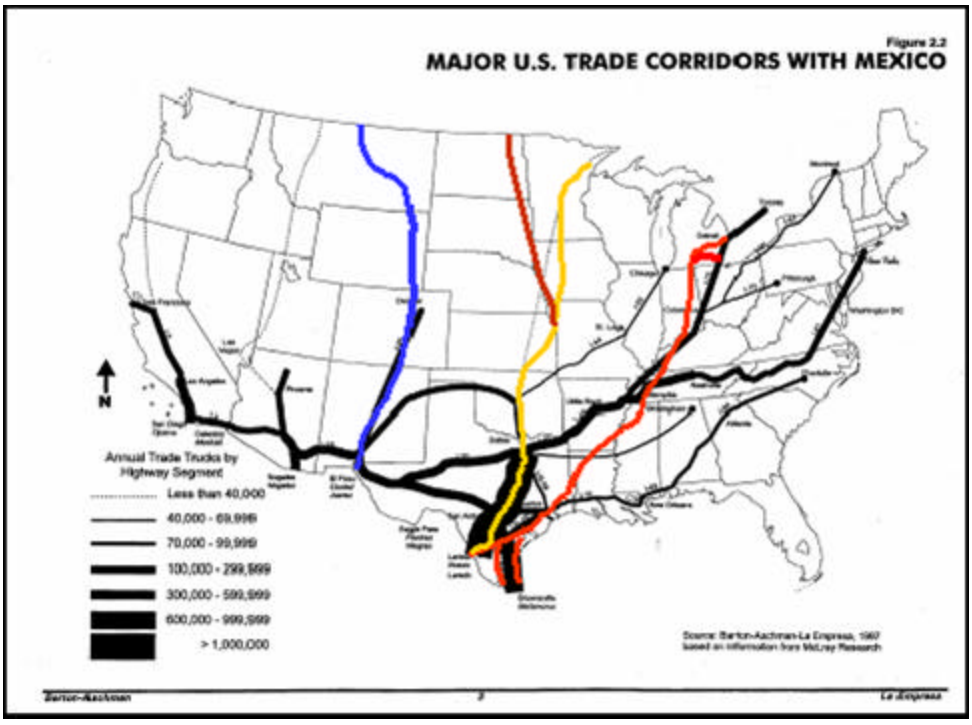
CHAPTER 9: THE ENVIRONMENTAL ECONOMIC CONSEQUENCES OF BORDER INDUSTRIALIZATION IN THE NAFTA ERA

The North American Free Trade Agreement (NAFTA) was implemented in January 1994, removing many barriers to trade between the U.S., Mexico, and Canada. As a result of NAFTA, trade and investment have increased dramatically in the Texas Borderlands. As a part of the NAFTA environmental agreements, institutions such as the Border Environment Cooperation Commission (BECC), and the North American Development Bank (NADB) were established, and Environmental Protection Agency (EPA) Border offices were put in place. In addition, the EPA and its Mexican counterpart have developed a series of plans designed to improve environmental conditions along the U.S.–Mexico Border.

The question remains, however, what strain on the Border's environmental infrastructure has been brought about by the industrialization of the region? While experts' answers differ, it is clear that the burden on environmental infrastructure and institutions has been enormous. Many critics argue that the mechanisms set up to deal with the consequences of industrial and population growth have proven to be woefully inadequate. And although the effects are felt most acutely on the Border, the chart *Major U.S. Trade Corridors with Mexico* shows that NAFTA has had an impact throughout the U.S.



This chapter examines the history of trade liberalization in the Border Region, binational institutions developed to address the resulting environmental stress, and

finally, an overview of environmental and economic conditions along the Border in the post-NAFTA era.

History

In the early 1990s, some cities lacked wastewater treatment facilities, and millions of gallons of untreated sewage fouled waterways and beaches along the Border. In Ciudad Juarez, 55 million gallons of raw sewage per day were released into the Rio Grande. A sizeable population of Border residents suffered from health problems, such as asthma and high blood lead levels. Emissions from vehicles, industrial sources, burning trash, residential heating, and dust from unpaved roads contributed to poor air quality. The chart *The U.S.-Mexican Border Environment* provides a brief overview of programs and legislation designed to assist those living in the Border Region.

The U.S.-Mexico Border Environment

1889-1965	
1889	International Boundary Commission (IBC) created
1944	International Boundary and Water Commission (IBWC) created
1964	Maquiladora program initiated in Mexico
1965-1990	
1982	SEDUE (Mexican environmental agency) established
1983	Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area (La Paz Agreement) signed
1986	Mexico joins the General Agreement on Tariffs and Trade (GATT)
1988	Mexico General Law for Ecological Equilibrium and Environmental Protection enacted
1990	U.S.-Mexican Border environmental working groups established
1990-1992	
1990	Presidents Bush and Salinas agree to pursue a North American Free Trade Agreement
1992	First U.S.-Mexico Border environmental plan (Integrated Border Environmental Plan for U.S.-Mexico Border Area) initiated Secreteria de Desarrollo Social (SEDESOL) created Good Neighbor Environmental Board created
1992-1993	Negotiations of NAFTA and environmental side agreements begin
1992 Early NAFTA Era	
1993	Negotiations of environment and labor side agreements begin The Commission on Environmental Cooperation (CEC), the Border Environment Cooperation Commission (BECC), and the North American Development Bank (NADB) established

