sorting process. For each direction and day of the week, distributions were determined for each bridge and for the system as a whole. The following sections include these distributions in terms of percentages for northbound and southbound travel on the entire system. For each item on the survey, detailed tables with distributions for each bridge, for each day and for each direction, can be found in the **Appendix**.

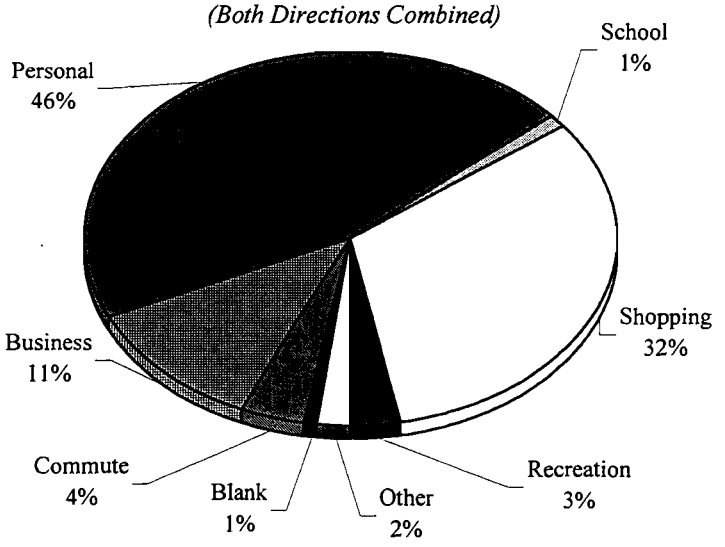
Trip Purpose Distribution

Motorists were asked which purpose the trip they were making was serving. **Table 5** indicates the systemwide distribution of trip purposes. The majority of southbound travel was to conduct business of a personal nature, with shopping as the second most common trip purpose. For northbound traffic, shopping was the trip purpose claimed by the majority of the motorists, while the personal business purpose was a close second. **Figure 6** shows this distribution graphically, although it combines all of the data collected.

Table 5. Systemwide Trip Purpose Distribution for POVs

Trip Purpose	Northbound	Southbound
Commute	3.5 %	4.2 %
Business	10.2 %	11.9 %
Personal	36.7 %	49.0 %
School	1.3 %	1.0 %
Shopping	40.7 %	28.7 %
Recreation	2.8 %	3.4 %
Other	4.3 %	0.8 %
Blank	0.5 %	0.9 %
TOTAL	100.0 %	100.0 %

Figure 6. Trip Purpose Distribution
(Both Directions Combined)



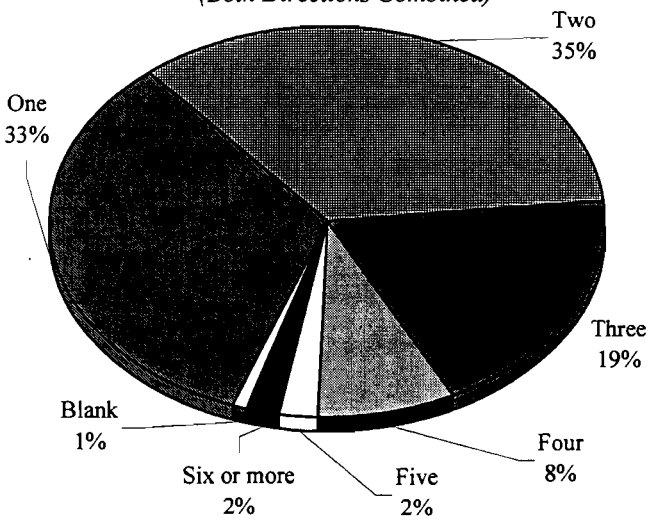
Vehicle Occupancy Distribution

The vehicle occupancy distribution for the entire system is shown in **Table 6**, for both southbound and northbound travel. Two-occupant vehicles were most prevalent for both directions of travel, with 32.9 percent of northbound vehicles and 35.2 percent of southbound vehicles. Single-occupant vehicles made up 29.5 percent and 34.8 percent of northbound and southbound traffic, respectively. **Figure 7** shows this information in a graphical manner.

Table 6. Systemwide Occupancy Distribution for POVs

Vehicle Occupancy	Northbound	Southbound
One	29.5 %	34.8 %
Two	32.9 %	35.2 %
Three	19.8 %	18.9 %
Four	9.6 %	7.3 %
Five	3.7 %	1.7 %
Six or more	3.1 %	1.6 %
Blank	1.3 %	0.6 %
TOTAL	100.0 %	100.0 %

Figure 7. Vehicle Occupancy Distribution
(Both Directions Combined)



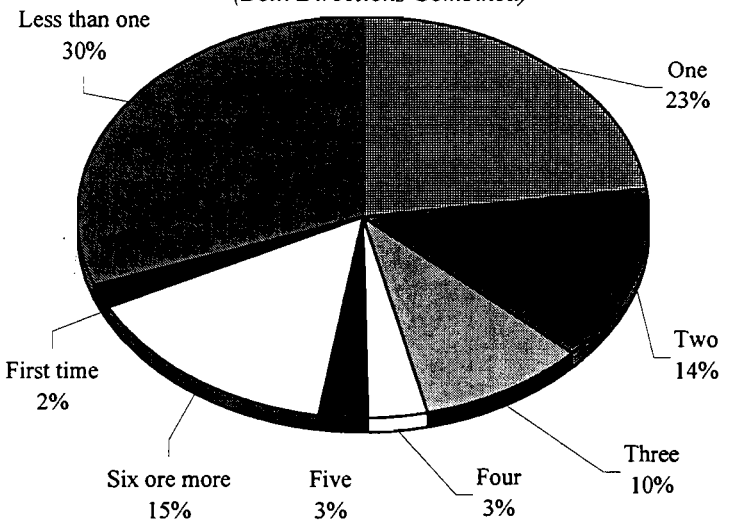
Trip Frequency Distribution

The trip frequency distribution for systemwide travel is shown in **Table 7**. The majority of motorists stated that they make the transborder trip less than once a week. A small percentage of motorists were crossing the Rio Grande for the first time or did so on an occasional basis. The surveys that indicated a first-time trip were not used in the traffic projections to ensure that the appropriate trip patterns were established and used to project annual border crossings. **Figure 8** shows the trip frequency distribution for all trips.

Table 7. Systemwide Trip Frequency Distribution for POVs

Times per week	Northbound	Southbound
Less than one	28.5%	32.4%
One	20.6%	25.2%
Two	14.3%	13.8%
Three	10.6%	8.6%
Four	3.2%	3.3%
Five	3.7%	1.7%
Six or more	18.0%	12.6%
First time	1.0%	2.3%
Blank	0.1%	0.3%
TOTAL	100.0%	100.0%

Figure 8. Per Week Trip Frequency Distribution
(Both Directions Combined)



Origin and Destination Distribution Tables

The primary purpose of the OD surveys was to gain an understanding of travel patterns for vehicles using the Progreso, Pharr, and Hidalgo International Bridges. Mail-out surveys were also distributed to customs brokers in the area to obtain information on the travel patterns of commercial vehicles using the bridge system, and are discussed in further detail elsewhere in the report. **Tables 8** and **9** summarize the origin and destination distribution for POVs using the entire bridge system. This provides a baseline from which to forecast future growth and from which to assign traffic to the Anzalduas Bridge. As with the previous distribution tables, more detailed OD matrices are found in the **Appendix**.

Table 8 shows the expanded OD matrix for the weekday southbound system traffic, while **Table 9** shows weekend southbound traffic for the entire bridge system. Values in the tables were factored to represent average daily traffic. The origin and destination locations shown on these tables differ slightly from those provided in the OD survey instrument in that they combine some of the smaller cities on the U.S. side, and, in some cases, combine zones which were previously contained entirely within another. For example, Brownsville, Los Fresnos, and South Padre Island are combined into one location because they are sufficiently far enough away from the proposed Anzalduas Bridge to behave as one zone. In Mexico, PEMEX and the Central Reynosa area are treated as one zone because PEMEX is contained entirely within Central Reynosa. The OD matrices in the **Appendix** show the distribution for the locations as originally shown in the survey instrument. Additionally, because of the significant number of "Other" responses given during the survey, for both origin and destination locations, these locations were further subdivided into regions (including groups of cities) within the United States, Mexico, and even Central America.

For the weekday OD distribution, McAllen to Central Reynosa/PEMEX showed the greatest percentage of total trips. Weekend traffic originated in the Pharr/San Juan area most often, followed closely by McAllen, and was destined primarily to Central Reynosa/PEMEX. McAllen was typically the most common origin for bridge system weekday trips (43.54 percent), while it came in second during the weekend (24.95 percent) following San Juan/Pharr (25.11 percent), which is very close to McAllen.

The most common destination in Mexico was Central Reynosa/PEMEX for both weekday and weekend trips (56.47 percent and 42.07 percent, respectively). Rio Bravo, Tamaulipas, was, in both cases, the

second most popular destination (9.79 percent of weekday trips and 27.76 percent of weekend trips). Rio Bravo is a city of approximately 150,000 people and is located about four miles east of the Pharr Bridge and eight miles west of the Progreso Bridge. **Figures 9** and **10** show the distribution of origin and destination locations in a graphical manner for weekday and weekend POV southbound traffic, respectively. Zones have been further aggregated to show the general travel patterns found in the data. In both instances, the majority of trips were between the McAllen metropolitan area and Reynosa—62 percent of total weekday trips and 43 percent of total weekend trips. The McAllen metropolitan area includes Mission, McAllen, Pharr, San Juan, and Edinburg. **Figure 10** also shows the greater variability in origin and destination locations observed in the weekend data. (For the sake of legibility, trip patterns that held less than two percent of the traffic share were not included in the figure.)

Table 8. Weekday Southbound Origin and Destination POV Distribution for Bridge System[1]

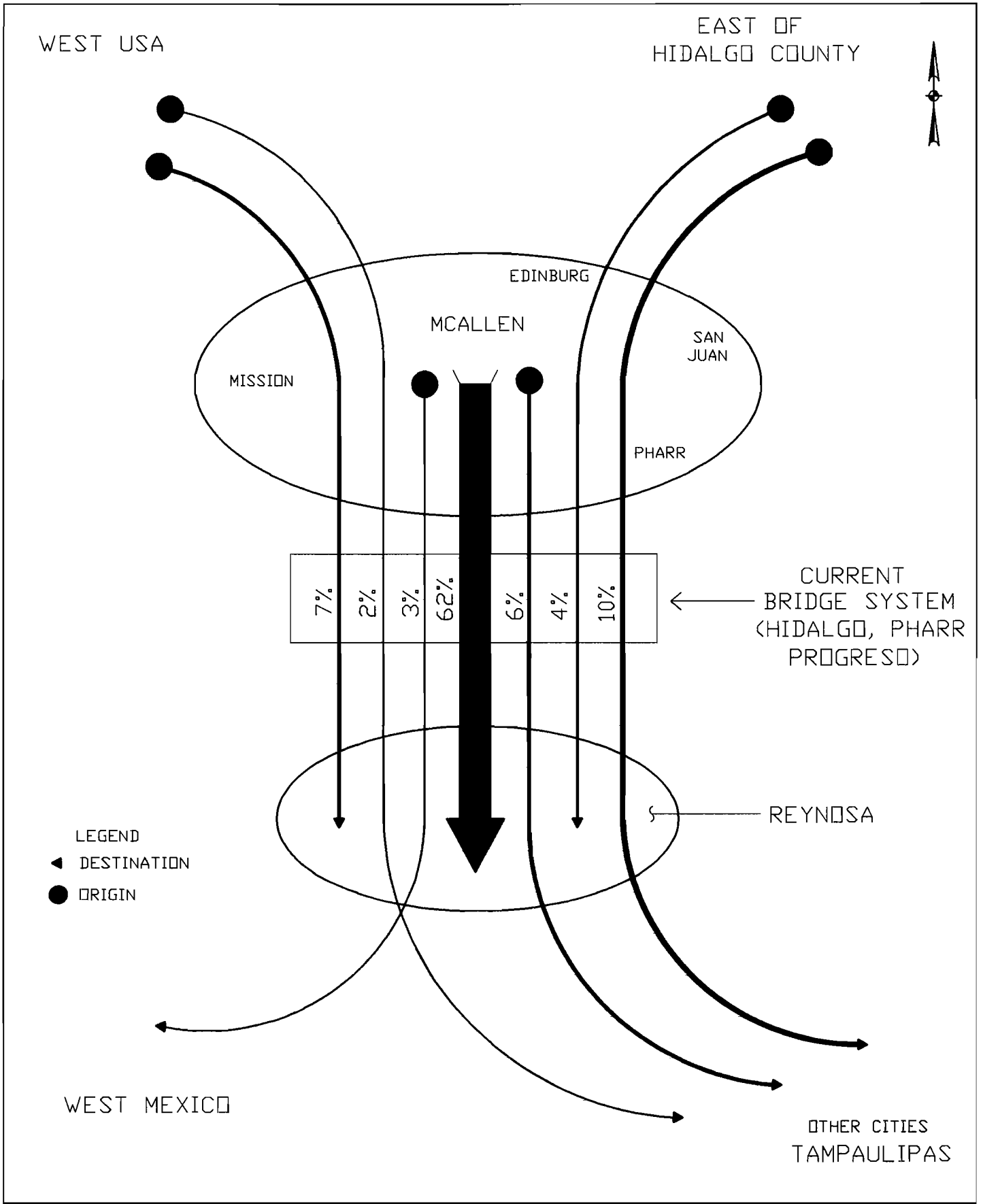
ORIGIN	DESTINATION																				
	West Mexico	Saltillo & Torreon COAH	Monterrey NL	North-west Reynosa	FINSA Maqui-ladora	North Reynosa	Central Reynosa & PEMEX	South central Reynosa	Parque del Norte	South Mexico	Parque Reynosa	Parque Manimex, Parque Colonia	East Reynosa	Rio Bravo TAMP	Nuevo Progreso TAMP	Valle Hermoso TAMP	East Mexico Gulf Coast	Central America	Other	Total	%
West USA	16	16	0	0	0	0	81	0	0	16	0	0	0	66	34	16	0	65	0	311	1.14%
Mission	0	0	97	16	0	210	1499	113	16	16	16	0	0	220	85	0	0	0	0	2289	8.43%
North USA	0	0	0	0	0	0	64	16	0	16	0	0	16	16	59	0	0	0	0	189	0.69%
Edinburg	0	0	48	0	16	81	856	81	0	16	0	16	0	163	110	0	32	0	0	1420	5.22%
MCALLEN	49	64	387	81	81	889	8081	936	195	32	261	130	0	497	117	0	0	16	16	11832	43.54%
Hidalgo	0	0	48	0	0	258	1968	129	16	0	16	32	16	113	8	0	0	0	16	2623	9.65%
Pharr, San Juan	0	0	98	16	49	373	1713	244	98	0	114	65	0	619	109	0	0	0	17	3515	12.94%
Alamo, Donna	0	0	0	0	0	129	323	49	0	0	0	0	0	320	195	17	0	0	0	1034	3.80%
Weslaco	0	0	32	0	0	81	113	32	8	0	16	0	0	326	467	0	0	0	8	1086	4.00%
Progreso	0	0	0	0	0	0	32	0	0	0	0	0	0	67	271	0	0	0	8	379	1.39%
Mercedes, La Feria	0	8	32	16	0	16	65	0	33	0	8	0	0	141	288	0	0	0	0	608	2.24%
Elsa, Edcouch, La Villa	0	0	0	0	0	0	0	0	0	0	0	0	0	17	42	8	0	0	0	68	0.25%
Harlingen, San Benito	0	0	16	0	16	16	97	32	0	0	0	0	0	25	339	0	0	0	0	543	2.00%
Raymondville, Lyford	0	0	0	0	0	0	64	0	0	0	0	0	0	17	42	0	0	0	0	124	0.46%
Brownsville, Los Fresnos, South Padre	0	0	81	16	0	65	145	0	0	0	0	0	0	0	51	0	0	0	0	358	1.32%
East USA, Gulf Coast	32	16	81	0	0	16	242	32	16	16	0	0	0	41	170	16	0	16	0	696	2.56%
Other	0	0	0	0	0	32	0	0	0	0	0	0	0	8	42	0	0	0	16	99	0.37%
Total	97	105	921	146	162	2167	15344	1665	383	113	432	244	32	2659	2430	58	32	98	83	27171	100%
%	0.36%	0.39%	3.39%	0.54%	0.60%	7.97%	56.47%	6.13%	1.41%	0.42%	1.59%	0.90%	0.12%	9.79%	8.94%	0.21%	0.12%	0.36%	0.30%	100%	

