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**EVALUATING MEXICAN TRUCK SAFETY  
AT THE  
TEXAS/MEXICO BORDER**

by

Mike Schofield  
Robert Harrison

**Research Report SWUTC/07/473700-00071-1**

Southwest Region University Transportation Center  
Center for Transportation Research  
University of Texas at Austin  
Austin, Texas 78712

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## **ABSTRACT**

In June 2004 the U.S Supreme Court ruled that the United States could open its borders to cross-border trucking and so fulfill its treaty obligations under the NAFTA. Opponents of this action included those who believed that Mexican trucks were unable to meet current U.S. trucking safety standards on a consistent basis. This report examines this legitimate concern by evaluating border trucking data collected at border safety inspection stations operated by the Texas Department of Public Safety (DPS). Safety statistics derived from Mexican trucks crossing the U.S. border are compared with American truck safety data to determine whether there is any warrant for the concerns that have helped delay the border opening. The results show that out of service rates are now not significantly different when comparing trucks from both countries. While increased border inspections since 2001 have reduced out of service citation rates, 2003 and 2004 seem to mark an equilibrium for 2005 and 2006, where increased inspections may have a diminished effect in lowering rates. This, if confirmed by safety data, questions the benefits of the planned permanent border safety inspection facilities – still not all in service in 2006 - relative to their substantial operational costs and the possible distortions in state safety from having a large percentage of DPS staff allocated to the southern part of Texas.

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## **EXECUTIVE SUMMARY**

To the casual observer, the southern U.S. border seems inefficient. Trailer interlining, cargo consolidation, differing border customs processes, congested infrastructure and security procedures create a slow moving, multi-step process that produces long truck lines, noise and air pollution. The drayage system, a necessity until the Supreme Court ruling is implemented, is needed to provide interlining – insuring that trailers moved to the border by Mexican highway tractors are delivered to truck load U.S terminals near the border. This is, of course, a more expensive process than simply driving across the border in Free-Flow traffic conditions. Opening the border at this moment would not remove all of the cost impediments currently preventing a move from dray to over-the-highway trucks. The answer lies in improving port of entry clearance processes to reduce truck queues which, when combined with border opening, will offer operators an opportunity to raise efficiencies.

The long held opinion that Mexican trucks are less safe is not supported by the post-2000 DPS data. The latest safety data show a difference in Vehicle Out of Service (VOOS) rates of only 0.5% between Mexican and U.S. trucks at the border – an amount that suggests equivalency. It should also be noted that these inspections mostly compare long-haul U.S. trucks with older, short-distance drayage Mexican trucks. Taking this additional information into account, this study finds that it is very doubtful that the average drayage Mexican truck is significantly less safe than its American equivalent.

All analyses from the temporary stations suggest that with the border open, Mexican long haul trucks entering through Texas ports of entry are likely to meet or exceed the safety standards set for U.S. trucking – a key sovereignty issue within the NAFTA. It is therefore an open question at this point whether the construction of state-of-the-art inspection facilities, together with greatly increased inspection rates at the border is good public policy when the current DPS operations have brought citations down to a level at, or below, those of regular over the highway trucks operating across the state.

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## Chapter 1. Background

The Mexico-United States element of the North American Free Trade Agreement (NAFTA) treaty, signed in 1992, significantly impacted trade between Canada, the U.S., and Mexico for the next 12 years. U.S.-Mexico trade grew from \$88 billion in 1994 to over \$200 billion in 2000, when there was a plateau in growth (1). This leveling-off of growth was caused first by a downturn of the economy after 2001 and also by increased competition from China and the Pacific Rim region (2). NAFTA trade then resumed its growth, but at a slower rate than in the 1990s, reaching \$287 billion and 11percent of total U.S trade in 2005. Texas plays an important role in facilitating NAFTA trade with Mexico since its borders contain important truck and rail gateways. In recent years, truck transport accounted for roughly 80-85% of surface trade between the two countries by value and much of this trade crossed the border in one of the Texas ports of entry (1). This substantial truck traffic is channeled on a few specific freight corridors, which has contributed to the highway investment decisions in the state, including the planned Trans-Texas Corridor (10).