1994	Mexico joins the Organization for Economic Cooperation and Development (OECD) President Zedilló administration begins, Secreteria de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAT) created (Mexico's environmental agency)
1995	Staff and operating procedures established for CEC, BECC, and NADB
1996	Second Border environmental plan initiated: U.S.-Mexico Border XXI Program
1996	Mexico's General Ecology law revised
1998	*OCED Performance Review of Mexico* published
2000	*U.S.-Mexico Border XXI Progress Report* published U.S. Mexico Border Health Commission created
Post-2000	
2001	Third border environmental plan, *Border 2012*, initiated
2004	President Bush signs H.R. 254, allowing for expansion of the NADB/BECC jurisdiction to include communities in Mexico up to 300 km from the Border.

Source: Southwest Center for Environmental Research and Policy

Against this backdrop, the United States, Mexico, and Canada negotiated a free trade agreement, which some advocates saw as an opportunity to enhance economic growth and generate new resources to address infrastructure and environmental problems on the Border. These problems, long recognized at the local level, gained national visibility as the trade debate intensified.

While certain mechanisms for improving Border environmental conditions have been put in place as a result of trade negotiations, the resources and scope of these mechanisms fall woefully short of what is needed. Expanded trade, population growth, and increased industrialization continue to tax the already stressed Border environment, and efforts, leadership, and resources to address these consequences are inadequate.

The Maquiladora Program- A Precursor for Border Industrial Growth

Increased stress on the Border environment began soon after the Mexican maquiladora program began in 1964. Maquiladoras are product assembly factories, the majority of which are located in the Mexican Border region. The program has grown dramatically since its inception. The expansion of the maquiladora sector, however, occurred without corresponding development of basic infrastructure, such as water and wastewater treatment plants, municipal and hazardous waste management facilities, or roads. The maquiladoras are also a magnet for domestic migration. The population growth resulting from industrialization with its associated urban sprawl, congestion, waste, air pollution, and increased depletion of natural resources was a major source of environmental stress.[1]

The overall result of Border industrial expansion was serious pollution, as well as increased demand for land, energy, water and environmental services. These environmental consequences, however, were slow to draw the attention of the U.S. and Mexican governments. Within Mexico, there was a perception that its northern Border, with its low unemployment and relatively high wages, did not merit particular attention. Moreover, since virtually all tax revenue from the maquiladora sector is federal, the decisions on how to use these resources are not made in the Border region. Compounding the problem is the fact that, since materials are imported to the maquiladoras, the factories do not have local suppliers. There are comparatively few entrepreneurial opportunities to create locally generated profits that could be cycled back into these communities.

The 1983 La Paz Agreement

The Agreement Between the United States and Mexico for the Protection and Improvement of the Environment in the Border Area (La Paz Agreement), signed in 1983, established the first binational framework for cooperation on environmental issues. The U.S. EPA and Mexico's environmental counterpart, SEMARNAT, acted as the national coordinators of efforts to address Border environmental problems. Under the La Paz Agreement, a Joint Advisory Committee (JAC) made up of 20 members, 10 from each country, was formed to make recommendations on improving air quality in the Paso del Norte airshed. Other formal workgroups, comprised of federally appointed governmental and academic experts make additional policy recommendations concerning water, air, contingency planning, emergency response, hazardous waste, enforcement cooperation, and pollution prevention. However, because the La Paz Agreement lacks any formal venue into national policies, some critics continue to see it as more symbolic than practical.

Programs Negotiated with NAFTA

Integrated Border Environment Plan (IBEP) 1992-1994

The IBEP was the first binational federal initiative created under the assumption that increased trade liberalization would create additional stress for the Border environment. The plan was initiated in 1992 amid NAFTA negotiations. It proposed strengthening enforcement of environmental laws, increasing cooperative planning, expanding wastewater treatment facilities, and developing a computer tracking system on transboundary movement of hazardous wastes. Because the IBEP lacked an implementation plan, it was widely criticized as nothing more than a plan to plan. There was also concern that the plan's policies were dictated by the federal capitals, rather than by residents of the Border Region.

Good Neighbor Environment Board (GNEB)

The Good Neighbor Environmental Board was created in 1992 to advise the President and Congress on environmental and infrastructure issues and needs in the U.S. border states. Board membership includes representatives from certain U.S. government agencies, Arizona, California, New Mexico, and Texas' state governments, and from private organizations, including community development, academic, health, environmental, and other nongovernmental entities. The board has made numerous recommendations, and while EPA workgroups and other Border institutions have implemented some of these recommendations, it does not have high visibility among federal officials.