1. Values factored to represent average daily trips.

Table 9. Weekend Southbound Origin and Destination POV Distribution for Bridge System[1]

ORIGIN	DESTINATION															
	West Mexico	Saltillo & Torreon COAH	Monterrey NL	North-west Reynosa	FINSA Maqui-ladora	North Reynosa	Central Reynosa & PEMEX	South central Reynosa	South Mexico	East Reynosa	Rio Bravo TAMP	Nuevo Progreso TAMP	Valle Hermoso TAMP	Central America	Total	%
West USA	237	0	0	0	0	0	586	0	0	0	488	0	0	1422	2734	2.31%
Mission	237	14	84	0	0	572	3962	70	0	474	3081	81	237	0	8814	7.45%
North USA	0	0	488	0	0	0	391	251	0	0	711	54	237	0	2133	1.80%
Edinburg	0	0	279	0	0	1185	2556	70	237	711	3122	63	237	0	8461	7.15%
MCALLEN	56	237	1146	237	14	2305	13973	379	251	2133	8445	346	0	0	29522	24.95%
Hidalgo	0	0	0	0	0	28	3957	572	0	237	976	9	237	0	6017	5.08%
Pharr, San Juan	237	0	14	237	0	3374	14969	1004	488	3318	5469	127	474	0	29712	25.11%
Alamo, Donna	0	0	28	237	0	1910	4228	251	0	1422	5720	281	9	0	14086	11.90%
Weslaco	0	0	0	0	0	237	1297	237	0	237	856	616	18	0	3498	2.96%
Progreso	0	0	0	0	28	0	321	0	0	0	63	472	9	0	894	0.76%
Mercedes, La Feria	0	14	23	0	0	237	643	0	0	0	2187	253	0	0	3358	2.84%
Elsa, Edcouch, La Villa	0	0	0	0	0	0	474	0	0	0	9	63	0	0	546	0.46%
Harlingen, San Benito	0	0	0	0	0	14	671	0	237	237	237	353	9	0	1758	1.49%
Raymondville, Lyford	0	0	0	0	0	0	0	0	0	0	0	36	0	0	36	0.03%
Brownsville, Los Fresnos, South Padre	0	0	739	0	0	14	544	14	0	0	18	81	0	0	1411	1.19%
East USA, Gulf Coast	14	0	1018	0	0	237	1173	0	237	237	1203	172	0	711	5002	4.23%
Other	0	0	14	0	0	0	28	0	0	0	255	45	0	0	343	0.29%
Total	781	265	3835	711	42	10114	49773	2849	1450	9006	32843	3054	1467	2133	**118324**	100%
%	0.66%	0.22%	3.24%	0.60%	0.04%	8.55%	42.07%	2.41%	1.23%	7.61%	27.76%	2.58%	1.24%	1.80%	100%	

1. Values factored to represent average daily trips.

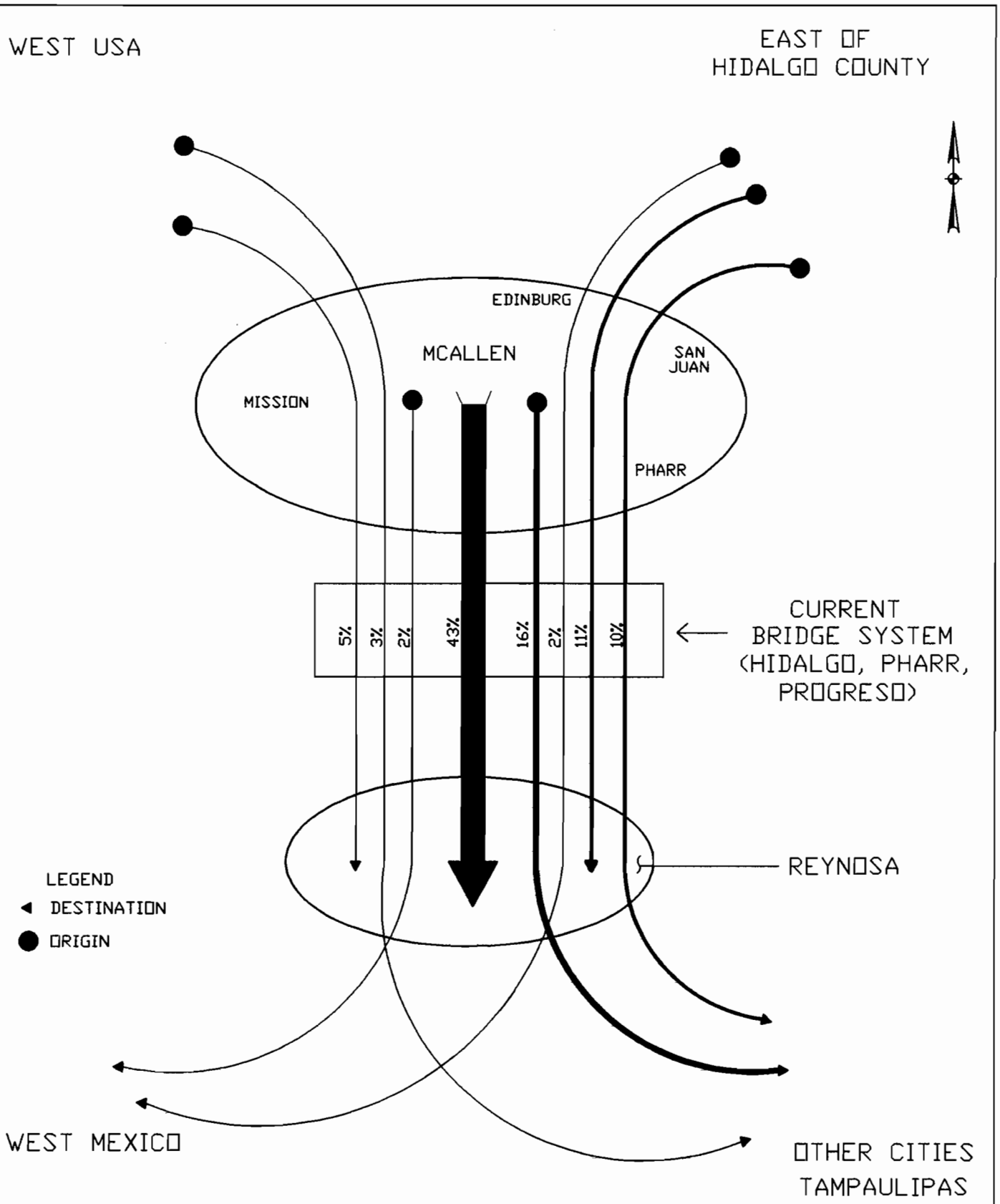


TEI Traffic Engineers, Inc.
6363 Southwest Freeway, Suite 200, Houston, TX 77074
TEL (713) 270-6145/FAX (713) 270-6148
Email tei@compuserve.com

WEEKDAY O&D DISTRIBUTIONS FOR POV SOUTHBOUND TRIPS

LOWER RIO GRANDE VALLEY

FIGURE 9



TEI Traffic Engineers, Inc.
5363 Southwest Freeway, Suite 200, Houston, TX 77074
TEL (713) 270-8145/FAX (713) 270-8148
Email tei@compuserve.com

WEEKEND O&D DISTRIBUTIONS FOR POV SOUTHBOUND TRIPS

LOWER RIO GRANDE VALLEY

FIGURE 10

As mentioned previously, bridge-specific OD matrices for both northbound and southbound trips are found in the **Appendix**. It is worth noting at this time, however, the origin and destination locations that were most prevalent at each bridge. **Table 10** shows the major origin and destination locations, along with the corresponding percentages, observed at each bridge for southbound travel.

Table 10. Major Origin and Destination Locations at Each Bridge (POV Southbound Travel)

Bridge		Origin[1]		Destination[1]	
Progreso	**Weekday**	Weslaco	23.91 %	Nuevo Progreso, TAMP	80.17 %
		Progreso	10.79 %	Rio Bravo, TAMP	16.91 %
		Harlingen	9.62 %		
		Mercedes	8.16 %		
		Donna	7.29 %		
	Weekend	Weslaco	25.67 %	Nuevo Progreso, TAMP	85.07 %
		Progreso	10.15 %	Rio Bravo, TAMP	13.13 %
		Mercedes	8.06 %	Valle Hermoso, TAMP	1.49 %
		Harlingen	7.46 %		
		Donna	7.16 %		
Pharr	**Weekday**	McAllen	30.41 %	Rio Bravo, TAMP	33.63 %
		Pharr	26.02 %	Central Reynosa	21.93 %
		Edinburg	6.73 %	North Reynosa	10.23 %
		Mission	5.85 %	South Central Reynosa	7.60 %
		Hidalgo	4.39 %	Parque Reynosa	6.43 %
	Weekend	Pharr	25.37 %	Central Reynosa	34.39 %
		McAllen	20.24 %	Rio Bravo, TAMP	33.17 %
		Alamo	8.05 %	North Reynosa	9.51 %
		Edinburg	7.80 %	East Reynosa	9.27 %
		Mission	6.34 %	Monterrey, NL	3.17 %
Hidalgo	**Weekday**	McAllen	53.75 %	Central Reynosa	73.68 %
		Hidalgo	12.65 %	North Reynosa	8.54 %
		Mission	10.01 %	South Central Reynosa	6.67 %
		Pharr	6.90 %	Monterrey, NL	3.97 %
		Edinburg	5.09 %	Rio Bravo, TAMP	1.55 %
	Weekend	McAllen	53.55 %	Central Reynosa	84.39 %
		Mission	14.14 %	North Reynosa	4.79 %
		Hidalgo	9.58 %	Monterrey, NL	4.10 %
		Mission	5.67 %	South Central Reynosa	3.94 %
		Edinburg	4.33 %	Rio Bravo, TAMP	1.16 %

1. Percentages of each bridge's total traffic.

Commercial Traffic Survey

As previously noted, trade in the Lower Rio Grande Valley has grown substantially in the past decade, most of it moved by trucks. Truck trips can be characterized into two types: first, those that move trade to and from maquiladoras located in the Reynosa area, and second, those taking goods to and from centers in continental Mexico and the United States. The measurement of truck flows is important in bridge analysis for several reasons, including:

- their impact on the capacity of the bridge system;
- their impact on customs, immigration, agricultural inspection, and other federal facilities on both sides of the border;
- the revenue that they provide to the bridge authority; and
- the traffic impacts they impose on the communities on either side of the border.

Methodology

The WSA report did not specifically address truck movements, but rather incorporated them into the general traffic flows for the bridge systems. Because of the importance of the nature and magnitude of truck flows, this study specifically focused on collecting and analyzing data on trucks.