A central tenet of the NAFTA treaty was that at a defined point in time – ten years after signing - the northern and southern borders would open to all truck traffic moving to and from any point in the U.S., Mexico, or Canada. On the southern U.S border, one advantage of this free movement of trade would be to drastically reduce the need for *drayage* where trailers are interlined between Mexican and U.S over-the-highway border trucking terminals using a third, usually older, tractor. This has been a long-standing concern of logistics managers and is generally regarded (at times unfairly) as being inefficient and likely to create financial benefits if removed through open access. The first phase of US-Mexico NAFTA trucking changes was set to begin in December 1995, with open access to all contiguous bi-national border states and provinces (3). However, eight days before the opening date, the White House announced a delay of undetermined length on the opening of the southern border. This stopped all tri-national discussions on trucking and created a six year of diplomatic stalemate that failed to address any of the key issues. A Mexican appeal on this issue ultimately led to international arbitration, held as part of the dispute resolution process within NAFTA, which decided in favor of Mexico in 2001.

One of the stated concerns resulting in the delay of the NAFTA provisions was the safety of Mexican trucks. It is the belief of many Americans that, in general, Mexican trucks are less safe than American trucks and for this reason, should not be allowed to operate on U.S.

highways. Determining whether either or both of these beliefs are true is a complicated subject which is often simply expressed as a matter of opinion. In late 2002, the White House again moved to open the border. Following this decision, opponents of border opening began to claim that Mexican trucks created disproportionately more emissions than American trucks. This was upheld to the Ninth Circuit Court of Appeals in California and the courts ordered an Environmental Impact Study (EIS) be completed before the border opening (4,5). On June 7, 2004, this decision was overturned by the United States Supreme Court, stating that no EIS is required for decisions made by under international treaty (6). This appeared to have cleared the way for Mexican trucks, although the first trucks are still to appear in any numbers and drayage is still the main method for transferring trailer based NAFTA cargo at the southern border.

The major issue of the border opening, even after the Supreme Court decision, continues to be the potential safety problems with Mexican trucks. This report reviews the latest safety data from the Texas-Mexico border, specifically vehicle and driver out of service rates, to examine this issue of truck safety from an unbiased standpoint and attempt to determine whether there is actually a safety deficiency.

## **Chapter 2. Texas Border Safety Inspections**

In the past 20 years, the trade growth between the U.S. and Mexico has created stress on all aspects of border port of entry operations. This includes not only the U.S. customs, immigration, and drug inspections that receive the most national attention, but national security after September 11, 2001 and also safety inspections, which were initially undertaken by the Federal Motor Carrier Safety Administration (FMCSA) within the federal facilities. More recently, the Texas Department of Public Safety (DPS) and California Highway Patrol (CHP) began conducting truck safety inspections at the border. One problem with these inspections in Texas was that their overall number was initially low, forcing DPS officers to conduct these inspections on a non-random basis. The small numbers of officers were generally forced to choose trucks that already showed visual signs of a safety problem and were therefore more likely to fail an inspection. This is an efficient method to get the best out of a small staff and to place the most dangerous vehicles out of service. However, for the same reason, using these results to represent the safety of the typical Mexican truck is wrong since they are not randomly selected. Using these data make Mexican trucks seem generally less safe than they really are as a population or group (7).

When examining North American truck based trade, one tends to find important differences between operations at the northern and southern U.S. borders. One very apparent difference is that while NAFTA allows Canadian trucks to enter the U.S. and deliver cargo to final destination, Mexican trucks have been restricted to the areas surrounding border cities, generally 5-20 miles. This is a hang-over from the time the Interstate Commerce Commission (ICC) supervised trans-border operations and was inherited by NAFTA upon its signature. The current process, therefore, has not had to accommodate change since none has taken place. The general transfer system is well known.(8). The trailer containing the cargo is first transferred to a drayage tractor from a maquiladora plant (if close) or a Mexican line haul terminal, taken across the border through both Mexican and United States customs and immigration systems, to an American truck line haul terminal for onward delivery in the U.S. This saves Mexican firms from using their newer trucks on short routes that can include hours of unproductive waiting at the border. Drayage tractors, as a matter of economic necessity, tend to be less suitable – because of age and reliability - for long-range travel. Accordingly, there is the reasonable expectation that, unless they are well maintained, they will fail inspections at a much higher rate than the typical Mexican or American highway truck. It is therefore important to note that many of the