The North American Free Trade Agreement (NAFTA)

NAFTA negotiators reached initial agreement in August 1992. The task of selling NAFTA to the U.S. Congress fell to then President-elect Bill Clinton, who would take office in January 1993. As a candidate, Clinton had announced conditional support for NAFTA, dependent on the establishment of satisfactory side agreements on environment and labor. A statement that Clinton made in October 1992 became the basis of the U.S. negotiating position for the environmental side agreements:

> *"Before we implement the agreement, we must establish an environmental protection commission with substantial powers and resources to prevent and clean up water pollution. The commission should also encourage the enforcement of the country's own environmental laws through education, training and commitment of resources and provide a forum to hear complaints. Such a commission would have the power to provide remedies, including money damages and the legal power to stop pollution." (Gov. Bill Clinton, North Carolina State University, Raleigh, NC, Oct. 1992)*[2]

NAFTA was the first major trade agreement between developed and developing countries and between partners with significant economic inequalities. NAFTA's primary goal was to promote trade and cross-Border investment by reducing tariffs and other barriers. The NAFTA Agreement included provisions concerning:

- Tariff liberalization
- Rules of origin for content in manufactured goods
- Foreign investment
- Financial services
- Intellectual property
- Government procurement
- Trilateral side agreements on labor and the environment
- Bilateral agreements on the border environment

However, NAFTA did not include:

- A labor agreement. Although some 63 professional occupations were able to move freely within the NAFTA region, there were no provisions for unskilled labor;
- An agreement to develop the human and physical capital of the poorer regions of the NAFTA areas in order to achieve convergence and full integration; and
- A program for Border regional development to directly benefit Border residents.[3]

Many environmental and consumer groups feared that NAFTA would result in a reduction of U.S. environmental standards, or that companies would relocate to Mexico to lower labor costs and avoid U.S. environmental regulations. Critics viewed Mexico as a pollution haven and argued that by promoting investments in Mexico with its limited enforcement of environmental and labor standards, NAFTA would exert a downward pull on environmental, labor and health standards throughout the region.

The Environmental Side Agreements

The Commission on Environmental Cooperation (CEC), created under the NAFTA side agreements, obligates countries to enforce their laws and regulations. Provisions of this agreement allow for citizen complaints when this obligation is not met. This side agreement also establishes a council of environmental ministers and an independent secretariat to assist in implementing the overall agreement, to manage dispute settlements, and to assess the environmental effects of NAFTA.

The Border Environment Cooperation Commission (BECC) was established to prepare and certify environmental infrastructure projects, and the North American Development Bank (NADB) was established to leverage private-sector capital for financing construction of BECC-certified projects. The institutional design of the BECC and the NADB was a departure from earlier approaches to bi-national infrastructure development, which previously had been largely administered through the International Boundary Water Commission (IBWC). Since NADB has not had the full faith and credit of the United States backing loans, a common criticism is that the cost of money from that bank is higher than market. This has severely restricted the flow of infrastructure money to communities across the border with great need. The NADB was capitalized with $225 million from each country and given the ability to draw on additional callable capital.[4] The chart *Projects with NADB Financing* shows where the greatest environmental resources are invested.

Projects with NADB Financing, 2003

Sector	Cost
Water and Wastewater	$1,344,384,246
Solid Waste	$13,281,296
Air Quality	$31,700,000
Total	**$1,389,365,542**

Source: North American Development Bank

The NADB was augmented in 1997 by the creation of the Border Environmental Infrastructure Fund (BEIF), which provides grants for water and wastewater projects.

The NADB has also established an Institutional Development Program, (IDP) primarily for utility capacity building.

The BECC, with headquarters in Ciudad Juarez, Chihuahua, was designated to assist local communities and other sponsors in developing and implementing environmental infrastructure projects, and to certify projects for NADB financing. BECC was augmented by grant funds from EPA for its Project Development Assistance Program (PDAP). To be certified by the board of directors, project sponsors must comply with general standards in several areas, including: (1) the environment and human health, (2) technical feasibility, (3) financial feasibility, (4) community participation, and (5) sustainable development. The chart *BECC Certification Criteria* further describes the criteria and requirements for BECC certification.

BECC Certification Criteria

Criteria	**Brief Description of Requirements**
Human Health and Environment	• human health and environmental need • environmental assessment • compliance with applicable environmental and cultural resource laws
Technical	• appropriate technology • operation and maintenance • compliance with applicable design regulations and standards
Financial and Project Management	• financial feasibility • fee/rate models • sound project management
Community Participation	• comprehensive community participation plan, including steering committee and public meetings to guarantee local community support
Sustainable Development	• compliance with principles of sustainable development • institutional and human capacity building • natural resource conservation • community development

Source: Southwest Center for Environmental Research and Policy

The U.S. and Mexican federal governments, recognizing that most communities in the Border area were not able to finance projects on their own, also committed to providing construction. As the BECC and NADB evolved, the U.S. government, through the EPA, made the decision to administer much of the U.S. portion of these appropriations through the BECC via its Project Development Assistance Program and the NADB.

Working alongside the BECC and NADB to ensure coordination is the Texas Commission on Environmental Quality (TCEQ). The TCEQ has a Division of Border Affairs to ensure that the BECC's certification process of Texas Border environmental infrastructure projects and the TCEQ's regulatory review of the projects are compatible.