This study also broke down the truck flows into their directional components, particularly those moving southbound since they provide the revenues to the U.S. bridge owners and are critical to the issuance of bonds for the construction of new facilities. In order to collect data on truck movements, researchers have typically followed the same techniques as those for measuring automobile travel. Trucks are stopped near or in the bridge system, are approached by interviewers who question their drivers concerning origins and destinations of the loads (CTR 1994). However, this technique has the following problems that compound the difficulty of accurately estimating truck impacts on a new bridge system:

- Since the survey is carried out in a limited time period, it cannot capture seasonal effects and may be biased. This is particularly relevant in the Lower Rio Grande Valley where many agricultural commodities are moved over the bridge system.
- Drivers can be uncooperative and/or are unable to answer all the questions posed.
- The process is slow and the sample size small.

Accordingly, a new approach was undertaken for the first time along the border: questioning the brokers in the McAllen/Reynosa region. First, the study team contacted the McAllen Economic Development Corporation, and asked them to invite brokers to attend a preliminary meeting. At that meeting, the project scope was discussed and a willingness to address the problem through broker questionnaires was established. CTR staff then developed a draft questionnaire, which was discussed with several brokers as part of a pilot scheme. The preliminary questionnaire was found to be too complicated and zones were simplified in order to match brokers' records. The questionnaire was further amended to meet the time and confidentiality constraints required by the brokers. Then, the amended questionnaire was sent out to all brokers registered in the McAllen area with a request to send or fax responses to CTR-UT Austin. A second request was sent out about one week after the first in order to increase the response rate and improve the effectiveness of the survey.

Survey Results

This approach proved to be extremely successful. The response rate was 55 percent, and data on 111,534 annual truck trips were collected. This response rate is unusually high for a survey of this type and reflects, in part, the care taken in its development. Therefore, not only did the research capture over 23 percent of the total truck trips in 1997 made over the three-bridge system, but it also captured the seasonal impacts that previous studies have been unable to measure. Moreover, the survey asked for—and obtained—total annual traffic, thus eliminating from the analysis the statistical uncertainties inherent to the process of expanding a two- or three-day survey to the entire year. Finally, this technique enabled both north and southbound directions to be measured and enabled researchers to estimate truck flows over the bridge system. This permitted researchers to develop reliable data for both the traffic assignment routines and for the revenue forecasts to be undertaken subsequent to this study. **Table 11** summarizes the results of the truck OD survey by combining both directions to show the prominent trip patterns. Individual northbound and southbound expanded OD matrices are included in the **Appendix**.

Table 11. Commercial Traffic Travel Patterns, Two-Way Average Daily Traffic
(Both Directions Combined)

U.S. Location	Mexico Location						
	Mexico West Interior	Northwest Reynosa	Central Reynosa	East Reynosa	Mexico East Interior	TOTAL	Percentage
U.S. Border West	21,405	36,923	21,376	6,437	26,550	112,690	23.6%
U.S. Interior	66,137	5,345	76,434	19,789	35,582	203,287	42.7%
U.S. Border East	50,444	5,322	15,358	32,578	56,908	160,610	33.7%
TOTAL	137,986	47,589	113,168	58,804	119,040	476,587	100%
Percentage	29.0%	10.0%	23.7%	12.3%	25.0%	100%	

The most common trip pattern observed in the commercial truck data was between the U.S. Interior and Central Reynosa with approximately 16 percent of the total truck trips (18 percent southbound and 14 percent northbound). This trip pattern was the most prominent in the southbound direction, but a greater percentage of northbound truck traffic traveled from Mexico East Interior to U.S. Border East (18 percent). Other common trip patterns were:

- 50 percent of southbound traffic originated in the U.S. Interior;
- 44.5 percent of southbound traffic was destined to Reynosa, west of Mexico's Highway 97, with approximately half of this traffic headed to Mexico's West Interior;
- 36 percent of northbound truck traffic was destined to the U.S. Interior; and
- 60 percent of northbound truck traffic originated in Reynosa west of Mexico's Highway 97, with over half of this traffic beginning trips in Mexico's West Interior.

Origin and Destination Survey Results, 1994

The 1994 WSA study used data collected from southbound motorists, and identified major origin and destination locations for motorists using the two-bridge system (Hidalgo and Progreso Bridges). In general, both the 1994 study and this report indicate that the predominant southbound trip pattern is from McAllen to central Reynosa. **Table 12** compares the survey results from the WSA study with those found from this analysis. This report also identified a larger percentage of trips with an external origin west of the study area.

Table 12. Comparison of OD Survey Results

	WSA[1]		CTR/TEI	
	Weekday	***Weekend***	***Weekday***	***Weekend***
Percentage of trips originating in McAllen	51	42	43.5	25.0
Percentage of trips destined to central Reynosa	50	51	55.2	41.2
Percentage of trips McAllen to central Reynosa	26		29.1	11.8
Trips originating west external	< 1		1.1	2.3

1. WSA 1994.

Additionally, this study has information on the trip patterns for northbound traffic and for commercial traffic (both southbound and northbound), which the 1994 WSA study did not include.

identification systems, and other measures are available to increase the throughput at the plazas. Therefore, the most critical capacity constraint at the border station is the inbound inspection process.

Roadway Corridor

The roadway corridor to an international bridge contains a maximum vehicular capacity. On the US side, the bridges in the study area are not located in the middle of the central business district, as in the case in Brownsville, Laredo, and El Paso, and are not influenced by the street network. However, in the northbound direction, the capacity of the Hidalgo Bridge is constrained by the downtown roadway systems in Reynosa. For this study, the highway corridor capacity in the southbound direction was reviewed.

The roadways approaching the three international bridges are designed to ultimately contain a five-lane cross section: four through lanes, and a center turning lane. The capacity of such a roadway is controlled by the signalized intersections along its route. The capacity of such design is in the range of 24,000 vehicles per day based on a normal truck composition, directional distribution, and signal green time splits. The roadway corridors will thus generally control the capacity of the bridge.

Bridge Access Roadway Descriptions and Planned Improvements

This section describes the roadway system in the vicinity of the Lower Rio Grande Valley near the existing bridges and the Proposed Anzalduas Bridge.

Progreso/Nuevo Progreso

Access to the Progreso Bridge is via F.M. 1015 or U.S. 281. F.M. 1015 is a rural two-lane roadway between U.S. Expressway 83 and the bridge. The Metropolitan Transportation Plan (MTP), a four-year plan developed by the Hidalgo County MPO, identifies projects and funding for projects over a four-year plan. Projects beyond the four-year plan are identified within a long-range plan.

The MTP includes the widening of F.M. 1015 between the bridge and U.S. 281to a four-lane roadway. The long-range plan includes the north extension of F.M. 1015, bypassing Progreso to the east and connecting into the existing F.M. 1015 alignment south of the floodway. This improvement would

consist of a two-lane rural cross section. The F.M. 1015 roadway between U.S. 83 and U.S. 281 would accommodate 12,000 vehicles per day. According to 1996 data, the traffic volume on F.M. 1015 is 16,700 vehicles daily near U.S. Expressway 83 and 10,300 vehicles daily north of the Progreso Bridge.

Pharr/Reynosa

Access to the Pharr Bridge is via U.S. 281 through the center of Pharr and its central business district. An alternative access is via Jackson Road (F.M. 2061) that borders McAllen and Pharr. Capacity constraints along these roadways include the numerous signalized intersections along U.S. 281 in the center of Pharr.

The intersection of U.S. Business 83 and U.S. 281 is controlled by an eight-phase traffic signal that constrains the corridor capacity for U.S. 281 to a maximum volume of 20,000 vehicles daily. A similar capacity constraint exists at Sam Houston Street and U.S. 281. U.S. 281 is a five-lane roadway providing a maximum capacity of 24,000 vehicles daily, except for the critical capacity-constrained segment between Sam Houston Street and U.S. Business. 83. An overpass is planned for the U.S. 281 and Spur 241 intersection north of the bridge.

Jackson Road (F.M. 2061) serves as the truck route to the Foreign Trade Zone as well as truck access to U.S. Expressway 83. Interchange access directly to U.S. Expressway 83 does not exist due to the complexity of the at-grade intersections. Jackson Road is a two-lane rural highway with planned widening in 1999 to a four-lane rural cross section between Spur 241 and Cemetery Road (F.M. 3072). An extension is planned for Cemetery Road westward through 10th Street (Spur 336) and 23rd Street (Spur 115). Improvements of Spur 241 to a five-lane curb and gutter cross-section are planned for construction between U.S. 281 and 10th Street. Data from 1996 show that U.S. 281 had a daily traffic volume of 13,000 vehicles daily south of Pharr, Jackson Road had a daily volume of 9,600 vehicles, while Spur 241 carried 14,200 vehicles daily near 23rd Street.

Hidalgo/Reynosa

Access to this bridge from U.S. Expressway 83 is via 23rd Street, a five-lane highway with an overpass over F.M. 1015. F.M. 1015 provides access to the McAllen Foreign Trade Zone. The north-south

corridor has a capacity of 24,000 vehicles daily along Spur 115, and 24,000 vehicles daily along 10th Street.

Anzalduas

Access planned for the Anzalduas Bridge would be via F.M. 494, a two-lane rural highway. No plans are included in the MTP for widening F.M. 494, although upon approval of the Anzalduas Bridge, the cross-section would be programmed as a five-lane highway. In 1996, F.M. 494 carried 5,900 vehicles per day near U.S. 83. F.M. 2220 is also expected to play a crucial role in carrying traffic between McAllen's FTZ and U.S. Expressway 83. F.M. 2220 is currently a four-lane divided roadway with a five-lane cross-section is planned for construction in 1999, between U.S. Expressway 83 and F.M. 1016. In 1996, F.M. 2220 carried 21,000 vehicles per day near U.S. 83.

U.S. Expressway 83

The distribution highway for the Rio Grande Valley is the U.S. Expressway 83. The expressway is a four-lane controlled access divided highway with frontage roads along most of its route between Mission and Brownsville. Widening to a six-lane expressway in McAllen is nearly complete between Ware Road in McAllen and F.M. 1426 in San Juan. The continued widening westward through Mission is planned, but not funded. A direct connection interchange is provided at U.S. 281 for traffic continuing northward via U.S. 281 to San Antonio. Data from 1996 shows that U.S. 83 (east of Pharr and west of Mission) carried 58,000 vehicles daily.

Significance to the Area Traffic Flows and to the Anzalduas Bridge

According to the U.S. Customs Port Director at Pharr, this bridge has four POV primary stations, and two stations are being added. The maximum capacity per station is 120 vehicles per lane per hour. The six stations would yield a capacity of 720 vehicles per hour if fully staffed. The Pharr Bridge can be expanded up to a maximum of 12 primary stations, yielding a northbound capacity of 1440 POVs per hour. The Pharr Bridge has four commercial primary stations expandable to eight stations, plus one empty truck station. Processing rates at the commercial primaries are approximately 20 trucks per lane per hour (80 trucks per hour) at Pharr with the capacity of 160 trucks per hour through the primary stations. On July 15, 1998, the flow of commercial vehicles through the Pharr primary station ranged

from 107 to 125 trucks per hour between 11 A.M. and 6 P.M. Therefore, Pharr is operating between 67 and 78 percent of its existing primary inspection capacity. At a growth rate higher than the overall system growth, the Pharr border station will be nearing full capacity in the year 2004, if not sooner. Expansion is underway for the Pharr primary station.

The cargo inspection docks at the Pharr Bridge are arranged in a pinwheel design with each ramp extension accommodating 25 trucks. The first pinwheel contains two ramps with plans to expand the first pinwheel to a 100-truck capacity, and space available for another pinwheel (100 additional trucks). This results in an ultimate capacity of 200 trucks at a dock at one time. Although critical to the efficient flow of imported and exported goods, the secondary inspection is seldom a significant factor in traffic congestion at the bridges. Usually, primary inspection and the roadway system will reach critical levels before the secondary inspection lots become congested enough to cause significant queue spillback on the bridge lanes and the adjacent roadway system.

At the Pharr Bridge, empty trucks are processed through a separate lane with 60 percent of these trucks are quickly inspected at a rate of four to five minutes per truck. However, loaded commercial trucks (8 to 10 percent) that are referred to the dock will require dock space for 45 minutes to an hour, depending on the cargo. USDA inspects five percent of the produce, although certain produce items require 100 percent inspections. The dock time would also be approximately 45 minutes for USDA. Each of these items is contained within a computer model to provide capacity data for customs. During this study, the data from this model was not released to the study team.

Street System Capacity

Generalized capacity flows for a typical street system or links range from 20,000 to 30,000 vehicles per day. In rural conditions, this range can be estimated to reach levels as high as 40,000 vehicles per day for two-way traffic. Therefore, it is estimated that the existing three-bridge system has a vehicular capacity of 60,000 to 120,000 vehicles per day along their respective roadway corridors. Desirable levels of service for street systems generally are bound at 75 percent of the capacity levels. Beyond this point, excessive queues and delays characterize undesirable levels of service. Therefore, the desirable demand levels for the existing bridge system would range from approximately 45,000 to 90,000 vehicles per day. According to the current growth pattern, the existing bridge system will generate enough

demand to make the roadway system reach desirable vehicular capacity on or before 2008. Although the year 2003 was selected as one possible opening day scenario for the Anzalduas Bridge, other scenarios are possible. In order to establish an optimal opening date for the Anzalduas Bridge, it is necessary to analyze the vehicular capacity of the entire bridge system, including the capacity of the street systems on both sides of the Rio Grande.

Forecasted Traffic Demand

The traffic demand on the proposed Anzalduas Bridge has been estimated based on the data collected and on observed growth patterns in the region. The estimated traffic assignments are based on the following assumptions.

