Air Quality Concerns Relating to the North American Free Trade Agreement (NAFTA) and Free Commercial Vehicle Travel in California

Report to the California Legislature

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California Environmental Protection Agency
AIR RESOURCES BOARD

This report has been reviewed by the staff of the California Air Resources Board (ARB) and approved for publication. To obtain this report in an alternative format, please contact the Air Resources Board ADA Coordinator at (916) 322-8168.

Questions regarding this report may be directed to Ms. Elizabeth Miller at (916) 322-6212 or efmiller@arb.ca.gov.

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Executive Summary

This report has been prepared at the request of the California Legislative Analyst's Office (LAO) and the Senate Budget and Fiscal Committee to address specific air quality concerns relating to the implementation of the transportation provisions of NAFTA. While the moratorium on free commercial vehicle travel was, in principle, lifted with the Supreme Court's June 7, 2004 decision (i.e., that the United States Department of Transportation's Federal Motor Carrier Safety Administration—FMCSA—was not bound to conduct a full environmental assessment of the impacts of implementing the transportation provisions of NAFTA), the decision to allow entry, which lies with U.S. President George W. Bush and Mexican President Vicente Fox, has not been issued. Subsequently free commercial vehicle travel authorized by NAFTA has not begun and no definitive date has been announced.

The first two questions posed by the LAO require information relating to actual emission increases resulting from free travel within California by commercial vehicles from Mexico. To evaluate actual emission increases and to project growth in emissions over a five-year period, both vehicle emission rates and travel activity data must be determined. Vehicle-related emission "inventories" are derived from complex calculations based on the emission profiles of the target vehicles (i.e., technology type, model year, speed, etc.) coupled with "activity" rates (i.e., number of trips, trip distances, speed profiles, etc.).

Because cross-border travel is still limited to the restricted commercial zone, not only have there not been any actual emission increases due to the implementation of NAFTA, but there has not been an opportunity to determine the many variables necessary to predict the extent of anticipated emission increases. However, the report summarizes what information we have been able to determine or estimate.

Introduction

On June 7, 2004, the United States Supreme Court overturned a 9th Circuit Court of Appeals decision finding that the United States Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) was not bound to conduct a full environmental assessment of the impacts of implementing the transportation provisions of NAFTA.[1] While President George W. Bush has not yet issued a decision to open the border to free commercial vehicle travel (i.e., to date, the moratorium limiting Mexican truck travel in the United States to the "20-mile commercial zone" has not been lifted), he has indicated that he intends to do so once final FMCSA regulations are promulgated.

When the border is officially opened, an additional 30,000[2] heavy duty diesel trucks and buses are expected to cross into the U.S. each day. California's two international border crossings are anticipating accommodating 25-40 percent[3] of this increased traffic which would bring the number of daily vehicle crossings up from the current 3,500 per day to between 12,250 and 17,500 per day.

Preliminary emission impact studies have been based on calculated age characteristics of Mexico's truck fleet. These studies have estimated that 25 percent of Mexico's trucks are model year 1980[4] or older and between 66 percent[5] and 90 percent[6] are model year 1993 or older, and therefore much dirtier than current U.S. and California fleets. (A more recent survey conducted by ARB in the border area found that 27 percent of these vehicles were model year 1993 or older.)

Based on these and other assumptions (e.g., travel patterns, vehicle speeds, etc.), it has been projected that the additional heavy-duty diesel vehicle traffic would generate up to 50 tons per day of smog-forming pollutants and would significantly increase toxic diesel particulate emissions in the southern California region.[7] This would have serious impacts on the region's health, and particularly on the health of those community members living adjacent to any heavily-traveled routes traversed by these vehicles. Additionally, the supplemental emissions generated by the increased truck traffic could impede California's progress towards attaining the federal air quality standards, which could potentially jeopardize billions of dollars in federal transportation funding.