Post-NAFTA Environmental Programs

Border XXI

The Border XXI Program was an effort to get the U.S. and Mexico to work cooperatively toward sustainable development through protection of human health and the environment and proper management of natural resources in both countries. It is the follow-up program to the IBEP.

The principal goal of Border XXI was to promote sustainable development in the Border Region by seeking a balance among social and economic factors, and environmental protection in Border communities and natural areas. The central strategy of Border XXI consisted of three components: public involvement; decentralization of environmental management through state and local capacity building; and improved communication and cooperation among federal, state, tribal, and local government agencies. Border XXI defined five-year objectives for the Border environment, as well as mechanisms for fulfilling those objectives.

Nine binational Border XXI workgroups implemented the program by integrating the efforts of participating entities and defining specific projects to meet Border XXI objectives. Each workgroup operated under the guidance of a U.S. and Mexican co-chairperson. The workgroups ensured effective coordination of bilateral efforts by bringing together federal agencies from both countries with interests in a given issue.

Border 2012 Program

Border 2012, the next iteration of the Border XXI program, was initiated in 2002. As a U.S.-Mexico binational partnership involving federal, state, local and U.S. tribal governments, the program's mission is to protect public health and the environment in the U.S.-Mexico Border Region, consistent with the principles of sustainable development. Border 2012 operates as a regionally-based program working to achieve a specific set of environmental and human health objectives. A three-tiered level of organization consisting of regional workgroups, local task forces and Border-wide policy forums carries out the programmatic work.

Stakeholders bring their perspectives to bear in the evaluation of projects proposed to address the environmental priorities within each region. The stakeholders represent local, state, tribal and federal governments, as well as communities, businesses, environmental organizations, academia and other interested entities. U.S. and Mexican federal agencies participate in regional workgroups. The regional workgroups are supported by local task forces.

Under the program, U.S. and Mexican federal agencies address issues that may be more effectively approached from a Border-wide perspective in a series of policy forums. This effort is led by SEMARNAT (Mexico's version of the EPA), the ten Border states, U.S. Border tribes, and other federal and state agencies. The Border 2012 program funds

task forces, workgroups and policy forums on such topics as the integration of sustainable development principles into Border programs.

On the U.S. side, at the policy forums, citizens expressed a range of concerns including water quality and quantity, wastewater, power plants, unpaved roads, wood burning, exposure to pesticides and toxic metals, used-tire piles, and hazardous-materials transportation through populated areas. They called for solutions to air basin and watershed problems. Programmatically, they supported the proposal for regional task forces but expressed concern about sufficient funding. Tribal participation, industry involvement, participation of natural resource agencies, and environmental education were also named as priorities. After revising the Border plan to reflect stakeholder input, the draft plan was finalized in 2003, and has been partially implemented.

Along with the Border XXI and Border 2012 Programs is the Southwest Center for Environmental Research and Policy (SCERP). With the assistance of an advisory council composed of experts from multiple disciplines, SCERP conducts research on the environment and develops Border policies to promote a higher quality of life for Border residents. In order to improve the environment and keep ecological systems intact, SCERP uses input from binational, state, tribal, and local policy-makers. SCERP is currently conducting numerous environmental studies dealing with such Border issues as agricultural burning, sewage treatment and levels of enteric disease, and thermoplastic waste in manufacturing in the El Paso-Ciudad Juárez Area.

The Impact of Industrialization on the Texas Border Environment

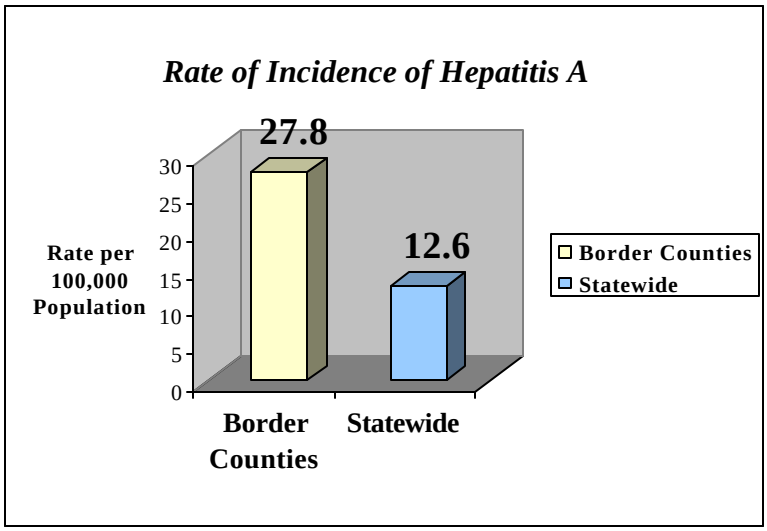
The U.S. General Accounting Office reported in 1999 that $3.3 billion would be needed to meet existing infrastructure requirements on both sides of the Border for potable water, wastewater treatment, and solid waste disposal. About 77 percent of this amount would be needed for wastewater treatment.[5]