- The Anzalduas Bridge will be open to traffic in early 2003.
- The Anzalduas Bridge will be adequately staffed and efficiently operated.
- At the time the Anzalduas Bridge is open to traffic, all previously mentioned proposed highway improvements would be completed.
- No other international bridge will be constructed near the Anzalduas Bridge.
- Because of their distance from the study area, and based on previous OD studies conducted for the Los Tomates Bridge, the bridges that are proposed or under-construction in Cameron County will not affect the demand for the Anzalduas Bridge.
- For southbound traffic, the toll schedule in the United States will be the same for all four area bridges. Similarly, for northbound traffic, the toll schedule in Mexico will be the same for all four bridges.
- Based on analysis of historical trip patterns, an annual growth rate for bridge system traffic of 4.2 percent will be used. This includes the assumption that the current NAFTA-induced growth will continue until the bridge opening and will then stabilize to pre-NAFTA levels.
- Commercial truck traffic growth is based on the growth of industrial space and maquiladoras in the United States and Mexico, respectively. This growth is assumed to continue for the ten-year period following NAFTA and then experience a five-year stabilization period before returning to pre-NAFTA levels.
- Traffic generated by the new facility (i.e., trips ending at the bridge itself) is negligible.
- There will be no national or international incident that will impede transborder travel (i.e., fuel shortages, national emergency).
- The systemwide traffic growth is independent of the construction of the Anzalduas Bridge. This is a conservative assumption, in that the model does not consider the additional demand likely to be generated by new developments attracted to the area by the existence of the Anzalduas Bridge.

Traffic Assignment

Based on the observed travel patterns of bridge system traffic, a diversion model was devised for traffic assignment to the proposed Anzalduas Bridge. The diversion is based on the location of the origin and destination for each trip pair, their relative distance from each bridge, and the proportion of travel required on the U.S. network of highways to Mexico's network of highways. As assumed previously, motorists using the Hidalgo Bridge are the most likely to divert to the Anzalduas Bridge, followed by motorists presently using the Pharr Bridge. The Progreso Bridge is slightly affected because the majority of traffic on this bridge is local (i.e., between Weslaco and Nuevo Progreso).

Expected Traffic Growth

The expected growth for traffic on the Anzalduas Bridge is shown in **Table 13**. Total average daily traffic volumes are shown for the total system. The system would only include the Hidalgo and Progreso Bridges in 1994, but from 1995 onward would also include the Pharr Bridge. The systemwide traffic growth is independent of the construction of the Anzalduas Bridge. Assuming opening occurs in 2003, the share of system traffic and the portion of it that is commercial traffic that is expected to use the Anzalduas Bridge are also included. If the Anzalduas Bridge is built, southbound commercial traffic will no longer be able to use the Hidalgo Bridge and will likely divert to the new facility. The total truck traffic estimated for the Anzalduas Bridge includes the diversion of southbound commercial traffic from the Hidalgo Bridge.

Upon opening, it is expected that the Anzalduas Bridge will serve 9,519 vehicles daily, 833 of which will be commercial vehicles. This will give the Anzalduas Bridge approximately 17.1 percent of the share of total crossings on the four-bridge system. As mentioned previously, the demand on the entire system will increase at an average of 4.2 percent per year and is ***independent*** of if and when the Anzalduas Bridge is built. However, as bridges reach capacity, some traffic will divert to bridges within the system, to another bridge system, or will be linked with other (i.e., will not be made). **Table 14** shows the average daily traffic (two-way total) for each bridge given that capacity is constrained. Traffic on the Anzalduas Bridge is expected to grow 6.1 percent per year, with a 5.6 percent per year growth in commercial traffic and 6.1 percent per year growth in POV traffic.

Based on growth patterns for the region, development on both sides of the Rio Grande will occur to the west of the currently urbanized areas of McAllen and Reynosa. Reynosa's perimeter highways will further accelerate the development in the southwestern quadrant of the city. As mentioned previously, this quadrant is becoming the focal point for maquiladora construction in Reynosa, which has itself been a leader in the growth of new maquiladora plants, employment, and production value. Because each zone's development—current and anticipated—were taken into consideration for the diversion model, Reynosa's westward development pattern combined with the rapid growth in the western part of Hidalgo county indicate that the majority of the increased border traffic will be using the westernmost bridges. This substantiates the assumption that the Anzalduas Bridge will capture a larger share of the system traffic over time. This is due in part to the capacity constraints of the Hidalgo and Pharr Bridges and to the subsequently increasing attractiveness of the Anzalduas Bridge. However, if the Anzalduas Bridge is not built, the Hidalgo Bridge would continue to carry the lion's share of the border traffic until it reaches capacity.

It is also anticipated that construction of the Anzalduas Bridge will provide a catalyst for further development in the area. As mentioned previously, construction of the Anzalduas Bridge will likely encourage Hunt Realty and Grupo Rio San Juan to accelerate their envisioned development. Some construction has already taken place, but further analysis would be necessary to determine the effects on the Anzalduas Bridge. Consequently, the traffic growth schedule for the Anzalduas Bridge does not include the potential impacts of this development, and, as mentioned in the assumptions, yields a conservative estimate for traffic demand on the Anzalduas Bridge. Given the potential for increased development in the area, namely the Hunt Realty/Grupo Rio San Juan development, the expected growth in the Anzalduas Bridge's system share will likely occur at a faster rate.

Table 13. Traffic Growth Schedule for Bridge System and Share of System Total Utilizing the Anzalduas Bridge

Year	System Total[1]	Anzalduas Total	Anzalduas Trucks[2]	Anzalduas Share
1994[3]	*36,348*	-	-	-
1995[4]	*38,113*	-	-	-
1996	*42,285*	-	-	-
1997	*42,274*	-	-	-
1998	44,264	-	-	-
1999	46,348	-	-	-
2000	48,531	-	-	-
2001	50,816	-	-	-
2002	53,210	-	-	-
2003[5]	55,717	9,519	833	17.1%
2004	58,448	10,028	946	17.2%
2005	61,311	10,563	1,075	17.2%
2006	64,313	11,125	1,159	17.3%
2007	67,461	11,715	1,250	17.4%
2008	70,761	12,336	1,349	17.4%
2009	74,221	12,988	1,455	17.5%
2010	77,848	13,673	1,570	17.6%
2011	81,652	14,392	1,695	17.6%
2012	85,639	15,148	1,830	17.7%
2013	89,819	15,942	1,975	17.7%
2014	92,379	17,138	2,057	18.6%
2015	94,494	18,568	2,123	19.6%
2016	96,888	20,210	2,199	20.9%
2017	98,998	21,992	2,270	22.2%
2018	100,358	23,987	2,321	23.9%
2019	101,824	26,075	2,376	25.6%
2020	103,400	28,261	2,436	27.3%
2021	105,093	30,550	2,500	29.1%
2022	105,236	31,250	2,499	29.7%
2023	104,213	30,750	2,461	29.5%

1. System total expressed in average daily traffic.
2. Truck total includes diversion due to closing of Hidalgo Bridge to Southbound commercial traffic.
3. System traffic distributed only Hidalgo and Progreso Bridges.
4. Pharr Bridge opened to traffic—carries portion of system traffic.
5. Estimated opening of Anzalduas Bridge.

Summary

Taking into account the recent trends in private and commercial transborder travel and the forecasted growth in the area, this study has indicated that the proposed Anzalduas Bridge will be warranted in the area despite the conservative assumptions used in this analysis. The growth rate used in this analysis was 4.2 percent per year, which takes into consideration the NAFTA-induced upswing, and is higher than the 3.3 percent per year growth used by WSA in 1994. This growth rate characterizes the change in traffic demand on the bridge system, but is lower once capacity constraints are taken into consideration. The estimated growth of traffic on the Anzalduas Bridge is 6.1 percent, compared to 6.9 percent used in the WSA study.

Table 14 summarizes the estimated distribution of total system traffic over the entire bridge system in the case that the Anzalduas Bridge is built, and in the case that it is not built. From the previous discussion on capacity, it can be seen that the Hidalgo Bridge is already operating below acceptable levels of service and the Pharr Bridge will approach undesirable levels of service at a faster rate if the Anzalduas Bridge is not built. **Table 14** also indicates that the Anzalduas Bridge will be affecting the three bridges in the order previously anticipated: the Hidalgo Bridge will experience the bulk of the diversion, then the Pharr Bridge, and then followed by the Progreso Bridge. **Figures 11** and **12** show the effects of the capacity constraint on each bridge. As a bridge reaches capacity, the traffic demand either diverts to another bridge within the system or is lost from the system. Traffic lost from the system consists of trips that are no longer made, combined with other trips, or use another bridge system. The number of trips that are lost from the system are shown for both scenarios. Diversion from over-capacity bridges was determined using the OD survey information. **Figures 13, 14,** and **15** show the resulting volumes on each of the bridges for both scenarios, including the total system traffic. **Figure 15** shows the Hidalgo and Anzalduas Bridges as one subsystem.

Figures 11 and **13** show the changes in average daily traffic on each of the three existing bridges. As the Hidalgo Bridge reaches capacity, some traffic will be diverted to the Pharr and Progreso Bridges, but some will be lost. Similarly, as the Pharr Bridge reaches capacity, some traffic will divert to the Progreso Bridge. As mentioned previously, traffic lost from the system will consist of trips that are either diverted to other ports of entry or no longer made. **Figures 12** and **14** show a similar diversion once bridges reach capacity, but with the Anzalduas Bridge available to take an increasing share of

system traffic. The amount of traffic lost from the system is significantly lower than in the previous scenario—a three-bridge system without the Anzalduas Bridge. Subsequently, **Figure 14** shows that the system achieves a higher two-way system total when the Anzalduas Bridge is included. This peak system total is expected when the Anzalduas Bridge hits capacity. **Figure 15** displays the information from **Figure 14**, but combines the Hidalgo and Anzalduas Bridges into one subsystem.

It should also be noted that these values do not consider any large development that may occur due to the construction of the Anzalduas Bridge. Therefore, these values are subject to significant change if the process is initiated for the construction of the Anzalduas Bridge. Further development outside of the McAllen and Reynosa urbanized areas will also likely be encouraged by the construction of the new bridge, which will in turn ease the demand on the local streets currently being stressed by the demand on the Hidalgo Bridge.

Table 14. Two-Way System Total Average Daily Traffic Distribution Scenarios[1]

	Anzalduas Bridge NOT BUILT				Anzalduas Bridge BUILT				
Year	**Hidalgo**	**Pharr**	**Progreso**	**Total**	**Anzalduas**	**Hidalgo**	**Pharr**	**Progreso**	**Total**
1997	*28,170*	*8,577*	*5,527*	***42,274***	-	*28,170*	*8,577*	*5,527*	***42,274***
1998	28,994	9,595	5,674	**44,264**	-	28,994	9,595	5,674	**44,264**
1999	29,843	10,680	5,825	**46,348**	-	29,843	10,680	5,825	**46,348**
2000	30,716	11,833	5,981	**48,531**	-	30,716	11,833	5,981	**48,531**
2001	31,616	13,060	6,141	**50,816**	-	31,616	13,060	6,141	**50,816**
2002	32,541	14,364	6,305	**53,210**	-	32,541	14,364	6,305	**53,210**
2003	33,494	15,750	6,474	**55,717**	9,519	26,025	13,797	6,376	**55,717**
2004	34,474	17,222	6,647	**58,343**	10,028	26,787	15,086	6,547	**58,448**
2005	35,484	18,785	6,825	**61,093**	10,563	27,571	16,455	6,722	**61,311**
2006	36,523	20,443	7,007	**63,973**	11,125	28,378	17,908	6,902	**64,313**
2007	37,592	22,202	7,195	**66,990**	11,715	29,209	19,449	7,087	**67,461**
2008	38,000	24,889	7,388	**70,277**	12,336	30,065	21,083	7,277	**70,761**
2009	37,500	28,800	7,587	**73,886**	12,988	30,945	22,816	7,472	**74,221**
2010	37,000	32,869	7,790	**77,659**	13,673	31,851	24,652	7,673	**77,848**
2011	36,500	34,702	8,067	**79,269**	14,392	32,784	26,596	7,879	**81,652**
2012	36,000	36,428	8,357	**80,785**	15,148	33,745	28,656	8,090	**85,639**
2013	35,500	36,000	8,719	**80,219**	15,942	34,733	30,836	8,308	**89,819**
2014	35,000	35,500	9,093	**79,593**	17,138	35,000	31,653	8,588	**92,379**
2015	34,500	35,000	9,480	**78,980**	18,568	34,500	32,546	8,880	**94,494**
2016	34,000	34,500	9,879	**78,379**	20,210	34,000	33,497	9,181	**96,888**
2017	33,500	34,000	10,290	**77,790**	21,992	33,500	34,000	9,506	**98,998**
2018	33,000	33,500	10,715	**77,215**	23,987	33,000	33,500	9,871	**100,358**
2019	32,500	33,000	11,153	**76,653**	26,075	32,500	33,000	10,249	**101,824**
2020	32,000	32,500	11,605	**76,105**	28,261	32,000	32,500	10,639	**103,400**
2021	31,500	32,000	12,073	**75,573**	30,550	31,500	32,000	11,043	**105,093**
2022	31,000	31,500	12,555	**75,055**	31,250	31,000	31,500	11,486	**105,236**
2023	30,500	31,000	13,053	**74,553**	30,750	30,500	31,000	11,963	**104,213**