In response to these concerns, the California Legislature adopted and Governor Arnold Schwarzenegger signed into law AB 1009, Pavley (Chapter 873 Statutes of 2004) requiring, to the extent permissible by federal law, that the

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[1] *Department of Transportation v Public Citizen* (2004) 541 US 752.
[2] *Critical Review of "Safety Oversight for Mexico-Domiciled Commercial Motor Carriers, Final Programmatic Environmental Assessment," Prepared by John A. Volpe Transportation Systems Center, January 2002* – Sierra Research, April 2002
[3] Ibid
[4] Ibid
[5] Ibid
[6] *North American Trade and Transportation Corridors: Environmental Impacts and Mitigation Strategies,* IFC Consulting (for the North American Commissions for Environmental Cooperation), August 2001
[7] Sierra Research, April 2002

owners/operators of all commercial vehicles weighing 10,000 pounds or more entering California be able to demonstrate that the vehicle's engine met appropriate federal emission standards when the engine was manufactured. The bill further directs ARB in consultation with the California Highway Patrol to adopt and implement regulations to establish an inspection protocol for ensuring compliance with these requirements.

To administer the inspection protocol required under AB 1009 and to deal with the projected increases in trans-border commercial vehicle traffic, ARB requested and received funding for resources to expand its HDVIP to include additional inspections in California's border areas (i.e., ports of entry for Mexico, Oregon, Nevada, and Arizona) and at the ports of Oakland, Long Beach and Los Angeles. To follow up on this allocation LAO requested Supplemental Report Language in the 2005-2006 Budget Bill and posed several questions regarding emissions increases resulting from Mexican commercial vehicle travel in California.

I. Background

A. NAFTA

NAFTA was initiated in June of 1990 when Mexico's then President Carlos Salinas de Gortari and U.S. President George Bush announced their intention to negotiate a free trade agreement. In November 1993, after considerable debate, the U.S. Congress ratified NAFTA by a vote of 234-201 in the House and 61 to 38 in the Senate. The implementing legislation was signed by President Clinton, and on January 1, 1994, NAFTA went into effect.

Years of legal controversy followed over numerous NAFTA issues, particularly on the impacts NAFTA would impose on the environment. On June 7, 2004, the U.S. Supreme Court overturned a 9th Circuit Court of Appeals decision that had directed the U.S. Department of Transportation Federal Motor Carrier Safety Administration (FMCSA) to conduct a full environmental impact study as required under the National Environmental Policy Act and a full State Implementation Plan (SIP) conformity determination as required under the Federal Clean Air Act Amendments of 1990.[8] Although the Supreme Court reversed the Appellate Court decision, FMCSA has to date not promulgated final regulations, and the moratorium limiting Mexican truck travel into the U.S. to a "20-mile commercial zone" has remained in effect.

Full execution of the transportation provisions of NAFTA is imminent, delayed only by negotiations between the U.S. and Mexico on implementation of U.S. safety regulations.

B. Heavy-Duty Vehicle Inspection Program

ARB has administered the Heavy-Duty Vehicle Inspection Program (HDVIP) in conjunction with the California Highway Patrol since 1991. Under this program inspectors examine heavy-duty vehicles traveling in the state to make sure that their smoke emissions do not exceed specific opacity standards and that the engine's emission control system has not been tampered. The program is enforced throughout

[8] *Department of Transportation*, *supra*, 541 US 752.

the state at CHP weigh stations, at California's shipping terminals (e.g., Ports of Los Angeles, Long Beach and Oakland) and at random roadside locations.

In preparation for the implementation of NAFTA, Senator Steve Peace authored legislation (Senate Bill 270, Chapter 727 Statutes of 1998) that requires ARB to maintain inspection operations at two California-Mexico border crossings (i.e., Otay Mesa in the San Diego region and Calexico in Imperial County) and perform random roadside inspections in the border area. These two stations have been on line since 1999 and have tested over 13,000 vehicles. The opacity test failure rate in the border region has consistently been higher than throughout the rest of the state, which lends credence to the generally-held assumption that Mexican commercial vehicles are older and dirtier than those registered in California.

The HDVIP has provided a foundation upon which a number of regulations have been built to address emissions of diesel smoke from commercial vehicles. In addition to border crossing inspections and random roadside testing, ARB participates in periodic multi-media enforcement events at California's ports. These events incorporate enforcement activities performed by a number of law enforcement entities including smoke opacity, illegal fuel, and engine certification/computerized emissions control systems inspections, and enforcement of idling regulations by ARB, safety inspections by the California Highway Patrol and local police, and freight and security inspections by the U.S. Coast Guard and Immigration and Customs Enforcement (a Division of the U.S. Department of Homeland Security). As proposed, the regulations required under AB 1009 will be enforced as an element of the existing HDVIP regulations.