Water

Population and industrial growth along the border stimulated by NAFTA has created large demands for clean and safe drinking water. In the United States, the lack of access to safe drinking water is associated primarily with colonias – small, peri-urban communities that are located mainly along the Border. A 1998 Texas A&M University document reported that 50 percent of the estimated 350,000 colonias residents lacked access to safe drinking water. In addition, due to population growth, major Border sister cities such as El Paso/Ciudad Juarez may face serious drinking water shortages unless additional water sources of potable water are found.[6]

One of the greatest threats to water quality in the Rio Grande also stems from the increase in Border population, which is straining community water and wastewater treatment plants. Without adequate service, raw or poorly treated wastewater is more likely to enter the river, increasing bacteria levels and contributing to an increase in levels

of waterborne diseases such as hepatitis A and shigellosis. As seen in the chart *Rate of Incidence of Hepatitis A*, on the next page, the rate of incidence statewide in Texas was less than half of that in the 14 Border counties.[7]



Source: Texas Commission on Environmental Quality

On the U.S. side, the majority of municipalities have EPA approved, publicly owned wastewater treatment plants. U.S. colonias which are usually outside of established water districts, generally do not have access to sewer and wastewater disposal systems. On the Mexican side of the Border, Mexico's National Water Commission estimated that in 1997, while 69 percent of the population lived in residences connected to sewage collection systems, only 34 percent of the collected wastewater was treated. In a few communities, raw or insufficiently treated wastewater eventually flowed into surface and drinking water sources shared by both countries.[8]

The International Boundary and Water Commission released in 2004 the final report in a series of studies of pollutants in the Rio Grande. The report on the *Rio Grande Toxic Substances Study* can be accessed online at http://www.ibwc.state.gov/PAO/CURPRESS/2004/RGToxicStudy.pdf.[9]

Air Pollution

Air quality also continues to be a major problem, as many residents in Border cities are exposed to health-threatening levels of air pollution from a variety of sources. According to the EPA, 14 Border cities in 1999 exceeded or were expected to exceed at least one of the ambient air quality standards set by their respective federal governments. Rapid urbanization and industrialization are responsible for most of the air pollution problems in the Border Region. The citizens of El Paso/Ciudad Juarez have long been exposed to high levels of air pollution. According to the Joint Advisory Committee on Air Quality, the sources of this pollution are emissions from the increasing vehicular

traffic in the area, dust from unpaved roads and the surrounding desert, open burning, fireplaces and wood-burning stoves, and industrial activity.[10]

The Ninth Report of the Good Neighbor Environmental Board identifies the increasing vehicular traffic at border crossings as a particular area of concern:[11]

> Along the U.S.–Mexico border, vehicle traffic has been steadily increasing over the past 15 years due to population growth, a booming economy, and rapidly expanding bilateral trade that is carried primarily by trucks. Mobile sources are major contributors of urban air pollution, and cause the formation of carbon monoxide, ozone, nitrous and sulfurous oxides, hydrocarbons and particulate matter. The increased traffic, passenger-vehicle fleet characteristics, and an aging drayage fleet (short-range commercial trucks used to deliver freight across the border) have concerned public and health officials. A health study conducted in November 2003 by the Commission for Environmental Cooperation of North America in the El Paso, Texas — Ciudad Juárez, Chihuahua urban region observed a significant association between ozone ambient levels and respiratory-related emergency visits by children.

Efforts are underway to reduce harmful diesel truck emissions. For example, the U.S. and Mexican governments are working to reduce sulfur levels in gasoline and diesel fuel beginning in 2006. U.S. EPA regulations require new heavy-duty diesel engines to equipped with advanced pollution controls starting in 2007. While these actions will reduce emissions from border truck traffic, there may continue to be localized "hot-spots" of pollution due to the sheer magnitude of traffic at border crossings and the slow turnover of diesel engines.

The EPA identifies six criteria pollutants – ozone, nitrogen dioxide, sulfur dioxide, particulate matter, carbon monoxide, and lead. If a geographical area is not in compliance with one of the criteria pollutants, the EPA may designate it a nonattainment area. El Paso is designated nonattainment for two pollutants, particulate matter and carbon monoxide.

In addition to the criteria pollutants, the EPA maintains a list of pollutants also potentially harmful to public health and the environment, called hazardous air pollutants (HAPs). The HAPs are also referred to as air toxics. Big Bend National Park and Guadalupe National Park in West Texas have problems with regional haze, and citizens in the Laredo area have expressed concern about carbon monoxide, even though the area is in compliance.

For more than a decade, residents and local officials have worked to lower high emissions of ground-level ozone, carbon monoxide, and particulate matter. In fact, according to the Texas Commission on Environmental Quality (TCEQ), El Paso was the only Texas city having to deal with nonattainment in three different pollutants. El Paso has already shed nonattainment status for ground-level ozone and expects to do the same for carbon monoxide. El Paso is working toward becoming the first Texas city to turn around its air quality profile and one of the few U.S. cities to go from nonattainment to attainment for more than one pollutant.[12]

The success of El Paso's clean up campaign can be attributed to a number of entities all working toward a common goal. According to TCEQ several measures have been put in place to help ensure cleaner air, which include:

Tailpipe inspections- Annual emissions testing for cars and trucks in El Paso have been in place since 1987, based on the two-speed idle test. Vehicles failing the test must be repaired and retested.