1. Values represent average daily traffic that would use each bridge given the capacity constraint of the corridor.

Figure 11. Each Bridge Constrained by Capacity, Anzalduas Bridge **NOT BUILT**

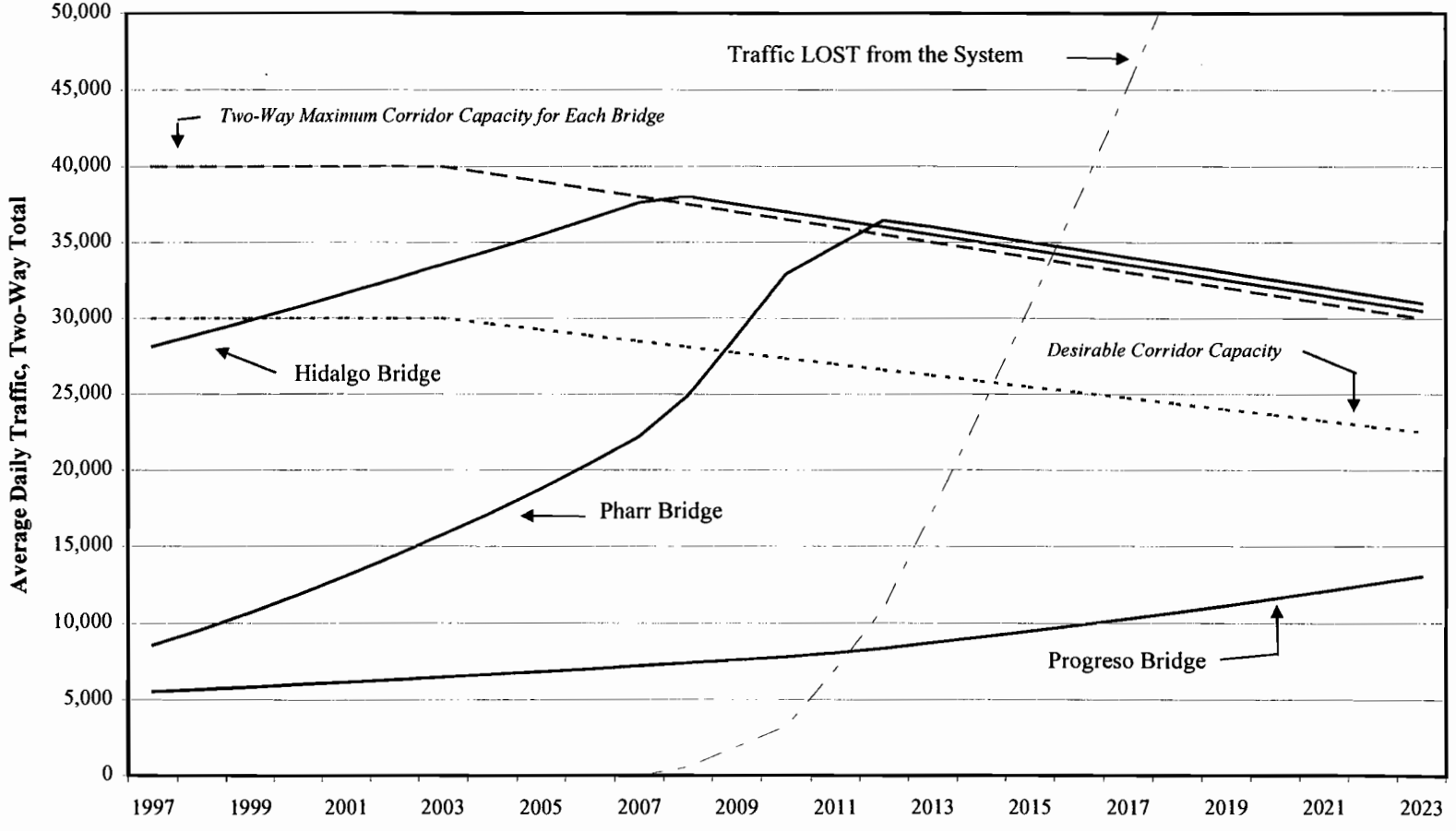


Figure 12. Each Bridge Constrained by Capacity, Anzalduas Bridge **BUILT**

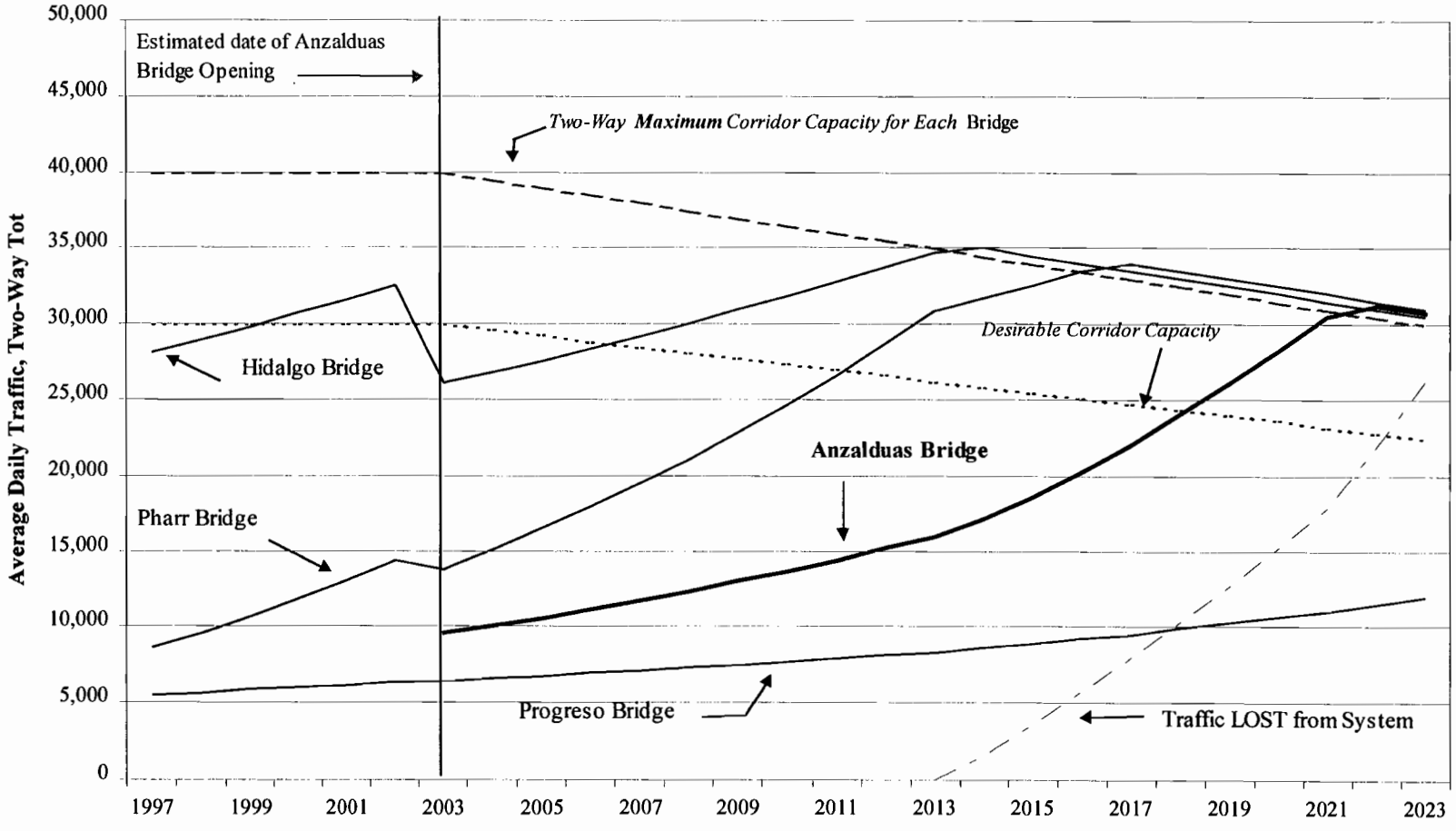


Figure 13. Two-Way Volume on Bridge System, Anzalduas Bridge **NOT BUILT**

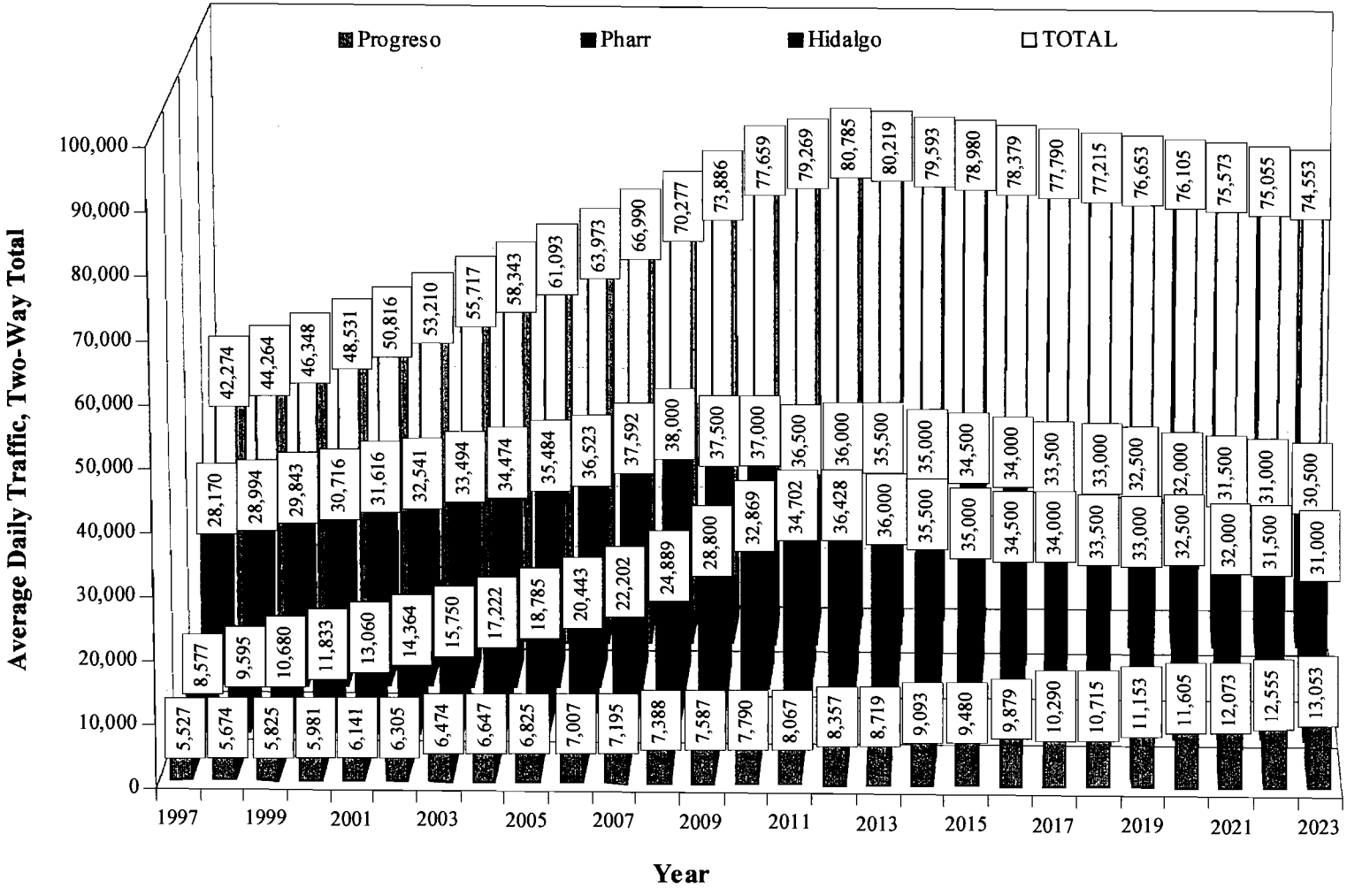


Figure 14. Two-Way Volume on Bridge System, Anzalduas Bridge **BUILT**

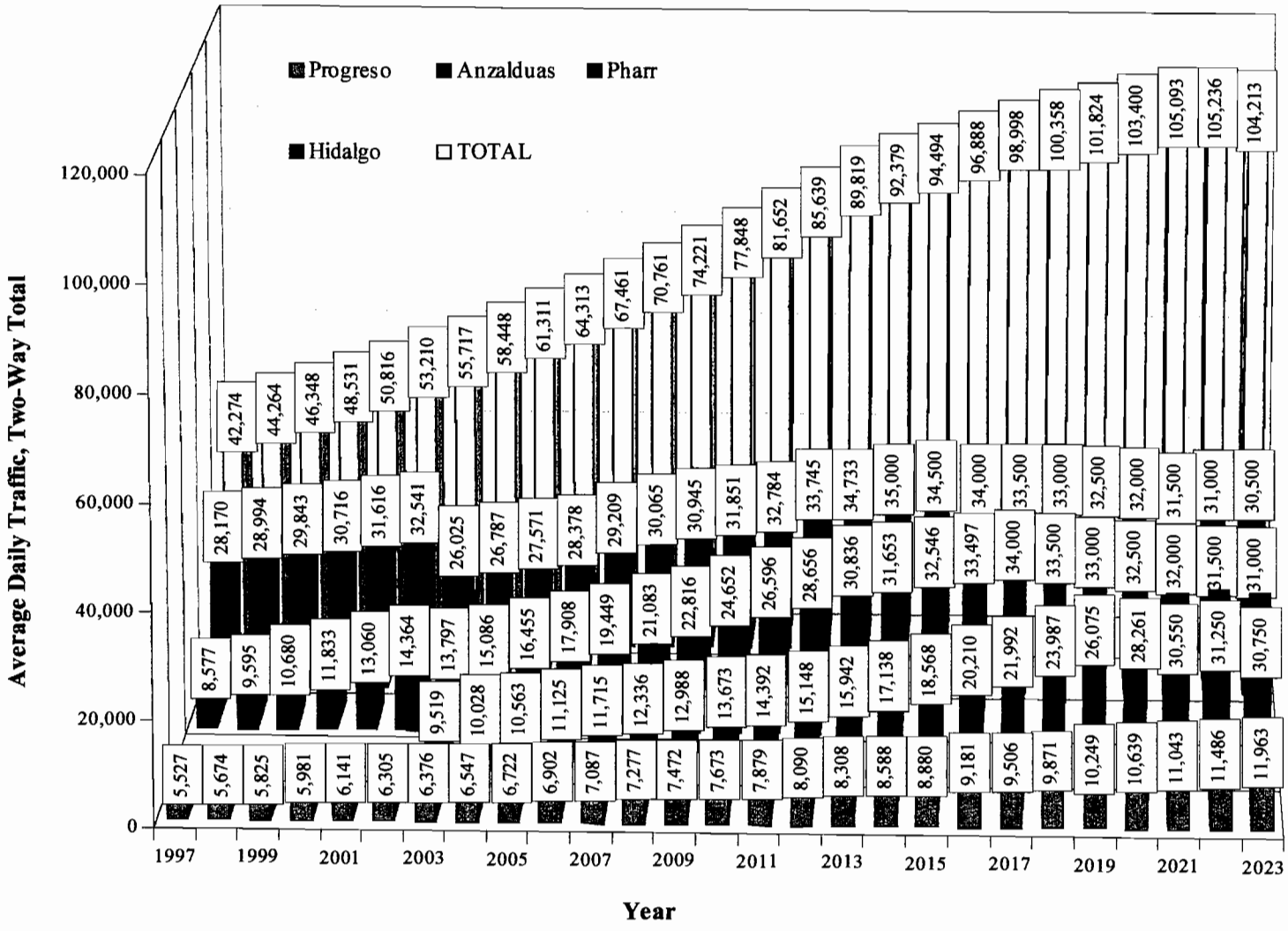
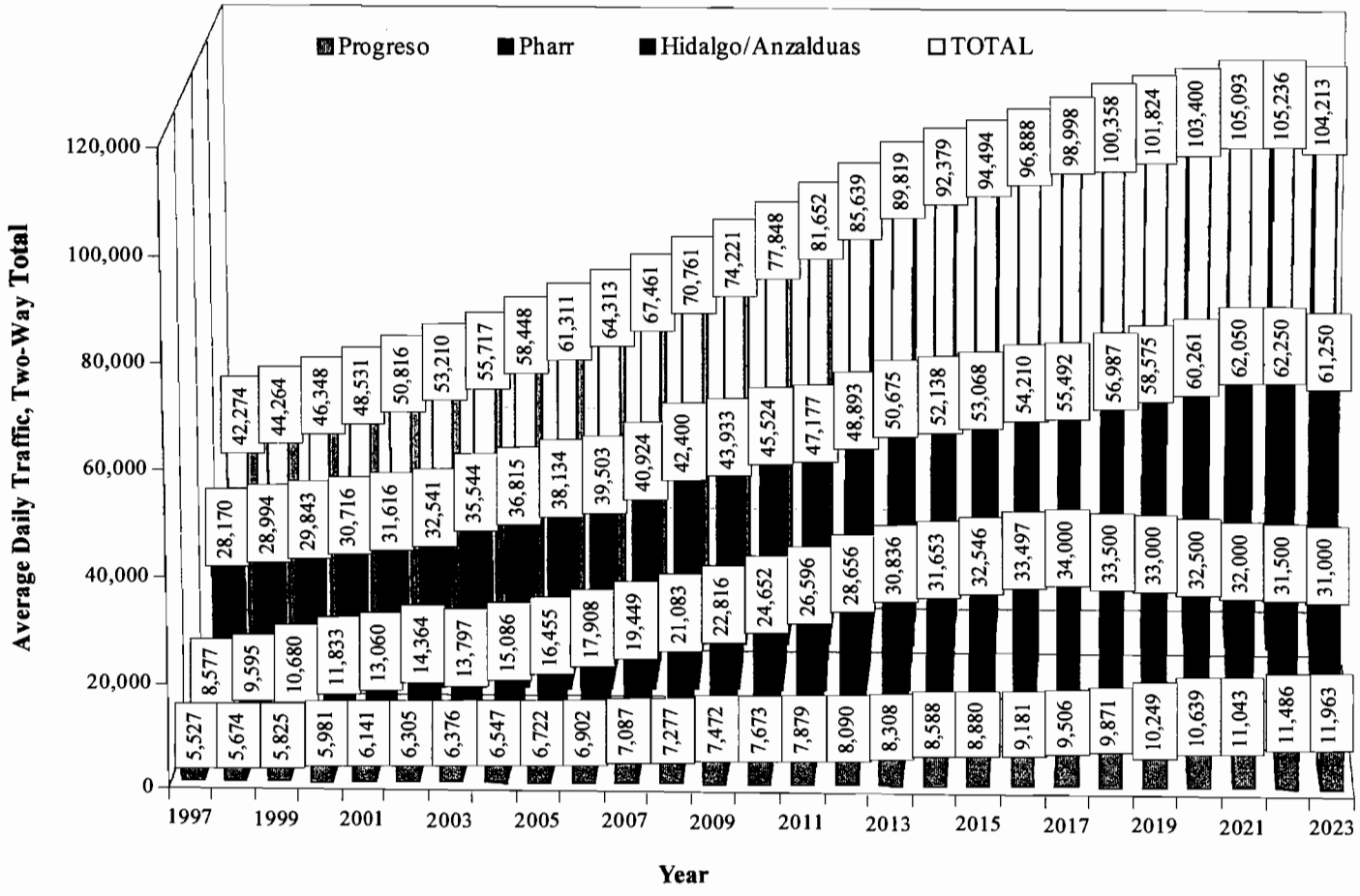


Figure 15. Two-Way Volume on Bridge System, Anzalduas Bridge **BUILT**
(Hidalgo/Anzalduas Combined)



Major Findings and Conclusions

This study has yielded several major findings and conclusions pertaining to the study area and the transborder travel that occur across the bridge system.

- Socio-economic indicators suggest sustained growth in the region.
- The west side of Reynosa has historically had more Maquiladora construction than both the east side of Reynosa and Rio Bravo combined.
- Without the Anzalduas Bridge, capacity constraints will cause a significant loss of traffic and revenue from the region before 2008.
- Upon opening of the Anzalduas Bridge, traffic will divert, in order of magnitude, from the Hidalgo, Pharr, and Progreso Bridges. Although each bridge will initially experience a *loss*, the overall system will be better equipped to carry more traffic. The Anzalduas Bridge will be able to capture traffic otherwise lost once the Hidalgo and Pharr Bridges become constrained by capacity.
- Without the Anzalduas Bridge, the maximum average two-way daily traffic using the bridge system is estimated at approximately 80,000 vehicles per day. The peak two-way system traffic is approximately 105,000 vehicles per day when the Anzalduas Bridge is factored into the system.
- This traffic study indicates that the Anzalduas Bridge is viable and will enhance the regional bridge system capacity.

References

1 Center for Transportation Research. "Overview of the Texas-Mexico Border: Background" January 1994.
2 Traffic Engineers, Inc. "Traffic Assignment Analysis for Los Tomates/Matamoros III Bridge" July 1997.
3 Cameron County International Bridge System, February 1998.
4 URS Consultants, Inc. "Port of Brownsville International Bridge: Traffic and Revenue Study" June 1996.
5 Summary Finding of the Developmental Impact on 22,000 Acres, MJBCO, August 1998.
6 Wilbur Smith Associates. "Anzalduas International Bridge Study" December 29, 1994.

Acknowledgements

The project staff would like to thank individuals at the following agencies for providing information for and assistance in the development of the Anzalduas International Bridge Traffic Study:

- U.S. Customs Offices at the Hidalgo, Pharr, and Progreso Bridges;
- Bridge Managers at the Hidalgo, Pharr, and Progreso Bridges;
- City of McAllen Engineering Staff; and
- Michael J. Blum, Company.

Project Staff

Center for Transportation Research at the University of Texas—Austin, Texas

Mr. Rob Harrison, Associate Director

Ms. Angela J. Weissmann, Ph.D., Principal Investigator

Ms. Wendy L. McAbee, Research Assistant

Traffic Engineers, Inc.—Houston, Texas

Mr. John W. Hudson, Jr., P.E., Principal-In-Charge

Mr. Isaac F. Joskowicz, P.E., Project Manager

Ms. Susan H. Alleman, Transportation Planner

Ms. Cristina B. Slabic, E.I.T., Project Analyst