trucks being inspected for safety and failing at the Texas border crossings are drayage vehicles not intended for long trips of the type that would occur if the border were opened as NAFTA intended.. Presumably, the full opening of the border will eliminate much of the need for drayage for economic reasons, lowering out-of-service rates as the inspections start to take a more representative sample of the average long haul Mexican truck engaged in NAFTA commerce. It should be noted that much of the NAFTA traffic is dominated by large truck firms who have carefully established, though partial equity in some instances, close business relationships – including common operating practices – with their Mexican partners. This was demonstrated as early as 1995 when faculty and staff at CTR undertook a weigh in motion study at Laredo and El Paso and measured northbound trucks over a year on specially constructed WIM sites. NAFTA trailers were found to be no heavier than the over-the-highway Texas truck trailers, in part a consequence of these commercial partnerships and their mutually agreed operating limits (9).

In the past decade, there has been a substantial increase in the number and proportion of trucks inspected at the Mexican border. Throughout these years, there has been a general decrease in out of service rates. However, it is not known whether the increased inspections caused a greater degree of compliance or whether these new data were now describing a more random sample of the trucks, rather than a sample of the higher risk trucks.

Due to the increased demand for more stringent safety regulations caused by the NAFTA delays and lawsuits that ensued, Texas DPS developed plans to construct their own truck inspection facilities adjacent to the eight largest truck border crossing locations in Texas. The permanent Border Safety Inspection Facilities (BSIFs), shown in Figure 1,



Source: TransAnalysis, 2002.

*Figure 1. Border safety inspection facility layout*

are arranged as recommended in a study to develop the best prototype facility and will check both vehicle equipment standards and driver documentation (10). Funding for their construction has been made available, partly from federal funding, but since their design and layout was determined, the cost of the facilities has gone up, complicating funding and slowing their implementation. The process of constructing these facilities takes at least two years, including land acquisition but excluding environmental impact studies (7).

Funding for the facilities came as part of a three year U.S. DOT commitment to fund border infrastructure. And of the \$150 million made available from the FHWA general operating expenses for safety inspection facilities at the border between 2002 and 2004, over \$100 million has been earmarked for Texas (11), showing the current commitment to border safety adopted by the FHWA .

A series of temporary stations have been put in place while the various planning processes – including purchase of land through eminent domain – are completed for the BSIFs . These stations conduct essentially the same safety inspections, with the only differences being less state-of-the-art equipment and a lower overall capacity for truck inspections. This requires that DPS officers allow more trucks pass unchecked at peak times and focus on the high-risk trucks, creating a more non-random system of inspection. These temporary stations input data into the same databases that the future BSIFs will utilize and over the past three years, this is where the data on the safety of Mexican trucks entering the U.S. has been stored. It is from these DPS databases that the data reported in this paper were acquired.



## **Chapter 3. Safety Inspection Data**

The data used in this study were recorded by Texas DPS at both the temporary safety facilities and also on the highways within the Texas-Mexico border counties, with the main focus at the border facilities. The temporary stations, which have all come on-line since 2002 at eight main border-crossing sites, have dramatically increased the number of inspections at the border. Inspections in border counties in 2004 exceeded 82,000, representing a 148% increase in inspections since 2002 when 33,102 inspections took place.