Alternative gasoline - Gasoline throughout the country is sampled to ensure that its quality meets required standards. In the winter, all vehicles go to oxygenated fuel to run cleaner and reduce carbon monoxide levels. In the summer, motorist switch to low Reid vapor pressure gasoline to control evaporation and reduce the rate of ozone formation.

Vapor recovery - All commercial gasoline pumps are equipped with Stage II vapor recovery systems. During fueling, the vapors escaping from vehicle gas tanks are captured and directed to underground storage tanks. Fuel delivery trucks must be similarly equipped with Stage I vapor recovery to minimize vapor leaks while filling fuel tanks.

Pollution prevention - The transportation of dirt and debris is regulated to prevent particulate matter from becoming airborne. Construction sites are required to water the ground surface as land is disturbed. Open burning is prohibited except by permit, and then closely monitored. When weather conditions warrant, such as during wintertime inversions, the use of residential fireplaces is prohibited. Projects that involve the removal of asbestos are monitored for compliance.

Public participation - Residents are asked to call a local complaint line when they see any infractions of local or state environmental rules. Calls are kept confidential.

Cactus Rustling

The current trend in home landscaping has focused on Xeriscape, a concept that conserves water and protects the environment. Select trees, shrubs, and groundcovers are selected based on their adaptability to a region's soil and climate. The desert southwest has used its native desert plants as a new means of conserving water under the Xeriscape landscape model. Stringent Arizona laws regulating desert plant trade, have made the West Texas desert a prime target for the illegal harvesting of cacti and other succulents. So called "cactus rustlers" take desert plants from public and/or public land with out permission. These plants are then sold for profit in Texas and other states, especially

Arizona and California. Some private landowners have also begun harvesting desert plants on their own land. The removal of these plants in large numbers is seriously damaging to the delicate desert ecosystem. A recent study commissioned by the World Wildlife Fund-US concluded that some of the plants Amay become threatened and even disappear locally if conservation measures are not implemented.@

During the 78th legislative session, Senator Shapleigh worked with Rep. Robert Puente (D-San Antonio) to author S.B. 970 which requires that those who harvest specified desert plants be registered with the Texas Department of Agriculture (TDA). To ensure that a shipment of desert plants was harvested by someone who is registered, TDA would have issued identification markers with each registration. An identification tag would have been required for every transaction involving the sale of at least 25 of the specified desert plants. While the bill passed both the House and Senate and had the support of the Senate Natural Resources and the House Agricultural & Livestock committees, it was vetoed by the Governor Rick Perry.

Big Bend and Carbon I and II

Two large coal burning plants, Carbon I and II, are located near Allende, Coahuila, the main coal-producing area of Mexico. The U.S. National Park Service (NPS) has expressed concern about the pollution from these power plants, especially the substantial reduction in visibility they cause. The Carbon II power plant is located approximately 20 miles south of the U.S.-Mexico Border from Eagle Pass. The pollution it produces is more than any other modeled by the NPS. Air quality models show emissions from Carbon I and II are affecting air quality in Big Bend National Park. Summertime visibility in the park can be affected as often as one in five days and for a duration of up to one week. The operation of Carbon I and II is estimated to add between 200,000 and 250,000 tons of sulfur dioxide per year to the atmosphere, an amount equivalent to the seventh largest source in the United States. Despite the fact that the plants comply with Mexico's environmental laws. neither power plant is equipped with scrubber devices or other technology to reduce emissions.[13] Two major field studies have been done to establish the causes of the haze at Big Bend National Park.

The Big Bend Regional Aerosol and Visibility Observational (BRAVO) Study, funded by the U.S. Environmental Protection Agency and the National Park Service, took place during July to October 1999. The primary goals of BRAVO were "to understand the long-range, trans-boundary transport of visibility-reducing particles from regional sources in the U.S. and Mexico and to quantify the contributions of specific U.S. and Mexican source regions and source types responsible for poor visibility at Big Bend NP."[14]

While the BRAVO report[15] concluded that the Carbon power plants had a bigger impact on the pollution levels at Big Bend than any other individual source, it also showed that power plants in Texas and other parts of the U.S. also had important contributions.[16] To date, the TCEQ has taken no action to address the pollution coming from Texas sources that harm air quality at Big Bend National Park.

Excessive Waste

Waste returned to the U.S. from maquiladoras under terms of the La Paz Agreement still concerns Border residents. While the amount returned is small in comparison to waste generated in the U.S., most waste either passing through or for disposal in Texas returns primarily through three ports of entry in El Paso, Laredo, and Brownsville. Of 216 facilities in Texas that treat commercial hazardous waste or provide on-site industrial treatment, only eight are in the Border Region.