Mr. Jorge Castillo, Survey Supervisor

APPENDIX

Table A1. Sample Size

Location	Date	Direction	Total Crossings[1]	Coded Surveys	Percent Sample Size
Progreso[2]	June 5, 1998	NB	2,989	317	10.61
		SB	1,523	370	24.29
	June 6, 1998	NB	3,789	300	7.92
		SB	2,001	357	17.84
Pharr	June 12, 1998	NB[3]	*2,773*	299	10.78
		SB[4]	3,053	350	11.46
	June 13, 1998	NB	*2,509*	197	7.85
		SB	2,771	422	15.23
Hidalgo	June 19, 1998	NB[3]	*9,458*	311	3.29
		SB[5]	10,220	1,196	11.70
	June 20, 1998	NB	*10,246*	306	2.33
		SB	11,182	1,361	12.17
Total Northbound			31,764	1,730	5.4
Total Southbound			30,750	4,056	13.2
TOTAL			62,514	5,786	9.26

1. Total crossing during 12-hour study period for passenger vehicles only.
2. Progreso volumes were given in 24-hour totals. Volume for 12-hour study period is estimate.
3. Northbound volumes estimated using 1997 data complied by *Business Border Indicators* Newsletter.
4. Southbound volumes for Pharr were given in 24-hour totals. Volume for 12-hour study period is an estimate.
5. Hidalgo southbound volumes directly computed from McAllen-Hidalgo Bridge Board information.

Table A2. Time of Day Distribution

	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
7 to 8 am	3.8%	4.1%	7.7%	9.7%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8 to 9 am	6.6%	15.7%	10.0%	9.1%	6.4%	9.4%	8.0%	12.6%	15.2%	8.1%	8.2%	9.7%
9 to 10 am	8.8%	19.2%	10.4%	11.7%	8.0%	8.7%	7.3%	9.2%	18.3%	13.7%	9.8%	10.1%
10 to 11 am	10.1%	17.0%	9.7%	11.1%	10.0%	8.2%	12.3%	9.8%	15.2%	14.7%	9.8%	9.9%
11 am to noon	7.6%	9.7%	7.0%	7.4%	9.6%	6.8%	7.7%	10.9%	14.7%	12.6%	10.1%	9.6%
noon to 1 pm	7.9%	14.9%	6.7%	7.1%	7.7%	9.6%	7.3%	10.4%	16.2%	14.0%	0.0%	0.0%
1 to 2 pm	6.3%	13.2%	6.7%	0.0%	9.6%	8.8%	8.0%	7.3%	11.7%	14.5%	9.5%	9.9%
2 to 3 pm	6.6%	6.2%	6.7%	0.0%	10.3%	8.6%	8.0%	7.3%	8.6%	11.4%	13.4%	10.2%
3 to 4 pm	15.1%	0.0%	8.7%	8.6%	9.3%	8.9%	7.3%	5.6%	0.0%	11.1%	13.1%	10.1%
4 to 5 pm	14.2%	0.0%	9.0%	8.0%	9.6%	9.4%	8.7%	7.6%	0.0%	0.0%	13.1%	10.0%
5 to 6 pm	12.9%	0.0%	9.4%	10.3%	9.6%	8.9%	13.0%	19.3%	0.0%	0.0%	13.1%	9.3%
6 to 7 pm	0.0%	0.0%	8.0%	16.9%	9.6%	7.8%	12.3%	0.0%	0.0%	0.0%	0.0%	11.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A3. Trip Purpose Distribution

Purpose	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Commute	3.2%	2.7%	10.0%	14.3%	0.6%	3.4%	0.7%	0.0%	3.6%	4.0%	2.9%	3.9%
Business	5.1%	9.7%	28.1%	19.1%	10.3%	12.4%	4.3%	10.1%	9.6%	17.1%	4.2%	9.1%
Personal	42.7%	45.1%	26.8%	52.6%	42.4%	51.8%	35.8%	27.7%	39.6%	57.7%	33.3%	49.5%
School	0.0%	2.4%	1.7%	0.0%	1.0%	1.1%	4.0%	2.2%	0.0%	0.0%	1.0%	0.8%
Shopping	28.5%	35.7%	32.1%	10.6%	42.1%	26.8%	45.5%	50.7%	44.7%	18.8%	52.9%	30.6%
Recreation	2.2%	1.9%	1.0%	0.6%	3.5%	3.6%	2.3%	2.2%	2.5%	2.1%	4.9%	5.0%
Other	17.7%	0.5%	0.0%	1.4%	0.0%	0.5%	6.0%	5.0%	0.0%	0.2%	0.0%	0.1%
Blank	0.6%	1.9%	0.3%	1.4%	0.0%	0.4%	1.3%	2.0%	0.0%	0.0%	0.7%	1.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A4. License Plate/Registration Distribution

	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Texas	76.0%	90.0%	49.0%	69.4%	44.1%	55.2%	77.7%	91.9%	43.1%	69.0%	38.4%	58.3%
Tamaulipas	15.8%	7.3%	41.9%	24.6%	42.4%	38.2%	12.7%	5.3%	47.2%	24.6%	50.8%	34.0%
Coahuila	0.0%	0.0%	0.3%	0.0%	1.0%	0.4%	0.0%	0.0%	1.0%	0.2%	1.0%	0.8%
Nuevo Leon	0.9%	0.3%	2.3%	1.4%	7.4%	2.8%	0.0%	0.0%	3.0%	0.7%	6.2%	2.8%
Other	4.4%	1.9%	4.7%	4.6%	3.5%	3.0%	3.7%	2.2%	3.0%	5.5%	2.3%	3.2%
Blank	2.8%	0.5%	1.7%	0.0%	1.6%	0.3%	6.0%	0.6%	2.5%	0.0%	1.3%	1.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A5. Occupancy Distribution