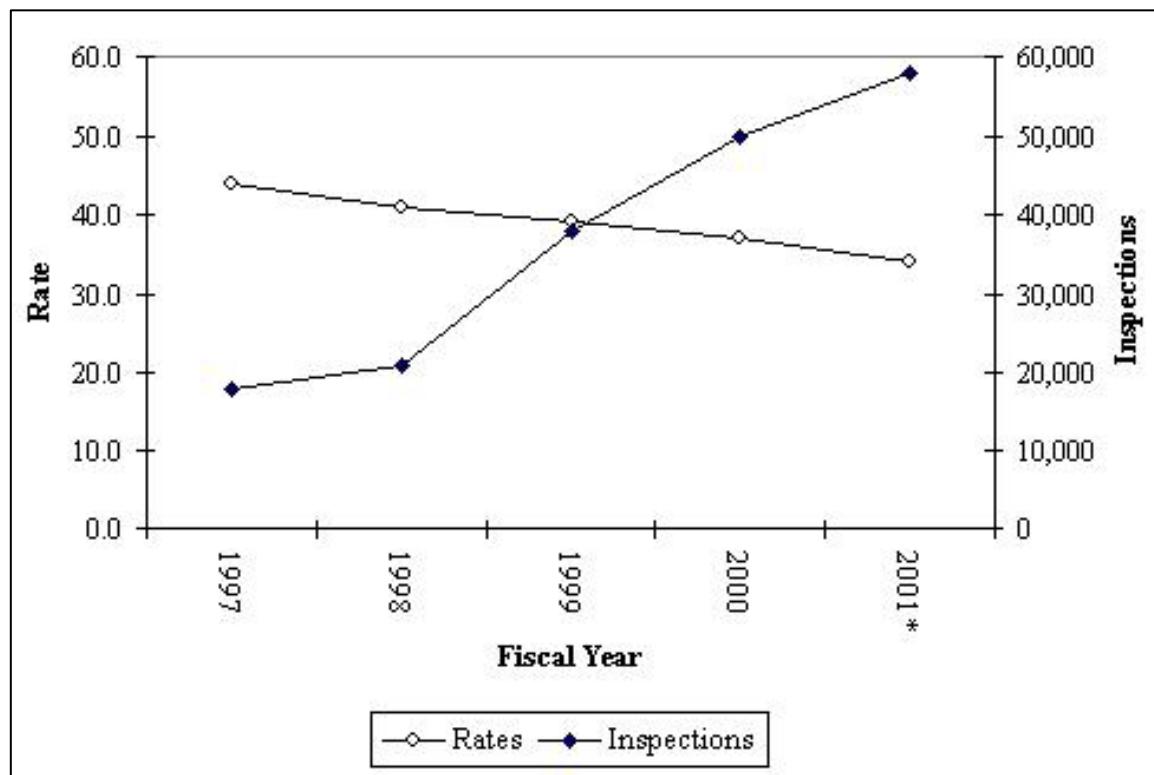
At the inspection facilities, a variety of data are collected during the inspection process. The total number of trucks crossing is recorded, and whether they were passed or inspected. This allows a comparison of increased inspections as a percentage of total crossing vehicles to be calculated, as opposed to simply the number of inspections. This is a possibly less biased form of comparison since it reflects how well DPS is keeping up with growing truck volumes moving across the border. This comparison creates a benchmark, a percentage increase, which signifies that from one year to another whether inspections are keeping up with border crossing or are increasing or decreasing proportionately. Between 2002 and 2004, the percentage of trucks inspected has increased from 1.1% to 2.2%, proportionately doubling the share of border-crossing trucks inspected (13). This is a direct result of the new temporary stations brought into service and the expectation is that when the permanent BSIFs are completed, so greatly increasing capacity, this percentage will increase further.

Also, data on all the trucks weighed at the facility and details of their violations are recorded. All violations that keep a vehicle from being permitted to operate are recorded as Vehicle Out of Service (VOOS) data. Alternately, the violations on the driver, including problems with the license and logbook, are considered Driver Out of Service (DOOS). This information is kept in a DPS database and can be requested by timeframe, location, or other queries.