C. Heavy-Duty Diesel Engine and Fuel Standards

Mexico began certifying new heavy-duty diesel engines in 1994. Prior to that date, new diesel-powered engines installed in heavy-duty vehicles were not required to meet any emissions standards. In 1994, Mexico's newly established emission standards for diesel-powered engines were aligned with the U.S. EPA standards and continued to be so through the 2003 model year. Mexico did not revise its emission standards to reflect the recent tightening of U.S. standards that require a 50 percent reduction of NOx for 2004-2007 engines and a 90 percent reduction of NOx and PM for 2007 and subsequent model year engines. (See Figures 1 and 2, below.)

While Mexico could readily have adopted the 2004-2006 standards, the more stringent 2007 and later model-year standards also require the use of ultra-low sulfur diesel (ULSD) fuel (i.e.,15 parts per million sulfur) which will be required throughout the U.S. beginning in 2006. Mexico has announced its intention to require the use of ULSD in the border regions beginning in 2007, and has set a goal to extend the standard to the rest of the country by 2009. The Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT – Mexico's Environmental Protection Agency) is currently revising existing fuel regulations to implement these changes. In addition, Petróleos Mexicanos, the national oil company of Mexico (generally known as "PEMEX") has been authorized to commit $2.5 billion over the next five years to update refinery operations to produce low sulfur diesel and gasoline fuels.

Figure 1

Heavy-Duty Diesel Engine Standards: NOx
U.S.—California--Mexico
(grams/brake-horsepower-hour)

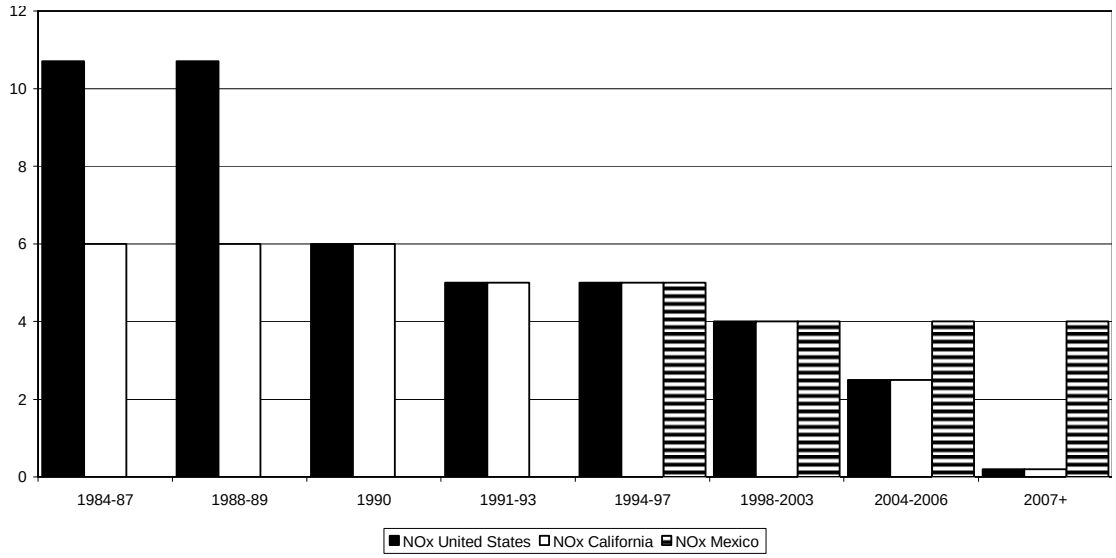
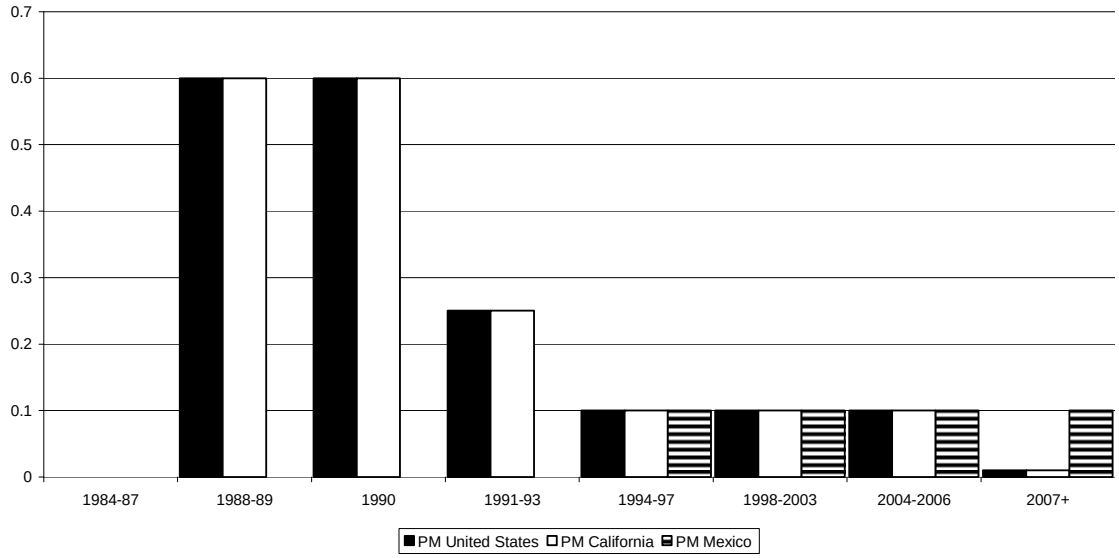