	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
One	19.2%	39.2%	48.0%	39.7%	32.5%	41.2%	23.0%	16.8%	32.5%	34.0%	23.6%	31.6%
Two	41.3%	34.9%	26.5%	42.9%	37.0%	34.7%	32.3%	44.8%	28.9%	35.2%	29.5%	31.3%
Three	20.8%	18.1%	14.8%	12.6%	21.5%	15.2%	21.0%	28.3%	15.2%	24.0%	23.9%	19.9%
Four	6.6%	5.4%	6.0%	4.0%	7.4%	6.3%	10.3%	6.2%	13.2%	4.5%	15.4%	10.6%
Five	4.4%	0.5%	2.7%	0.6%	1.0%	1.4%	5.0%	1.4%	4.6%	1.2%	4.9%	2.6%
Six or more	5.0%	0.3%	1.3%	0.3%	0.3%	0.7%	5.7%	1.4%	4.6%	1.2%	2.3%	3.2%
Blank	2.5%	1.6%	0.7%	0.0%	0.3%	0.5%	2.7%	1.1%	1.0%	0.0%	0.3%	0.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A6. Average Time to Cross Distribution

	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Less than 5 min	39.7%	98.6%	24.7%	99.4%	1.6%	44.3%	29.7%	94.4%	8.6%	93.8%	4.6%	52.3%
6 to 10 minutes	16.4%	0.0%	9.7%	0.0%	15.8%	23.2%	17.3%	3.1%	24.4%	0.5%	11.4%	24.5%
11 to 15 minutes	13.6%	0.0%	16.1%	0.3%	28.0%	15.5%	6.7%	0.0%	21.3%	1.9%	37.3%	13.3%
16 to 20 minutes	7.9%	0.0%	16.7%	0.3%	28.9%	5.6%	4.0%	0.0%	18.8%	1.4%	31.7%	4.3%
21 to 30 minutes	8.5%	0.0%	18.4%	0.0%	14.8%	5.8%	8.3%	0.0%	12.2%	0.7%	10.8%	3.3%
31 to 40 minutes	3.8%	0.0%	6.7%	0.0%	6.8%	4.8%	6.7%	0.0%	5.1%	0.9%	1.6%	0.9%
41 to 50 minutes	2.2%	0.0%	2.0%	0.0%	2.3%	0.3%	3.0%	0.0%	3.0%	0.0%	0.3%	0.5%
51 to 60 minutes	3.5%	0.0%	1.0%	0.0%	1.0%	0.4%	8.3%	0.0%	2.0%	0.0%	0.0%	0.1%
More than an hour	2.2%	0.0%	4.7%	0.0%	1.0%	0.0%	13.7%	0.0%	3.6%	0.0%	0.3%	0.0%
Blank	2.2%	1.4%	0.0%	0.0%	0.0%	0.3%	2.3%	2.5%	1.0%	0.7%	2.0%	0.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A7. Frequency Distribution

	WEEKDAY						WEEKEND					
	Progreso		Pharr		Hidalgo		Progreso		Pharr		Hidalgo	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Less than one	44.5%	47.4%	11.2%	19.4%	30.9%	20.0%	41.0%	57.8%	24.6%	27.4%	28.1%	24.0%
One	19.6%	23.3%	17.3%	18.3%	18.3%	23.4%	17.7%	19.8%	29.2%	24.9%	30.7%	28.1%
Two	15.5%	11.5%	14.2%	14.2%	13.6%	15.7%	15.2%	10.3%	11.8%	16.8%	13.9%	14.6%
Three	7.9%	6.3%	15.3%	9.9%	11.6%	12.0%	9.2%	2.9%	8.7%	7.2%	8.6%	11.0%
Four	1.3%	1.1%	4.4%	4.3%	1.7%	4.3%	3.9%	1.1%	6.7%	5.7%	2.3%	3.0%
Five	0.9%	2.0%	3.4%	8.7%	0.7%	4.5%	1.1%	1.7%	2.1%	1.0%	1.3%	2.3%
Six or more	8.5%	6.3%	32.9%	24.6%	21.9%	18.2%	8.5%	4.9%	14.4%	15.3%	14.5%	14.8%
First time	1.9%	2.0%	1.4%	0.6%	1.3%	1.9%	2.8%	0.9%	2.6%	1.5%	0.3%	2.0%
Blank	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.7%	0.6%	0.0%	0.2%	0.3%	0.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A8. Geographic codes for OD Survey

US Trip Ends		Mexico Trip Ends	
50	Alamo	30	Parque del Norte
51	Brownsville	31	Parque Colonia
52	Donna	32	Parque Reynosa
53	Edinburg	33	Parque Manimex
54	Harlingen	34	FINSA maquiladora
55	Hidalgo	35	PEMEX
56	La Feria	36	Central area
57	Los Fresnos	37	South Central area
58	McAllen	38	North area
59	Mercedes	39	Northwest area
60	Mission	40	East area
61	Pharr	41	Rio Bravo TAMP
62	Progreso	42	Nuevo Progreso TAMP
63	San Benito	43	Monterrey NL
64	San Juan	44	Saltillo COAH
65	South Padre	45	Torreon COAH
66	Weslaco	46	Valle Hermoso TAMP
67	Other in US	47	Other in Mexico
201	West USA Interior	101	West Mexico Interior
202	North USA Interior	102	South Mexico Interior
203	East USA Interior/Gulf Coast	103	East Mexico Gulf Coast
205	Raymondville, Lyford	105	Central America
206	Elsa, Edcouch, La Villa		

Table A9. Weekday Northbound Traffic: Progreso Bridge

ORIGIN	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	202	203	205	206	Total
32										9													9
41	18	9	18	9	45		9		27	27	18		98	9	9		196				9	27	526
42	53	62	89	125	116	9	62	27	98	196	152	80	267	71	9		535	9	9	45	18	98	2131
46																							9
47	9																						9
101					9																		9
Total	80	71	107	134	169	9	71	27	125	232	169	80	366	80	18	0	731	9	9	45	27	125	2693

Table A10 Weekend Northbound Traffic: Progreso Bridge

ORIGIN	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	202	203	205	206	Total
41	11		21		11		11		11	53		11	21	11			128				11	11	309
42	43	32	128	117	181	21	160	11	107	245	53	21	213	107	64	21	619	53	64	181	21	43	2507
46									11														11
47			11																				11
101													11										11
Total	53	32	160	117	192	21	171	11	128	299	53	32	245	117	64	21	747	53	64	181	32	53	2849

Table A11 Weekday Northbound Traffic: Pharr Bridge

ORIGIN	50	51	52	53	54	55	56	58	59	60	61	64	65	66	67	201	202	203	206	Total
30								17												17
31			17																	17
32								17												17
33											17									17
34								70			35									105
36				17	35	70		174		35	122	17		17			17			505
37						35		35			17									87
38				35				209		35	17			17						314
39			17			17		17												52
40	70	52	52	122	70	209	17	1150		105	470	122		35	17	35				2526
41	35		52	35		52		592	17	35	174	52	17	52	17		17		17	1167
43		17						35			17		52					17		139
44								17												17
46											17									17
47				17											17					35
102								17												17
Total	105	70	139	226	105	383	17	2351	17	209	888	192	70	122	52	35	35	17	17	5051

Table A12 Weekend Northbound Traffic: Pharr Bridge

Origin	50	51	52	53	54	55	56	58	59	60	61	64	65	66	67	201	202	203	206	Total
37											43									43
38						22		65												87
39								22												22
40	152	43	65	87		65		1431	43	87	586	130	43	87				87	22	2928
41	65		43	22	22	65		369		65	87			43	22	22			43	868
43								22					22				22			65
44								22			22									43
103											22									22
Total	217	43	108	108	22	152	0	1930	43	152	759	130	65	130	22	22	22	87	65	4077

Table A13 Weekday Northbound Traffic: Hidalgo Bridge

ORIGIN	50	51	52	53	54	55	57	58	59	60	61	64	65	66	201	203	205	Total
30								348										348
31											58							58
32						58			58									116
33								58										58
36		116	58	290	58	1623		5737		1159	464	116			116	174		9909
37	58			58		290		927		174	290	58						1854
38				58		290		1159		174		58						1738
39				58		406		927		58	174							1623
41						58								58				116
43					58			869				58	174					1159
44								58										58
101						58		174										232
102								174										174
Total	58	116	58	464	116	2782	0	10431	58	1565	985	290	174	58	116	174	0	17443

Table A14 Weekdend Northbound Traffic: Hidalgo Bridge

ORIGIN	50	51	52	53	54	55	57	58	59	60	61	64	65	66	201	203	205	Total
30								174		58								232
36				521		1506	58	7065		1042	579	116	58	116		116	58	11234
37	58					232		1621		116			58	58				2143
38						174		1216		174	58		58			58		1737
39				58				463										521
41						58												58
43								753					116	58				927
44								58										58
47								58										58
101								116										116
Total	58	0	0	579	0	1969	58	11524	0	1390	637	116	290	232	0	174	58	17083

Table A15. Weekday Southbound Traffic: Progreso Bridge

ORIGI	30	32	41	42	43	44	46	47	Total
50			8	51					59
51				42					42
52			51	144			17		212
53				93					93
54			17	263					280
55				8					8
56				127					127
57				8					8
58			8	85					93
59		8	59	161		8			238
60			8	85					93
61				68				8	76
62			51	255				8	314
63			8	76					85
64				8				8	17
66	8		212	467				8	696
67			8	42					51
201			17	34					51
202				59					59
203			8	170					178
205			17	42					59
206			17	42			8		68
Total	8	8	492	2333	0	8	25	34	2910

Table A16. Weekend Southbound Traffic: Progreso Bridge

ORIGI	30	32	41	42	43	44	46	47	Total
50				91					91
51			9	63					72
52			18	190			9		217
53			27	63					91
54				217			9		226
55				9					9
56			18	54					72
58			9	109					118
59			36	199	9				244
60				81					81
61			9	91					100
62			63	235			9		308
63				136					136
64			9	36					45
65			9	18					27
66			145	616			18		778
67			18	45					63
202				54					54
203			18	172					190
205				36					36
206			9	63					72
Total	0	0	398	2580	9	0	45	0	3032

Table A17. Weekday Southbound Traffic: Pharr Bridge

ORIGI	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	46	47	101	102	103	105	Total
50							16	33	16			131										196
51						16			16					16								49
52							33	16				131										180
53		16					114	33	49			131	16							16		375
54							16	16						16								49
55				16			114	33	33			33					16					245
56												16										16
58	131	33	228	33	33	16	457	65	196	33		408		16			16	16			16	1697
59	33						16		16			49										114
60	16		16			16	16	16	33	16		180		16								326
61	98	16	82	49	16	33	343	131	114	16		506	16	33								1452
62												16	16									33
64			16				33	33	33			65		33								212
65									16													16
66			16				49	16	33			114		16								245
67									16													16
201						16						49			16	16			16		65	180
202								16				16										33
203	16						16	16				33		33		16					16	147
Total	294	65	359	98	49	98	1224	424	571	65	0	1877	49	180	16	33	33	16	16	16	98	5581

Table A18. Weekend Southbound Traffic: Pharr Bridge

ORIGI	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	46	47	101	102	103	105	Total
50							121	11	33	11	55	132										362
51							22							22								44
52						11	44		55		11	132										253
53							88		55		33	143		11		11			11			351
54							11												11			22
55						11	99	22			11	44				11						198
56												11										11
58							275		77	11	99	384	11	33	11				11			912
59							22		11			88										121
60							77		22		22	143				11		11				286
61						22	549	44	143	11	132	198				22		11	11			1142
62							11						11									22
63							11				11	11										33
64							66		11		22	55							11			165
65														11								11
66							55	11	11		11	33										121
67												11										11
201							22					22						11			66	121
202							11	11				33		22		11						88
203							44		11		11	55		44					11		33	209
206							22															22
Total	0	0	0	0	0	44	1549	99	428	33	417	1494	22	143	11	66	0	33	66	0	99	4503

Table A19. Weekday Southbound Traffic: Hidalgo Bridge

ORIGI	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	47	101	102	103	Total
50						16	161		48												226
51							48		16					32							97
52							97		64												161
53					16	16	725	48	32			32		48					16	16	951
54							64	16													81
55	16	16	16			32	1821	97	226		16	81		48							2369
56							16							16							32
57							16		16	16											48
58	64	16	32	48	48	145	7462	870	693	48		81	32	371	32	32		32	32		10041
59							32			16		16		16							81
60							1467	97	177			32		81					16		1870
61			16			48	951	81	145			32		16							1289
62							32														32
63					16		16		16												48
64					32		306		81			16	16	16							467
65							64							32							97
66							64	16	48					16							145
67									16								16				32
201							64											16			81
202							64				16								16		97
203							226	16	16					48		16		32	16		371
205							64														64
Total	81	32	64	48	113	258	13764	1241	1596	81	32	290	48	741	32	48	16	81	97	16	18680

Table A20. Weekend Southbound Traffic: Hidalgo Bridge

ORIGI	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	47	101	102	103	Total
50						14	281		14												309
51							28							14							42
52							140	14				14		28							197
53						14	646	70				14		42							786
54							154		14					0							169
55						14	1573	98	28			28		0							1741
56							42							0							42
57							28	14	14					0							56
58					14	56	7991	379	646			140		435				56	14		9733
59						14	112							14	14						154
60							2303	70	98					84		14					2570
61							885	56	56					14					14		1025
62					28		84							0							112
63							42							0							42
64							337							0							337
65							14							14							28
66							112							0							112
67							28							14							42
201							112					14		0							126
202							154	14						14							183
203						14	211							70				14			309
206							56							0							56
Total	0	0	0	0	42	126	15336	716	871	0	0	211	0	744	14	14	0	70	28	0	18173