A trend that becomes evident when examining the most recent DPS data is the quickly growing rate of Level 1 inspections at the border. Of the six types of DPS inspections, Level 1 is the most comprehensive and deals with a full documentation check together with an under-vehicle inspection routine specifically aimed at critical elements such as braking performance (12). The latest data show an increase in the percentage of inspections that are Level 1 from 45% in 2002 to 71% only two years later. Apparently, the introduction of the temporary inspection stations in the past two years has made it more feasible to conduct Level 1 inspections more frequently. This holds Mexican trucks entering Texas to a higher standard than

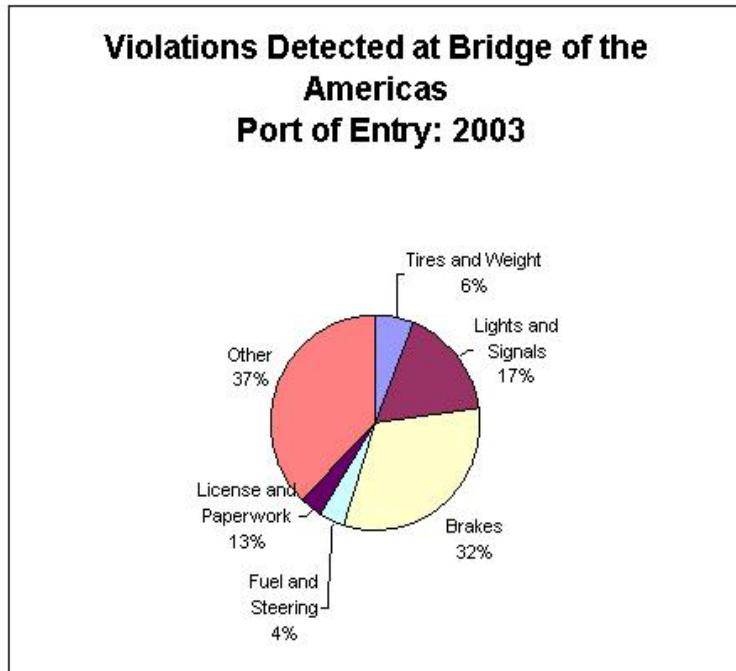
they have been in the past, with the hope being that operators will respond by raising maintenance to the standards of American-operated trucks. As a comparison, information from Texas-Mexico crossings provided by the Motor Carrier Management Information System (MCMIS) from six months in 2003-4 shows trucks of U.S. origin crossing the border were only submitted to a Level 1 inspection 41% of the time. Also, there were over four times as many inspections on Mexican trucks as there are on American trucks (14). This suggests a significant difference in the treatment of Mexican versus American trucks, when considering the selection of vehicles to be inspected.

Figure 2 shows violations recorded at the Bridge of the Americas, a major crossing in El Paso in 2003. This crossing was chosen because it is a large site and has been on-line for the longest of the eight sites, making it more representative of how the other sites should eventually act. The most important safety violations, in terms of most likely to cause a serious accident, are generally considered to be those related to brakes and steering. In 2003, fuel, steering, and brakes accounted for only 36% of the overall violations. Thus, failure percentages and out of service rates reported can be somewhat deceiving since the majority of the out of service citations are not related to critical equipment likely to impact the safety of other road users.



*Figure 2. Type of violations at Bridge of the Americas crossing in 2003*

The increasing number of inspections across the entire Mexican border since the late 1990s has been shown to be effective in lowering out of service rates. Figure 3 shows the total Mexican out of service rates related to the number of inspections from 1997-2001. The figure shows that as the number of truck inspections has increased the out of service rates have fallen steadily (15). This trend would be expected to continue as temporary and then permanent inspection facilities are built and operated in Texas.



*Figure 3. Mexican out-of-service rates*

However, the latest data seems to indicate an apparent plateau in the out of service rates. The DPS data shows that from 2002 until 2004, on average at the eight ports, the VOOS rate dropped from 31% to 28%, and then rose back to 30% the next year. This seems to suggest that an equilibrium of some type may have been reached, where an extra increase in the number of inspections or percentage of crossing trucks inspected does not make a substantial difference on the number of trucks that are put out of service. One possible explanation for this is that the increased inspection rates results in sampling occurring on a more random basis, giving a better approximation of the real proportion of violators, which may not vary substantially. At some point, all trucking companies make a trade-off between increased investments – like maintenance – and cost, such as loss of revenue and fines. Drayage at the border is a somewhat marginal business – rates are fixed and the truckers are largely price

takers. The profit is slim and returns on investment small, so there is likely to be a balancing act carried out where maintenance and tires – the biggest cost items when considering older vehicle operating costs are driving decision making. It is unlikely that rates will approach zero because at some point, economically, a shipping company is better off risking a violation than maintaining all of its short-range drayage trucks in perfect condition.