Figure 2

Heavy-Duty Diesel Engine Standards: PM
(grams/brake-horsepower-hour)



II. Responses to Specific Inquiries

Question 1. *What are the actual increases in emissions resulting from free commercial vehicle travel between the United States and Mexico as a result of NAFTA implementation?*

Question 2. *What will the increases in emission be over the next five years?*

As previously noted, full implementation of NAFTA has yet to take place, and therefore anticipated associated emissions increases have not occurred. After the border opens, ARB will collect the information necessary to develop an accurate emissions inventory and project growth in vehicle travel.

An early study (*Critical Review of "Safety Oversight for Mexico-Domiciled Commercial Motor Carriers, Final Programmatic Environmental Assessment," Prepared by John A. Volpe Transportation Systems Center, January 2002* – Sierra Research, April 2002) indicated that an additional 30,000 heavy duty diesel trucks and buses could be expected to cross into the U.S. each day, with approximately 25-40 percent of these adding to the 3,500 crossings currently experienced by California. It also estimated that Mexico's older and more polluting fleet would generate up to 50 tons per day of smog-forming pollutants and would significantly increase toxic diesel particulate emissions in the southern California region. While this study is a preliminary work, it is generally considered to be the definitive treatise on the potential impacts of cross-border commercial travel in California.

Anecdotal reports (i.e. conversations with Mexican fleet owner/operators) indicate that the vehicles currently traveling within the commercial zone will be used for long-haul trips when the travel restrictions are removed. These carriers have suggested that they anticipate the majority of their trips will be to and from the ports in Los Angeles and Long Beach. These will have the most impact on the southern California region with potentially acute effects on communities located adjacent to heavily traveled routes. Additionally, increased crossings at the California/Arizona border on Interstate 8 are expected as Mexican trucks from the Nogales region and trucks from Texas and New Mexico come west to use the Ports of Los Angeles and Long Beach.

As technical support for the rulemaking required under AB 1009, Pavley (Chapter 483 Statutes of 2004), ARB conducted a survey of heavy-duty commercial vehicles in the California-Mexico border region to determine the certification profile of the engines that will be subject to the regulations. Using these preliminary fleet characteristics as well as assumptions culled from existing studies and models, ARB estimates that implementation of the regulations* would potentially prevent emission increases of oxides of nitrogen (NOx) and particulate matter (PM) as follows:

Statewide:	**2.9 tons/day NOx**	**0.12 tons/day PM**
South Coast Air Basin:	**1.1 tons/day NOx**	**0.04 tons/day PM**

Clearly, these emissions estimates appear to differ significantly from those noted in the Sierra Research report. The distinction lies in the assumptions of the fraction of U.S. commercial vehicle travel that would be displaced by Mexican vehicles and the number of Mexican vehicles that are not certified to emission standards aligned with the federal

emission standards. The Sierra Research study estimated a 50 percent displacement rate while ARB's estimates, based on a sampling of vehicles in the border areas, were closer to 1 percent. Additionally, the ARB's estimates do not project future displacement rates. Following full implementation of NAFTA, the ARB will observe the actual vehicle displacement and scale the emissions impacts accordingly.