Table A21. Commercial Traffic, Expanded Northbound OD Matrix

ORIGIN	DESTINATION						TOTAL	
	U.S. Border West		U.S. Interior		U.S. Border East			
Mexico West Interior	15628	6.19%	32390	12.82%	39652	15.70%	87670	34.71 %
Northwest Reynosa	10827	4.29%	2071	0.82%	2469	0.98%	15367	6.08 %
Central Reynosa	6268	2.48%	36497	14.45%	5223	2.07%	47989	19.00 %
East Reynosa	4975	1.97%	7402	2.93%	16498	6.53%	28876	11.43 %
Mexico East Interior	15380	6.09%	12536	4.96%	44774	17.73%	72690	28.78 %
TOTAL	53078	21.01 %	90897	35.99 %	108616	43.00 %	252591	100 %

Table A22. Commercial Traffic, Expanded Southbound OD Matrix

ORIGIN	DESTINATION										TOTAL	
	Mexico West Interior		Northwest Reynosa		Central Reynosa		East Reynosa		Mexico East Interior			
U.S. Border West	5777	2.58%	26095	11.65%	15107	6.74%	1462	0.65%	11170	4.99%	59611	26.61%
U.S. Interior	33747	15.07%	3273	1.46%	39937	17.83%	12387	5.53%	23046	10.29%	112390	50.17%
U.S. Border East	10792	4.82%	2854	1.27%	10135	4.52%	16080	7.18%	12135	5.42%	51995	23.21%
TOTAL	50316	22.46%	32222	14.39%	65179	29.10%	29928	13.36%	46350	20.69%	223996	100.00%

Table A23. Southbound Traffic on Hidalgo-Pharr-Progreso-Anzalduas Bridge System (average daily traffic)

	Hidalgo Southbound			Pharr Southbound			Progreso Southbound			Anzalduas Southbound			SB SYSTEM		
	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	TOTAL
1997	*14,144*	*270*	*14,414*	*3,154*	*312*	*3,466*	*2,691*	*38*	*2,729*	*0*	*0*	*0*	*19,988*	*621*	*20,609*
1998	14,628	190	14,818	3,466	440	3,906	2,744	47	2,792	0	0	0	20,839	677	21,516
1999	15,026	207	15,232	3,894	480	4,374	2,804	52	2,856	0	0	0	21,724	739	22,462
2000	15,433	226	15,659	4,346	524	4,870	2,865	56	2,922	0	0	0	22,645	806	23,451
2001	15,851	246	16,097	4,825	572	5,396	2,927	62	2,989	0	0	0	23,603	879	24,483
2002	16,279	269	16,548	5,330	624	5,954	2,990	67	3,058	0	0	0	24,600	959	25,560
2003	13,218	0	13,218	5,105	628	5,733	3,008	73	3,081	4,307	345	4,652	25,638	1,047	26,684
2004	13,588	0	13,588	5,595	687	6,282	3,072	80	3,152	4,530	378	4,908	26,785	1,145	27,929
2005	13,968	0	13,968	6,111	751	6,862	3,137	88	3,224	4,764	413	5,177	27,980	1,252	29,232
2006	14,360	0	14,360	6,678	798	7,476	3,205	93	3,299	5,021	439	5,460	29,264	1,330	30,594
2007	14,762	0	14,762	7,278	848	8,126	3,276	99	3,374	5,291	466	5,757	30,606	1,413	32,019
2008	15,175	0	15,175	7,912	900	8,813	3,347	105	3,452	5,575	495	6,070	32,009	1,501	33,510
2009	15,600	0	15,600	8,582	956	9,539	3,420	112	3,531	5,873	526	6,399	33,475	1,594	35,069
2010	16,037	0	16,037	9,290	1,016	10,306	3,494	119	3,613	6,186	559	6,745	35,007	1,693	36,700
2011	16,486	0	16,486	10,024	1,092	11,116	3,568	127	3,696	6,508	600	7,109	36,587	1,820	38,406
2012	16,947	0	16,947	10,798	1,173	11,971	3,644	137	3,781	6,846	645	7,491	38,235	1,955	40,190
2013	17,422	0	17,422	11,613	1,261	12,874	3,721	147	3,868	7,200	693	7,893	39,956	2,101	42,057
2014	17,500	0	17,500	12,559	1,343	13,903	3,800	157	3,957	7,668	739	8,407	41,528	2,239	43,767
2015	17,250	0	17,250	13,624	1,422	15,046	3,883	166	4,049	8,237	782	9,019	42,994	2,370	45,364
2016	17,000	0	17,000	14,736	1,511	16,247	3,966	176	4,143	8,908	831	9,739	44,611	2,519	47,129
2017	16,750	0	16,750	15,415	1,585	17,000	4,068	185	4,253	9,685	872	10,557	45,918	2,642	48,560
2018	16,500	0	16,500	15,132	1,618	16,750	4,207	189	4,395	10,652	890	11,542	46,491	2,696	49,187
2019	16,250	0	16,250	14,846	1,654	16,500	4,349	193	4,542	11,664	910	12,573	47,109	2,756	49,865
2020	16,000	0	16,000	14,557	1,693	16,250	4,495	197	4,692	12,721	931	13,652	47,774	2,821	50,595
2021	15,750	0	15,750	14,265	1,735	16,000	4,645	202	4,847	13,827	954	14,782	48,488	2,891	51,379
2022	15,500	0	15,500	13,988	1,762	15,750	4,807	206	5,012	14,656	969	15,625	48,950	2,937	51,887
2023	15,250	0	15,250	13,768	1,732	15,500	4,997	202	5,199	14,423	952	15,375	48,438	2,886	51,324

Table A24. Northbound Traffic on Hidalgo-Pharr-Progreso-Anzalduas Bridge System (average daily traffic)

	Hidalgo Northbound			Pharr Northbound			Progreso Northbound			Anzalduas Northbound			NB SYSTEM		
	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	TOTAL
1997	*13,756*	*0*	*13,756*	*4,468*	*643*	*5,111*	*2,756*	*41*	*2,798*	*0*	*0*	*0*	*20,980*	*685*	*21,665*
1998	14,177	0	14,177	4,941	748	5,689	2,834	48	2,882	0	0	0	21,952	796	22,748
1999	14,610	0	14,610	5,435	870	6,306	2,913	56	2,969	0	0	0	22,959	926	23,886
2000	15,058	0	15,058	5,951	1,012	6,963	2,994	65	3,059	0	0	0	24,003	1,077	25,080
2001	15,518	0	15,518	6,487	1,177	7,664	3,076	76	3,152	0	0	0	25,081	1,253	26,334
2002	15,993	0	15,993	7,041	1,369	8,410	3,159	88	3,247	0	0	0	26,193	1,457	27,650
2003	12,807	0	12,807	6,954	1,110	8,064	3,194	102	3,295	4,379	488	4,867	27,333	1,700	29,033
2004	13,199	0	13,199	7,513	1,292	8,805	3,277	118	3,395	4,552	568	5,120	28,540	1,979	30,519
2005	13,602	0	13,602	8,089	1,504	9,593	3,360	138	3,498	4,725	661	5,386	29,776	2,303	32,080
2006	14,019	0	14,019	8,794	1,638	10,432	3,454	150	3,604	4,945	720	5,665	31,211	2,508	33,719
2007	14,448	0	14,448	9,540	1,783	11,324	3,549	163	3,713	5,174	784	5,958	32,711	2,731	35,442
2008	14,890	0	14,890	10,330	1,941	12,271	3,647	178	3,825	5,412	854	6,266	34,279	2,973	37,251
2009	15,345	0	15,345	11,164	2,114	13,277	3,747	194	3,941	5,659	929	6,589	35,916	3,236	39,152
2010	15,815	0	15,815	12,045	2,301	14,346	3,849	211	4,060	5,916	1,012	6,928	37,625	3,523	41,149
2011	16,299	0	16,299	12,991	2,490	15,481	3,955	228	4,183	6,189	1,095	7,283	39,434	3,812	43,246
2012	16,797	0	16,797	13,991	2,693	16,685	4,063	247	4,310	6,473	1,184	7,657	41,324	4,124	45,448
2013	17,311	0	17,311	15,048	2,914	17,962	4,173	267	4,440	6,768	1,281	8,049	43,300	4,462	47,762
2014	17,500	0	17,500	14,753	2,997	17,750	4,357	275	4,631	7,413	1,318	8,731	44,022	4,590	48,612
2015	17,250	0	17,250	14,451	3,049	17,500	4,552	279	4,831	8,209	1,340	9,549	44,462	4,668	49,130
2016	17,000	0	17,000	14,139	3,111	17,250	4,753	285	5,038	9,102	1,368	10,471	44,994	4,764	49,759
2017	16,750	0	16,750	13,820	3,180	17,000	4,962	291	5,253	10,037	1,398	11,435	45,569	4,869	50,438
2018	16,500	0	16,500	13,496	3,254	16,750	5,178	298	5,476	11,014	1,431	12,445	46,188	4,983	51,171
2019	16,250	0	16,250	13,165	3,335	16,500	5,402	305	5,707	12,036	1,466	13,502	46,853	5,106	51,959
2020	16,000	0	16,000	12,828	3,422	16,250	5,633	313	5,947	13,104	1,505	14,609	47,566	5,240	52,806
2021	15,750	0	15,750	12,483	3,517	16,000	5,873	322	6,195	14,223	1,546	15,769	48,329	5,385	53,714
2022	15,500	0	15,500	12,272	3,478	15,750	6,155	319	6,473	14,096	1,529	15,625	48,022	5,326	53,348
2023	15,250	0	15,250	12,070	3,430	15,500	6,450	314	6,764	13,867	1,508	15,375	47,637	5,252	52,889

Table A25. Two-Way Total Traffic on Hidalgo-Pharr-Progreso-Anzalduas Bridge System (average daily traffic)

	Hidalgo			Pharr			Progreso			Anzalduas			TOTAL SYSTEM		
	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	Total	POVs	Trucks	TOTAL
1997	*27,899*	*270*	*28,170*	*7,622*	*956*	*8,577*	*5,447*	*79*	*5,527*	*0*	*0*	*0*	*40,968*	*1,305*	*42,274*
1998	28,805	190	28,994	8,407	1,188	9,595	5,578	96	5,674	0	0	0	42,790	1,474	44,264
1999	29,636	207	29,843	9,329	1,350	10,680	5,718	108	5,825	0	0	0	44,683	1,665	46,348
2000	30,491	226	30,716	10,297	1,536	11,833	5,859	122	5,981	0	0	0	46,647	1,883	48,531
2001	31,369	246	31,616	11,311	1,749	13,060	6,003	137	6,141	0	0	0	48,684	2,132	50,816
2002	32,272	269	32,541	12,372	1,992	14,364	6,150	155	6,305	0	0	0	50,794	2,416	53,210
2003	26,025	0	26,025	12,059	1,738	13,797	6,202	175	6,376	8,686	833	9,519	52,971	2,746	55,717
2004	26,787	0	26,787	13,107	1,979	15,086	6,349	198	6,547	9,082	946	10,028	55,325	3,123	58,448
2005	27,571	0	27,571	14,200	2,255	16,455	6,497	225	6,722	9,488	1,075	10,563	57,756	3,555	61,311
2006	28,378	0	28,378	15,472	2,436	17,908	6,659	243	6,902	9,966	1,159	11,125	60,476	3,838	64,313
2007	29,209	0	29,209	16,818	2,631	19,449	6,825	262	7,087	10,465	1,250	11,715	63,318	4,143	67,461
2008	30,065	0	30,065	18,242	2,842	21,083	6,994	283	7,277	10,987	1,349	12,336	66,288	4,473	70,761
2009	30,945	0	30,945	19,746	3,070	22,816	7,167	305	7,472	11,532	1,455	12,988	69,391	4,830	74,221
2010	31,851	0	31,851	21,335	3,317	24,652	7,344	329	7,673	12,102	1,570	13,673	72,632	5,216	77,848
2011	32,784	0	32,784	23,015	3,581	26,596	7,523	355	7,879	12,697	1,695	14,392	76,020	5,632	81,652
2012	33,745	0	33,745	24,789	3,867	28,656	7,707	384	8,090	13,319	1,830	15,148	79,559	6,080	85,639
2013	34,733	0	34,733	26,661	4,175	30,836	7,894	414	8,308	13,967	1,975	15,942	83,256	6,564	89,819
2014	35,000	0	35,000	27,312	4,341	31,653	8,157	431	8,588	15,081	2,057	17,138	85,550	6,829	92,379
2015	34,500	0	34,500	28,075	4,471	32,546	8,435	445	8,880	16,445	2,123	18,568	87,456	7,039	94,494
2016	34,000	0	34,000	28,875	4,623	33,497	8,720	461	9,181	18,011	2,199	20,210	89,605	7,283	96,888
2017	33,500	0	33,500	29,235	4,765	34,000	9,030	476	9,506	19,722	2,270	21,992	91,487	7,511	98,998
2018	33,000	0	33,000	28,628	4,872	33,500	9,384	487	9,871	21,666	2,321	23,987	92,679	7,679	100,358
2019	32,500	0	32,500	28,012	4,988	33,000	9,750	498	10,249	23,699	2,376	26,075	93,961	7,862	101,824
2020	32,000	0	32,000	27,385	5,115	32,500	10,128	511	10,639	25,826	2,436	28,261	95,339	8,061	103,400
2021	31,500	0	31,500	26,749	5,251	32,000	10,518	525	11,043	28,050	2,500	30,550	96,817	8,276	105,093
2022	31,000	0	31,000	26,260	5,240	31,500	10,961	524	11,486	28,751	2,499	31,250	96,972	8,263	105,236
2023	30,500	0	30,500	25,838	5,162	31,000	11,446	516	11,963	28,289	2,461	30,750	96,074	8,138	104,213