Equilibrium points in the lower range of VOOS rates in truck citations, must exist for both Mexican and U.S vehicles. So, what are they? In the MCMIS data utilized above, the VOOS rate of American trucks crossing the Texas-Mexico border over a six month period was 25%, while the Mexican trucks in the same area, over the same period, had a 26 %. And Mexican drivers had a lower DOOS rate at 2%, compared with 4% for U.S. drivers (14). As stated earlier, all of data came from a time period when Mexican trucks were being given the more thorough Level 1 inspections – about 30% higher than American trucks. This suggests that there is little difference between the safety of a Mexican truck or driver compared to an American truck or driver at the border ports of entry.

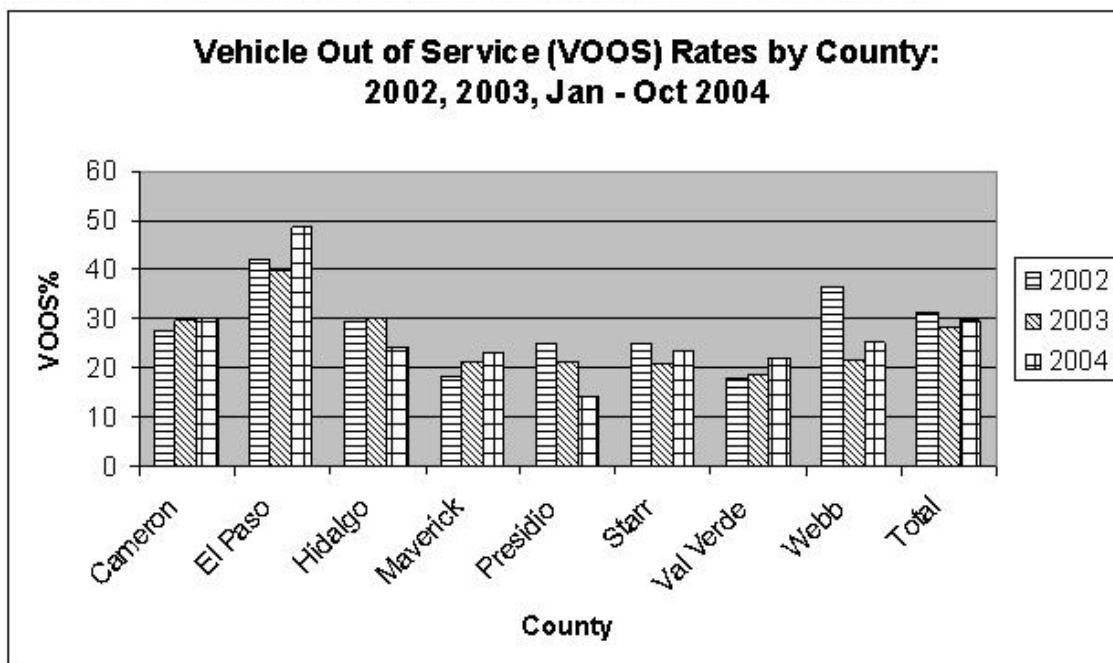
## **Chapter 4. Conclusions and Recommendations**