Border residents are also concerned about the transportation of hazardous materials. Concerns are heightened because residents often do not know the types and amounts of hazardous materials being transported through or temporarily stored within their communities while awaiting transfer to Mexico.[17]

Many communities in the Border Region also still lack the infrastructure to collect and properly dispose of solid waste. Solid waste disposal problems in Texas are mainly restricted to colonias, where solid waste collection is often inconsistent and inadequate. Compared to the rest of the state, municipal solid waste (MSW) issues stand out as a Border concern. In those areas, access to and affordability of proper MSW collection and disposal systems are limited, frequently resulting in improper waste disposal.

Illegal dumping also continues to be a major issue in the Border Region. A 1997 assessment found illegal dumping to be the most frequently reported Border-wide MSW concern. Used-tire disposal is another rampant problem, with almost four million scrap tires generated in Texas annually. This issue is more acute in the Border region than in the rest of the state.[18]

Perhaps the most well noted battle over illegal dumping and excessive waste on the Border Region deals with ASARCO. Founded in 1899, ASARCO grew to be known as a copper giant, who had plants across the county including one in El Paso, TX. ASARCO has been the target of federal, state and local complaints involving at least 94 sites in 21 states.[19] In 1999 the Environmental Protection Agency (EPA) reached a landmark national $20 million cleanup and penalty settlement with ASARCO. In 2005 ASARCO filed for bankruptcy. In El Paso alone, 1,097 residential homes have been found with lead contamination exceeding 500 parts per million (ppm) and arsenic contamination exceeding 46ppm.[20] In 2002, the U.S. Environmental Protection Agency designated ASARCO as the "potential responsible party" for the contamination. In a newly released document from the Environmental Protection Agency indicates that ASARCO, and its Corpus Christi subsidiary, Encycle, had a permit to extract metals from hazardous waste products but used that as a cover to burn the waste until the late 1990's, saving the high cost of proper disposal.

According to the EPA memo, at least 247 shipments totaling approximately 5,079 tons of hazardous waste that had virtually no metals value, were received and incorporated into Recycle alleged "products". At the time Encycle was to only accept wastes for metals recycling that could contribute in a significant way to the production of metals concentrates.

In addition to accepting waste with no significant value for mixture, Encycle also mixed hazardous waste sludge's into its products. This is a form of "sham" recycling since the hazardous waste sludge had no recycling value. Though mandated by state and federal law this toxic waste was not manifested, not permitted, and thus transported, stored and burned in violation of the law.[21]

Transportation

As U.S. and Mexican trade has increased due to NAFTA, the growth has led to more commercial vehicle traffic at U.S.-Mexico ports-of-entry. U.S.-Mexico trade is mostly moved across land via commercial vehicle. In Texas, 23 international crossings serve as ports-of-entry for trade with Mexico and handle approximately 80 percent of U.S.-Mexico overland trade. This percentage is not expected to change any time in the foreseeable future. Rather, the number of commercial vehicle crossings will grow exponentially over the next 10 to 15 years, creating choke points for trade and negative consequences for the environment.[22]

Enhanced trade has increased the number of northbound commercial vehicle crossings from 2.7 million in 1994 to more than 4.3 million in 2001. In Texas, the Federal Motor Carrier Safety Administration reported that the state had 3.1 million Border crossings in 2000. This is three times more than California, which has the second busiest Border. In fact, Texas was home to the top two busiest crossings – Laredo, with 1.3 million and El Paso, with 725,000 crossings. In this same year, Border bridges at Texas ports-of-entry recorded over 6.7 million commercial vehicle movements, more than half of which had U.S. origins or destinations outside of the state.[23]

In June 2004, the U.S. Supreme Court opened the way for Mexican trucks to travel throughout the U.S., granting the free access intended by NAFTA in 1995. Critics expressed concern, not only because of projected dramatic increases in congestion at ports-of-entry, but also because Mexican carriers do not have to meet U.S. standards for safety, driver certification, pollution controls and hazardous material transport.[24]

In Alpine, Texas, many residents fear that the increased traffic will destroy a growing tourist economy centered almost exclusively on nearby Big Bend National Park. The highway going through town that averaged 50 trucks per day in 2002 is projected to carry as many as 500 trucks per day in the next five years.[25]

Another cause for concern is increased rail traffic carrying hazardous materials. Texas hazardous materials incidents have risen dramatically since 1996, from 1,004 to 1,450 in 2000.[26] The breakdown of these accidents can be seen in the table *Total Rail Accidents/Incidents, 2000.* These accidents appear to correspond with the steady increase in incoming rail container crossings of the U.S.-Mexico Border, which went from 127,570 in 1996 to 239,421 in 2000, in Texas alone.[27]

Total Rail Accidents/Incidents, 2000

Accidents/Incidents	**Fatalities**	**Injuries**
1260	90	777

Source: Bureau of Transportation Statistics State Transportation Profile

Homeland Security

Homeland security concerns have also significantly increased congestion along Texas trade corridors. With no reliable means to filter illicit cross-border activity from the legitimate exchange of goods and people, the response has been to restrict the bi-national transportation arteries.