*(*The bill and ensuing regulations require that all heavy-duty commercial vehicles entering California be able to demonstrate that their engines met U.S. emission standards at the time they were manufactured.*)

Question 3. *What is the level of emission reductions achieved by the HDVIP along the border and at the Port of Long Beach and Port of Los Angeles?*

Because the impacts of heavy-duty diesel emissions on public health are of particular concern in the border region and in the neighborhoods surrounding the ports, ARB has focused a great deal of its HDVIP enforcement in these areas. The most recent data available (January 2004 through September 2005) show that approximately 27 percent of all HDVIP inspections during that period were performed at the ports and in the border areas.

It is important to note, however, that the HDVIP measures and enforces smoke opacity standards and not actual emissions of NOx and PM, and while emissions can be estimated from opacity data, conversion is not straightforward. Additionally, while remote emission sensors and portable emissions monitors are currently used to gather emissions data from in-use heavy-duty diesel vehicles, no existing technologies are sufficiently robust for enforcement use.

As the HDVIP regulation was under development, emission reductions were modeled for NOx and PM based on the projected fleet profile for 2010. The model assumed that 100 percent compliance would yield 14 tons/day emission reductions of NOx (statewide) and 3.2 tons/day reductions of PM. Extrapolating from these modeled reductions, and assuming that 27 percent of all inspections take place at the ports and in the border areas, 100 percent compliance (i.e., all vehicles that failed the inspection were repaired and all citations were cleared) would yield 3.8 tons/day emission reductions in NOx and 0.86 tons/day of PM. In reality, of the vehicles tested in border regions and at the ports, approximately 50 percent of the citations remain delinquent (i.e., the engines have not been repaired and the citations have not been cleared). A 50 percent rate of "full compliance" would yield emission reduction estimates of 1.9 tons/day NOx and 0.43 tons/day of PM for the border regions and ports.

Question 4. *What state actions have been taken to maximize federal funds available to address the environmental impacts of free commercial vehicle travel?*

ARB has been an active participant in the Border 2012 U.S.-Mexico Environmental Program (Border 2012), a 10-year environmental cooperation program launched in 2003 by the governments of Mexico and the U.S. in response to the continuing environmental and public health problems in the border region. This program is an important source of federal funds for addressing environmental problems in the area.

Through Border 2012, ARB has secured a $100,000 grant from the U.S. EPA to characterize the Mexican truck fleets operating in California. Current estimates of the impact of Mexico's trucks on California's air quality rely heavily upon assumptions regarding the size and composition of the Mexican commercial fleet that will travel through the state, how these vehicles will be driven, and how far north into the state these vehicles will travel. ARB is designing a study to better estimate the impact of these vehicles on the state's air quality. Information will be collected from roadside surveys, vehicle inspections, fuel samples, and from databases maintained by Immigration and Customs Enforcement (a Division of the U.S. Department of Homeland Security), the ports of Los Angeles and Long Beach, and the California Highway Patrol. The more accurate estimates of the impact of Mexico's commercial vehicles on the state's air quality will allow ARB to better address these emissions through the air quality planning process.

ARB is also a major partner in the West Coast Diesel Collaborative, a consortium of federal, state and local government agencies, non-profits and industry working together to find voluntary solutions, incentives and shared approaches to reducing diesel pollution along the west coasts of Canada, the United States, and Mexico. Through the West Coast Diesel Collaborative, U.S. EPA awarded the San Diego County Air Pollution Control District $150,000 for a demonstration project on the feasibility and effectiveness of diesel retrofit technologies on heavy-duty diesel vehicles that operate in the San Diego-Tijuana region. The West Coast Diesel Collaborative's goal is to ultimately secure $100 million through public/private partnerships to address and solve the diesel pollution problems along the west coast.

In addition, ARB has actively participated in the U.S.-Mexico Air Policy Forum (APF), one of the coordinating bodies under Border 2012, which is responsible for prioritizing federal policies on border wide air quality issues. ARB, along with air quality agencies from other border states, has successfully advocated for the recognition of cross-border heavy duty diesel truck emissions as one of the issues that require ongoing dialogue between the two countries, and which should be at the forefront of the APF's funding priorities. ARB plans to seek funds allocated through the APF's prioritization process to address the impact of Mexico's commercial vehicles on the state's air quality.