To the casual observer, the southern U.S. border seems inefficient. Truck trailer interlining, cargo consolidation, differing border customs processes, congested infrastructure and security procedures create a slow moving, multi-step process that manifests itself frequently in long truck lines, noise and air pollution. The drayage system, a necessity until the Supreme Court ruling, is needed to address interlining – insuring that trailers moved to the border by Mexican highway tractors and delivered to truck load U.S truck terminals near the border. This is, of course, a more expensive process than simply driving across the border, as is the case with Canada. One study found that, taking the cost of time into account, over \$7 billion is lost annually because of the drayage system, which amounts to an equivalent tariff of 1-6% (17). This equivalent tariff is contrary to the whole idea of NAFTA and free trade. Clearly, if this is true, both countries would be better off economically without drayage. The problem with this type of calculation is that drayage is capturing all delays at the border, some of which have nothing to do with trucking – like DHS security procedures. Imagine, for example, that all drayage trucks were banned and Mexican over the highway trucks pulled the trailers across the border. They would still be subject to all the U.S customs, immigration and security checks that are currently in force – the leading cause of congestion. Now, expensive tractors and drivers would be delayed, so creating a substantial rise in vehicle operating costs. Paradoxically, drayage is needed because the congestion is so bad. Opening the border at this moment would not remove all of the cost impediments facing truckers whether they be dray or over the highway operators. The answer lies in improving port of entry clearance processes to reduce truck queues, which when combined with border opening will offer operators an opportunity to raise efficiencies.

Aside from the drayage issue, the biggest concern is a safety gap between Mexican and U.S. trucks and drivers. However, the long held opinion that Mexican trucks are less safe is not supported by the post-2000 DPS data. The latest MCMIS data (14) show a difference in VOOS rates of only 0.5% between Mexican and U.S. trucks at the border – an amount that suggests equivalency. It should also be noted that these inspections mostly compare long-haul U.S. trucks with older, short-distance drayage Mexican trucks. Maintaining drayage trucks to the same level as long-haul trucks, other than in key areas such as brakes, steering, lights and tires, is unnecessary since they travel short distances, can be fixed quickly if they break down and never interact with mainline highway traffic. Taking this information into account, this study finds

that it is very doubtful that the average drayage Mexican truck is significantly less safe than its American equivalent.

An interesting question centers on the likelihood that vehicle and driver out of service rates will continue to decline with the planned increase in truck inspections linked to the operation of the large border safety inspection facilities (BSIFs). At this moment, the data does not provide a clear answer. Both VOOS and DOOS rates have increased or stayed



*Figure 4. Vehicle out-of-service by Texas county in 2002, 2003, 2004*

approximately the same in 2004 despite the added inspection effort. The data coming from the border DPS operations seem to suggest that while Mexican trucks are not particularly unsafe, there is not certainty that increasing the rate of inspections will result in significantly lower out-of-service citations. This questions the value of the planned border safety inspection facilities, which will vastly increase the number of inspections, but at a price greater than the \$100 million initially made available for them.

One of the inequalities found between the northern and southern U.S. borders when looking at North American trade is the difference in the proportion of inspected trucks. While there is approximately 50% more U.S. trade with Canada than Mexico in the average year, the FMCSA inspects approximately 50% less Canadian trucks than Mexican trucks (1,16). This

seems to indicate a bias in the treatment of Mexican trucks, which is not justified by the out of service numbers recorded at the border.

It would be understandable to increase border inspections for drug trafficking, security, or immigration, but all of these tasks take place in the federal facilities over which DPS has no responsibility. The planned BSIFs will only be used for increased and more in-depth safety inspections and the planned transfer of vehicle inspections from the federal to the state DPS facility will now not take place complicating the vehicle inspection process and making it potentially a two-part process. Actions by the federal civil service union prevented this transfer so some Mexican trucks are inspected twice, sometimes (it is alleged) with the bizarre situation of a driver getting a citation at the second inspection, having passed the first moments before. This emphasizes the inequity raised earlier. Not only are Mexican trucks inspected at higher rates than Canadian trucks but they can be inspected twice – first by federal safety inspectors, then by state DPS staff.

All analyses from the temporary stations suggest that with the border open, Mexican long distance trucks entering through Texas ports of entry are likely to meet or exceed the safety standards set for U.S. trucking – meeting the key issue of sovereignty set within the NAFTA. It is therefore an open question at this point whether the construction of state-of-the-art inspection facilities, together with greatly increased inspection rates at the border is good public policy when the current DPS operations have brought citations down to a level at, or below, those of regular over the highway trucks operating across the state.



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