The complex nature of the U.S.-Mexico Border presents undeniable risks from a homeland-security perspective. With heightened awareness of the need to protect water supplies, there is concern about important watercourses and reservoirs associated with the Rio Grande. Infrastructure such as pipelines, rail lines, dams, and canal systems may easily be viewed as targets. In addition, the heavily industrialized nature of some Border communities raises concerns about the dangers posed by the transport and storage of hazardous materials.

Texas has an Office of Homeland Security in the Governor's Office. Citizens can get general preparedness and safety information at http://www.texashomelandsecurity.com/, and can access the Texas Homeland Security Strategic Plan at http://www.governor.state.tx.us/divisions/press/pressreleases/files/thsplan.pdf.

The merits and effectiveness of specific homeland security measures are subject to debate. But there is no question that some of those measures have had unintended adverse consequences for the environment along the U.S.-Mexico Border. And although the effects are felt across the entire nation, they are acutely felt by U.S.-Mexico Border communities. Prolonged waits at the Border have compounded existing air-quality problems by increasing emissions from idling vehicles, resulting in a negative impact to residents' health.

Effects on the Mexican Border Environment[28]

As noted earlier, U.S. and Mexican government officials argued that increased trade and investment under NAFTA would generate the resources needed to clean up the environment. They also argued that NAFTA would remove incentives for concentrating industrial development along the U.S.-Mexico Border, dispersing environmental damage already occurring there. It is clear, however, that NAFTA-related activity has increased air and water pollution and generated tons of hazardous waste in Mexico. Instead of industrial development being more dispersed throughout the country, it intensified along the Border, inflicting still more environmental degradation in already heavily polluted

areas. During the NAFTA era, the number of maquiladora factories nationwide more than doubled from 1700 plants in 1990 to 3600 in 2001, with 2700 plants located along the Border. According to Mexican government figures, the cost of NAFTA-related environmental damage was an estimated $47 billion in 1999 alone. Meanwhile, the institutions that were set up to facilitate and fund environmental cleanup and protection programs have proven themselves to be wholly inadequate.

Since NAFTA, spending on the environment in Mexico has fallen 45 percent in real terms and plant-level environmental inspections declined at a similar rate. Under Mexican law, hazardous waste created by U.S. companies in the maquila zones must be shipped back to the U.S. for treatment. However, Mexico's Institute of Natural Ecology (INEGI) calculated in 1997 that only 12 percent of eight million tons of hazardous wastes generated in the maquila zones received adequate treatment and as little as 20 percent is actually returned to the country of origin. The only tool to monitor waste flows was the U.S. Government's "Haztracks" database, but it was cancelled in 2003.

While Mexico's general population increased 40 percent between 1980 and 2000, the Border population has more than doubled. Mexico's overcrowded Border cities have struggled to meet their basic sewage and waste disposal needs. The lack of adequate sewer systems means that water sources are contaminated with garbage and human wastes. The rates of diseases related to unsafe water, such as hepatitis A and shigellosis, and those related to failed public health infrastructure, such as tuberculosis, have skyrocketed, with hepatitis A infection rates along the Border more than double the Mexican national rate. Contamination from toxic waste and industrial chemicals has been linked to a concentration of clusters of high cancer rates, birth defects and lupus along the Border.

The new water projects and sewage treatment facilities that NAFTA promised in 1993 have been hamstrung by the cumbersome rules of the institutions designed to fund them. The NADB has an estimated lending capacity of almost $3 billion, but by the end of 2001 had only loaned $15 million, in large part because the impoverished communities involved could not raise the required equity financing and user fees. Meanwhile, between 1991 and 2001, there was a 218 percent increase in truck traffic carrying goods northward from Mexican assembly plants, which has contributed to smog problems along the Border.

An INEGI study estimates the financial costs of environmental degradation at 10 percent of Gross Domestic Product (GDP) from 1988 to 1999, an average of $36 billion U.S. dollars of damage each year. The impact overwhelms the value of economic growth, which has been 2.5 percent annually, or $14 billion U.S. dollars per year. The environmental side institutions created by NAFTA set some important precedents, but were not equipped to address these problems and are buried by environmental needs totalling $36 billion U.S. dollars.

Environmental degradation is occurring because the proper mechanisms were not put in place to help Mexico manage its economic growth in an environmentally

sustainable manner. In preparation for NAFTA, Mexico doubled spending on environmental protection and started a much-needed industrial environmental inspection program. However, shortly after NAFTA was signed and fiscal woes set in, attention to the environment plummeted. According to INEGI, real spending on environmental protection declined by the equivalent of $200 million U.S. dollars since 1994.

CONCLUSION

In 2004, there seems to be a growing concern in Border communities about the broken promises of NAFTA. Even though proponents of free trade agreements prefer to address only economic issues, it is impossible to separate economic issues from social, political, legal, demographic, and environmental issues. Perhaps the greatest failure of NAFTA is that it was not a more comprehensive agreement with emphasis on social and environmental infrastructure investment and on economic and political reform. While such a comprehensive approach was probably not possible given the political realities of the time, the NAFTA approach may make economic convergence and sustainable development unattainable for the foreseeable future.

This chapter was written in conjunction with Wesley Leonard and Cynthia Conroy, Center for Environmental Resource Management, University of Texas at El Paso

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